

OIE Collaborating Centres Reports Activities

Activities in 2019

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Title of collaborating centre:	Emerging and Re-Emerging Zoonotic Diseases
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ToR: To provide services to the OIE, in particular within the region, in the designated specialty, in support of the implementation of OIE policies and, where required, seek for collaboration with OIE Reference Laboratories

ToR: To identify and maintain existing expertise, in particular within its region

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by the OIE

Disease control	
Title of activity	Scope
Taking a Multisectoral, One Health Approach: A Tripartite Guide to Addressing Zoonotic Diseases in Countries (TZG)	The CDC One Health Office provided financial, technical, and in-kind support in the development of all aspects of the TZG. The Collaborating Centre provided multiple CDC subject matter experts to serve on the TZG and associated working groups. CDC made significant contributions through providing technical expertise to the writing and development of the TZG. CDC promoted the TZG during the launch as well as updated content (e.g. additional languages) to their extensive global network of human, animal, and environmental health experts. Additionally, the CDC Loaned Expert to OIE and the CDC Loaned Expert to the Food and Agriculture Organization of the United Nations (FAO) served as OIE or FAO representatives to the Tripartite Secretariat managing the TZG project to provide technical expertise and coordination throughout all stages of the TZG development.
Support development of Operational Tools (OTs) to support implementation of the guide, "Taking a Multisectoral, One Health Approach: A Tripartite Guide to Addressing Zoonotic Diseases in Countries (TZG)" including tools for Joint Risk Assessment, Multisectoral, One Health Coordinating Mechanisms, and Surveillance and Information Sharing	The CDC One Health Office provided financial, technical, and in-kind support in the development of Operational Tools to support the implementation of the TZG. The Collaborating Centre provided multiple CDC subject matter experts to serve as members of technical working groups for OT development including Joint Risk Assessment, Multisectoral, One Health Coordinating Mechanisms, and Surveillance and Information Sharing. CDC made significant contributions through providing technical expertise to the development of the TZG OTs and associated materials including designing an electronic tool platform for the Surveillance and Information Sharing OT. The CDC Loaned Expert to the OIE served as a member of the three OT working groups as an OIE representative and also supported the TZG secretariat. The CDC Loaned Expert to FAO has led the workgroup and development of the TZG Surveillance and Information Sharing Operational Tool, including organizing and leading two Expert Consultation development meetings at FAO.
Desk Review: One Health Materials, Processes and Activities	CDC experts contributed to a desk review of One Health materials, processes, and activities to support an OIE led project. This desk review provides information that allows partners to best assist OIE member countries in building One Health capacity. Over the past year, this document has been used as a reference by the Tripartite and other global partners including for composing lists of available One Health resources and for the development of the TZG Surveillance and Information Sharing Operational Tool.
Healthy Pets, Healthy People	CDC's One Health Office manages the Healthy Pets, Healthy People website. This website provides up-to-date information on zoonotic diseases related to pets, livestock, and wildlife, including U.S. outbreaks linked to animals and animal products. The website also provides resources for public health and animal health officials; educational materials on staying healthy around animals; guidelines for preventing zoonoses in infants, the immunocompromised, and in public settings such as petting zoos; and resources for pet owners on how to prepare pets for disasters. This website is used globally by >50 countries annually and is among the top 100 CDC sites. www.cdc.gov/healthypets

Brucellosis One Health Guidance and Tools	<p>CDC's One Health Office, in partnership with CDC's Bacterial Special Pathogens Branch and FAO, have developed a toolkit called the Brucellosis One Health Guidance and Tools (BOHGAT). The BOHGAT includes a guidance document that builds upon FAO's existing stepwise approach model for disease control, and a spreadsheet-based self-assessment tool, the Staged Tool for the Elimination of Brucellosis (STEB), that countries can use to assess their capacity to prevent, control, and eliminate brucellosis. The STEB has undergone piloting in eight countries and is being prepared for finalization and publication.</p>
Influenza and Zoonoses Education for Youth in Agriculture in the United States	<p>The U.S. Centers for Disease Control and Prevention has worked with the Council of State and Territorial Epidemiologists (CSTE) to promote a One Health collaboration between federal, state, and local public health and animal health authorities and state youth agriculture groups through a program called Influenza and Zoonoses Education Among Youth in Agriculture. This innovative program educates youth about zoonotic diseases shared between animals and people, delivers disease prevention messages, and strengthens One Health networks among state human and animal health departments and agricultural communities across rural America. For more information and to access globally available prevention resources, please visit www.cdc.gov/onehealth/pdfs/youth-in-ag-508.pdf and www.cdc.gov/onehealth/domestic-activities/index.html</p>
Operationalizing One Health in the Arctic	<p>CDC's Arctic Investigations Program (AIP) in Anchorage, Alaska has led and participated in One Health activities related to the health of Arctic populations, zoonotic diseases and developing relationships with stakeholders in Alaska and internationally. These include:</p> <ul style="list-style-type: none"> -AIP Director participates in the Arctic Council's One Health initiative. Begun under the US Chairmanship in 2015, "Operationalizing One Health in the Arctic" was a joint effort of the US Department of State and CDC. Activities are ongoing through the Arctic Council, under Iceland's chairmanship (2019-21). Accomplishments over the past year include: <ul style="list-style-type: none"> oArctic Council One Health Table Top Exercise, Dec 10-11, 2018 in Ottawa, Canada oFinland hosted a conference called "One Arctic - One Health", Feb 7 - 9, 2019 in Oulu, Fi. Details can be found here: www.oulu.fi/thule/onehealth oOne Health Zoonotic Disease Prioritization Workshop, March 20-21, 2019 in Fairbanks, Alaska. Details can be found here: www.cdc.gov/onehealth/global-activities/prioritization.html oIceland hosted the Arctic Circle Assembly, Oct 10-12, 2019 in Reykjavik, Iceland. <p>Details can be found here: www.arcticcircle.org/</p>
Alaska One Health Workgroup	<p>AIP has co-lead a quarterly Alaska One Health Workgroup meeting and webinar with the Alaska Native Tribal Health Consortium since 2013. Participants include federal, state, tribal, university and local stakeholders. Meetings focus on situational awareness using reports from Local Environmental Observer network and agency updates. Scientific presentations and hot topics are covered. Ongoing themes include unusual mortality events in wildlife, zoonotic disease emergence, environmental toxin accumulation and food security. The events are announced through the IARPC collaborations website: www.iarpcollaborations.org</p> <p>The archive of webinars can be found here www.leonetwork.org/en/leo/hubpage/ALASKA?show=one-health-group</p>

Interagency Arctic Research Policy Committee	AIP's Director represents CDC on the Interagency Arctic Research Policy Committee, an US government committee charged with coordinating and carrying out the US Arctic Research Plan. The most recent plan features a specific One Health objective (1.1) and performance elements (1.1.1 -1.1.5); all require interagency collaboration and most engage CDC subject matter experts related to zoonotic diseases or Alaska Native health concerns. The 2017 -2021 US Arctic Research Plan and implementation progress can be found here: www.iarpcollaborations.org/plan/index.html
Infectious Disease Prioritization for Multijurisdictional Engagement at The United States Southern Border Region	<p>Building on progress from Spring of 2018 using the One Health Zoonotic Disease Prioritization tool, U.S.-Mexico Unit finalized plans, to address gaps in surveillance, response, and other activities for the prioritized diseases for the US southern border region. The prioritized diseases are tuberculosis, Aedes mosquito-transmitted arboviral diseases (dengue, chikungunya, Zika), enteric diseases (Vibrio spp., Listeria monocytogenes, non-typhoidal Salmonella (NTS), and Brucella spp.), and rickettsioses (R. rickettsii, R. typhi, R. parkeri).</p> <p>The prioritization process began with a preliminary list of 20 diseases developed through previous border health initiatives involving CDC, state and local public health, and federal partners operating in the southern border states. During a September 2018 workshop, representatives defined criteria and corresponding weights for prioritization, and developed questions to categorize each disease by criteria. After analyzing the diseases against the criteria, the group prioritized the four infectious diseases or disease groupings listed above. Preliminary recommendations for collaborative actions were elicited at the meeting, with further discussion during three post-meeting webinars held in 2019.</p>
Zoonotic Influenza Disease Control Activities	<p>CDC Influenza Division's mission is to improve global control and prevention of seasonal and novel influenza and improve influenza pandemic preparedness and response. In collaboration with domestic and global partners, the Influenza Division accomplishes this by building surveillance and response capacity, monitoring and assessing influenza viruses and illness, improving vaccines and other interventions, and applying research to provide science-based enhancement of prevention and control policies and programs. Examples of activities to improve domestic and global zoonotic influenza disease control included:</p> <ul style="list-style-type: none"> • Monitor and report novel human infections with zoonotic influenza viruses in the United States • Monitor human infections with zoonotic influenza viruses and outbreaks of animal influenza viruses domestically and internationally • Through the Influenza Risk Assessment Tool, assess the potential pandemic risk posed by influenza A viruses that currently circulate in animals but not in humans • Assess virus evolution and global emergence patterns of zoonotic influenza viruses, to improve potential mitigation efforts for pandemic preparedness and response • Generation and assessment of pre-pandemic candidate vaccine viruses targeting globally detected zoonotic influenza viruses and collaboration with government agencies and industry to prioritize vaccine development for pandemic preparedness
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Continued Increase in Human Salmonella Infections Linked to Contact with Live Poultry and Partnerships for Prevention	<p>Epidemiologic, laboratory, and traceback findings linked several outbreaks of human Salmonella infections to contact with chicks, ducklings, and other live poultry from multiple hatcheries. In 2019, over 1,000 illnesses, the largest number ever reported in a single year, were reported from almost every state in the United States. CDC is actively working with industry partners to develop new strategies to address this significant public health concern.</p> <ul style="list-style-type: none"> • Outbreak details: www.cdc.gov/salmonella/backyardpoultry-05-19/index.html • Partnerships: www.cdc.gov/nceid/what-we-do/partnership-in-action/prevent-salmonella-flocks.html

<p>Multidrug-resistant Salmonella Infections Linked to Contact with Pig Ear Pet Treats</p>	<p>CDC, multiple states, and the Food and Drug Administration's Center for Veterinary Medicine investigated a multidrug-resistant outbreak of Salmonella infections linked to contact with pig ear pet treats. Over 150 people were sickened from 34 states. Many brands of pig ear pet treats tested positive for Salmonella, including some that were labeled as irradiated. Many of the pig ears treats were imported from Argentina, Brazil, and Colombia. FDA continues to work with companies to identify sources of contamination. Details at: www.cdc.gov/salmonella/pet-treats-07-19/index.html</p>
<p>Multistate Salmonella Illness Outbreak Infections Linked to Contact with Pet Hedgehogs</p>	<p>CDC and several states investigated a multistate outbreak of Salmonella Typhimurium infections linked to contact with pet hedgehogs. Over 50 people were sickened from 23 states. Details at: www.cdc.gov/salmonella/typhimurium-01-19/index.html</p>
<p>Multistate Salmonella Illness Outbreak Infections Linked to Contact with Pet Turtles (ongoing)</p>	<p>CDC and several states are investigating a multistate outbreak of Salmonella Oranienburg infections linked to contact with pet turtles with shell lengths greater than four inches/10.1 centimeters in length. Most turtles were purchased at pet stores. As of October, 21 people were sickened from 13 states. This investigation is ongoing. Details at: www.cdc.gov/salmonella/typhimurium-01-19/index.html</p>
<p>AR Threats Report</p>	<p>CDC published the Antibiotic Resistance Threats in the United States (AR Threats Report) indicating that antibiotic-resistant bacteria and fungi cause more than 2.8 million infections and 35,000 deaths. When Clostridioides difficile—an infection that is not typically resistant but is associated with antibiotic use—is added, the total number of cases exceeds 3 million infections and 48,000 deaths. Using electronic health data for the first time, CDC applied the new methods to recalculate the overall burden of AR healthcare-associated infections previously published in 2013.</p> <p>Antibiotic resistance remains a significant One Health problem, affecting humans, animals, and the environment. The 2019 report highlights the One Health actions and partnerships the U.S. has spearheaded, including forming the Transatlantic Taskforce on Antimicrobial Resistance (TATFAR), serving as a founding member of the Global Antimicrobial Resistance Research and Development Hub, and establishing national programs to detect, prevent, and treat antibiotic-resistant infections. Implementing this work across settings addresses the global challenge to prevent antibiotic-resistant infections and slow their spread.</p> <p>The 2019 report shows that prevention efforts work, however, it is critical the United States continue to take a global, One Health approach to combatting antibiotic resistance.</p>
<p>AMR Challenge</p>	<p>The United States celebrated the success of the AMR Challenge in September during the United Nations General Assembly in New York, receiving nearly 350 commitments from 33 countries to combat AMR globally. The Challenge, in coordination with HHS, is one of the most ambitious global initiatives to date. Committed organizations represent more than 10,000 healthcare facilities globally, and nearly half of the commitments focus on improving infection prevention and control or improving antibiotic use in human medicine or in agriculture.</p> <p>These commitments include more than 40 food and animal organizations committed to improving antibiotic use, including multiple global companies. Additionally, more than 50 pharmaceutical and biotech groups committed to develop or provide access to products that will prevent and treat resistant infections. Notably, the Food and Drug Administration approved a new drug regimen, supported by The TB Alliance, to treat drug-resistant tuberculosis. There were also significant commitments related to safe drinking water, sanitation, and hygiene (WASH) and developing or providing access to vaccines, diagnostics, or therapeutics to prevent or treat antibiotic-resistant infections.</p>
<p>Surveillance of viral hemorrhagic fevers in India</p>	<p>In cooperation with the National Virus Institute, CDC expanded surveillance of the geographic distribution of Kyasansur Forest Disease and Nipah virus, providing technical assistance and supplies for surveillance in bats.</p>
<p>Ebola outbreak response support in the Democratic Republic of Congo</p>	<p>From 25 July 2018 through 19 December 2019, 358 CDC staff participated in a combined 563 deployments in response to the Ebola outbreak in the Democratic Republic of the Congo (DRC): 252 deployments to DRC; 85 to Uganda; 52 to Rwanda; 48 to South Sudan; and 126 to WHO headquarters in Switzerland. CDC deployers are providing a range of expertise, including infection prevention and control, epidemiology, and social and behavioral scientists working to improve relationships with community members. CDC is assisting the DRC Ministry of Health with capacity building in infectious disease prevention activities such as evaluating vaccine data, establishing DRC's National Emergency Operations Center, and supporting DRC's national reference laboratory. The agency's permanent country offices in Uganda, Rwanda, and South Sudan have also made long-term disease control and capacity-building investments in those countries, and CDC has deployed additional staff there to assist in Ebola preparedness by improving border health measures at points of entry, implementing surveillance systems to detect suspected Ebola cases as quickly as possible, building local Ebola laboratory testing capacity, improving infection prevention and control in health care facilities, and planning preventive vaccination of health care workers.</p>

Multiple country VHF outbreak response support	Including deployment of mobile laboratories when requested by countries, CDC aided response to Ebola in DRC, Lassa in Liberia, Ebola, Marburg, RVF and CCHF in Uganda, preparation for Ebola in Rwanda and South Sudan, and Chapare virus in Bolivia.
Expanding VHF surveillance and diagnosis in Uganda	Maintained and expanded surveillance in-country for viral hemorrhagic fevers. Expansion included training for case recognition and management for health professionals, providing reagents and training for diagnostic testing, and completing renovation of the VHF diagnostic laboratory at Uganda Virus Research Institute. UVRI is also performing enhanced surveillance/assessment for Rift Valley Fever and CCHF in human and livestock populations across the country to help target surveillance and health education and interventions.
Implementing surveillance protocols for brucellosis in Jordan	Initial implementation of brucellosis surveillance protocol in East Amman, Al-Mafraq and Karak directorates with the Jordan University of Science and Technology (JUST). The program has begun the first batch of sample confirmatory testing sent to CDC in December 2019.
Canine-mediated rabies outbreak in Hispaniola (Haiti and Dominican Republic)	CDC provided in-country assistance in Haiti and Dominican Republic in response to a bi-national rabies outbreak. Over 30,000 dogs were vaccinated as part of this response to prevent expansion of the outbreak.
Technical assistance and financial support for rabies surveillance	CDC provided technical expertise and financial support for laboratory-based surveillance for rabies in Haiti, Peru, India, Malawi, Ethiopia, Pakistan, Bangladesh, and Vietnam. CDC also conducted risk assessment and modeling studies for rabies in Uganda, Bangladesh, China, Haiti, Guatemala, and Vietnam.
Leptospirosis response in Federated States of Micronesia	Deployed staff to provide technical assistance to investigate a potential leptospirosis outbreak in Yap State.
Outbreak response to Monkeypox in multiple countries	Nigeria: In support of the outbreak response of monkeypox, CDC has tested samples of suspect cases for confirmation and for sequencing. DNA sequencing informed the response by distinguishing if cases are human-to-human or zoonotically transmitted. CDC also provided subject matter expertise to monkeypox outbreak investigations in Singapore, DRC, Cameroon, Liberia, and Sierra Leone.
Rocky Mountain spotted fever (RMSF) outbreaks in Mexico	Enhanced efforts from subject matter experts at CDC to improve surveillance and understanding of ongoing Rocky Mountain spotted fever (RMSF) outbreaks in the two northern states most impacted by the disease, Baja California and Sonora. Engagement includes Memorandums of Understanding with Universities, medical schools, and ministries of health prioritizing community-based prevention, clinical education, and the validation of new PCR-based diagnostic assays. CDC further continues to support the training of Mexican scientists, physicians, and public health professionals in diagnostic methods, epidemiology, and clinical education.
Zoonotic Influenza Activity in the United States	CDC Influenza Division collects and analyzes information on domestic influenza through year-round routine surveillance activities and sporadically detects zoonotic infections which are genetically and antigenically characterized to select pre-pandemic candidate vaccine viruses for targeting emerging zoonotic and animal-origin viruses. CDC also collaborates with partners to guide public health and clinical recommendations and conduct risk assessments on animal influenza A viruses to understand their zoonotic/pandemic potential. Key activities included: <ul style="list-style-type: none"> • Continued response monitoring through mid-January 2019 to a confirmed outbreak of low pathogenic avian influenza (LPAI) A(H5N2) virus of N. American wild bird lineage, detected in Minnesota, October-November 2018 • Continued monitoring of animal influenza activity, including avian, swine, equine, and canine influenza • Provided public communication and technical support to Michigan for a human infection of a zoonotic (novel) influenza A(H1N1) variant virus • Deployed mobile sequencing platforms to detect and genetically characterize influenza viruses in exhibition swine in real-time • Collaborated with The Ohio State University to characterize swine influenza viruses collected from exhibition pigs • Partnered with USDA to characterize domestic swine influenza viruses to assess antigenic cross-reactivity with pre-pandemic candidate vaccine viruses

<p>Zoonotic Influenza Activity in Multiple Countries</p>	<p>CDC Influenza Division’s International Program strategic objectives are to 1)optimize surveillance of seasonal influenza viruses, 2)monitor atypical viruses, investigate outbreaks, and contribute to the risk assessments, 3)address critical gaps in knowledge about influenza prevention and control that can directly guide policy, and 4)facilitate the development of prevention and control programs. Influenza Division provided technical support to >80 countries and monitored animal influenza outbreaks in >30 countries. Examples of zoonotic influenza projects include the following.</p> <ul style="list-style-type: none"> •Assessed the emergence of novel avian influenza viruses in Vietnam •Piloted integration of approved point-of-need molecular diagnostic RT-PCR technologies to improve surveillance at the animal-human interface in Lao •Enhanced Vietnam Department of Animal Health’s laboratory capacity to prepare and respond to emerging avian influenza viruses •Conducted surveillance of avian influenza viruses in live poultry markets in Bangladesh, Cambodia, Vietnam and Laos to identify circulation of low and highly pathogenic avian influenza viruses •Genetic and antigenic characterization of human infections with avian influenza A(H9N2) viruses detected in Oman and India •Genetic and antigenic characterization of a human infection of avian influenza A(H7N9) virus detected in China and a human infection of A(H5N1) detected in Nepal
<p>Global Disease Detection Operations Center</p>	<p>Prominent United States Government (USG) Source for Epidemic Intelligence: the Global Disease Detection Operations Center (GDDOC) monitors outbreaks across the globe and assesses their potential risk to the global one health community.</p> <ul style="list-style-type: none"> •The GDDOC was established in 2007 to address weaknesses or gaps in global public health surveillance and response capacity. The GDDOC monitors outbreaks from infectious and non-infectious causes, including public health events attributable to disasters, intoxications, and chemical, radiological, or nuclear events. Of note, zoonotic diseases are also monitored to assess whether emerging or re-emerging disease outbreaks among humans are occurring. •The GDDOC conducts event-based surveillance, which includes scanning numerous sources of information about disease events and other health threats -- searching the internet and other media for key words in over 50 languages. <p>By conducting event-based surveillance, the GDDOC is able to better position CDC to respond to public health threats earlier. Through rapid information gathering, prompt verification, and timely dissemination of information, the GDDOC ensures that CDC is always prepared to respond to an outbreak among humans or animals.</p>
<p>Global Disease Detection Operations Center Responses</p>	<p>With the collaboration of multiple CDC centers, including NCEZID, the GDDOC supported multiple One Health-related responses during 2019, including:</p> <ul style="list-style-type: none"> •Ebola, the Democratic Republic of the Congo •Rabies, Haiti •Rabies, Dominican Republic •Dengue, Honduras •Dengue, Republic of the Marshall Islands •Dengue and leptospirosis, Micronesia •Lassa fever, Sierra Leone
<p>Training, capacity building</p>	
<p>Title of activity</p>	<p>Scope</p>

<p>OIE Scientific and Technical Review, Vol. 38 (1), April 2019: "Successes and remaining challenges within the One Health approach"</p>	<p>Two experts from the CDC One Health Office served as coordinators, editors, and reviewers for the published OIE Scientific and Technical review issue titled "Successes and remaining challenges within the One Health approach" which covers numerous topics on emerging and reemerging zoonotic diseases and related One Health issues. These CDC experts worked closely with OIE's Publications Unit to identify specific topics and authors, develop and co-author manuscripts, and edit the content for this issue. Multiple CDC subject matter experts were also co-authors for several manuscripts in this issue.</p>
<p>One Health Zoonotic Disease Prioritization (OHZDP) Workshops in multiple countries</p>	<p>Experts from CDC's One Health Office work with partners to conduct OHZDP workshops to bring together representatives from human, animal, and environmental health sectors, as well as other relevant partners, to prioritize zoonotic diseases of greatest concern for multisectoral, One Health collaboration in a country, region, or other area and develop next steps and action plans to address the priority zoonotic diseases in collaboration with One Health partners.</p> <p>The OHZDP Process uses a transparent, collaborative approach that incorporates equal input from all represented One Health sectors. These workshops help connect representatives from different sectors that strengthens multisectoral, One Health collaboration, coordination, and communication, supports the creation or strengthening of multisectoral, One Health coordination mechanisms, helps participants focus limited resources to build capacity, is adaptable to local context and scalable for use at the subnational, national, and regional levels.</p> <p>In 2019, three national workshops were conducted in China, Colombia, and Ethiopia and a state-level workshop was conducted in Alaska. Zoonotic diseases commonly prioritized include rabies, zoonotic influenza, viral hemorrhagic fevers such as Ebola virus and Rift Valley fever, anthrax, and brucellosis. Additional details can be found at: www.cdc.gov/onehealth/global-activities/prioritization.html</p>
<p>One Health Zoonotic Disease Prioritization Process Facilitator Trainings in multiple countries and regions</p>	<p>CDC's One Health Office conducted four facilitator trainings on the One Health Zoonotic Disease Prioritization Process for ministerial representatives from multiple countries and FAO and WHO staff from many regions. During these facilitator trainings, CDC facilitator trainers trained 54 facilitators representing the countries of Cambodia, China, Colombia, Japan, LAO PDR, Malaysia, Myanmar, Philippines, Republic of Korea, Singapore, and Thailand, as well as regional representatives from Africa, Europe, Central Asia, Middle East, and Southeast Asia.</p>
<p>Ecologic sampling of VHF in wildlife, Uganda</p>	<p>Trained staff at the Uganda Wildlife Authority in ecological sampling/surveillance. Provided refresher training for ecological surveillance on pathogens in bats at UVRI and enhanced their ability to perform next-generation sequencing.</p>
<p>Molecular diagnostics for anthrax in Uganda</p>	<p>Provided a three-day training on molecular diagnostics for anthrax to UVRI staff and select representatives from national human health, environmental, and veterinary labs.</p>
<p>Molecular diagnostics for brucellosis in Cameroon</p>	<p>Training of human laboratories on molecular diagnostic techniques and sub-typing of circulating Brucella species from human specimens.</p>
<p>Geographic Information System mapping in Cameroon</p>	<p>Conducted a 4-Day global information system (GIS) training for participants from various sectors of the Cameroon Government. Training focused on mapping anthrax outbreaks covering a range of topics and analytical methods.</p>

Comprehensive diagnostic training for brucellosis in Jordan	Trained laboratorians in the Ministries of Health and Agriculture on multiple brucellosis diagnostic tests. Conduct a one-week training in Amman, Jordan at the Jordan University of Science and Technology (JUST) laboratory on a wide span of brucellosis diagnostic methods. Provided refresher training to clinicians and veterinary workers on brucellosis symptomology, case definitions, laboratory criteria, and standardized case reporting.
Influenza Global Systems Development in Multiple Countries	CDC Influenza Division's international capacity-building efforts have led to substantial improvements in foreign countries' ability to conduct influenza surveillance and detect emerging virologic threats. Progress was made in the quality of influenza testing and the extent to which countries report data to WHO FluNet and contribute to vaccine strain selection.
Zoonoses	
Title of activity	Scope
Preventing, Detecting, and Responding to Emerging and Reemerging Zoonotic Diseases	Details on a number of zoonotic disease activities around the globe are cross reported in other sections of this report.
Suspending importation of dogs from Egypt due to risk of canine rabies virus variant	<p>In January 2019, a dog infected with canine rabies variant virus (CRVV) was imported into the U.S. from Egypt, the third such case from Egypt since 2015. On May 10, 2019, CDC published a Federal Register Notice titled, "Notice of Temporary Suspension of Dogs Entering the United States from Egypt". CDC acted to protect public health and prevent the reintroduction of CRVV, which has been eliminated from the U.S. since 2007. From July-November 2019, CDC coordinated with state and federal partners to review the suspension, evaluate rabies status of dogs whose owners applied for import permits from Egypt, and conduct a risk assessment. Importers of dogs originating from Egypt must apply for a CDC permit and provide proof of age, vaccination status, and permanent identification to be eligible to import dogs from that country. The suspension revealed that the number of dogs coming from Egypt for adoption/rescue and as personal pets was severely underestimated. Nearly 40% of applicants asking for an exemption to the ban did not have proof their dog was protected against rabies and could pose a risk to U.S. public health.</p> <p>Review of data from other CRVV-free countries and discussion with federal partners revealed the risk of CRVV importation may be higher than initially thought. Therefore, the suspension will remain in place until CDC publishes additional mitigation measures in the Federal Register.</p>
Diagnosis, biotechnology and laboratory	
Title of activity	Scope
Rapid Diagnostic Testing for leptospirosis in Indonesia and Bangladesh	<p>Introduced use of leptospirosis rapid diagnostic tests (RDTs) for surveillance in Jakarta and satellite sites in East Java. Provided lab supplies to perform Microscopic agglutination testing (MAT) for leptospirosis.</p> <p>Worked with the Institute of Epidemiology, Disease Control and Research (IEDCR) of Bangladesh to validate the use of leptospirosis RDTs for presumptive diagnosis at 10 hospital sites.</p>

Laboratory technical assistance for Viral Hemorrhagic Fevers in multiple countries	CDC provided diagnosis, biotechnology and laboratory technical assistance for VHF programs in Liberia, Burkina Faso, Colombia, Bolivia, Sierra Leone, Liberia, Uganda, Bangladesh, India, Iraq, Pakistan, Afghanistan, EUA, Kazakhstan, Rwanda, Sudan and South Sudan.
Reference testing for Monkeypox in multiple countries	CDC provided reference laboratory testing or genomic analysis of human monkeypox specimens from the Democratic Republic of the Congo, the Republic of the Congo, Nigeria, Sierra Leone, Liberia, and Singapore.
Zoonotic Influenza Laboratory Activities	<p>CDC Influenza Division provides diagnostic and laboratory support to domestic and international partners related to zoonotic influenza virus detection and characterization. Select 2019 laboratory activities include the following.</p> <ul style="list-style-type: none"> • Strengthening global influenza laboratory surveillance through improved diagnostic capacity through provision of reagents and support of training. • The International Reagent Resource (IRR) website at www.influenzareagentresource.org serves as the program's online hub for managing more than 1000 annual requests for influenza reagents. <p>o Laboratories can view the IRR's catalog of 700+ influenza reagents and submit their requests electronically, as well as download product information sheets and certificate of analyses.</p> <ul style="list-style-type: none"> • Strengthening global coordination of and communication with WHO's Global Influenza Surveillance and Response System (GISRS) by supporting periodic National Influenza Center (NIC) surveys. • Supporting NICs to attend the WHO vaccine composition consultations in September and February.
Vaccines	
Title of activity	Scope
Rift Valley Fever vaccine development	CDC has developed a live-attenuated Rift Valley fever (RVF) vaccine named DDvax, an RVF virus missing two genes encoding for virus virulence factors. This work is in collaboration with the Colorado State University and University of California at Davis.
Crimean-Congo Hemorrhagic Fever vaccine development	CDC has also developed a prototype vaccine for Crimean-Congo Hemorrhagic Fever Virus (CCHFV). This novel vaccine uses virus-like particles that use the CCHFV surface antigen but lack the surface glycoprotein gene. The vaccine was tested and shown to be safe and highly efficacious in a small animal model.
Clinical trial of Monkeypox vaccine in DRC	CDC is performing a clinical trial of JYNNEOS™ monkeypox vaccine in 1,600 healthcare workers in a monkeypox-endemic area of the Democratic Republic of the Congo.
Providing materials for Rabies vaccine in multiple countries	CDC provided rabies virus vaccine strains and challenge chains through technical transfer to Belarus, Brazil, China, and Mexico.

Zoonotic Influenza Vaccine Activities	<p>CDC's Influenza Division contributes to the genetic and antigenic analyses of influenza A viruses with zoonotic or pandemic potential in order to make recommendations and develop Candidate Vaccine Viruses (CVV) for pandemic preparedness. Key activities:</p> <ul style="list-style-type: none"> • Assessment of the genetic and antigenic properties of Asian lineage avian influenza A(H7N9) CVVs and cross reactivity testing with emerging A(H7N9) viruses • Performed antigenic testing of A(H7N9) CVVs developed by others to verify their cross-reactivity with parental strains. These studies led to collaborations with vaccine manufacturers to evaluate A(H7N9) CVVs for use in clinical trials <ul style="list-style-type: none"> • Based on the analyses performed by the Influenza Division and partners, WHO recommended the development of new CVVs derived from emerging A(H5N6), A(H7N4) and A(H7N9) zoonotic influenza novel viruses. These CVVs can be used for vaccine production, clinical trials, stockpiling and other pandemic preparedness purposes • A human infection of A(H1N1) variant virus was identified and, with USDA, the virus was compared to influenza A(H1N1) viruses found in domestic pigs to understand possible exposure sources • Surveillance of avian influenza viruses in live poultry markets in Bangladesh, Laos and Vietnam identified ongoing circulation of low pathogenicity A(H9N2) viruses and highly pathogenic A(H5) viruses. Identified emerging lineages of viruses causing outbreaks in poultry in Vietnam
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ToR : To propose or develop methods and procedures that facilitate harmonisation of international standards and guidelines applicable to the designated specialty

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the surveillance and control of animal diseases, food safety or animal welfare

Proposal title	Scope/Content	Applicable area
Collaborating for the Implementation of the Revised International Health Regulations National Surveillance and Response Capacity	CDC works to assure that the IHR process will be accommodated during all investigations, surveillance activities, and research when appropriate. Whenever possible, animal and human components are sharing biologic isolates and epidemiologic data to facilitate the control and containment of disease.	<input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input type="checkbox"/> Animal welfare

ToR: To establish and maintain a network with other OIE Collaborating Centres designated for the same specialty, and should the need arise, with Collaborating Centres in other disciplines

ToR: To carry out and/or coordinate scientific and technical studies in collaboration with other centres, laboratories or organisations

3. Did your Collaborating Centre maintain a network with other OIE Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Multiple OIE CCs/RLs/other organizations	Multiple	<input checked="" type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East	CDC is in communication with multiple collaborating centres, reference laboratories, and other organizations from multiple countries and regions to maintain a network and share information on One Health activities related to emerging and re-emerging zoonoses.

4. Did your Collaborating Centre maintain a network with other OIE Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Centers for Disease Control and Prevention; United States Department of Agriculture; National Institutes of Health; Food and Drug Administration; Environment Protection Agency; U.S. Department of the Interior: National Park Service, U.S. Fish and Wildlife Service, U.S. Geological Survey; U.S. Department of Homeland Security; U.S. Department of Defense; Defense Threat Reduction Agency; U.S. Department of Labor, U.S. Agency for International Development, and others	United States	<input checked="" type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East	<p>To communicate, coordinate, and collaborate on projects related to One Health; Approaches to prevention and control of emerging and re-emerging zoonotic diseases;</p> <p>To identify and pursue opportunities to improve efficiency outcomes for human, animal, and environmental health across the U.S. government.</p>
Food and Agriculture Organization, World Health Organization	International	<input checked="" type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East	<p>To communicate, coordinate, and collaborate on projects related to One Health; Approaches to prevention and control of emerging and re-emerging zoonotic diseases;</p> <p>To identify and pursue opportunities to improve efficiency outcomes for human, animal, and environmental health.</p>

ToR: To place expert consultants at the disposal of the OIE.

5. Did your Collaborating Centre place expert consultants at the disposal of the OIE?

Yes

Name of expert	Kind of consultancy	Subject
Casey Barton Behravesh, MS, DVM, DrPH, DACVPM	Technical Assistance, Attendance at OIE Meetings, Steering committee Members, Editor of the published OIE Science and Technical Review	One Health, global health security, emerging and reemerging zoonoses, surveillance, outbreak investigation and response, antimicrobial resistance, public health, and World Animal Health Information System + Steering Committee
Julie R. Sinclair, MA, DVM, MPH, DACVPM	CDC Loaned Expert and One Health Liaison to OIE; Co-editor of the published OIE Science and Technical Review	Global health security, emerging and reemerging zoonoses, border health, surveillance, laboratory capacity, workforce development, joint risk assessment, antimicrobial resistance, and World Animal Health Information System + Steering Committee
Sean Shadomy, DVM, MPH, DACVPM	CDC Loaned Expert and One Health Liaison FAO; Technical assistance (Ad hoc Working Group observer), OIE ad hoc Group on Rabies (Oct 2019); Technical assistance (contributor), Kiosk on Rabies at 87th OIE General Session (May 2019); Technical assistance (contributing author), Rev Sci Tech Off Int Epiz. 2019;38 (1). doi: 10.20506/rst.38.1.2942	Global health security, emerging and reemerging zoonoses, bioweapons/weapons of mass destruction, surveillance, laboratory capacity, outbreak investigation and response, and antimicrobial resistance
Laura Smith Murrell	Communications Assistance	OIE WAHIS+ communication strategy
Ryan M. Wallace, DVM, MPH	Technical Assistance, Ad-hoc Committee Member on Rabies, Head of the OIE Reference Laboratory for Rabies, Technical assistance on Chapter on Rabies Surveillance for the OIE Terrestrial Manual, Technical Assistance to United Against Rabies	Rabies
Multiple CDC Subject Matter Experts	Technical Assistance	One Health, Zoonotic Diseases

ToR: To provide, within the designated specialty, scientific and technical training to personnel from OIE Member Countries

6. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by the OIE, to personnel from OIE Member Countries?

Yes

- a) Technical visits: 50
- b) Seminars: 25
- c) Hands-on training courses: 20
- d) Internships (>1 month): 30

Type of technical training provided (a, b, c or d)	Content	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
b	CDC's One Health Office hosts the Zoonoses and One Health Updates (ZOHU Call), a monthly webinar to provide the latest news and resources on zoonoses and other One Health issues, including public health and animal health professionals working in government, non-governmental organizations, industry, and academia. ZOHU calls offers continuing education for a variety of health professionals. For more information on the ZOHU calls or to access archived webinar recordings, please visit: www.cdc.gov/onehealth/zohu/index.html	USA	13000
d	CDC's One Health Office hosted Epidemiology Elective Students and graduate student interns to provide public health training; students supported work on OIE projects	USA	16
c	CDC's One Health Office and other trained CDC facilitators conducted a training on the One Health Zoonotic Disease Prioritization Process in China	China	6
c	CDC's One Health Office and other trained CDC facilitators conducted a training on the One Health Zoonotic Disease Prioritization Process in Colombia	Colombia	8
c	CDC's One Health Office conducted a One Health Zoonotic Disease Prioritization (OHZDP) Facilitator Training in collaboration with FAO. The training was held for 20 FAO and WHO staff from multiple regions around the world. These trained facilitators will work with the One Health Office to support future OHZDP trainings and workshops for human, animal, and environmental health and other relevant partners at the subnational, national, and regional levels	Africa, Europe, Central Asia, Middle East, and Southeast Asia	20
c	CDC's One Health Office and trained FAO facilitators conducted a training on the One Health Zoonotic Disease Prioritization Process for the Association of Southeast Asian Nations	Cambodia, Japan, LAO PDR, Malaysia, Myanmar, Philippines, Republic of Korea, Singapore, Thailand	20

ToR: To organise and participate in scientific meetings and other activities on behalf of the OIE

7. Did your Collaborating Centre organise or participate in the organisation of scientific meetings on behalf of the OIE?

Yes

National/International	Title of event	Co-organiser	Date (mm/yy)	Location	No. Participants
International	Tripartite Multisectoral, One Health Coordination Mechanism expert consult	WHO	01/16-01/18/2019	Geneva, Switzerland	25
International	Africa One Health Congress	U.S. DOD/DTRA	02/04-02/08/2019	Johannesburg, South Africa	50
International	OIE PVS Expert Training	OIE	03/26-03/28/2019	Paris, France	40
International	OIE 87th General Session	OIE	05/26-05/31/2019	Paris, France	500
International	TZG SISOT expert consult	FAO	06/11-06/13/2019	Rome, Italy	25

ToR: To collect, process, analyse, publish and disseminate data and information relevant to the designated specialty

8. Publication and dissemination of any information within the remit of the mandate given by the OIE that may be useful to Member Countries of the OIE

a) Articles published in peer-reviewed journals: 10000

Over 10,000 full text articles can be accessed at CDC Stacks: stacks.cdc.gov/welcome

CDC Stacks is a free, digital archive of scientific research and literature produced by CDC. This online archive is composed of curated collections tailored for public health research needs. This repository is retained indefinitely and is available for public health professionals, researchers, as well as the general public. CDC Stacks provides access to current CDC research and literature such as the Open Access Collection. In addition, CDC Stacks offers a historical perspective that was previously not available, such as the first 30 volumes of the Morbidity and Mortality Weekly Report. As a fully-featured repository, CDC stacks provides the ability to search the full text of all documents, browse journal articles by public health subjects, and explore the curated collections of documents on relevant topics.

b) International conferences: 100

Each year, CDC NCEZID technical and program staff attend and present at numerous international conferences.

c) National conferences: 100

Each year, CDC NCEZID technical and program staff attend and present at numerous national conferences.

d) Other

(Provide website address or link to appropriate information): 5

Emerging Infectious Diseases (EID) Journal - Published monthly by CDC, EID was established to promote the recognition of new and re-emerging infectious diseases around the world and improve the understanding of factors involved in disease emergence, prevention, and elimination. EID Journal Website:

www.cdc.gov/ncidod/EID

The National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) website maintains updated information on current outbreaks, recent work, and publications. www.cdc.gov/ncezid/

CDC's One Health Office maintains two websites (One Health website [www.cdc.gov/onehealth/index.html] and Healthy Pets, Healthy People website [www.cdc.gov/healthypets/]), which provide up-to-date information on One Health activities and zoonoses-related prevention for the general public, public health professionals, human and animal health professionals, policymakers, partners, and other stakeholders. The One Health Office led efforts for or participated in numerous One Health-related communication campaigns, including One Health Day, National Pet Week, National Preparedness Month, and US Antibiotic Awareness Week. Promotional activities included social media, graphic development, blog posts, feature articles, newsletters, ZOHU Call presentations, and partner outreach, resulting in global awareness. The One Health Office supported CDC programs in promoting One Health-related activities, publications, and events, such as new communication materials for handwashing and CDC's new Antibiotic Resistance Threats Report.

Additionally, the office continued its monthly Zoonoses and One Health Updates (ZOHU) Call, a webinar that reaches public health and animal health officials, epidemiologists, physicians, nurses, and other public health practitioners in federal, state, and local agencies as well as non-governmental organizations, industry, and academia. In 2018, ZOHU Calls started offering free Continuing Education, and subscribers to the call increased 730% to more than 13,000.

Other communication activities included new One Health social media graphics; two new One Health in Action stories posted online; a new patient handout on pet zoonoses for clinicians; a new coloring book for children with educational messaging on animal interaction; a new poster for classrooms on staying healthy around class pets; a blog post on preparing pets for emergencies; and new webpages for clinicians and veterinarians. The office distributed 37 newsletters on zoonotic diseases and One Health topics to >55,000 subscribers in 2019.

9. Additional comments regarding your report: