

OIE Collaborating Centres Reports Activities

Activities in 2021

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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
Provided expertise to OIE through expert consultation on the OIE ad hoc Group on COVID-19 at the animal-human-ecosystem interface	CDC's One Health Office experts participated in the OIE ad hoc Group on COVID-19 at the animal-human interface as an OIE Collaborating Centre (CC) for Emerging and Re-Emerging Zoonotic Diseases. The head of the CC was invited as a consultant to this group (Expert groups and guidance: OIE - World Organisation for Animal Health) and participated in monthly meetings with global experts. The CC provided regular updates on the status of SARS-CoV-2 animal testing, transmission reports, and research in the U.S. relevant to production animals, companion animals, zoo animals and wildlife. These CDC experts also provided input on OIE technical documents, shared CDC and US COVID-19 guidance and other resources and helped answer queries from other OIE advisory groups. Additionally, the head of the CC served as lead for a subgroup to develop "Guidance on working with farmed animals of species susceptible to infection with SARS-CoV-2."
Advancing One Health approach to address an emerging zoonoses including COVID-19 in the US	Guiding domestic strategy and priorities on the One Health aspects of COVID-19; Investigating zoonotic transmission of SARS-CoV-2 between people and animals to understand inter-species transmission dynamics and identify the role of animals as hosts and potential reservoirs of SARS-CoV-2 through collaborations with One Health partners; Supporting subnational, national, and global public health, animal health, and other partners in preventing and managing SARS-CoV-2 transmission events between people and animals (and maintaining 24/7 call consultation); Disseminating timely, evidence-based guidance to best protect human and animal health and welfare by maintaining 14 CDC webpages (>>14 million web views globally by December 2021; Tracking global and domestic animal cases of SARS-CoV-2 reported to OIE and USDA/CDC respectively to maintain updated numbers of reported SARS-CoV-2 cases in various animal species in the US.

<p>Created and maintains a federal level One Health Coordination Mechanism for COVID-19, the One Health Federal Interagency COVID-19 Coordination Group (OH-FICC) and OH-FICC Subgroups</p>	<p>CDC chairs the One Health Federal Interagency COVID-19 Coordination (OH-FICC) Group to bring together representatives from over 20 key federal agencies representing multiple Departments across the US government in regular meetings to exchange timely information, updates, and to collaborate to address One Health aspects of COVID-19 in the United States relevant to human health, animal health, and the environment. Multiple federal agencies and departments including CDC, U.S. Food and Drug Administration, U.S. Department of Agriculture, U.S. Department of the Interior, and others are involved. The OH-FICC has 5 subgroups relevant to human-animal-environment interactions with a focus on Companion Animals, Production Animals (e.g., farmed mink), Animal Diagnostics and Testing, Wildlife and Zoo Animals, and Environment. CDC chairs the OH-FICC Companion Animal Subgroup and provides technical expertise to all 5 subgroups.</p>
<p>Provided One Health Coordination between the OH-FICC and a variety of One Health partners on COVID-19</p>	<p>1. CDC coordinated a weekly One Health State Federal COVID-19 Update Call to bring together state, tribal, local, territorial, and federal partners on the One Health aspects of COVID-19 to share timely updates, disseminate information, and address concerns. Invitees included state, local, and territorial public health officials, animal health officials, and wildlife officials and OH-FICC members.</p> <p>2. CDC coordinated a One Health Partners COVID-19 Webinar to present news and key updates on the One Health aspects of COVID-19, as well as guidance and resources and to provide a platform for non-governmental partners to ask questions; a variety of non-governmental partners including organizations, academic, industry, and others.</p>
<p>Healthy Pets, Healthy People</p>	<p>CDC manages the Healthy Pets, Healthy People website. This website provides up-to-date information on zoonotic diseases related to people and interactions with 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 (domestic and wildlife), as well as veterinarians and human healthcare providers; educational materials on staying healthy around animals; guidelines for preventing zoonoses in high-risk people, 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 most popular CDC websites. www.cdc.gov/healthypets</p>
<p>Influenza and Zoonoses Education for Youth in Agriculture in the United States</p>	<p>CDC 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 (including emerging zoonoses), 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>

One Health Brucellosis Tool	CDC in partnership with FAO, 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. Collaborative work is ongoing to create an additional resources section.
Multiple country Viral Hemorrhagic Fever (VHF) outbreak response support	CDC experts deployed for VHF outbreak response support in multiple countries including deployment of ecology teams from Sierra Leone to neighboring Guinea in support of an outbreak of Marburg virus there. CDC aided in response to and preparation for Lassa in Liberia, RVF and CCHF in Uganda, preparation for Ebola in Rwanda and South Sudan, and Chapare virus in Bolivia, Ebola in Democratic Republic of the Congo and Nipah virus in Bangladesh in 2021.
Response to a US Monkeypox case - Nigerian investigation	In July 2021, CDC confirmed West African Monkeypox virus in a US resident who had traveled from and exposed in Nigeria. The CDC (headquarters and Abuja office) worked closely with partners in Nigeria to support an investigation in-country, including animal sampling, based on information provided by the patient.
Response to Imported Rabid Dog from Azerbaijan	CDC confirmed the importation of a dog infected with rabies with recent history of importation from Azerbaijan. An extensive investigation was conducted to prevent onward transmission of this eliminated variant. As of December 2021, no further cases were reported. This event was reported to WAHIS.
Antimicrobial Resistance (AMR) Exchange Series	<p>In 2021, CDC launched the AMR Exchange Series, a new, global webinar series to engage a broad group of partners, practitioners, veterinarians, and policymakers on antibiotic resistance (AR) topics across One Health. Since May, CDC has hosted three webinars attracting nearly 10,000 registrants globally. During the first event, AMR in a Changed World: Building Resilient Systems for Today and Tomorrow, experts highlighted lessons learned from the COVID-19 pandemic, underscoring that more resilient public health systems are critically needed to protect humans, animals, and the environment from future infectious disease threats. In the second event, Understanding AMR in Water, hosted in August, experts discussed what is known about the emergence and spread of AR and its genes in water, what they are doing—from wastewater surveillance to analyzing hospital discharge into surrounding water and soil—and how it can impact the health of humans, animals, and the environment.</p> <p>During the final event of the year in December, Hooves, Paws, or Feet: Examining AMR in Animals (link to video under development at time of report), experts discussed how to improve antibiotic use in animals and how AR in animals can impact human health, expanding on veterinary prescribing practices, and how to leverage biosecurity and prevention measures to ensure humans and animals are healthy. CDC will continue to coordinate the AMR Exchange Series in 2022.</p>
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope

<p>CDC conducting genomic analysis from five on farm investigations for SARS-CoV-2 in people and multiple animal species on affected Mink Farms in the United States in collaboration with partners</p>	<p>CDC collaborated with USDA's National Veterinary Services Laboratory (NVSL) to conduct sequence analysis to compare mink sequences from SARS-CoV-2 positive mink, SARS-CoV-2 positive domestic and feral cats and dogs associated with SARS-CoV-2 affected farms, COVID-19 confirmed positive humans with epidemiological links to these farms, and sequences from the surrounding communities in order to evaluate the overall picture of SARS-CoV-2 strains and mutations present in people, mink, and other animals on affected mink farms in the US.</p>
<p>Pilot Project for Surveillance and Investigation of SARS-CoV-2 in Animals in the United States</p>	<p>CDC, in collaboration with the Council of State and Territorial Epidemiologists, is supporting a pilot program for coordinated surveillance for zoonotic SARS-CoV-2 infections to better understand the transmission dynamics between people and a variety of animals species (companion animals, including working dogs, free-ranging wildlife, and production animals). Five jurisdictions (3 states, 2 large counties) throughout the United States were selected to participate in this pilot program. These sites have been conducting surveillance for SARS-CoV-2 in households, veterinary clinics, animal shelters, zoos/sanctuaries, and wildlife rehabilitation centers. To-date they have collected over 500 samples from animals with epidemiologic links to people with SARS-CoV-2 infection; data analysis is ongoing, and findings will be disseminated once available.</p>
<p>Development of a One Health surveillance and reporting forms for linked human-animal epidemiological investigations in the United States</p>	<p>CDC developed two surveillance and reporting forms for state, local, tribal, and territorial partners that are conducting epidemiological investigations of animals with suspected or confirmed SARS-CoV-2. These forms collect information on suspected or confirmed animals infected with SARS-CoV-2. The data collection and investigation tool, called the One Health Case Investigation Form for Animals with SARS-CoV-2, assists state, local, tribal, and territorial partners that are conducting epidemiological investigations of animals with suspected or confirmed SARS-CoV-2 that were exposed to people or other animals with COVID-19. State and local public health officials can access the form on HHS Protect, CDC's COVID-19 surveillance platform.</p>
<p>Texas A and M household study on SARS-CoV-2 transmission dynamics between people and companion animals in the United States</p>	<p>CDC is collaborating with researchers at Texas A&M University to conduct a household transmission study of pets in the households of people with COVID-19. The study seeks to determine the transmission dynamics between people and animals in households within an area experiencing high human transmission rates. Specifically, the intention of this project is to characterize transmission from people to pets, among pets, and determine whether pet-to-human transmission is occurring. To-date, research from this project has generated 3 peer reviewed publications with at least 3 other publications anticipated. A website for this research can be found at: www.vetmed.tamu.edu/hamer-lab/covid-19-pets-research/</p>
<p>Brucellosis surveillance using a One Health Approach in Jordan</p>	<p>CDC experts are supporting ongoing Brucellosis surveillance using a One Health Approach in East Amman, Al-Mafraq and Karak directorates in collaboration with the Jordan University of Science and Technology (JUST). CDC is providing confirmatory testing and whole genome sequencing in both humans and susceptible animals to help gain a better understand of the burden of disease in this region.</p>
<p>Viral Hemorrhagic Fever (VHF) surveillance in Sierra Leone</p>	<p>Since 2020, CDC has collaborated with Njala University to conduct routine surveillance in small mammal populations for VHF. This work continued in 2021.</p>
<p>VHF surveillance in Uganda</p>	<p>CDC continued in 2021 to prospectively sample livestock and humans associated with livestock in multiple districts in Uganda. This data will help determine the rate of spread and force of infection for Rift Valley Fever and Crimean-Congo Hemorrhagic Fever in these populations. This data is also being used to model potential high-risk areas and determine risk factors associated with high seropositivity and transmission.</p>
<p>Characterize pathologic findings for natural SARS-CoV-2 infections in US-farmed mink</p>	<p>CDC completed pathologic evaluation and SARS-CoV-2 detection by immunohistochemistry, in situ hybridization, electron microscopy, and polymerase chain reaction (PCR) for samples from farmed mink naturally infected by SARS-CoV-2 collected during CDC One Health investigations conducted on mink farms in the US. Identified features reminiscent of human COVID-19 and characterized viral host cell receptor ACE2 distribution in mink respiratory tract, supporting development of mink models of human disease. Manuscript provisionally accepted for publication in Veterinary Pathology.</p>
<p>Use of a clinical algorithm to estimate the proportion of cutaneous anthrax cases with meningitis in Kyrgyzstan, 2005-2015</p>	<p>Using abstracted data from confirmed cutaneous anthrax cases (~230) in Kyrgyzstan from 2005 through 2015, a CDC developed algorithm is being used to estimate the number of patients likely to have anthrax meningitis based on signs, symptoms, and diagnostic laboratory results in this population. These data will be added to the evidence base for updating our clinical treatment guidelines for anthrax meningitis.</p>

Consulting on a study of feline <i>Sporotrichosis brasiliensis</i> in Argentina	CDC is consulting with partners in Argentina (Argentina Ministry of Health of Argentina, Buenos Aires Ministry of Health, University of Buenos Aires, and Argentina's National Reference Lab) on a study detecting feline <i>Sporothrix brasiliensis</i> in Buenos Aires province. This study aimed to identify strategies effective for <i>Sporotrichosis</i> case identification (i.e., veterinary clinics, vaccination campaigns, or public notifications) and testing. Further studies on the emergence of <i>Sporothrix brasiliensis</i> in South America are in progress.
Multistate Salmonella Illness Outbreak Infections Linked to Backyard Poultry	<p>CDC and public health officials in several states investigated multistate outbreaks of <i>Salmonella</i> infections with serotypes of Enteritidis, Hadar, Indiana, Infantis, Mbandaka, and Muenchen. Epidemiologic and laboratory data showed that contact with backyard poultry made people sick. As of November 18, 2021, a total of 1,135 people infected with one of the outbreak strains were reported from 48 states, the District of Columbia, and Puerto Rico.</p> <p>274 ill people were hospitalized, and 2 deaths were reported.</p> <p>268 were under 5 years and 140 were under 1 year.</p> <p>CDC continues to release up to date guidance to reduce the risk of <i>Salmonella</i> infections in people and backyard flocks.</p> <p>Details at: www.cdc.gov/salmonella/backyardpoultry-05-21/index.html</p>
Multistate Salmonella Illness Outbreak Infections Linked to Small Turtles	<p>CDC and public health officials investigated two <i>Salmonella</i> outbreaks linked to small turtles (shell length less than 4 inches/10.1 cm). Epidemiologic, laboratory, and traceback data show that contact with small turtles made people in both outbreaks sick. CDC continues to provide guidance to reduce the risk of <i>Salmonella</i> infections in people who contact small turtles.</p> <p>Details at: www.cdc.gov/salmonella/typhimurium-02-21/index.html</p>
Multistate Salmonella Illness Outbreak Infections Linked to Wild Songbirds	<p>CDC and public health officials in several states collected different types of data to investigate a multistate outbreak of <i>Salmonella</i> Typhimurium infections in people. Epidemiologic and laboratory data showed that contact with wild songbirds and bird feeders made people sick in this outbreak. As of May 28, 2021, a total of 29 people infected with the outbreak strain of <i>Salmonella</i> Typhimurium were reported from 12 states.</p> <p>14 ill people were hospitalized, and no deaths were reported</p> <p>Details at: www.cdc.gov/salmonella/typhimurium-04-21/details.html</p>
Investigation of an outbreak of extensively drug-resistant <i>Campylobacter jejuni</i> infections associated with pet store puppies	<p>CDC collaborated with state and local public health officials to investigate cases of extensively drug-resistant <i>Campylobacter jejuni</i> associated with pet store puppies. This report, published in 2021, summarizes the epidemiologic, laboratory, and traceback findings to characterize these persistent, extensively drug-resistant strains. The report is available at: www.jamanetwork.com/journals/jamanetworkopen/article-abstract/2784113</p>
Monkeypox outbreak response & surveillance capacity	<p>CDC continues to work closely with partners in Cameroon, Democratic Republic of Congo, and Nigeria to support laboratory-based surveillance of disease and technical input on outbreak investigations of monkeypox.</p>
Risk assessment published to support OIE change in titer requirements for dogs	<p>Negligible risk of rabies importation in dogs thirty days after demonstration of adequate serum antibody titer.</p> <p>Smith TG, Fooks AR, Moore SM, Freuling CM, Müller T, Torres G, Wallace RM.</p>

Disease Surveillance	<p>Liberia- The Ministry of Health (MOH)/One Health Coordination Platform, Ministry of Agriculture, Environmental Protection Agency, Forestry Development Authority, the National Public Health Institute, EcoHealth Alliance, and the Department of Defense- Defense Threat Reduction Agency continue to collaborate on a CDC-funded Acute Febrile Illness (AFI) project to identify threats from high-risk pathogens, including leptospirosis, causing AFI in Liberia with the goal of enhancing integrated disease surveillance capabilities and response. As of Nov 2021, 3,339 patients have been enrolled.</p> <p>Kenya - CDC supported the Government of Kenya (Ministry of Health and Ministry of Agriculture) to develop a draft operational guide on data sharing between human and animal health sectors with guidance from WHO, FAO, and OIE reference materials.</p>
Disease Reporting	<p>Cameroon, Cote d' Ivoire - CDC provided technical assistance to the Ministry of Health to develop standardized reporting procedures and templates and processes for multisectoral coordination for reporting to WHO, Food and Agriculture Organization (FAO), and the International Organization of Animal Health (OIE).</p>
Training, capacity building	
Title of activity	Scope
COVID-19 Infection Prevention and Control Assessment Tool for Captive Wildlife Facilities: Zoos, Sanctuaries, Aquaria, and Wild Animal Rehabilitation Centers	<p>CDC experts contributed to the COVID-19 Infection Prevention and Control Assessment Tool for Captive Wildlife Facilities: Zoos, Sanctuaries, Aquaria, and Wild Animal Rehabilitation Centers which was collaboratively developed by the One Health Federal Interagency COVID-19 Coordination Group (OH-FICC) Wildlife and Zoos Subgroup in collaboration with the Zoo and Aquarium All Hazards Partnership; This assessment tool provides a guide for baseline biosecurity measures and controls that should be in place to prevent transmission of SARS-CoV-2 between animals housed in captive wildlife facilities and people (including employees such as caretakers, maintenance staff, and other employees, volunteers, and the public) who may have direct or indirect contact with animals or their environment. Link: www.zahp.org/covid-19-infection-prevention-and-control-assessment-tool-for-captive-wildlife-facilities/</p>
SARS-CoV-2 at the Zoo: Update on Investigations and Interventions to Prevent Infections in Captive Wildlife	<p>CDC experts presented on a webinar for zoo and aquarium staff hosted in partnership with the Association of Zoos and Aquariums with more than 500 attendees to address the growing number of SARS-CoV-2 cases detected in animals in zoos and aquariums across the US since July 2021. CDC experts presented an update on what is known from national data collected through epidemiologic One Health case investigations of people and animals at zoos and the COVID-19 Infection Prevention and Control Assessment Tool for Captive Wildlife Facilities.</p>
One Health Zoonotic Disease Prioritization (OHZDP) Workshops	<p>CDC's One Health Office works with partners to conduct OHZDP workshops to bring together human, animal, and environmental health sectors and other relevant partners to prioritize zoonotic diseases of greatest concern for 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. The OHZDP helps strengthen multisectoral, One Health collaboration, coordination, and communication, supports the creation or strengthening of multisectoral, One Health coordination mechanisms, helps build capacity for identified priorities, and is adaptable to local context. Zoonoses most commonly prioritized globally include rabies, zoonotic influenza, viral hemorrhagic fevers such as Ebola virus and Rift Valley fever, and anthrax.</p> <p>In 2021, four OHZDP workshops were conducted in Benin, Niger, Sudan, and Indonesia. Additional details can be found at: www.cdc.gov/onehealth/global-activities/prioritization.html</p>
One Health Zoonotic Disease Prioritization Process Facilitator Training	<p>CDC's One Health Office, in collaboration with trained facilitators from WHO, FAO, and OIE conducted facilitator trainings on the One Health Zoonotic Disease Prioritization Process for ministerial representatives from human, animal, and environmental health sectors in Benin, Niger, Sudan, and Indonesia.</p>
Developing Field Epidemiology Training for Veterinarians	<p>CDC Field Epidemiology Training Program (FETP) staff contributed and provided support to the development of FAO's Developing field epidemiology training for veterinarians - Technical guidelines and core competencies.</p>
FETP One Health Experiences Survey: Mozambique and Zambia	<p>In August 2021, CDC FETP HQ sent out a survey to collect One Health experiences from CDC-supported FETPs. Of 16 programs, nine have incorporated One Health into FETP trainings: 4 Frontline (Belize, Burkina Faso, Cabo Verde, Saudi Arabia), 1 Intermediate (Afghanistan), and 5 Advanced (Bangladesh, Mozambique, Nigeria, Saudi Arabia, Zambia). Some highlights are below.</p> <p>Mozambique: Mozambique's FETP-Frontline launched in 2021 with a multidisciplinary cohort including trainees from the Ministries of Agronomy, Veterinary Services, and Fisheries. In FETP-Advanced, the human and animal have collaborated on One Health fieldwork regarding malaria and influenza investigations.</p> <p>Zambia: With support from Ministry of Health and the Ministry of Fisheries and Livestock, Zambia FETP incorporates One Health into their Advanced program where multidisciplinary teams investigate endemic zoonotic diseases (e.g., anthrax and rabies), foodborne outbreaks, and other One Health topics.</p>

<p>FETP One Health Experiences Survey: Cabo Verde and Nigeria</p>	<p>In August 2021, CDC FETP HQ sent out a survey to collect One Health experiences from CDC-supported FETPs. Of 16 programs, nine have incorporated One Health into FETP trainings: 4 Frontline (Belize, Burkina Faso, Cabo Verde, Saudi Arabia), 1 Intermediate (Afghanistan), and 5 Advanced (Bangladesh, Mozambique, Nigeria, Saudi Arabia, Zambia). Some highlights are below.</p> <p>Cabo Verde: In September 2021, 12 residents graduated from Cabo Verde's first FETP-Frontline cohort with a One Health approach. Human, animal, and environmental health trainees completed joint investigations and fieldwork in topics like African Swine Fever, parasitic infections, and water quality surveillance projects.</p> <p>Nigeria: The Federal Ministry of Health (FMoH) and Federal Ministry of Agriculture and Rural Development (FMARD), with support from Nigeria CDC and two collaborating universities, run the FETP-Advanced program in 3 technical tracks: veterinary, medical, and laboratory. Trainees and graduates have participated in wildlife pathogen surveillance, joint investigations for zoonotic diseases like avian influenza, rabies, and monkey pox, and zoonotic diseases prioritization workshops involving participants from different sectors.</p>
<p>FETP One Health Experiences Survey: Saudi Arabia and Bangladesh</p>	<p>In August 2021, CDC FETP HQ sent out a survey to collect One Health experiences from CDC-supported FETPs. Of 16 programs, nine have incorporated One Health into FETP trainings: 4 Frontline (Belize, Burkina Faso, Cabo Verde, Saudi Arabia), 1 Intermediate (Afghanistan), and 5 Advanced (Bangladesh, Mozambique, Nigeria, Saudi Arabia, Zambia). Some highlights are below.</p> <p>Saudi Arabia: Saudi Arabia's FETP-Advanced trains field epidemiologists from various disciplines to collaborate on One Health surveillance projects and outbreak investigations regarding topics like zoonotic diseases, foodborne outbreaks, and antimicrobial resistance.</p> <p>Bangladesh: Multidisciplinary residents of the FETP-Advanced for Veterinarians collaborate on surveillance projects related to topics including avian influenza, anthrax, rabies, Nipah virus, bovine tuberculosis, brucellosis, and antimicrobial resistance.</p>
<p>In Service Applied Veterinary Epidemiology (ISAVET) Training</p>	<p>Liberia, Burkina Faso, Ethiopia - CDC supported development of competencies and curriculum for ISAVET training of animal surveillance officers in collaboration with FAO, USAID, ministries of Agriculture, and academic partners.</p>
<p>Disease Surveillance in Cameroon</p>	<p>CDC supported Cameroon government partners with training and mentoring at the national and regional levels on methods to deactivate anthrax specimens, allowing labs to continue working with samples in a manner that will improve biosafety and biosecurity. Work will continue for further understanding of the geographical risk of anthrax, and developing strategies to prevent, detect, and respond to potential outbreak and public health emergency situations in a safe and timely manner. These activities will also aim to strengthen surveillance capacity, improve knowledge about circulating Brucella species, and improve the ability to safely test animal and human specimens.</p>
<p>Leptospirosis in Indonesia</p>	<p>CDC is finishing a project to build surveillance capacity in Jakarta, including diagnostic capacity and active surveillance at selected health facilities to aid in detection of cases. The success of the project in Jakarta led the MOH to expand surveillance using this protocol to Probolinggo Health District in East Java. CDC continues to provide virtual technical assistance.</p>
<p>VHF capacity building and maintenance in Sierra Leone</p>	<p>CDC continued in 2021 to support and maintain state-of-the-art molecular diagnostic lab capacity at Njala University for the purposes of detecting VHFs, including Marburg virus, in biological samples of animal origin. CDC support includes expertise to conduct workforce training as well as providing specialized reagents and supplies and funding support.</p>
<p>Tripartite Zoonoses Guide (TZG) and Operational Tools</p>	<p>CDC loaned experts to OIE & FAO and other CDC experts continue to provide technical expertise to support the development and piloting of operational tools linked with the Tripartite Zoonoses Guide including the One Health, Multisectoral Coordination Mechanism tool (MCM) and the Surveillance and Information Sharing Operational Tool (SISOT). Specific to the SISOT, CDC experts led the development and updating of the Excel-based tool that was piloted in Indonesia in 2021.</p>
<p>Global Laboratory Leadership Programme (GLLP)</p>	<p>CDC is partnering with OIE and other GLLP founding partners (Association of Public Health Laboratories, European Centre for Disease Prevention and Control, Food and Agriculture Organization of the United Nations, and the World Health Organization) to develop a Global Laboratory Leadership Programme (GLLP). The GLLP aims at fostering and mentoring current and emerging laboratory leaders to build, strengthen and sustain national laboratory systems, under a One Health approach. The program available for virtual or in-person implementation is flexible and may be adapted to meet country-specific workforce needs. The program was piloted in Pakistan and Liberia and has now expanded to Armenia, Moldova, Kazakhstan, Ukraine, Ecuador, Paraguay, Brazil, Burkina Faso, Oman, and Thailand.</p>
Zoonoses	
Title of activity	Scope
<p>Preventing, Detecting, and Responding to Emerging and Reemerging Zoonotic Diseases in Multiple Countries</p>	<p>Details on multiple zoonotic disease activities around the globe are cross reported in other sections of this document.</p>
<p>Zoonotic monkeypox transmission and the human-animal interface</p>	<p>CDC continues to work closely with colleagues in Democratic Republic of the Congo to better understand and characterize the interactions between humans and wild animals in monkeypox endemic areas.</p>

<p>CDC-designated Food Safety Centers of Excellence: Integrated Food Safety Centers of Excellence One Health and Antimicrobial Resistance Projects</p>	<p>CDC-designated Food Safety Centers of Excellence will lead collaborative One Health projects across states to explore antibiotic stewardship (improving antibiotic use), animal health, and animal ownership and their impact on antibiotic-resistant enteric (gut) infections in humans. These efforts will guide the development of educational interventions and materials for animal owners, caretakers, and veterinarians to prevent the spread of infections. Projects include:</p> <ul style="list-style-type: none"> • Assessing pet owners' understanding of antibiotic use, antibiotic resistance, and attitudes toward antibiotic prescribing in animals. • Exploring the knowledge, attitudes, and practices of pet store employees and feedstore workers regarding prevention of transmission of enteric (gut) illnesses, including antibiotic-resistant infections, from contact with animals. • Evaluating effective methods to provide education on antibiotic stewardship in animal health and veterinary medicine. • Strengthening data sharing between veterinary diagnostic laboratories, veterinary clinics, and public health to increase prevention opportunities for antibiotic-resistant infections.
Diagnosis, biotechnology and laboratory	
Title of activity	Scope
<p>SARS-CoV-2 laboratory diagnostics in the United States</p>	<p>CDC is supporting laboratory work for linked human and animal samples submitted for SARS-CoV-2 diagnostics by state, tribal, local, and territorial partners or as part of CDC-led One Health Investigations. CDC diagnostic capabilities for SARS-CoV-2 include nucleic acid extraction, reverse transcription polymerase chain reaction, antibody testing, virus isolation, histopathology, sequencing, and genomic analyses.</p>
<p>SARS-CoV-2 Serological DIVA Assay Development</p>	<p>CDC is supporting development of a new serological assay that will be capable of differentiating between SARS-CoV-2 naturally infected and vaccinated animals (DIVA). This assay will enable better understanding the transmission dynamics of SARS-CoV-2 among human and animals, evaluate vaccine efficacy in animals, and allow active surveillance and determination of serological status for vaccinated farmed mink.</p>
<p>Rapid Diagnostic Testing for leptospirosis in Indonesia and Bangladesh</p>	<p>Trainings for confirmatory testing of anthrax and leptospirosis provided by CDC. A sample of specimens from the leptospirosis surveillance project in Bangladesh were shipped to CDC for validation of results.</p>
<p>SARS-CoV-2 diagnostics in animals supporting US zoos</p>	<p>CDC is providing histopathologic evaluation and immunohistochemistry, in situ hybridization, and PCR testing of necropsy tissues from animals with suspected or confirmed SARS-Cov-2 infection. This has been primarily utilized for confirmation of infection in zoo felids, with collaboration of CDC and zoo veterinary pathologists facilitating development/modification of guidelines for prevention of SARS-Cov-2 transmission to zoo animals.</p>

Tissue-based diagnosis of mycobacterial infections	CDC provides pathologic evaluation of human and animal biopsy and autopsy specimens for mycobacterial infections, including M. tuberculosis complex and nontuberculous mycobacteria, by immunohistochemistry and PCR. Molecular detection of drug resistance testing is provided in cases where M. tuberculosis complex is identified.
Laboratory Capacity	India - CDC completed a 4-year rabies laboratory training program with Karnataka Veterinary, Animal, and Fisheries Science University (KVAFSU) as part of the OIE Official Lab Twinning Program. The program established OIE-standard diagnostic capacity for rabies and non-rabies Lyssaviruses. The KVAFSU laboratory was designated as the 12th OIE Reference Laboratory at the 88th General Assembly.
Antimicrobial Resistance	Uganda – CDC collaborated with the Ministry of Agriculture, Animal Industry and Fisheries, the National Drug Authority, Makerere University, the National AMR sub-Committee, and USAID Medicines, Technologies, and Pharmaceutical Services Program to develop guidelines on infection prevention and use of antimicrobials that can limit zoonotic disease transmission, utilizing the current global and national recommendations by WHO, OIE, and FAO.
New Global Networks and AR Innovation Research Projects	<p>In December 2021, CDC launched the Global Antimicrobial Resistance Laboratory and Response Network (Global AR Lab & Response Network) to improve the detection of new and existing AR threats including zoonoses, identify risk factors that drive the emergence and spread of AR relevant to One Health, and respond on-the-ground to AR threats emerging across health care, enteric, fungal, sexually transmitted, and invasive and respiratory bacterial pathogens.</p> <p>As a part of this collaborative network, CDC also launched the Global Healthcare in Action Network (GAIHN), which identifies AR-related threats in healthcare settings through its AR module. GAIHN also works to prevent, detect, and respond to other infectious disease threats in healthcare settings, such as COVID-19 and healthcare-associated infections.</p> <p>The Global AR Lab & Response Network and GAIHN, paired with short-term global AR innovation research projects focused on identifying new solutions to combat AR, span more than 50 countries and include nearly 30 organizations, institutions, and public health partners globally. These initial investments represent progress in accomplishing the ambitious goals in the National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB) 2020 - 2025 and reflects CDC's commitment to transforming the way the world responds to AR across One Health.</p>
Vaccines	
Title of activity	Scope
Assessment of the anthrax vaccine value/distribution chain in Ethiopia	CDC worked with the Ethiopian Ministries of Health and Agriculture to assess the viability of nationally produced anthrax vaccine for livestock and to perform a systematic assessment of the situation in the field regarding farmers' knowledge, attitudes, and practices towards anthrax vaccination.

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
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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>
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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, Member of Steering committees, OIE ad hoc Group on COVID-19 at the human-animal interface	One Health, COVID-19, emerging and reemerging zoonoses, surveillance, outbreak investigation and response, public health, Tripartite Zoonoses Guide, global health security, and World Animal Health Information System+ Steering Committee
Colin Basler, DVM, MPH, DACVPM	CDC One Health Liaison to OIE, Technical Assistance for OIE-FAO-WHO joint project "Building Tripartite International Guidance Tools for the National Implementation of One Health"; Member of OIE WAHIS Active Search Team; Member of Global Laboratory Leadership Program (GLLP) Animal Health Working Group	One Health, COVID-19, emerging and reemerging zoonoses, surveillance, outbreak investigation and response, public health, Tripartite Zoonoses Guide, antimicrobial resistance, global health security, food safety, World Animal Health Information System+, laboratory capacity, multisectoral workforce development, and joint risk assessment

Sean Shadomy, DVM, MPH, DACVPM	CDC Loaned Expert and One Health Liaison to FAO; Technical Assistance, FAO Technical project lead and focal point for OIE-FAO-WHO joint project, "Building Tripartite International Guidance Tools for the National Implementation of One Health"; lead for developing and piloting the Tripartite Zoonoses Guide Surveillance and Information Sharing Operational Tool; FAO member, OIE Ad Hoc Group on COVID-19 at the Human-Animal Interface; contributor, FAO Emergency Management Centre-Animal Health Incident Coordination Group (ICG) for Rift Valley Fever and for COVID-19; FAO observer to OIE Ad Hoc Group on Rabies, developed performance indicator Monitoring and Evaluation template for dog-mediated rabies control programs endorsement by OIE; FAO focal point for FAO-OIE-WHO United Against Rabies collaboration; co-presenter for FAO-OIE invited joint presentation for European Food Safety Agency Parma Summer School (June 2020)	One Health, COVID-19, emerging and reemerging zoonoses, surveillance, outbreak investigation and response, public health, Tripartite Zoonoses Guide, global health security and multisectoral workforce development
Multiple CDC Subject Matter Experts	Technical Assistance	One Health, emerging and reemerging zoonoses, surveillance, outbreak investigation and response, preparedness, Global Health Security, Antimicrobial resistance, building laboratory and epidemiology capacity, and multisectoral workforce capacity
Ryan Wallace, DVM, MPH	Vaccine Bank Tender Review	Ad hoc committee to review rabies vaccine tenders for inclusion in the OIE Vaccine Bank
Ryan Wallace, DVM, MPH	Co-Chair	RABLAB rabies laboratory network

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: 0
- b) Seminars: 4
- c) Hands-on training courses: 1
- d) Internships (>1 month): 1

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 (domestic and wildlife) and environment experts 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 webinar recordings or to subscribe to the monthly ZOHU Newsletter, visit: www.cdc.gov/onehealth/zohu/index.html	USA	15000
d	CDC hosted Epidemiology Elective Students and graduate student interns to provide public health training; students supported work on OIE projects	USA	25
c	CDC's One Health Office and trained facilitators from FAO, WHO, and OIE conducted facilitator training sessions on the One Health Zoonotic Disease Prioritization Process for Benin, Sudan, Niger, and Indonesia	Benin, Sudan, Niger, Indonesia	35
b	CDC experts presented on a webinar for zoo and aquarium staff hosted in partnership with the Association of Zoos and Aquariums with more than 500 attendees to address the growing number of SARS-CoV-2 cases detected in animals in zoos and aquariums in the US since July 2021. CDC experts presented an update on what is known from national data collected through epidemiologic One Health case investigations of people and animals at zoos and the COVID-19 Infection Prevention and Control Assessment Tool for Captive Wildlife Facilities.	USA	500
b	CDC hosted a webinar in February 2021, "Addressing SARS-CoV-2 Outbreaks in People and Multiple Animal Species on Mink Farms: The Role of Public Health in a One Health Approach," for local and state public health officials from 17 states with known or reported operational mink farms. The purpose of this webinar was to assist public health partners in preparing for potential SARS-CoV-2 outbreaks in people and multiple animal species on mink farms by addressing a wide range of topics including workers health, human case investigations on mink farms, genomic sequencing efforts, and the importance of collaboration across local, state, and federal partners representing public health and animal health.	USA	22
b	CDC experts participated in a webinar on SARS-CoV-2 in Big Cat Sanctuaries in April 2021, hosted by the Big Cat Sanctuary Alliance. Following reports that 2 wildlife sanctuaries recently experienced confirmed outbreaks of SARS-CoV-2 among big cat collections, this webinar was collaboratively organized to increase awareness of risks to wildlife sanctuaries, allay concerns over epidemiological investigations and perceived negative impacts on facility operations. The 2-hour webinar provided information on lessons learned from previous cases of SARS-CoV-2 in big cats in zoos and sanctuaries, how to prevent infections among staff, volunteers, and animals, the importance of epidemiological investigation, vaccination efforts, and how to seek animal testing.	USA	25

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	OIE ad hoc Group on COVID-19 at the animal-human interface (January-December 2020)	OIE	Monthly	Virtual	20
International	R+D Blueprint for COVID-19	WHO	Ad hoc	Virtual	100

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: wwwnc.cdc.gov/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. CDC's 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, 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.

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 have since increased to more than 15,000.

In 2021, the One Health Office focused on maintaining, streamlining, and distributing COVID-19 guidance for key One Health audiences outlining the risks and information known on SARS-CoV-2 and animals, including pets. Two new One Health Zoonotic Disease Prioritization Workshop reports and one new infectious disease prioritization report were published. A new social media graphic on the importance of One Health and new graphics for preventing zoonotic diseases from pets were posted online. For One Health Day, CDC released a media statement along with a social media campaign. New webpages were posted on solving outbreaks linked to animals, pet travel safety, risks to people with compromised immune systems and people at higher risk for illness from animals. Three new One Health stories were posted on antibiotic resistance in water, new approaches to zoonotic diseases in Cambodia, and a One Health investigation into otters with SARS-CoV-2 infections. The Office distributed 37 newsletters to One Health partners and stakeholders, as well as pet owners.

9. Additional comments regarding your report: