

OIE Collaborating Centres Reports Activities

Activities in 2019

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Title of collaborating centre:	Zoonoses in Europe
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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
Infections of West Nile virus / Usutu virus in Germany	<p>One year after the first autochthonous transmission of WNV to birds and horses in Germany, an epizootic emergence of WNV was again observed in 2019.</p> <p>From July to November 2019, 76 cases of WNV infections in wild- and zoo birds and 36 cases of WNV infections in horses were reported in Germany. Except a single specimen in Hamburg and in Thuringia, all WNV-positive animals originated from the eastern part of Germany with a distinct focus for the federal states Saxony-Anhalt, Saxony, Berlin and Brandenburg.</p> <p>For the first time, a large number of different species of zoo birds were affected in the endemic areas. But also several different songbird species have been infected. Thus, the virus could successfully overwinter in Germany and first evidence of the virus in mosquitoes in Berlin shows a successful establishment in the native mosquito population. Further phylogeographic analyses of the WNV-isolates from 2018 and 2019 suggest up to six different introductions of WNV from neighbouring countries to Germany (publication under preparation). Other European countries reported also ongoing WNV activity in 2019 with a variety of human and horse cases.</p> <p>The USUV has now been established in Germany for ten years, with the first nationwide spread of USUV being recorded in 2018, with sometimes massive deaths among songbirds and owls in some regions. The frequency of USUV in 2019 appears to be declining somewhat, but there is not enough data available.</p>
Technical Support for Namibia in Eliminating Rabies in Dogs	<p>OIE/German Project to eliminate rabies in dogs in Namibia: Assessment of epidemiological surveillance data Monitoring of vaccination campaigns Phylogenetic analysis of rabies virus isolates</p>
Epidemiology, surveillance, risk assessment, modelling	
Title of activity	Scope
Re-emergence of human and animal brucellosis in developing countries	<p>Disruption of state structures worldwide, climate change and globalization have favoured the re-emergence of brucellosis in man and animals. Ongoing surveillance in various non-EU countries and risk analysis for transmission or importation to EU via infected animals, food, feed or travelers are permanent tasks.</p>

Global re-emergence of glanders	Surveillance of glanders in Europe, Asia and South America is ongoing testing of several samples every year. The improvement of international regulations and developing better tests is a permanent task to prohibit introduction of glanders to free areas.
German nationwide wild bird surveillance network for zoonotic arthropod-borne virus infections in migratory and resident birds.	This unique German monitoring network within the frame of the German Centre for Infection Research (DZIF) is ongoing in 2019 and includes more than 20 different collection sites distributed all over Germany and brings together veterinary universities or institutes, bird clinics, wild bird rescue stations, zoological gardens as well as ornithologists. We investigated preferential blood samples by WNV and USUV-specific realtime polymerase chain reactions as well as by differentiating virus neutralization tests and ELISAs. In addition, we examined different organ samples from diseased or dead wild birds. In 2019, hundreds of wild bird samples were examined by PCR and VNTs again. Due to the extensive WNV events among wild birds and zoo birds in 2019, no conclusive results for 2019 from these network are yet available.
Molecular epidemiology of Shiga toxin-producing E. coli (STEC/EHEC)	Assessing the association between the abundance of STEC strains in cattle and risk of human disease in the same geographic region; efforts focussed to develop high-impact testing and management strategies in cattle on STEC strains that pose the greatest risk to human health (Advice provided to Agriculture and Agri-Food Canada, Alberta Health Service and University of Calgary, ongoing)
Screening for bacterial/parasitic pathogens and AMR determinants in alpaca	Small and medium-sized alpaca flocks in three federal states of Germany were screened for chlamydiae, clostridia, cryptosporidia, mycobacteria and salmonellae as well as for the occurrence of AMR
Training, capacity building	
Title of activity	Scope
Training on diagnosis and surveillance of animal and zoonotic pathogens	<p>FLI cooperates with local institutions to increase their capacity in the diagnosis and surveillance of animal and zoonotic pathogens. In 2019 these activities included:</p> <p>Avian Influenza (Egypt, Bangladesh): Training on diagnosis and surveillance of avian influenza viruses in endemically infected countries.</p> <p>Hemorrhagic fevers CCHF/RVVF (Mauretania, Mozambique, Zambia): Training course for the serological and molecular diagnosis of Rift Valley fever virus, Crimean-Congo Hemorrhagic fever virus, and the identification of vector species (ticks and mosquitoes)</p> <p>Q fever (Egypt): Training on serological and molecular diagnosis of Q fever in ruminants in Egypt, estimation of Q fever seroprevalence in Egypt in collaboration with Egyptian partners.</p> <p>Q-fever (Chile): Diagnostic support and training on Q fever during an outbreak of abortions in cattle and associated atypical pneumonia in cattle workers in the south of Chile.</p> <p>Brucellosis (Pakistan; Egypt): already existing labs have been further equipped and technically supported to carry out specific methods for the diagnosis of brucellosis. Training courses in brucellosis diagnosis have been conducted.</p>
Laboratory Twinning Projects: Rabies (Namibia) and viral hemorrhagic fevers (Cameroon)	<p>OIE Lab Twinning Project between FLI and the Central Veterinary Laboratory in Windhoek (CVL): Adaptation of standard operating procedures and Training of CVL staff at FLI</p> <p>OIE Twinning between FLI and Laboratoire National Vétérinaire (LANAVET) in Cameroon: Strengthening the National Veterinary Laboratory in viral hemorrhagic fever diagnostics, preparedness and research.</p>

Zoonoses	
Title of activity	Scope
Highly pathogenic zoonotic viruses (BSL4 viruses: Ebola virus, Junín virus, Henipaviruses, Crimean Congo Hemorrhagic Fever Virus)	<p>Studies of virus-host interactions of highly pathogenic zoonotic viruses (Ebola virus, Junín virus, Henipaviruses, Crimean Congo Hemorrhagic Fever Virus) on the molecular, cellular, tissue, and organism level. In 2019 the work with BSL4-agents has been initiated at the new BSL4 facility of the FLI.</p> <p>Establishment of in vitro infection models for Nipah, Ebola, and Junín virus under BSL4 conditions.</p> <p>Training of BSL4 personnel for future work in maximum containment laboratories.</p>
Arenavirus-host interaction	<p>Host cell responses to highly pathogenic and apathogenic arenaviruses were comparatively studied.</p> <p>Molecular biological tools for the high-throughput, low-biocontainment assessment of antibody (cross-)reactivity were developed.</p> <p>Analysis of small peptide sequences derived from the glycoprotein were assessed for immunogenicity, including development of relevant ELISA assays.</p> <p>Third-generation sequencing (i.e. MinION) protocols to allow analysis of defective viral genome production during arenavirus infection were developed.</p>
Molecular biology of filovirus	<p>Development of life cycle modelling systems (i.e. minigenome systems) for novel filoviruses (Lloviu virus and Bombali virus), and use of these systems to assess compatibility of viral proteins across genera.</p> <p>Establishment of full-length clone systems for the generation of recombinant Ebola and Reston virus.</p> <p>Comparative studies between apathogenic (Reston virus) and highly pathogenic (Ebola virus) filoviruses with respect to efficiency of defined aspects of their viral life cycle (i.e. viral RNA synthesis and protein expression, entry, morphogenesis and budding) as possible pathogenicity determinants.</p> <p>Continuation of studies regarding the role of specific host factors for the life cycle of Ebola viruses.</p>
Crimean-Congo Hemorrhagic Fever Virus	<p>In 2019 we have also carried out (together with our local partners) CCHF seroprevalence and molecular diagnostic studies in domestic ruminants in Egypt, Mauritania, Cameroon, Pakistan and Ukraine. The results have been published, however studies are still ongoing.</p> <p>Therefore FLI has developed indirect ELISAs for sheep, goat, cattle and camelid CCHFV antibodies and competition ELISAs for species independent detection of CCHFV infections.</p>
Zoonotic Borna Virus	<p>A series of additional human cases of Borna disease virus 1 (BoDV-1) infections were identified in the South of Germany and further analysed e.g. by histopathological studies in collaboration with partners from veterinary and human medicine (Liesche et al. 2019 Acta Neuropathol. 2019 doi: 10.1007/s00401-019-02047-3.). The epidemiology of human Borna disease virus infections and the sequences of the different BoDV-1 strains from the human cases are now further analysed. In addition, BoDV-1 and VSBV-1 cases will be notifiable in Germany from March 2020 on.</p>

<p>Rabies research and virus-host interaction</p>	<p>Genetic tracing of fox mediated rabies in Turkey to study within-host viral dynamics of RABV in a new host (red fox) following sustained spillover from dogs in Turkey Virus-host interaction of phylogroup II lyssaviruses studies: The pathogenicity of Lagos bat virus in its reservoir host is analyzed. Assessment of sensitivity and specificity of commercial available lateral flow devices (LFDs) for rabies Assessment of the utility of a commercial ELISA to measure seroprevalence against lyssaviruses Development and validation of an indirect GFP fluorescent antibody test for detection of rabies specific antibodies.</p>
<p>West Nile virus infections in humans</p>	<p>In addition to the massive WNV infection of birds and horses in the affected regions, 5 cases of WNV infection in humans were described for the first time for Germany (identified by the Bernhard Nocht Institute for Tropical Medicine Hamburg).</p>
<p>Zoonotic Poxviruses</p>	<p>Twelve different cowpox viruses (CPXV) could be isolated and characterized. All isolates originated from reservoir species (bank vole, common vole). Three cases of parapox virus infections were confirmed: one cattle, one in sheep and one in seal.</p>
<p>Bat breeding colonies and immunological studies.</p>	<p>Further maintenance and extension of two breeding colonies of fruit bats (<i>Rousettus aegyptiacus</i> and <i>Eidolon helvum</i>). Serological and immunological studies were continued. To generate data on the physiological body temperature of bats, we implanted temperature transponders and revealed a daily fluctuation of the body core temperature (depending on the animal's activity) between 34 and 41°C. Such transponders were then also used during different infection studies using a highly pathogenic Rift Valley Fever virus (RVFV) strain and influenza viruses. No clinical signs or altered temperature patterns were observed.</p>
<p>Arthropod vector monitoring and studies of the vector-pathogen interactions</p>	<p>Maintenance of BSL2 and BSL3 insectaries to bred and study invasive and native mosquito species and strains, some tick species and biting midge colony (<i>Culicoides</i>). Current studies involve non-infectious experiments, i.e. on temperature tolerance and development and infectious experiments on vector competence under BSL2 and BSL3 conditions. Passive and active monitoring to gain information about occurrence, distribution and ecology of the different mosquito species in Germany, e.g. "Mücken Atlas", a citizen science project.</p>
<p>Parasites: <i>Toxoplasma gondii</i> and <i>Echinococcus multilocularis</i></p>	<p>Several studies have been performed focussing on <i>Echinococcus multilocularis</i> and <i>Toxoplasma gondii</i>. Other parasites related to <i>T. gondii</i> such as <i>Neospora caninum</i>, <i>Hammondia</i> spp. and <i>Besnoitia</i> spp. have also been worked on. A multiplex real time PCR for detection of various members of the <i>Echinococcus granulosus sensu lato</i> group has been developed in our laboratory. Previously published magnetic capture DNA extraction protocols for the detection of <i>E. multilocularis</i> in definitive hosts were evaluated by an interlaboratory comparison with the aim to eventually harmonize protocols. Furthermore, a commercially available kit for DNA extraction, applicable on an extraction robot was validated to provide a fast and economic DNA extraction protocol for fox faecal samples. A real time PCR was established to diagnose feline <i>Hammondia hammondi</i> infections and to differentiate zoonotic <i>T. gondii</i> from <i>H. hammondi</i>. Further <i>T. gondii</i> in-vitro isolates from Europe were generated and genetically characterized.</p>

Clostridioides (Clostridium) difficile as potential zoonotic pathogen	Ongoing research on the prevalence of <i>C. difficile</i> in farm animals as well as in pets and their owners as basis for risk assessments. Research on typing and antimicrobial resistance of <i>C. difficile</i> in animals.
Drivers of transmission dynamics and spread of antimicrobial resistance genes	Identification of drivers of AMR spread in livestock and at the livestock-human-interface by means of whole genome and resistome analysis and phenotypic assessment of AMR bacterial strains from human and non-human sources (collaborations with medical and veterinary research institutions and services at national and international level)
Q fever GermAn Interdisciplinary Program for reSearch (QGAPS)	In an interdisciplinary consortium we investigate with other partners unsolved questions relating to the epidemiology, immunology, pathogenesis, surveillance and control of <i>Coxiella burnetii</i> . We focus on two aspects: Modelling uptake and organ distribution of the Q fever agent <i>Coxiella burnetii</i> by ticks and possible effects on virulence. <i>C. burnetii</i> mediated subversion of antigen presenting cell function in the protective immune response to Q fever in animals and humans.
Wildlife	
Title of activity	Scope
Surveillance of hantaviruses and other pathogens in rodents and other small mammal reservoir hosts	Within the research network "rodent-borne pathogens" the screening of small mammals for hanta-, hepe-, polyoma-, borna- and orthopoxviruses, <i>Leptospira</i> spp., and other bacterial pathogens was continued together with national and international collaborators in Switzerland, Lithuania, Belgium, Spain and Czech Republic. Our investigations indicated a broad geographical distribution and high genetic divergence of Tula hantavirus in voles. Orthopoxvirus DNA was only rarely detected in common voles and bank voles from Germany. The investigations resulted in the discovery of novel hepe- and polyomaviruses.
Investigations on tetracycline resistant <i>Chlamydia suis</i> in wild boars	Prevalence of <i>Chlamydia suis</i> in wild boars and distribution of tetracycline resistant strains were investigated in hunting areas of three federal states of Germany in cooperation with University of Veterinary Medicine Hanover
Animal welfare	
Title of activity	Scope
European Union Reference Centre for Animal Welfare	EURCAW-Pigs provides technical support and coordinated assistance to the Member States to carry out official controls on animal welfare. It will also contribute to the dissemination of good practices, expertise and information on technical innovations as well as training of personnel. FLI leads the activities on welfare indicators and scientific and technical studies. Partners are the Wageningen Livestock Research (Netherlands), the Friedrich-Loeffler-Institut (Germany) and the Department of Animal Science at Aarhus University (Denmark) https://www.eurcaw.eu/en/eurcaw-pigs/about.htm
Diagnosis, biotechnology and laboratory	
Title of activity	Scope

Francisella tularensis and tularemia in Europe	The development, validation and optimization of wet-lab and dry-lab methods for the generic detection of novel/unknown/unexpected pathogens is ongoing. Whole-Genome-Sequencing using the Illumina MiSeq platform has been established for bacterial isolates. Follow-up bioinformatics pipelines for routine genotyping and analysis of outbreaks have been implemented and evaluated for Francisella, Brucella, Campylobacter and Salmonella spp, as well as for Bacillus anthracis. Currently, pipelines are being augmented to predict factors responsible antimicrobial resistance (AMR) and to include more zoonotic bacteria.
Next-Generation-Sequencing (NGS) and Bioinformatics	The development, validation and optimization of wet-lab and dry-lab methods for the generic detection of novel/unknown/unexpected pathogens is ongoing. Whole-Genome-Sequencing using the Illumina MiSeq platform has been established for bacterial isolates. Follow-up bioinformatics pipelines for routine genotyping and analysis of outbreaks have been implemented and evaluated for Francisella, Brucella, Campylobacter and Salmonella spp, as well as for Bacillus anthracis. Currently, pipelines are being augmented to predict factors responsible antimicrobial resistance (AMR) and to include more zoonotic bacteria.
Vaccines	
Title of activity	Scope
Identification and evaluation of new vaccine candidates for the prevention of zoonotic diseases	For viral zoonotic diseases FLI is collaborating within international research consortia in the development and evaluation of novel vaccine candidates. CCHFVaccine (Horizon2020) The assessment of the safety, immunogenicity and efficacy of novel vaccine candidates for vaccinating ruminants against bovine tuberculosis (M. bovis/M. caprae infections) (interdisciplinary research consortium) Methods for the detection of proteins that may be used in vaccine production and new serological diagnostics were implemented and standardized focusing on Coxiella, Brucella and Yersinia spp..

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
Standardization and validation of glanders diagnostics used for serology	Western blot, ELISA and CFT are tested for their diagnostic specificity and sensitivity to facilitate their use for international trade. Results have been analyzed and published. (Elschner et. al. 2019. PLoS one 14:e0214963; https://doi.org/10.1371/journal.pone.0214963).	<input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input type="checkbox"/> Animal welfare
Characterization of avian influenza viruses by RITA2	Development and multicenter evaluation of new RT-qPCR arrays for the subtyping of avian influenza viruses; in collaboration with joined FAO/IAEA laboratory Seibersdorf, Austria.	<input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input type="checkbox"/> Animal welfare

Development of a guideline for the disinfection of animal pathogens in livestock production premises	Germany has updated its national guidelines for the mandatory disinfection of animal and zoonotic pathogens in livestock holdings. In a second step we propose to adapt this guideline internationally	<input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input type="checkbox"/> Animal welfare
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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 cooperations with other OIE CCs and RLs as well as other organizations	worldwide	<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	FLI collaborates with multiple collaborating centers, reference laboratories and other organizations from multiple countries to maintain a network and share information on One Health activities.
ANSES French Agency for Food, Environmental and Occupational Health & Safety	France	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	OIE-RL Rabies, Chlamydiosis and Brucellosis EU-RL equine diseases several ongoing research projects: e.g. One Health EJP - Promoting One Health in Europe through joint actions on foodborne zoonoses, antimicrobial resistance and emerging microbiological hazards (Horizon2020: 2018-2022; 41 partners); COMPARE; EVAg; VetBioNet, PALE Blu
Institut Pasteur in Guinea	Conakry, Guinea and France	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	Emerging Diseases: Haemorrhagic Fevers (CCHFV, RVFV, Ebola virus, etc.), transboundary diseases several research projects: Ebola Foresight Study: The Role of Livestock and Wild Animal Species in the Biology of Filoviruses (additional partners: Sierra Leone Agricultural Research Institute; Njala University in Sierra Leone; Institut Pasteur in Guinea. IMI-ZAPI: Zoonoses Anticipation and Preparedness Initiative and other Horizon2020 projects, e.g. OneHealthEJP; COMPARE; PALE Blu; VetBioNet

Pirbright Institute	UK	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	MMoU – Strategic cooperation including joint PhD- programme on topics of common interest: Transboundary diseases, (re-)emerging animal diseases, vector competence studies, poultry immunology) OIE-RL AHS, BT, ASF, CSF, FMD, SVD, Lumpy skin disease, PPR,RP, sheep and goat poxseveral ongoing research projects (Horizon2020): EVAG; Defend; PALE Blu; VetBioNet
APHA: Animal and Plant Health Agency	UK	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	One Health: Animal disease and zoonoses OIE-RL Brucellosis, Influenza, TSE, bovine tuberculosis, rabies several ongoing research projects (Horizon2020): OneHealthEJP; COMPARE; EVAG; Delta-Flu; Defend; PALE Blu; VetBioNet
Canadian Food Inspection Agency (CFIA),	Canada	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Emerging disease: High consequence viruses and TSEs Biosafety Level 4 Zoonotic Laboratory Network (BSL4ZNet) several ongoing research projects (Horizon2020): e.g. Delta-Flu; Defend
Centers for Disease Control and Prevention (CDC), Atlanta	USA	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	emerging and transboundary diseases, OIE_RL Rabies
Australian Animal Health Laboratory, CSIRO, Geelong, Australia	Australia	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Harmonization of diagnostic approaches for zoonotic diseases, participation in ring trials for the detection of henipavirus infections organized by AAHL Biosafety Level 4 Zoonotic Laboratory Network (BSL4ZNet) Foot and Mouth Disease (FMD Ready Project)
Harbin Veterinary Research Institute (HVRI) subordinated to the Chinese Academy of Agricultural Sciences (CAAS)	China	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Emerging diseases and zoonoses control (High-containment laboratories and animal facilities BSL-3 and BSL-4) OIE-CC for Zoonoses
Biosafety Level 4 Zoonotic Laboratory Network (BSL4ZNet)	worldwide	<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	BSL4ZNet is creating a global alliance of biosafety level 4 laboratories to optimize how we combat the global threat of diseases that spread from animals to humans. This network is coordinated by the CFIA, it comprises over 60 participants around the world (https://twitter.com/hashtag/BSL4ZNet?src=hash&lang=de). In 2019, FLI researchers participated in numerous online trainings, discussions and webinars, and in addition, two FLI researchers also participated in the BSL4ZNet Live Animal Handling Workshop held in Geelong, Australia. https://twitter.com/hashtag/BSL4ZNet?src=hash&lang=de

Emerging Viruses Disease Laboratory Network (EVD-LabNet)	Europe	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	<p>An expert laboratory network for networking, external quality assessments and training of laboratories involved in these activities initiated by ECDC and coordinated by Erasmus MC:</p> <p>The network focuses on virus families and genera that are rare, imported and (re)emerging in EU/EEA countries. These include the genera Alphavirus, Bornavirus, Calicivirus, Coronavirus, Flavivirus, Henipavirus, Picornavirus and the families Arenaviridae, Bunyaviridae, Filoviridae, Poxviridae, Paramyxoviridae, Reoviridae and Rhabdoviridae. Risk class 4 pathogens are a primary focus of the EMERGE network</p> <p>www.evd-labnet.eu/index.php#background-evd-labnet</p>
EMERGE consortium (EU funded Joint Action, Health Programme)	Europe	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	<p>Efficient response to highly dangerous and emerging pathogens at EU level It contributes to an integrated European laboratory infrastructure and strategy to protect European citizens against exposure to a panel of globally recognized high threat bacteria and viruses (risk group 3 bacteria and 4 viruses). Coordinated by the RKI, Germany, the network comprises about 40 diagnostic laboratories.</p> <p>https://www.emerge.rki.eu/Emerge/EN/Home/Homepage_node.html</p>
Sharp consortium (EU funded Joint Action, Health Programme)	Europe	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	<p>SHARP: Laboratory preparedness and responsiveness</p> <p>Totally 30 countries (24 EU members, 3 EEA/EFTA members and 3 European neighborhood countries) participate in the Joint Action. The SHARP JA will liaise with and collaborate with the ECDC, the WHO EURO regional office and the WHO Health Emergency and IHR unit in Lyon, and IANPHI in relevant activities. Special emphasis will be made to avoid duplication of work for the member states.</p>
China Animal Health and Epidemiology Centre (CAHEC)	Qingdao, China	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	MoU Emerging diseases and zoonoses control

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
One Health EJP Consortium (Horizon2020)	Europe	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	<p>One Health EJP - Promoting One Health in Europe through joint actions on foodborne zoonoses, antimicrobial resistance and emerging microbiological hazards (Horizon2020: 2018-2022; 41 partners)</p> <p>https://onehealthejp.eu/</p>

Compare Consortium (Horizon 2020)		<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Collaborative Management Platform for detection and Analyses of (Re-)emerging and foodborne outbreaks in Europe (Horizon 2020: 29 Partner, 2014-2019); http://www.compare-europe.eu/
Delta-Flu Consortium (Horizon 2020)	Europe, worldwide	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	DELTA-FLU Dynamics of avian influenza in a changing world (Horizon 2020: 2017- 2022; 9 Partner) https://delta-flu.fli.de/de/dynamics-of-avian-influenza-in-a-changing-world/
EVAg Consortium (Horizon 2020)	Europe, worldwide	<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	EVAg: European Virus Archive goes global (Horizon2020: 25 Partner; 2015-2019); https://www.european-virus-archive.com
VetBioNet (Horizon 2020)	Europe	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	VetBioNet: Veterinary Biocontained facility Network for excellence in animal infectiology research and experimentation (Horizon 2020: 19 Partner; 2017-2020); http://www.vetbionet.eu
Aedes Invasive Moquitoes (AIM- COST)	Europe	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	Establishment of a transboundary network across Europe to cost effectively address the management of the risk of introduction and spread of Exotic Invasive Aedes Mosquito Borne Viruses. (COST Action CA17108: Partners from 19 countries; 2018-2022)

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
FLI scientists	FLI experts are available to the OIE at any time for consultation.	Zoonoses and animal diseases, including aquatic diseases. Furthermore, FLI can provide consultancy in the areas of animal welfare, animal feeding and farm animal genetics.

FLI scientists	Comments to OIE Terrestrial Manual and Terrestrial Code	FLI scientist regularly comment on the draft chapters for the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals.
Prof. T. Harder	Joint FAO/IAEA Programme Vetlab network (CRP D32032)	Training Course on Transboundary Animal Disease Diagnoses: Validation, Implementation, Monitoring and Quality Control for Molecular Assays 18-29 November 2019, IAEA Laboratories, Seibersdorf, Austria
Dr. Thomas Müller	Member of the OIE ad hoc group on Rabies	Position Statement on Oral Rabies Vaccination for Dogs To provide expert opinion to the OIE regarding the post-titer importation waiting period for dogs to be imported from infected countries or zones Drafting of an OIE Rabies Laboratories Network Description
Dr. Klaas Dietze	Invited expert	OIE GF-TADs standing group of experts on ASF Asia (2. Meeting) Member of the CMC Mission (OIE/FAO) on ASP in Mongolia FAO-OIE Global Conference on Peste des Petits Ruminants

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: 7
- b) Seminars: 3
- c) Hands-on training courses: 12
- d) Internships (>1 month): 6

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
a	Coordination meeting in Nouakchott, Mauritania of project on the epidemiology of RVFV and CCHFV	Mauritania	3
a	Workshop for the serological and molecular diagnosis of neglected viral diseases in Yaoundé, Cameroon	Cameroon	5
a	Workshop for the serological and molecular diagnosis of neglected viral diseases in Garoua, Cameroon	Cameroon	14
a	Bioinformatics workshop	Ukraine	8

a	Brucellosis diagnosis	Pakistan	30
a	Brucellosis diagnosis/ Antibiotic resistance testing	Algeria	10
a	Brucellosis diagnosis	Egypt	20
c	Training course for the Anthrax and Brucellosis diagnosis	Ukraine	2
c	Training course for the Antibiotic resistance testing	Ukraine	2
c	Training course for the Brucellosis diagnosis	Egypt	1
c	Training course for the diagnosis of Brucellosis and Glanders	Pakistan	1
c	Training course for the Brucellosis diagnosis	Algeria	1
c	Training course for the diagnostics of CCHFV and ASFV, including an introduction to bioinformatics	Ukraine	3
c	Training course for the serological and molecular diagnosis of Rift Valley fever virus, Crimean-Congo Hemorrhagic fever virus, and the identification of vector species (ticks and mosquitoes)	Mauritania	2
c	Long-term Europe-African Research Network (LEARN), training in serological and molecular diagnostics of neglected African zoonotic arboviruses	South Africa	2
c	Training course for the serological and molecular diagnosis of Rift Valley fever virus, Crimean-Congo Hemorrhagic fever virus	Mauritania	1
c	Diagnostics of Crimean-Congo Hemorrhagic fever virus in livestock	Tunisia	1
c	Dissection of small mammals according a standard protocol and sample bank storage	Netherlands	1
d	Bioinformatics and Next-Generation Sequencing	Italy	1
d	Internship-CAHEC: Diagnosis, microbiology and epidemiology of zoonotic bacterial agents (Chlamydia, Coxiella, Mycobacteria et al.) and Veterinary epidemiology. Biosafety training and biorisk management in high containment laboratories and experimental animal facilities.	China	2
d	Internship on Brucellosis (diagnostic methods)	Palestine	1
d	Internship on Brucellosis (diagnostic methods)	Egypt	1
d	Lab visit of a MSc student to be trained in Brucellosis diagnosis	Sudan	1

d	Lab visit of PhD student to analyze sera and ticks from cattle in Nigeria for the presence of CCHFV and Flaviviruses	Nigeria	1
c	Training on rabies diagnostic and surveillance	Namibia	2

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	Towards Rabies elimination in Asia-Pacific - From Theory to Practice	Worldorganisation of Health (WHO), World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO) International Alliance for Biological Standardization (IABS)	09/19	Bangkok, Thailand	60

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: 317

b) International conferences: 100

Each year, FLI researchers present at numerous international conferences.

c) National conferences: 100

Each year, FLI researchers present at numerous national conferences.

d) Other

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

Website of the Friedrich-Loeffler-Institut, including general information and actual information on animal diseases (www.fli.de)

Twitter-Account of the Friedrich-Loeffler-Institut, including special information, press-releases and retweets of special interest. (@Loeffler_News)

Radar Bulletin Germany - it compiles and evaluates information on the global situation and on the spread of the

most important animal diseases which are relevant for Germany and Switzerland.
<https://www.fli.de/en/publications/radar-bulletin-germany/>

Rabies - Bulletin - Europe: Rabies Information System of the WHO (www.who-rabies-bulletin.org/)

German Research Platform for Zoonoses - an information and service network, funded by the Federal Ministry of Education and Research (BMBF), for all working groups operating in Germany in the field of zoonoses research (www.zoonosen.net)

9. Additional comments regarding your report: