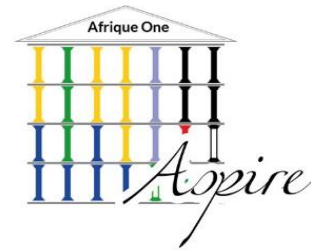


**CSRS**  
Centre Suisse de Recherches  
Scientifiques en Côte d'Ivoire



## **Call for Fellowships Afrique One-ASPIRE**

### **TTP5: Human and Animal Disease Surveillance-Response Systems**

TTP5 aims to address the need to increase the reporting of zoonotic diseases through integration of human and animal surveillance systems, the use of innovative surveillance tools and involvement of communities in disease reporting. This TTP will focus on three themes:

- Surveillance tools and community involvement
- Surveillance-response systems
- Cost–benefit analysis of integrated human–animal disease surveillance systems

**For more information, contact the Co-leads:**

Nare Ngandolo Bongo, IRED, Chad, [bongo\\_nov@yahoo.fr](mailto:bongo_nov@yahoo.fr)

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# Theme 1: Surveillance tools and community involvement

Ref: [TTP5-Surveillance-Response-PDF1](#)

**Project Title:** New tools for integration of animal disease surveillance into existing HDSS in Sub-Saharan Africa

**Enrolment:** The postdoctoral fellow will be enrolled at IRED, Chad or NM-AIST, Tanzania and will work in collaboration with all TTPs (1–5).

**Project Description:** The control and elimination of zoonotic diseases will depend on adequate collection and compilation of all necessary data related to each disease. However, currently, one of the major impediments to zoonotic disease surveillance is poor reporting, particularly for animal diseases. As compared with the animal disease surveillance systems in place, the ones specific to humans are better equipped to collect information which is partially due to the existence of Health and Demographic Surveillance Systems (HDSS). It has been established that outbreaks of many zoonotic diseases in humans can be traced back to animal infections in the same area. Integration of animal disease surveillance in pre-existing HDSS will therefore enhance zoonoses surveillance that will account for both human and animal diseases. The postdoc will be expected to develop and test tools for integrating animal disease surveillance into HDSS such as questionnaires and others in West and East Africa.

**Mentorship Team:** Richard Ngandolo Bongo (IRED); Joram Buza and Emmanuel Mpolya (NM-AIST); Julius Keyyu (TAWIRI); Esther Schelling, Jürg Utzinger and Jakob Zinsstag (Swiss TPH); Daniel Haydon and Sarah Cleaveland (UoG); Phare G. Mujinja (MUHAS); Bassirou Bonfoh (CSRS); Enock Matovu and Vincent P. Alibu (MAKUN); Lucas Matemba (NIMR)

**Qualifications:** The candidate must be a citizen of an African country. Candidates with a background contributing to One Health will be considered (e.g. public health, veterinary and animal sciences, social sciences, geography, epidemiology and health economics). Candidates with a PhD degree in a different field are preferred.

**Training:** Training will be provided primarily in Chad or Tanzania.

Ref: TTP5-Surveillance-Response-PhD1

**Project Title:** The use of mobile phones for integrated zoonotic disease surveillance in pastoralist Maasai in northern Tanzania

**Enrolment:** The PhD will be most likely enrolled in NM-AIST, Tanzania.

**Project Description:** One of the major constraints for the control of zoonotic diseases in developing countries is the absence of qualitative/quantitative information on the diseases. Poor disease monitoring systems and a lack of resources (i.e. research funds and researchers) are among the main factors responsible for this deficit. Most of the currently available disease information is generated by active identification of disease cases by researchers and limited or passive participation by the communities affected. We hypothesize that the involvement of communities in disease reporting, using tools such as mobile phones may enhance zoonotic disease surveillance and provide information which can help in designing interventions.

The project will engage Maasai pastoralists and their families to report diseases affecting them and their livestock. Using structured questionnaires, pastoralists will be interviewed at regular intervals through mobile phones to report incidences of health issues affecting them and their animals. Information such as human demographic information (e.g. number, ages, sex, birth and death) as well as signs of disease such as fever and death will be recorded. Information on animals including species, ages, numbers, births, and signs of diseases (e.g. fever, abortions, lameness, death) will be collected. Furthermore, building on experience of home-based HIV testing, the use of field diagnostic tests that can potentially be deployed in communities will be explored to investigate how rapid diagnosis can empower and engage front-line health workers and communities.

**Mentorship Team:** Richard Ngandolo Bongo (IRED); Joram Buza and Emmanuel Mpolya (NM-AIST); Julius Keyyu (TAWIRI); Esther Schelling, Jürg Utzinger and Jakob Zinsstag (Swiss TPH); Daniel Haydon and Sarah Cleaveland (UoG); Phare G. Mujinja (MUHAS); Enock Matovu and Vincent P. Alibu (MAKUN)

**Qualifications:** The candidate must be a citizen of an African country and should have an MSc degree in health and allied sciences. A degree or experience in epidemiology will be an added advantage.

Ref: TTP5-Surveillance-Response-Msc1

**Project Title:** Human–animal tuberculosis control in nomadic pastoralists: the role of communities and new technologies in the detection of new cases

**Enrolment:** The candidate will be enrolled at NM-AIST, Tanzania.

**Project Description:** Tuberculosis (TB) is prevalent worldwide, infecting human populations, livestock and wildlife and is transmitted within this group of hosts. TB control in Africa is effective at the public health level with little knowledge on its impact in 'hard to reach'-populations such as those with nomadic lifestyle. However, TB control in African livestock herds does not exist, as highlighted by several studies, hence nomadic people who are in permanent and close contact with the herd animals are continuously exposed to TB and other zoonotic diseases. This project will focus on detecting diseased animals and infected nomadic people using an integrated approach. The use of technologies that are new to the populations assessed, such as mobile phone and the implication of communities in the disease management will be encouraged in order to build a suitable intervention system that can be maintained in the long-term. The impact of informal transportation systems such as motorcycle taxis in the care of patients will be assessed in addition. In the animal health setting, detection of diseased animals using a SICCT cut off will be used.

**Mentorship Team:** Rudowick Kazwala (SUA); Kennedy Kwasi Addo (NMIMR); Sayoki Mfinanga (NIMR); Richard Ngandolo Bongo (IREG); Joram Buza and Emmanuel Mpolya (NM-AIST); Julius Keyyu (TAWIRI); Esther Schelling, Jürg Utzinger and Jakob Zinsstag (Swiss TPH); Daniel Haydon and Sarah Cleaveland (UoG); Phare G. Mujinja (MUHAS); Enock Matovu and Vincent P. Alibu (Makerere)

**Qualifications:** The candidate must be a citizen of an African country and have a BSc in health or allied health sciences with experience in research.

## Theme 2: Surveillance-response systems

Ref: [TTP5-Surveillance-Response-PhD2](#)

**Project Title:** Zoonotic disease surveillance-response in nomadic pastoralists in Sub-Saharan African countries: the role of human–animal disease surveillance integration systems in zoonosis control

**Enrolment:** The selected candidate will be enrolled at NM-AIST or SUA, Tanzania or EISMV, Senegal.

**Project Description:** Pastoralists and other ‘hard to reach’ communities are not well served by conventional health services. Pastoralist communities are in permanent close contact with livestock and are therefore at high risk of exposure to zoonotic pathogens. Tuberculosis (TB) and brucellosis are widespread in both animal and human nomadic populations. It has been shown that pastoral communities often engage with human health services more effectively when interaction is catalysed through animal health service delivery. This project will liaise with on-going national and NGO programmes that are engaging with mobile populations (e.g. for malaria and TB control) and will explore the potential to build on these platforms for developing integrated active surveillance systems. A pilot study will be carried out in order to design such a system and integrate data collection, in human and animal populations, through existing animal health service delivery pathways.

The project will explore the feasibility, reliability, acceptability and the costs of collecting data via tuberculin skin tests involving the farmers who will be recording the 3-day cattle responses. The project will also examine possible mitigating responses to bovine TB surveillance data, including recommendations for boiling milk and slaughter of reactors.

Equally we aim to explore the feasibility, reliability, acceptability and cost of collecting data on conventional diagnostic rapid tests for brucellosis in order to identify diseased cows that have to be removed from the farms to protect women and children from brucellosis infection. Women and children will be trained to identify animal brucellosis symptoms and to report new cases to veterinary staff using mobile phones.

In order to identify TB and brucellosis cases in nomadic populations, the exposed herd will be reported to the medical staff by mobile phones used for disease investigation. This way all new cases in the herd will be reported and treated by the program. One MSc student will focus on the development of new strategies that will help to detect new TB cases in both human and animal hosts. A second MSc candidate will assess the impact of an integrated human–animal health service in the detection of brucellosis cases in human populations and establish strategies that will

help limiting abortions in both human and animal populations. The two different topics developed within this frame are:

- Human–animal TB control in nomadic people: the role of communities and new technologies in the detection of new cases (1 MSc)
- Human–animal brucellosis control in nomadic people: the impact of an integration intervention in the reporting and treatment of new human cases and removal of infected animals from the herds (1 MSc)

The project will be based in Chari Baguirmi and Hadjer Lamis (Chad) and Kilimanjaro (Tanzania). Laboratory work will be done at IRED (Chad), NMIMR (Ghana) and SUA (Tanzania).

**Mentorship Team:** Rudowick Kazwala (SUA); Joram Buza (NM-AIST); Kennedy Kwasi Addo (NMIMR); Richard Ngandolo Bongo (IRED); Bassirou Bonfoh (CSRS); Jakob Zinsstag (SwissTPH); Prosper Chaki and Nicodemas Govella (IHI)

**Qualifications:** The candidate must be a citizen of an African country. MSc in health and allied sciences. Experience in working on TB or brucellosis will be an added advantage.

Ref: [TTP5-Surveillance-Response-MSc2](#)

**Project Title:** Establishing surveillance systems for human and livestock abortion: etiology, impact and the design of interventions

**Enrolment:** The candidate will be enrolled at NM-AIST, Tanzania, EISMV, Senegal or UFHB, Côte d'Ivoire.

**Project Description:** Ruminant livestock are critical to the livelihoods and food security of millions of livestock-keeping communities across Africa. However, productivity is constrained by a high burden of infectious diseases. Many abortive agents are known to circulate widely in livestock in Sub-Saharan Africa, causing reproductive losses. Many of these pathogens are zoonoses that are equally important causes of common human diseases. However, surveillance systems to generate data on the incidence and etiology of livestock reproductive losses and their impact on productivity in Sub-Saharan Africa are inadequate. In addition, there is still a poor understanding of the most effective and acceptable interventions that can be implemented in response to livestock abortion surveillance data. Currently there is no accepted modeling framework for measuring the direct and indirect impact of animal health interventions on farmers in low-income settings. Interventions are often conducted piecemeal and the benefit–cost ratio of potential up-scaling is difficult to evaluate.

This PhD project aims to address these gaps through trailing a pilot livestock abortion surveillance platform in livestock-keeping communities in Tanzania. The different aims of this project are to (a) determine the etiology of livestock (i.e. cattle, sheep and goat) abortions in different livestock systems; (b) assess the impact of livestock abortions in terms of production losses and impacts on household economics; (c) evaluate the cost–effectiveness of different reporting systems; (d) identify and evaluate potential response/intervention strategies; (e) explore the relationship between reporting and response to understand factors that are likely to increase farmer/community engagement and to improve the cost–effectiveness and sustainability of different potential interventions.

**Mentorship Team:** Blandina Mmbaga (KCRI/KCMC); Joram Buza (NM-AIST); Rudovick Kazwala (SUA); Ruth Zadoks, Alicia Davis and Sarah Cleaveland (UoG); Felix Lankester (WSU); Bassirou Bonfoh and Gilbert Fokou (CSRS)

**Qualifications:** The candidate must be a citizen of an African country and have a BSc in health and allied sciences.

Ref: [TTP5-Surveillance-Response-MSc3](#)

**Project Title:** Human–animal brucellosis control in nomadic pastoralists: the impact of an integrated intervention in the reporting and treatment of new human cases and removal of infected animals from the herds

**Enrolment:** The selected candidate will be enrolled at SUA, NM-AIST Tanzania, EISMV, Senegal or University Félix Houphouët-Boigny, Côte d'Ivoire.

**Project Description:** Brucellosis is a bacterial infectious disease that is transmitted to humans when they are in contact with infected animals or animal products contaminated with the bacteria. The most commonly infected animals include sheep, cattle, goats, pigs, and dogs. Brucellosis infection has been previously reported in animals from many African countries and it is one of the main causes of abortion in cattle. Some of the human brucellosis symptoms are similar those caused by other common infection tropical diseases such as malaria. Diagnosis is challenged by the fact that human brucellosis is not well known by medical staff. This project will use an integrated approach in order to enhance detection of diseased herds and infected nomadic patients that have to be treated by public health services. The project will be based in Chad, Tanzania and Uganda.

**Mentorship Team:** Rudowick Kazwala (SUA); Kennedy Kwasi Addo (NMIMR); Richard Ngandolo Bongo (IREG); Jakob Zinsstag (Swiss TPH); Bassirou Bonfoh (CSRS)

**Qualifications:** The candidate must be a citizen of an African country and have a BSc in health or allied health sciences with at least two years' experience in research.



## Theme 3: Cost–benefit analysis of integrated human–animal disease surveillance systems

Ref: [TTP5-Surveillance-Response-PhD3](#)

**Project Title:** Cost analysis of integrated disease surveillance and response systems in Sub-Saharan Africa

**Enrolment:** The selected candidate will be enrolled at MAKUN, Uganda.

**Project Description:** Zoonotic diseases are an important cause of illness and death in Sub-Saharan Africa. To address this problem, Afrique One-ASPIRE is developing a regional strategy of integrated disease surveillance and response (IDSR) based on a One Health approach. This calls for a coordinated use of resources, tools and approaches for early detection and response to zoonotic diseases. The main objective of this study is to analyse cost vs. benefit of IDSR based on a One Health approach compared with the conventional strategy based on segregated human and animal disease surveillance.

Systematic communication between medical, veterinary and wildlife disciplines is important for efficient surveillance, diagnosis and control of zoonotic diseases. Such collaborations reduce costs and delays and can enhance disease detection and control. Interdisciplinary collaboration has already started to yield good results in the control of zoonotic diseases. The cost–benefit gains derive from achieving more while sharing resources or by doing the same using fewer resources. Typical examples as quoted from the 'Economics of One Health' include:

- 'In Chad, joint animal–human vaccination campaigns of DPT and polio in children and CBPP control in livestock resulted in greater coverage in both humans and livestock, and pastoralists became more aware of public health services.'
- 'In Jaipur, India, dog vaccination and sterilization resulted in a decline of human rabies cases to zero (whereas cases increased in other states that did not have this campaign). The population of stray dogs declined by 28 percent.'
- 'In Kyrgyzstan, public health and veterinary workers together visit farms, resulting in lower costs of surveillance for brucellosis, echinococcosis, and other zoonotic diseases.'
- 'In Canada, the integration of animal and human health facilities led to a 26% reduction in operation costs, an improvement in efficiency that is not yet directly applicable in most developing countries.'

This study will involve data collection for conventional and One Health–IDSR activities focusing on brucellosis.

**Mentorship Team:** Richard (IREG); Joram Buza (NM-AIST); Julius Keyyu (TAWIRI), Esther Schelling, Jürg Utzinger and Jakob Zinsstag (Swiss TPH); Daniel Haydon and Sarah Cleaveland (UoG); Phare G. Mujinja (MUHAS); Emmanuel Mpolya (NM-AIST); Enock Matovu and Vincent P. Alibu (MAKUN); Bassirou Bonfoh (CSRS)

**Qualification:** The candidate must be a citizen of an African country and have a BSc in health and allied sciences and an MSc in health economics.