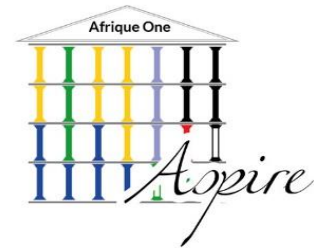


CSRS

Centre Suisse de Recherches
Scientifiques en Côte d'Ivoire



Call for Fellowships Afrique One-ASPIRE

TTP4: Foodborne Diseases and Nutritional Illnesses

TTP4 aims to address the nutritional patterns in transitional landscapes and their impact on food-related diseases by studying the epidemiological links between infectious diseases and selected/related non-communicable diseases of livestock dependent populations. It covers the following aspects:

- Animal-source food value chains – livelihood of livestock dependent populations
- Consumption patterns – true foodborne disease (FBD) burden and risk of infection – non-communicable disease (NCD) analysis and opportunities
- Socioeconomic cost-effective design of interventions

For more information concerning TTP4, contact the Co-leads:

Bassirou Bonfoh, CSRS, Côte d'Ivoire, bassirou.bonfoh@csrs.ci

Sayoki Mfinanga, NIMR, Tanzania, gsmfinanga@yahoo.com

[Ref: TTP4-Food-PDF1](#)

Project Title: Development of innovative surveillance tools for predicting and evaluating the risks of FBDs and NCDs

Enrolment: The postdoctoral fellow will be enrolled at CSRS, Côte d'Ivoire and NIMR, Tanzania and collaborate with the other four thematic training programmes on rabies, tuberculosis (TB), brucellosis and surveillance-response.

Project Description: FBDs (e.g. poisoning, brucellosis and TB) are taking a massive toll on the world's poorest communities in Sub-Saharan Africa. According to WHO the global burden of foodborne diseases, as assessed for 31 hazards, was 33 (95% UI 25–46) million DALYs in 2010, positioning the problem as the second biggest public health concern worldwide. Moreover, WHO identified malnutrition as the single most important risk factor for developing disease. Economic constraints (e.g. low income, high medical costs) at the household level often perpetuate ill-health by leading to reduced and poor quality food consumption. Other determinants that influence a person's health status include education, social status, personal health and hygiene practices (e.g. hand washing). The emergence of NCDs is linked to nutrition and the types of food that is consumed, according to WHO.

The fellow will address the epidemiological links between food and human health including infectious and non-infectious diseases, and how these risk factors will influence the cost-effectiveness of control interventions. The work will characterise multipathogen patterns and their effects on animal-source food value chains. An intervention model comprising sensitivity analysis will be the core methodology to develop novel policy standards and guidelines. We believe that effective control of foodborne diseases should be based on validated information derived from One health research. Therefore, the specific methods and approach that will be used to address the topic are (i) participatory risk analysis, (ii) intervention design based on risks and incentives, (iii) cost-effectiveness of risk mitigation and (iv) capacity development in FBD control and policy. The project will cover settings in East Africa (Tanzania) and West Africa (Côte d'Ivoire) and consider rural and urban contexts.

Mentorship team: Appolinaire Djikeng, Josephine Birungi and Francesca Stomeo (BecA-ILRI); Giovanna Raso, Jakob Zinsstag and Felix Roth (Swiss TPH); Daniel Haydon and Tiziana Lembo (UoG); Phare G. Mujinja (MUHAS); Nonga Hezron Emmanuel (SUA); Emmanuel Mpolya and Neema Kassim (NM-AIST); Andrew Yona Kitua (NIMR); Shabbar Jaffa (LSHTM)

Qualifications: The candidate must be a citizen of an African country. Candidates with a background related to any One Health discipline 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.

Duration and Training: The position is funded for 3 years. Training will be provided primarily in Tanzania or Côte d'Ivoire, with opportunities within the Afrique One-

ASPIRE consortium and with supervisory partners in the UK and Switzerland depending on need and internal budget considerations.

Ref: TTP4-Food-PhD1

Project Title: Development of an innovative surveillance tool for predicting and evaluating the risks of FBDs and NCDs

Enrolment: The PhD will be enrolled primarily in NM-AIST, Tanzania or UFHB, Côte d'Ivoire or any other member university of Afrique One-ASPIRE.

Project Description: This project will address how FBDs can be effectively quantified, monitored, surveyed, controlled and prevented. We face complexity in estimating or forecasting the emergence of FBD outbreaks. There is a need for evidence-based data from households, communities and health centres. By using a participatory approach combined with conventional molecular biology tools across the value chain (i.e. farms, markets, households, hospitals), the project will develop a tool for assessing the true burden of FBDs. Households and clinical cases will, therefore, be compared. Bayesian inference will be implemented to estimate the true disease burden using populations at risk and active cases. The project will contribute to the national Food Safety Agencies programme. The fellow may use the potential and opportunities offered by the HDSS in the country where he/she will conduct the study.

Mentorship Team: Julius Dotto Keyyu (TAWIRI); Esther Schelling, Jürg Utzinger, Jakob Zinsstag, Marcel Tanner and Fabrizio Tediosi (Swiss TPH); Bassirou Bonfoh (CSRS); Joram Buza (NM-AIST); Sayoki Godfrey Mfinanga (NIMR); Delia Grace (ILRI/CGIAR); Reginald Kavishe (KCRI/KCMC)

Qualifications: The candidate must be a citizen of an African country. Candidates with any discipline contributing to One Health (e.g. public health, veterinary and animal sciences, social sciences, geography, epidemiology and health economics) will be considered.

Duration and Training: This PhD fellowship is funded for a maximum of 4 years. Training will be provided primarily in Tanzania or Côte d'Ivoire, with further opportunities within the Afrique One-ASPIRE consortium and with supervisory partners in the UK, Switzerland and Zimbabwe, depending on need and internal budget considerations.

Ref: TTP4-Food-PhD2

Project Title: The role of pastoral nutritional systems in early childhood and risk factors of emergence of NCDs in adults

Enrolment: The PhD fellow will be enrolled at NM-AIST, Tanzania.

Project Description: NCDs, consisting mainly of cardiovascular diseases (CVD), diabetes, chronic respiratory diseases and cancer have emerged relatively unnoticed in most African countries in the past years and are now representing a major health concern. Under-nutrition *in utero* and low birth weight which is particularly prevalent among low-income populations, increase the subsequent risk of CVD and diabetes. There is evidence that the childhood socioeconomic status is linked to type 2 diabetes and obesity in later life which, in turn, is associated with CVD. Pastoralist communities, whose diet is mainly based on meat and meat products, may have therefore a relatively high exposure to NCDs owing to the potentially high intake in saturated fats. The pastoralist behaviour of eating mainly meat-based food puts this segment of the population in high risk for NCDs. In general, more research is necessary to establish the risk factors related to the consumption of meat and meat products in African settings and suitable interventions to mitigate the risk factors.

In this project we will investigate nutritional status and weaning practices in early childhood to predict future NCDs risk factors. The aim is to develop best practice interventional packages for mitigating the risk factors for developing NCD in adulthood in rural ethnic groups that differ according to the degree of traditional livestock-keeping: (a) Maasai (Tanzania) and Fulani (Côte d'Ivoire) that traditionally practice pastoralism.

Mentorship Team: Sayoki G. Mfinanga and Esther Ngadaya (NIMR); Bassirou Bonfoh (CSRS); Pammla Petrukea, Joram Buza, and Neeama Kassim (NM-AIST); Kaushik Ramaiya (MUHAS); Julius Mwaisalage (Ocean Road Cancer Institute Dar Es Salaam)

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

Duration and Training: The PhD fellowship is funded for a maximum for 4 years. Training will be provided primarily in Tanzania or Côte d'Ivoire, with further opportunities within the Afrique One-ASPIRE consortium and with supervisory partners in the UK, Switzerland and Zimbabwe, depending on need and internal budget considerations.

Ref: TTP4-Food-PhD3

Project Title: Socioeconomic analysis of behaviour change intervention in foodborne diseases

Enrolment: The PhD fellow will be enrolled at MUHAS, Tanzania, EISMV, Senegal or an Ivorian University.

Project Description: Foodborne and neglected zoonoses are taking a massive toll on the world's poorest and most marginalised communities in Sub-Saharan Africa each year, according to WHO. Neglected viral, parasitic and bacterial diseases are among some of the most common infections affecting about 2.7 billion people who live below the poverty line of less than 2 US\$ a day (WHO 2006). Poverty and food insecurity are the main determinants of endemic and emerging zoonotic diseases.

This PhD fellowship will address zoonotic risk of domestic and game food products by exploring local and cost effective interventions that can be scaled up. The methodological approach will include assessing the costs and benefits of a variety of selected food safety interventions in rural and urban areas. Health and wellbeing outcomes in the population will be explored including consumption patterns that may lead to NCDs and/or infectious diseases.

The project will use the WHO STEPS survey methods to establish the burden of NCDs in agro-pastoral communities in rural and urban areas. The evidence generated from the cost–benefit analysis will deliver policy options and strategies for effective behavioural change.

The consortium is looking for a PhD candidate to conduct an in depth economic analysis of different behaviour change models/options conducting cost–benefit analysis (e.g. BIA, DCE) to identify the most feasible interventions to address the burden of foodborne illnesses in the rural and urban communities. This project will build on the existing work of foodborne zoonoses, food safety and behavioural economics in Africa and globally. It will implement the lessons learned from current interventions that have demonstrated positive results in addressing the social economic and behavioural aspects of foodborne illnesses and NCDs. The following components will be investigated: (a) risk factors and treatment seeking patterns for selected foodborne zoonoses and NCDs b) burden of disease in the affected communities (i.e. DALYS/QUALYS) (c) benefit–incidence outcomes of disease interventions (d) feasibility for designing a cost-effective behaviour change intervention addressing foodborne zoonoses and NCDs and socioeconomic and behavioural risk factors for foodborne zoonoses and NCDs.

The project will be based in central Tanzania as part of foodborne interventions within ongoing research programmes (e.g. ZELS, DTRA, ErAfrica food safety [EISMV], ZELS Brucellosis [EISMV, UoG, SUA], Novartis comorbidity [Infections, NCD/HDSS Taabo] and PASRES). The project will involve extended periods of fieldwork in selected locations within the study areas.

Mentorship Team: Melkzedeck T. Leshabari, Mangi J. Ezekiel and Dereck Chitama (MUHAS); Sayoki G. Mfinanga (NIMR); Mwita Chacha (University of Dar Es Salaam, Tanzania); Rudowick Kazwala (SUA); Bassirou Bonfoh (CSRS); Julius Keyyu (TAWIRI); Martin Kimanya (NM-AIST); Jennifer Keiser (Swiss TPH)

Qualifications: The candidate must be a citizen of an African country. Candidates from any discipline contributing to One Health (e.g. public health, veterinary and animal sciences, social sciences, epidemiology and health economics) will be considered. Candidates with an Undergraduate degree (GPA 3.5 and above) in a relevant field from a recognised university are preferred.

Duration and Training: The PhD fellowship is funded for a maximum of 4 years. Training will be provided primarily in Tanzania or Côte d'Ivoire, with further opportunities within Afrique One-ASPIRE consortium and with supervisory partners in the UK, Switzerland and Zimbabwe, depending on needs and internal budget considerations.

Ref: TTP4-Food-MSc1

Project Title: Association of eating red meat and emergence of NCDs in two African populations

Enrolment: The MSc fellow will be enrolled at the NM-AIST, SUA, Tanzania or at an Ivorian university.

Project Description: The process that delivers food from the farm to the plate has changed drastically over the past half century. Food contamination that occurs in one place may affect the health of consumers living on the other side of the planet. This means that everyone along the production chain, from producer to consumer, must follow safe food handling practices (WHO, 2015).

NCDs, mainly represented by cardiovascular diseases (CVD), diabetes, chronic respiratory diseases, and cancer have emerged relatively unnoticed in most African countries in recent years and are now representing a major health concern. Red meat in the diet may be unprocessed or processed by methods other than freezing (e.g. salting, smoking, marinating or air-drying). Common examples are ham, bacon, sausages, salami, corned beef and tinned meat. On a global level, epidemiological studies have implicated possible associations between eating too much red meat (i.e. both processed and unprocessed) and weight gain, as well as an increased risk in various chronic diseases including CVDs, type 2 diabetes and colorectal cancer. A nutritional transition due to urbanization in Africa and pastoralist behaviour of eating mainly meat-based foods put the African urban and rural population at high risk for NCDs. However, knowledge gaps remain regarding the established risk factors related to eating unprocessed and processed meat and meat products in African settings and the intervention to mitigate the risk factors.

In this project we will investigate the risk factors for, and the prevalence of non-communicable diseases, and develop intervention packages for mitigating the risk factors in a defined urban population in Tanzania and Côte d'Ivoire in rural ethnic groups that differ according to the degree of traditional livestock-keeping: (a) Maasai (Tanzania) and Fulani (Côte d'Ivoire) that traditionally practice pastoralism.

Mentorship Team: Sayoki G. Mfinanga and Esther Ngadaya (NIMR); Bassirou Bonfoh (CSRS); Pammla Petrukea, Joram Buza, and Neeama Kassim (NM-AIST); Kaushik Ramaiya, (MUHAS); Julius Mwaisalage (Ocean Road Cancer Institute Dar Es Salaam)

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

Duration and Training: The fellowship is funded for a maximum of 30 months. Training will be provided primarily in Tanzania, with further opportunities within the

Afrique One-ASPIRE consortium and with supervisory partners in the UK and US, depending on needs and internal budget considerations.

Ref: TTP4-Food-MSc2

Project Title: Significance of animals to people in different cultural settings: trauma and mental health implications

Enrolment: The MSc will be enrolled primarily in UFHB, UAO, Côte d'Ivoire, EISMV, Senegal, NM-AIST or MUHAS, Tanzania or any other university member of Afrique One-ASPIRE.

Project Description: Animal-human relationships take place on different levels - there are animals that populations eat, fear or love. The growing ethical concerns on the use of livestock as food-producer or the use of animals for laboratory experiments has raised questions on the trade-offs between food security and the emotional aspects of livestock and animal welfare. In different cultural settings, the approach may differ. It is important to understand the current role of livestock, the utilitarian human–animal relationship and how to set comprehensive ethical boundaries. In time of threat (e.g. drought, flood, conflict) livestock dependent populations lose their assets and enter into a traumatic situation which can lead to mental health issues, which represent neglected diseases in pastoral zones in Africa. The candidate may choose to work on one of the two following topics:

- Companion animals in households (e.g. dogs and cats)
- Ruminants in pastoral zones (e.g. cattle, sheep and goats)

Mentorship team: Pfeiffer Constanze and Jakob Zinsstag (Swiss TPH); Karim Ouattara (UFHB); Sarah Cleaveland and Daniel Wight (UoG); Bassirou Bonfoh and Gilbert Fokou (CSRS); Serge Bakou (EISMV); Melkzedek T. Leshabari and Mangi Ezekiel (MUHAS); Marion Sumari de Boer (KCRI/KCMC); Akindès Francis (UAO)

Qualifications: The candidate must be a citizen of an African country. Candidates from disciplines related to social science, anthropology, psychiatry, ethology contributing to One health with knowledge on ethics and animal welfare will be considered.

Duration and Training: The fellowship is funded for a maximum of 30 months. Training will be provided primarily in Tanzania or Côte d'Ivoire, with further opportunities within the Afrique One-ASPIRE consortium and with supervisory partners in the UK, Switzerland and Zimbabwe, depending on needs and internal budget considerations.

Ref: TTP4-Food-MSc3

Project Title: Socio-behavioural risks affecting the control of cysticercosis and toxoplasmosis in pastoral communities

Enrolment: The MSc fellow will be enrolled at the University of Dar Es Salaam, Tanzania.

Project Description: Cysticercosis and toxoplasmosis are becoming more prevalent in Africa due to increasing numbers of uncontrolled pig farming and pets living together with humans, particularly amongst the pastoral communities in rural settings. Infection can be acquired by ingestion of oocytes from contaminated environmental sources. Once ingested, the parasites migrate through the human body to reach their target tissues and may, depending on location, cause a variety of symptoms such as late-onset epilepsy or ocular damage.

Recent findings indicate that people in rural communities (southern–northern highland of Tanzania) are knowledgeable on the existence of these parasites as well as the roles of pigs, dogs and cats in the transmission of cysticercosis/toxoplasmosis infections. Some members in these communities are even aware of the behaviours that facilitate the infection process, such as living together with cats and dogs in the same house, poor sanitation and uncontrolled pig farming systems. Despite this knowledge, people in these communities do not change their behaviours. The project is anticipated to identify (i) the social drivers of disease transmission and to propose a community based control/elimination strategy of cysticercosis/toxoplasmosis infection in the study regions in Tanzania, (ii) to assess the socio-cultural settings responsible for the persistence of the *Taenia solium/Toxoplasma* spp. cycle in those regions and (iii) to propose an effective community communication plan for the prevention and control strategy for *T. solium/Toxoplasma* spp. infection.

The project will be based in Mbulu, northern Tanzania and the Katavi/Sumbawanga regions, southern Tanzania where other studies on transmission dynamics of *T. solium* cysticercosis are being conducted.

Mentorship Team: Mangi Ezekiel (MUHAS); Gamba Nkwengulila (UDSM); Helen Ngowi (SUA); Gbati Oubri Bassa (EISMV), Bassirou Bonfoh and Gilbert Fokou (CSRS)

Qualifications: The candidate must be a citizen of an African country. Candidates from disciplines related to social science, anthropology, contributing to One health with knowledge on ethics and animal welfare will be considered.

Duration and Training: The fellowship is funded for a maximum of 30 months. Training will be provided primarily in Tanzania or Côte d'Ivoire, with further opportunities within Afrique One-ASPIRE consortium and with supervisory partners in the UK, Switzerland and Zimbabwe, depending on needs and internal budget considerations.

Ref: TTP4-Food-MSc4

Project Title: Socio-ecology of bush meat consumption and zoonoses in the Serengeti ecosystem and the value chain outside of Serengeti

Enrolment: The MSc fellow will be enrolled at the NM-AIST or SUA, Tanzania or EISMV, Senegal

Project Description: Bush meat consumption is widespread in most communities surrounding protected areas in Sub-Saharan Africa. In most cases, bush meat is obtained and sold in informal or illegal settings. Owing to the fact that the majority of bush meat is obtained and sold outside the formal markets, there is a potential risk for community infection with zoonoses as bush meat is not subjected to ante mortem or post mortem inspection. Foodborne zoonoses are taking a massive toll in the world's poorest communities in Sub-Saharan Africa. According to the WHO, neglected zoonoses affect majority of poor and marginalized people worldwide every year. Generally, poverty and food insecurity are the main determinants of endemic and emerging zoonotic diseases. This project aims to collate information on the role of bush meat consumption on community livelihoods and transmission of zoonotic diseases. Specifically, the project will determine what people produce, process and eat, the socio-cultural motives for wildlife hunting, the bush meat food chain, risks of bush meat consumption and how health and conservation risks can be reduced.

Mentorship Team: Bassirou Bonfoh, Inza Koné, Gilbert Fokou and Karim Ouattara (CSRS); Esther Schelling (Swiss TPH); Joram Buza (NM-AIST); Julius Keyyu (TAWIRI) and Sarah Cleaveland (UoG).

Qualifications: The candidate must be a citizen of an African country. Candidates from any discipline contributing to One health (e.g. public health, veterinary and animal sciences, biological sciences, epidemiology or health economics). Candidates with an MSc Master's degree in a relevant field are preferred.

Duration and Training: The MSc fellowship is funded for a maximum for 2 years. Training will be provided primarily in Tanzania, with further opportunities within the Afrique One-ASPIRE consortium and with supervisory partners in the UK or elsewhere depending on the need and budgetary considerations.

Ref: TTP4-Food-MSc5

Project Title: Livestock product infections and drug resistance patterns in rural and urban settings

Enrolment: The Master fellows will be enrolled at the NM-AIST or SUA, Tanzania or EISMV, Senegal.

Project Description: Livestock products forms are major component of nutritional transition in the modern life style. However, contaminated livestock products are a significant threat to public health. *Escherichia coli* and *Salmonella* spp. are the major causes of contamination of livestock products.

Salmonella spp. is one of the most common pathogenic bacteria associated with food. Meat and meat products, poultry and poultry products and dairy products are the main sources of *Salmonella* and other foodborne pathogen infections in humans. Presence of *Salmonella* spp. in fresh raw products can vary widely. In the infected, *Salmonella* spp. can cause food poisoning which results in fever, diarrhoea, and abdominal cramps. If left untreated disease can develop into typhoid fever. Complications such as heart diseases (endocarditis) and arthritis can furthermore arise.

E. coli is an intestinal pathogen that can contaminate food products via faecal matter. Dairy cow and pig factories often dump millions of gallons of putrefying waste into massive open-air cesspits which can leak. The contaminated water is subsequently used to irrigate crops. This is one possible pathway of how a, potentially deadly, faecal pathogen like *E. coli* O157:H7 can end up contaminating our vegetables. *E. coli* can cause urinary tract infections while *E. coli* O157:H7 can result in acute kidney failure with long-term consequences such as insulin dependent diabetes.

Extensive use of antimicrobial drugs in the animal industry (e.g. meat, dairy and poultry production) and in modern medicine has resulted in drug resistance that threatens human health and raises a very serious public health concern. Antibiotic use can promote the creation of superbugs which can contaminate meat and poultry and might lead to persistent disease in people. Superbugs can also exit farms via farm workers, wind, runoff, and wildlife. Even if they don't immediately cause illness, those bacteria are uniquely equipped to exchange genetic immunity via their plasmids, with other bacteria wherever they encounter them.

Infections with antibiotic-resistant bacteria are commonly confused with malaria and are, hence, often misdiagnosed. Studies in Africa documenting the magnitude of risk factors and diseases caused by these infections and drug resistance in general, are limited.

In this project we will investigate the existence of animal and vegetable food contamination with *E. coli* spp. and *Salmonella* spp., and drug resistance patterns as risk factor for human infection.

Mentorship Team: Sayoki G. Mfinanga and Esther Ngadaya (NIMR); Bassirou Bonfoh (CSRS); Pammla Petruoka, Joram Buza, and Neeema Kassim (NM-AIST); Kaushik Ramaiya (MUHAS); Julius Mwaisalage (Ocean Road Cancer Institute Dar Es Salaam, Tanzania); Joseph Addo Ampofo (Water Research Institute, Ghana)

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