



Project Duration

09/2020 – 02/2023

Target Region

Tanzania,
East African Community (EAC)



Project Funding

German Federal
Ministry of Education
and Research (BMBF)

Project ID

01DU20005(A-D)

Project Partners

Bernhard Nocht Institute for
Tropical Medicine (BNITM)
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Epidemiology (Project Coordinator)*

Hamburg University of Applied
Sciences (HAW Hamburg)
*Department of Health Sciences
Department of Computer Sciences
Research and Transfer Centre
"Sustainability and Climate
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University Medical Center
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*Institute of Medical Biometry
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University of Hamburg (UHH)
*Institute of Plant Science and
Microbiology, Department for
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Nelson Mandela African
Institution of Science and
Technology (NM-AIST)
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Teaching Excellence and
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Epidemiological Surveillance for Infectious Diseases in Sub-Saharan Africa

Project Focus

Research and networking project to strengthen Epidemiological Surveillance for Infectious Diseases in Sub-Saharan Africa

The **Overall Objective** of the ESIDA project is to connect skills, methods and data objects from different research disciplines and information sources in order to design new approaches of data-driven health information and surveillance systems for early detection and control of emerging infectious disease outbreaks in the target region Tanzania. The project builds upon previous networks of German and African partners and aims to strengthen international cross-disciplinary collaboration in research and education, involving epidemiology, clinical research, biosecurity, public health, environmental sciences, computer and data sciences.



Project Description

Early detection and timely response to infectious disease epidemics remain a key challenge for health systems worldwide. Especially in regions with limited epidemiological surveillance capacity, disease outbreaks often go unnoticed, particularly affecting resource-restricted areas such as countries in sub-Saharan Africa.

The growing digital infrastructure in sub-Saharan Africa and advances in communication technologies and computer sciences hold considerable potential for strengthening local surveillance systems and early outbreak detection. For example, the collection of health information through mobile devices and Open Data as an additional dimension of traditional epidemiological surveillance systems open new avenues for research and development. However, they also require joint efforts of qualified actors across borders and research disciplines.

The German-Tanzanian research and networking project ESIDA aims to address this challenge by connecting skills, methods and data objects from different research disciplines involving clinical research, epidemiology, public health, biosecurity, environmental sciences, data and computer sciences. Its long-term goal is to expand the ESIDA network and enhance scientific exchange to strengthen Infectious Diseases Surveillance in sub-Saharan Africa.

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ESIDA Overall Structure

The **ESIDA** project integrates seven modules with specific research objectives:

Module 1: ESIDA Collaboration and Networking (led by BNITM, HAW Hamburg)

The aim of module 1 is to initiate a cross-disciplinary research and education network of African and German partners in order to strengthen epidemiological surveillance for infectious diseases in sub-Saharan Africa. Together with local stakeholders in Tanzania, infectious diseases of public health importance shall be prioritized. The main activities include the overall research coordination, the identification of the strengths, weaknesses, opportunities and threats of the ESIDA network and joint capacity building in research and teaching.

Module 2: eHealth Strategies in Epidemiological Surveillance (led by BNITM, NM-AIST)

Module 2 aims to explore the potentials and challenges of digital epidemiological surveillance in sub-Saharan Africa using eHealth solutions. The work focuses on aspects of feasibility and acceptance of eHealth solutions for early case detection and infectious disease surveillance in Tanzania using mobile phones. With the help of local partners from research and health care, existing strategies will be reviewed and new approaches explored to support automated real-time syndrome monitoring and early detection of disease, while providing users with health information. The concept builds on the results of the BMBF-funded pilot study eHISS, which was conducted in Ghana 2013-2015 by the BNITM in collaboration with the Kumasi Centre for Collaborative Research, the Ghana School of Public Health, UKE and the National Institute for Public Health and the Environment.

Module 3: Potentials of Open Data Sources in Epidemiological Surveillance (led by HAW Hamburg)

The goal of module 3 is to identify the potentials of Open Data (health and non-health information) as an untapped resource for epidemiological surveillance in Tanzania. The epidemiological description of the emerging infectious disease under study and its key determinants in Tanzania forms the groundwork of this research. The main activities of this module focus on the identification and critical evaluation of Open Data sources as a key source of information of the ESIDA system, taking into account the environmental, social, political and cultural context of local disease dynamics.

Module 4: ESIDA Data Management (led by HAW Hamburg, NM-AIST)

Module 4 aims at combining and structuring various spatiotemporal health and non-health data in a joint database using information gathered through eHealth tools (module 2) and Open Data sources (module 3). The activities form the basis of the technical concept of the ESIDA health information and surveillance system and will further focus on the development of guidelines for the management, privacy and security of electronic health information.

Module 5: Indicator-based Risk Assessment for Early Outbreak Detection (led by UHH, UKE)

Module 5 focuses on the identification and classification of early warning indicators for outbreak detection in Tanzania using the results obtained in module 2-4. The key activities focus on the development of a methodological framework and software concept of the ESIDA system for data monitoring and analysis to lay out spatiotemporal disease patterns for visualization, e.g. using digital maps. The output will be used to generate and disseminate outbreak alerts targeting public health actors and health policy makers.

Module 6: ESIDA Pilot (led by BNITM, NM-AIST)

In module 6, the four operational sub-systems created in modules 2-5 will be combined to design an electronic health information and surveillance system ESIDA (pre-prototype level). The main aim is to pilot the ESIDA system concept in the target area Tanzania by looking at its functionality and user acceptance. Additionally, it is envisaged to develop standard operating procedures (SOP) based on the early warning principle of the ESIDA system in order to coordinate local activities of outbreak investigation and laboratory diagnostics. The outcomes are to support and complement the activities and achievements of the project "EAC Mobile Labs" in East Africa.

Module 7: ESIDA Decision Support System (led by HAW Hamburg, NM-AIST)

Alongside module 6, module 7 focuses on the concept development of a decision support approach for early outbreak detection and control in Tanzania using the ESIDA system. Here collaboration with local stakeholders is key. The main activities include the planning and conduction of stakeholder workshops, the identification of health care pathways for effective outbreak management together with local health care providers, as well as the development of an ESIDA information and implementation guideline for local stakeholders. The goal is to provide the basis for a possible follow-up pilot phase in collaboration with the East African Community (EAC).