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Ethiopia Foodborne Disease Surveillance (PIONEER) Project

Background

Foodborne disease (FBD) is caused by the consumption of contaminated food or beverages. FBD is usually infectious or toxic in nature and caused by bacteria, viruses, parasites, or chemical substances entering the body through contaminated food. FBD can have significant health impacts, resulting in disability and death. Until recently in many Low- and Middle-Income Countries (LMICs), food safety has received little policy attention, and only modest investments have been made to manage food safety risks. This has been due to two main factors.

- There is weak empirical evidence for the country-level incidence of FBD, the economic costs of unsafe food, and the efficacy of food safety interventions.
- Institutional efforts to address food safety are fragmented across value chains and government ministries, and most LMIC countries lack effective consumer protection and advocacy organizations.

What is the PIONEER Project

PIONEER aims to co-create a national, integrated FBD surveillance system in collaboration with key stakeholders utilizing state-of-the-art genomic methods for pathogen identification and chemical methods to provide timely and actionable data on FBDs to improve food safety and support evidence-based decision making.

Why this Project Matters

Despite their large health and economic importance, the burden of FBD is still unknown in Ethiopia because of the absence of a dedicated surveillance system. As in many countries, infectious disease surveillance in Ethiopia is relying on signals from the health care system to be reported to regional and national authorities. These are mainly based on symptoms such as acute watery diarrhea, and do not provide information on causative agents and incriminated foods. There is no FBD surveillance and exposure to microbial and chemical contaminants in food. This project proposes an integrated FBD surveillance using HDSS as sentinel sites.

Thus, this investment is critical to building resilient, sustainable surveillance systems that generate evidence to strengthen food systems, contribute to long-term impacts, and promote public health.

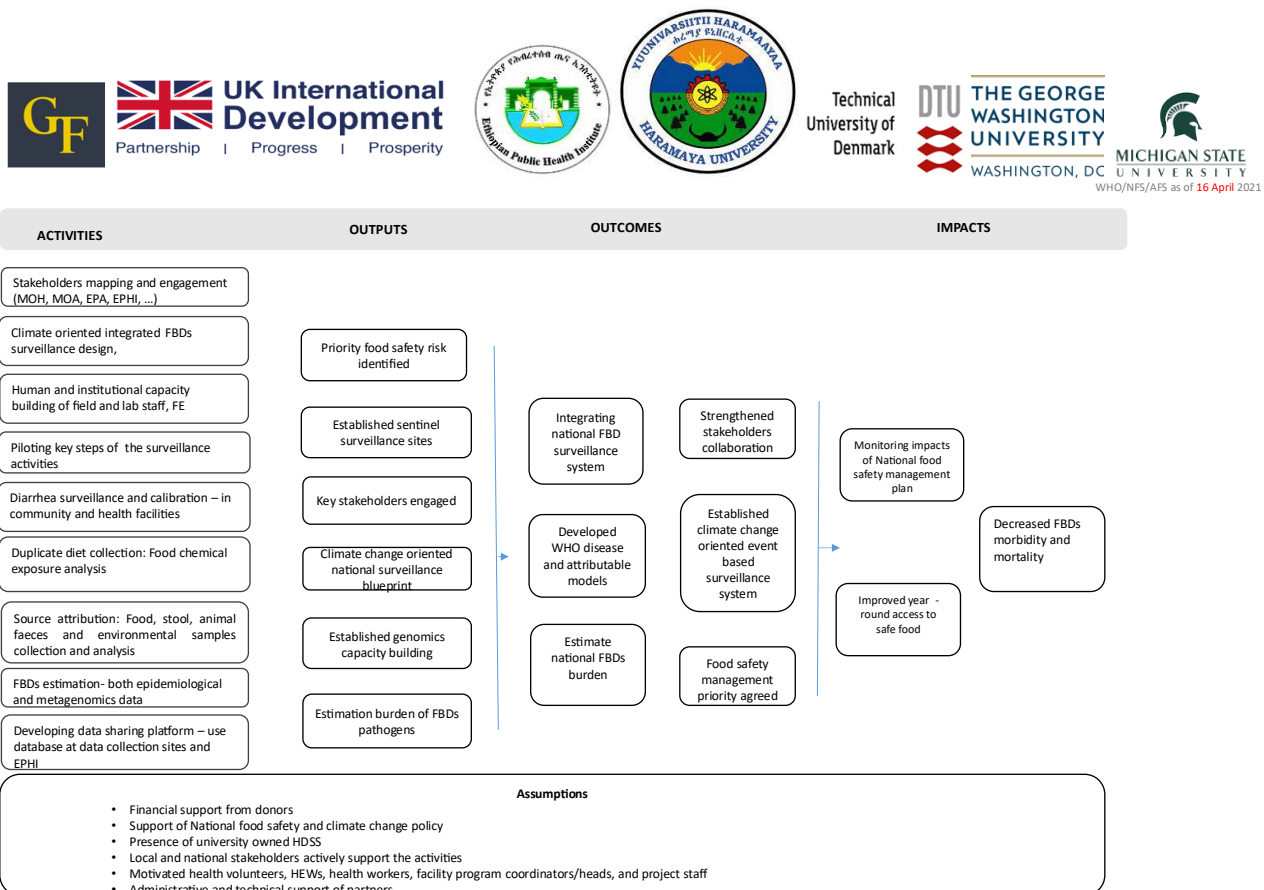


Figure 1. Theory of change to improve year-round access to safe food through integrated FBD surveillance system through HDSS sites in Ethiopian

Project objectives

- Co-design and co-evolve an integrated national FBD surveillance system with key stakeholders and foster multisectoral collaboration to ensure sustainability.
- Establishing integrated sentinel FBD surveillance system at four HDSS sites of the country
- Determine incidence and spatiotemporal distribution of FBD, and identify sources and transmission pathways that affects food safety
- Estimate the burden of microbiological and chemical FBD in Disability Adjusted Life Years (DALYs) to support risk-based food safety management

What Makes PIONEER Innovative

- Integration of human, food, animal, water, climate, and environmental data
- Use of state-of-the-art diagnostics for pathogen detection (multiplex PCR, metagenomics, whole-genome sequencing)
- Inclusion of chemical hazards (aflatoxin, arsenic, lead, cadmium) using duplicate diet studies
- Linkage of climate data with foodborne disease trends in predictive models



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- Strong stakeholder engagement to co-create an integrated FBD surveillance system

How the Project Works and Expected Impact



Timeline

Project Period: 2025 – 2029

PIONEER Partners

- Ethiopian Public Health Institute
- Technical University of Denmark
- George Washington University
- Michigan State University

Expected Outcomes

- Co-created integrated sentinel foodborne disease surveillance system in Ethiopia
- Reliable estimates of foodborne disease burden and key risk factors
- Identification of priority pathogens, sources and contamination routes
- Evidence to support implementation of Ethiopia's National Food Safety Master Plan (2025–2029)
- Strengthened laboratory, analytic, and surveillance capacity
- Improved outbreak preparedness and food safety decision-making

Collaborating institutions

- Addis Ababa University (Butajira HDSS)
- Arba Minch University (Arba Minch HDSS)
- Saint Paul Hospital Millennium Medical College (North Shoa HDSS)



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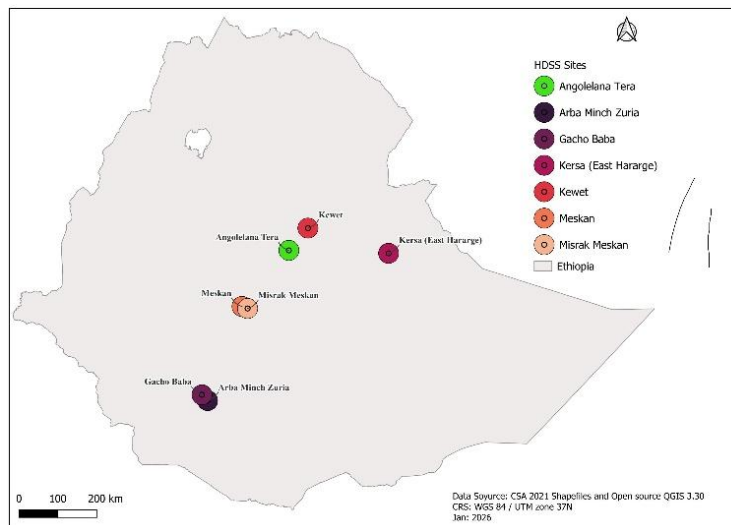
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Project sites



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Project center

College of Health and Medical Sciences
Haramaya University