

One Health cross-sectoral cooperation in Namibia under the Global Health Protection Programme (GHPP) 2020-2026

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Project coordinator
FLI / MAFWLR

One Health Networks for Strengthening AMR & Zoonotic Disease
Detection, Prevention and Control in Africa (OHNet)

Rundu, August, 2026

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- In 2016, the German Federal Ministry of Health established the Global Health Protection Programme (GHPP)
- Focus of the programme:
 - to assist partner countries and the WHO in epidemic prevention measures.
 - strengthen international and national health security, especially the prevention, detection, and containment of infectious diseases with epidemic and pandemic potential.
- The GHPP contributes to achieving the United Nations Sustainable Development Goal 3, which aims to “Ensure healthy lives and promote well-being for all at all ages”.
- GHPP: **53 projects** in **>40 countries** with a total approx. budget of 20 Million Euro/year **with FLI serving as one of seven German implementing institutions**

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FRIEDRICH-LOEFFLER-INSTITUT
Federal Research Institute
for Animal Health





The work of the Friedrich-Loeffler-Institut (FLI) focuses on farm animal health & welfare and on the protection of humans from zoonoses – including related research.

Goals:
Addressing animal infectious diseases and zoonoses where they emerge

The Friedrich-Loeffler-Institut (FLI):
First virological (Animal Health) research institute in the world, established in 1910),
Headquarters: Riems (Greifswald)

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12 specialist Institutes in 5 locations with over 820 employees





Viruses, prions & parasites
Epidemiology & immunology One Health

- Institute of Epidemiology (IfE)
- Institute of Immunology (IfI)
- Institute of International Animal Health/One Health (IITG):** HoD: Prof Sascha Knauf
- Institute of Infectology (IMED)
- Institute of Molecular Virology and Cell Biology (IMVZ)
- Institute of Novel and Emerging Infectious Diseases (INNT)
- Institute of Diagnostic Virology (IVD)

Animal sciences

- Institute of Farm Animal Genetics (ING), Mariensee
- Institute of Animal Welfare and Animal Husbandry (ITT), Celle
- Institute of Animal Nutrition (ITE), Braunschweig

Bacteria

- Institute of Bacterial Infections and Zoonoses (IBIZ)
- Institute of Molecular Pathogenesis (IMP)

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The eponym of our institute

By discovering the foot-and-mouth disease virus, Friedrich Loeffler (1852–1915), physician and microbiologist, became one of the founders of the science of virology. From 1888 on, he taught hygiene as professor at the University of Greifswald.

Loeffler founded the first virological research institute worldwide on the island of Riems, which began research on foot-and-mouth disease on Oct. 10, 1910, and today is the headquarters of our institute.

Institutes

- 🔍 Institute of Bacterial Infections and Zoonoses (IBIZ)
- 🔍 Institute of Epidemiology (IE)
- 🔍 Institute of Immunology (II)
- 🔍 Institute of Infectology (IIMED)
- 🔍 Institute of International Animal Health/One Health (IITG)
- 🔍 Institute of Molecular Pathogenesis (IMP)
- 🔍 Institute of Molecular Virology and Cell Biology (IMVZ)
- 🔍 Institute of Farm Animal Genetics (ING)
- 🔍 Institute of Novel and Emerging Infectious Diseases (INNT)
- 🔍 Institute of Animal Nutrition (ITE)
- 🔍 Institute of Animal Welfare and Animal Husbandry (ITT)
- 🔍 Institute of Diagnostic Virology (IVD)
- 🔍 Department of Experimental Animal Facilities and Biorisk Management (ATB)



WOAH Collaborating Centre for Zoonoses in Europe



Federal Ministry of Food and Agriculture



DZIF



EURCAW Pigs

The FLI operates more than 75 national reference laboratories for notifiable animal diseases and non-notifiable animal diseases, see <https://www.fli.de>

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Collaborative activities in Namibia under GHPP (2020 - 2028)			
GHPP I Started in 2016, with a total of 39 projects funded with durations ranging from 2 to 7 years	01.01.2020 - 31.12.2022	One Health-oriented Interventions in Namibia (One Health Namibia) Partner institutions: - Ministry of Agriculture, Fisheries, Water and Land Reform (MAFWLR) - UNAM	
GHPP II Around 40 projects are funded	01.01.2023 - 31.12.2025	One Health Institutionalisation in Namibia (I-OH Namibia) Partner institutions: - Ministry of Agriculture, Fisheries, Water and Land Reform (MAFWLR) - UNAM	
GHPP III Funding for around 35 projects	01.01.2026 - 31.12.2028	One Health Networks for Strengthening AMR & Zoonotic Disease Detection, Prevention and Control in Africa (OHNet) Partner institutions: - Ministry of Agriculture, Fisheries, Water and Land Reform - Ministry of Environment, Forestry and Tourism - UNAM	

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GHPP I Activities (2020 – 2022)			
Strategic area	OH Nam / GHPP I (Project focus & related activities)		
Zoonotic disease research & application with a focus on Rabies (in support of Namibia's rabies elimination program)	- Innovative approaches to increasing vaccination coverage among free-roaming dogs through two field trials of oral rabies vaccination (ORV) in free-roaming dogs with DVS and CVL: Omusati/Oshana (Oct 2021, 1,115 baits delivered) and a Zambezi emergency-response trial (Nov 2022, 3,097 dogs reached in 4 day). Published in PLOS Neglected Tropical Diseases (2022) and One Health (2023); presented at the United Against Rabies Forum, feeding into WHO/WOAH guidance (oral rabies vaccination in dogs)		
Antimicrobial resistance (AMR) (in support of Namibia's National Action Plan on AMR, NAAP 1.0)	Laboratory capacity building & infrastructure support at the Central Veterinary Laboratory (CVL); - Delivered a laboratory workshop on methods and sample preparation, and the analysis of samples from abattoirs and livestock - Established an ESBL <i>E. coli</i> detection protocol with relevant SOPs aligned to Namibia's AMR National Action Plan (NAAP 1.0). - Joint CVL-UNAM-FLI AMR pilot study (July - Dec 2022) sampling livestock & wildlife, extending multi-sectoral AMR datasets across animal & environmental sectors.		

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Antimicrobial Resistance Activities

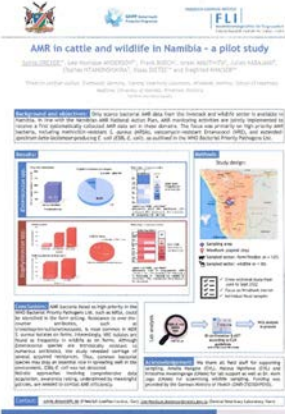


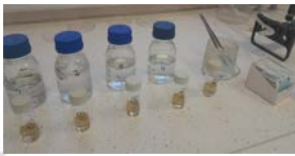


AMR surveillance capacity building studies:
Collaboration between MAFWLR (DVS), FLI and UNAM

AMR cross-sectional pilot study, 2022-2023
 Methicillin Resistant *Staphylococcus aureus* (MRSA), Vancomycin Resistant Enterococci (VRE), and ESBL *Escherichia coli* (ESBL *E.coli*) in Cattle and Wildlife faeces, and surface water

AMR longitudinal study, 2024-2025
 Same pathogens as in the pilot study above (MRSA, VRE and ESBL *E.coli*) in Cattle and Wildlife faeces, nasal swabs, and milk, as well as abattoir and surface water





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GHPP I Activities (2020 – 2022)



Strategic area	OH Nam / GHPP I (Project focus & related activities)
Stakeholder meetings / public engagements	- Co-hosted Namibia's national AMR stakeholder meeting & workshop (April 2022) spanning the human, animal and environment sectors, Government, Quadripartite, Africa CDC and Academia. - Delivered annual World Antimicrobial Awareness Week campaigns (2021 & 2022) with FAO and WOA, including public awareness drives in Windhoek. - Supported World Rabies Day activities (2021 & 2022), including a ministerial speech read in Namibia's parliament. - Distributed a further 300+ oral rabies baits with awareness material around Windhoek and Oshikoto, outside the formal trials.
International dissemination	- Presented Namibia's ORV results as a country case study at the United Against Rabies Forum (UARF), feeding into international rabies-elimination guidance. Featured by WHO (news feature on Namibia's One Health approach to rabies control) and referenced by WOA and CDC. - Published two peer-reviewed papers with our Namibian partners Oral vaccination of dogs (Freuling et al., 2022, PLOS NTD) and Emergency response using oral rabies vaccination of dogs (Freuling et al., 2023, One Health).

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GHPP II Activities (2023 – 2025)



Strategic area	GHPP II contributions
Antimicrobial resistance (AMR)	- Extended inter-institutional AMR research across livestock-wildlife & environment (water bodies) - Co-hosted Namibia's national AMR stakeholder meeting with the MAFWLR (multisectoral coordination, implementation NAAP 1.0, antimicrobial stewardship) - Yearly commemoration of World AMR Awareness Week (WAAW), co-hosted (MAFWLR-UNAM-FLI) Youth AMR Symposium, community outreach, radio interviews, developed awareness film with young local actors and filmmakers 'A Silent Pandemic'. - Developed and distributed AMR information brochures for farmers in seven local languages, covering responsible antimicrobial use, medicine storage and disposal.
Veterinary Medicines Regulation	Supported the Namibia Medicines Regulatory Council (NMRC) through a stakeholder consultation and workshop to review the regulation and

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GHPP II Activities (2023 – 2025)



Strategic area	GHPP II contributions
Zoonotic disease research & application with a focus on Rabies (in support of Namibia's rabies elimination program)	- Supported Namibia's national rabies elimination efforts through continued oral rabies vaccination of free-roaming dogs - Zambezi Region -distribution of >8000 baits First Namibian seal health study, focusing on zoonotic pathogens including Brucellosis, Toxoplasmosis, HPAI, Coxiella burnetii and - Co-hosted a One Health Research Workshop with NUST, delivered for participants from government, academia, laboratories, and international partners. One Health outreach, community support & education (community clean-ups, One Health education with a focus on SAN communities in the Otjozondjupa region (UNAM-MAFWLR-FLI) - Combined rabies vaccination and deworming of community dogs with health and hygiene awareness (UNAM-MAFWLR-FLI)
One Health Research & Community Engagement with UNAM Cares	

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Research studies 2020 - 2025



Study name - Publication	Research focus
Emergency response using oral rabies vaccination of dogs – field data from Namibia demonstrate high efficiency	The use of oral rabies vaccination as an emergency response, including its effectiveness in reaching and vaccinating dogs under field conditions in Namibia.
Oral rabies vaccination of dogs – experiences from a field trial in Namibia	Practical experience with introducing and delivering oral rabies vaccination to dogs during a field trial in Namibia.
Dog Ecology and Rabies Knowledge, Attitude and Practice (KAP) in the Northern Communal Areas of Namibia	Dog populations and ownership patterns, together with community knowledge, attitudes and practices relating to rabies prevention and control.
Serological Survey on Hepatitis E Virus in Namibian Dogs, Cats, Horses, and Donkeys	Evidence of previous exposure to Hepatitis E virus among different domestic animal species in Namibia.
Serological Evidence of Crimean-Congo Haemorrhagic Fever in Livestock in the Omaheke Region of Namibia	Evidence of exposure to Crimean-Congo haemorrhagic fever among livestock in the Omaheke Region, providing insight into the circulation of the disease among animals.
Pilot One Health Community Engagement Research Project in the Tsumkwe Constituency, Otjozondjupa Region	Community health needs, access to healthcare and opportunities for a more integrated One Health approach to working with communities in Tsumkwe.
Implementing One Health Community Engagement Visits to Enhance Healthcare Services for Indigenous, Marginalised Communities in the Tsumkwe Constituency, Otjozondjupa Region, Namibia	Community-based One Health engagement with the Ju/'Hoansi and !Kung communities, focusing on health needs and strengthening connections between communities and healthcare services.

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Research studies 2020 - 2025



Study name - Publication	Research focus
Evaluation of the 2024 Dog Oral Rabies Vaccination Campaign in the Zambezi Region: Coverage and Effectiveness measured by GIS and post-vaccination Household Survey	The reach and effectiveness of the 2024 oral rabies vaccination campaign in the Zambezi Region, including vaccination coverage and community-level assessment following the campaign.
Evidence of Crimean-Congo Haemorrhagic Fever Susceptibility among Big Felids in Namibia: Leopards and Lions	Evidence of exposure to CCHF among lions and leopards in Namibia, contributing to understanding the potential role of wildlife in the wider disease cycle.
Knowledge, Attitudes, and Practices on Rational Antimicrobial Use and Antimicrobial Resistance among the General Population in Namibia	Public understanding and use of antibiotics in Namibia, including awareness and behaviours related to antimicrobial resistance.
AMR Cross-Sectional Pilot Study (2022–2023)	The presence of important antibiotic-resistant bacteria in cattle and wildlife and in surrounding surface water, highlighting connections between animal health and the environment.
AMR Longitudinal Study (2024–2025)	Continued monitoring of antibiotic-resistant bacteria across cattle, wildlife, milk, abattoirs and surface water to better understand their presence and distribution across interconnected settings.
Investigation of Factors and Contributors to Cape Fur Seal Mortalities along the Namibian Coastline	Investigation of the factors associated with Cape fur seal mortalities, including poor nutritional condition, infectious and zoonotic diseases, harmful environmental substances and exposure to heavy metals.

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Antimicrobial Resistance Activities



Extending AMR capabilities and capacity:

AMR laboratory workshop, CVL Windhoek, 22.11 - 25.11.2021

Focus on methodology & sample preparation

Several other technical capacity building visits to CVL by a FLI colleagues throughout the period 2021-2025



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Antimicrobial Resistance Activities



AMR stakeholder meetings, annually 2022 - 2025

General outcomes

- Reviewed progress and implementation of Namibia's National Action Plan on Antimicrobial Resistance (AMR).
- Shared updates on national, regional, and global AMR priorities, activities, surveillance, and evaluation tools.
- Strengthened multisectoral collaboration, coordination, and stakeholder engagement through a One Health approach.
- Presented technical outputs, best practices, and emerging AMR issues across human, animal, environmental, apiculture and aquaculture sectors



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Oral Rabies Vaccination Campaign in the Zambezi Region (13 - 18 June 2024)



- Distribution of over 8000 oral rabies baits to 8000 free roaming dogs in the span of 4 days (a third of the entire dog population in the Zambezi Region)
- Provided training for 12 state veterinarians and state animal health technicians (correct application of oral rabies vaccination baits (theory and practice of ORV control strategies);



The mass oral rabies vaccination campaign for free-roaming dogs in Zambezi was a collaboration involving veterinarians from Namibia's Directorate of Veterinary Services (DVS), and the Friedrich Loeffler Institut (FLI) with support from the World Organisation for Animal Health (WOAH).

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Antimicrobial Resistance Activities



World AMR Awareness Week, and other awareness activities

- 1st campaign in 2022, annually since then
- In collaboration with MOHSS, MEFT, NIP, WHO, WOA, FAO, Youth groups, etc
- AMR Awareness walks, community engagements, youth led symposiums



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Antimicrobial Resistance Activities



World AMR Awareness Week, and other awareness activities

- IEC material developed and distributed up to regional level
- Farmer's educational guide (in 7 different local languages), 2 AMR podcast episodes, children's magazine information pages, locally produced AMR awareness film



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Antimicrobial Resistance Activities



KAP study, 2024

Electronic supplementary material:
The online version of this article contains supplementary material.

journal of
global
health

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Cite as: Aluvilu AN, Fuller WL, Erastus AB, Busch F, Dreyer L, Anderson L, Nabyonga-Orem J. Knowledge, attitudes, and practices on rational antimicrobial use and antimicrobial resistance in Namibia: an online cross-sectional survey. *J Glob Health*. 2025;15:04294.

Knowledge, attitudes, and practices on rational antimicrobial use and antimicrobial resistance in Namibia: an online cross-sectional survey

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Ndilimeke Erastus³, Frank
Busch⁴, Sylvia Dreyer⁵,
Lee-Monique Anderson⁴, Juliet
Nabyonga-Orem^{1,2}

Background Antimicrobial resistance (AMR) is a growing global health threat, particularly in low- and middle-income countries. Understanding public knowledge, attitudes, and practices (KAP) regarding antimicrobial use (AMU) and AMR is essential for designing effective interventions. Through this cross-sectional study, we aimed to assess the KAP related to rational AMU and AMR among Namibian adults using an online, self-administered survey.

PAPERS

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OH Activities



OH research workshop, 24 -25 November 2025

- Two-day event with over 30 participants, hosted by MAFWLR-FLI-NUST in collaboration with UNAM, RKI, MEFT, Stellenbosch University (SA), Namibia Institute of Pathology (NIP),
- Practical training on research fundamentals, including research question development, study design, research ethics, networking, and the (ethical) use of AI in research.



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OH Research Activities



Pinnipeds study, 2025 - 2026

- Pathogen surveillance conducted in Cape Fur seals at various coastal sites in Namibia
- *Coxiella burnetii*, Avian influenza virus, *Brucella* spp. and *Toxoplasma gondii* and rabies
- Environmental assessments via domoic acid & heavy metals



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Collaborative activities with MEFT under GHPP II (2020 - 2025)



Rabies awareness raising & training in Etosha with Park staff (Namibia Wildlife Resorts, NWR), February 2025



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Collaborative activities with UNAM under GHPP II (2020 - 2025)

One Health Community Engagement Project with UNAM Cares:



Objectives:

- Assess/improve the health status of indigenous, marginalized communities, incl. livestock, wildlife, and the environment.
- enhance the provision of healthcare services for indigenous, marginalized communities under the One Health umbrella.
- Focus on the Southern African Natives (SAN), Ju/'Hoansi and !Kung speaking communities in the Tsumkwe constituency



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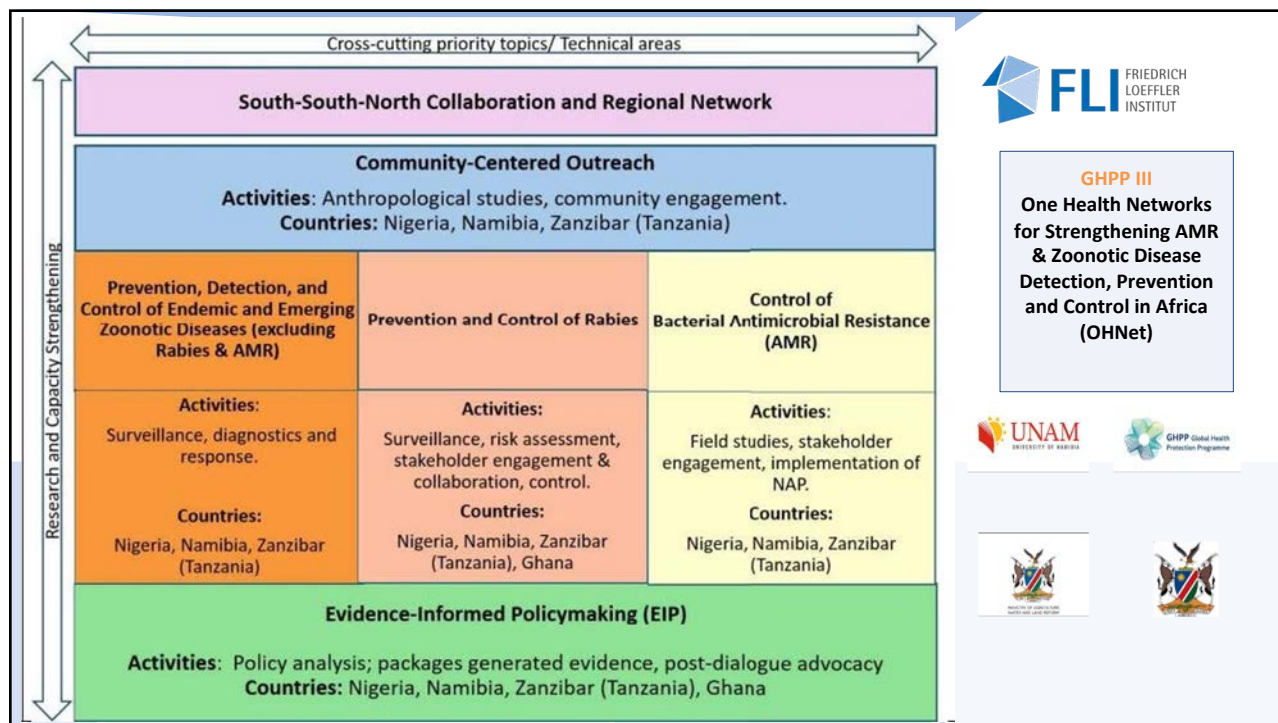
GHPP Phase III

One Health Networks for Strengthening AMR & Zoonotic Disease Detection, Prevention and Control in Africa (OHNet)

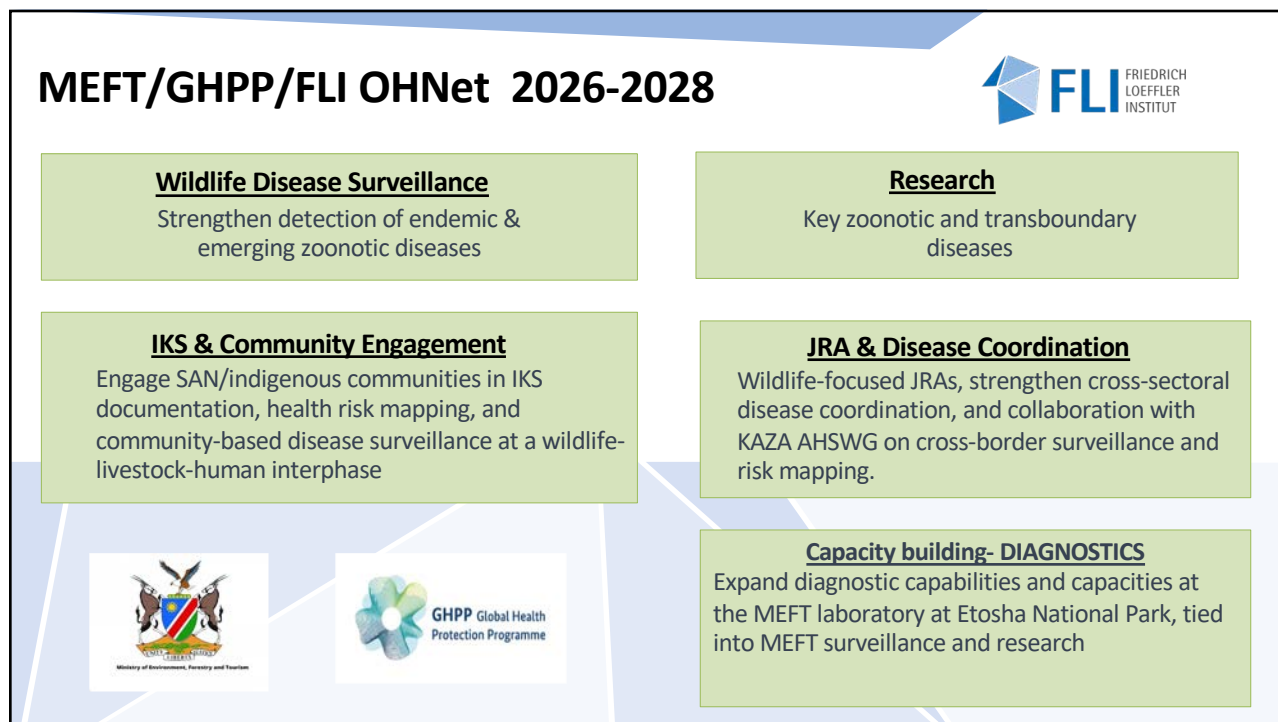


- OH-NET is a multi-country, multi-sectoral initiative that is designed to foster collaboration across disciplines and institutions, while creating opportunities for joint research, capacity strengthening, and policy engagement.
- The project combines technical, policy, and community-based interventions to strengthen One Health systems through five complementary work packages.
- Focus countries: Namibia, Nigeria, Ghana and Zanzibar (Tanzania)
- Duration: 01.01.2026 - 31.12.2028

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 Federal Ministry of Health	 STOP THE WAR			
 MAWLR Namibia Hon Inge Zaamwani-Kamwi Mr Petrus-Canisius Nangolo Dr Kenneth Shoombe Dr Juliet Kabajani Dr Johannes Shoopala Dr Natangue Amuthenu Dr Emmanuel Hikufe Dr Rauna Athingo Dr Josef Kapapero Dr Paul Sitwala Dr Beatrice Shikongo Dr Reinhold Haimbodi Dr Janett-Star Erastus Dr Magracia Hausiku Dr Lee-Monique Anderson Dr Esther Mukete Dr Saara Lukas Dr Albertina Shilongo	 MoHSS Namibia Dr Esperance Luvindao Dr Esther Muinjangu Dr Theo Ben Kandetu Ms Emmy-Else Ndevaetela Ms Helena Hakwenye Ms Naita Nghishekwa Ms Tuyakulo Johannes Ms Olivia Fikameni	 UNAM UNIVERSITY OF NAMIBIA Prof Kenneth Matengu Prof Davis Mumbengegwi Prof Rachel Freeman Prof Siegfried Khaiseb Prof Charles Ntahonshikira Dr Rainer Hassel Dr Mark Jago Dr Yvonne Hemberger Prof Simbarashe Chitanga Dr Erastus Haindongo Ms Amalia Nangolo (GHPP)	 World Organisation for Animal Health Founded as OIE Dr Moetapele Letshwenyo Dr Tenzin Tenzin Dr Gregorio Torres	 SWA VET (KEMES) BPK (PTY) LTD Goi Geurtse Blandine Meesher
	 MEFT (Namibia): Mr Kenneth Uiseb Ms Claudine Cloete Dr Janine Sharpe Dr Sandra Shikomba Dr Lungowe Sibalatani	 FLI FRIEDRICH LÖWENSTEIN INSTITUT Prof Christa Kühn (DG) Prof Sascha Knauf (HoD) Dr Klaas Dietze (PM) Ms Aune Amuthenu (GHPP) Ms Ndahafa Imene (GHPP) Ms Eunike T Mutota (GHPP) Ms Aina Namundunga (GHPP)	 World Health Organization African Region Dr Richard Banda Dr Walter Fuller Ms Anastasia Aluvilu Dr Rosalia Nairenge Dr Wilam Soroses	 NLU NAU Dr Ingrid Henckert-Weissnar FMD Support Fund LPO: Egbert Hoff
 Responsible for Federal Ministry of Health as the back of a decision by the German Bundestag	 GHPP Global Health Protection Programme			
	 FLI FRIEDRICH LÖWENSTEIN INSTITUT			