



# GIBACHT Biosecurity Symposium 2025

14 July 2025 at Bernhard Nocht Institute for Tropical Medicine

Bernhard-Nocht-Straße 74, 20359 Hamburg, Germany

## Abstract Book





## ❖ Programme agenda

### ❖ Oral presentation:

- Strengthening Biosafety and Biosecurity in Pakistan.....1
- Including Biosafety and Biosecurity Course into Academic Programs.....2
- Gamification in Medical Education: Enhancing Biosafety and Biosecurity Training in Kazakhstan Background.....3
- Case Study as An Instructional Training Tool.....4
- Impact of GIBACHT Training on Infectious-Disease Detection, Response, and Biosafety Practices in Sindh-Pakistan: A Cross-Sectional Mixed-Methods Study.....5
- Enhancing bio-risk disaster preparedness and management through application of GIBACHT-learned concepts and competences in two Sub-Saharan-global-hotspot countries, 2018-2025.....6

### ❖ Poster presentations:

- Post-GIBACHT-fellowship initiatives at the Central Lab for Evaluation of Veterinary Biologics (CLEVB) in Egypt.....7
- Optimizing Biosecurity in South Africa with Predictive Analytics: A GIBACHT Graduate's Initiative.....8
- A One-Health Approach to Crimean-Congo Hemorrhagic Fever: Lessons from a Nosocomial Outbreak and Zoonotic Surveillance in Balochistan, Pakistan 2023.....9
- Development of the Monitoring and Evaluation Framework of the Biosafety and Biosecurity Initiative of the Africa Centres for Disease Control and Prevention.....10
- Continuing the GIBACHT program in Tunisia: Novel Applications and Insights from Hedia Bellali's Post-Fellowship Contributions.....11
- Application of Disease Ecology to Map Disease Transmission Risks in Tanzania.....12
- Sustaining the GIBACHT Agenda: Enhancing Biosecurity and Biosafety through Capacity Building and Risk Mitigation Strategies.....13
- Institutionalizing Biosafety and Biosecurity in Veterinary Systems: Policy Development, Capacity Building, and One Health Integration in Jordan.....14
- The COST-19 Initiative in Ghana, 2021.....15
- Enhancing Biosafety and Biosecurity Practices of District Rapid Response teams (RRTs) through SectorConnect: Field Epidemiology Program (FEP) in One health.....16
- GIBACHT-Driven Resilience: From Pandemic Response to Long-Term Capacity Building in Pakistan.....17
- Leveraging GIBACHT Training to Strengthen Biosecurity and IHR Core Capacities at Pakistan's Points of Entry.....18
- Global Partnership-Initiated Biosecurity Academia for Controlling Health Threats (GIBACHT) Program Impact in Georgia.....19
- Global Partnership-Initiated Biosecurity Academia for Controlling Health Threats (GIBACHT) Program Impact in Bosnia and Herzegovina.....20

## GIBACHT Biosecurity Symposium 2025

14th July 2025 at Bernhard Nocht Institute for Tropical Medicine

Bernhard-Nocht-Straße 74, 20359 Hamburg, Germany

- 8:30 AM**    **Arrival**
- 9:00 AM**    **WELCOME**  
BNITM chair - Prof. Dr. Jürgen May  
German Biosecurity Programme representative - Wanda Metzke
- 9:30 AM**    **A BRIEF HISTORY OF GIBACHT**  
Dr. Dewi Ismajani Puradiredja (BNITM)
- 9:45 AM**    **OPENING KEY NOTE**  
Dr. Simon Antara (AFENET)
- 10:30 AM**    **COFFEE BREAK | POSTERWALK**
- 11:00 AM**    **ALUMNI PRESENTATIONS: BEYOND THE GIBACHT FELLOWSHIP I**  
chair: Prof. Elizeus Rutebemberwa (AFENET)
- 12:15 PM**    **LUNCH BREAK | GIBACHT PHOTO EXHIBITION | POSTER WALK**  
Dr. Joachim Pelikan (SWISS TPH)
- 13:15 PM**    **ALUMNI PRESENTATIONS: BEYOND THE GIBACHT FELLOWSHIP II**  
chair: Dr. Joachim Pelikan (SWISS TPH)
- 14:30 PM**    **COFFEE BREAK | POSTERWALK**
- 15:00 PM**    **PANEL TALKS**  
chair: Dr. Kristina Aleksic-Babic (RKI)
- ▶ **50 YEARS OF THE BIOLOGICAL WEAPONS CONVENTION: CHALLENGES & OPPORTUNITIES**  
Oscar Meless (BWC ISU)
  - ▶ **SIGNATURE INITIATIVE TO MITIGATE BIOLOGICAL THREATS IN AFRICA (SIMBA)**  
Karoline Oberländer (RKI)
  - ▶ **STRENGTHENING THE UN SECRETARY-GENERAL'S MECHANISM**  
Dr. Stefan Kloth (RKI)
- 16:00 PM**    **PANEL DISCUSSION: LESSONS LEARNT & WAYS FORWARD**  
moderator: Dr. Dewi Ismajani Puradiredja (BNITM)
- 16:55 PM**    **CLOSING**

### Contact

**Email:** For further information please contact us at: [gibacht@bnitm.de](mailto:gibacht@bnitm.de)

**Homepage:** [gibacht.org](http://gibacht.org)



## Strengthening Biosafety and Biosecurity in Pakistan

**Dr Afreenish Amir**

*Project Director AMR*

*National Institutes of Health Pakistan*

*GIBACHT Alumnus from Cohort 4, 2018*

Introduction: Pakistan has taken significant steps towards implementing BSBS measures as per commitment to Global Health Security agenda. As a trained GIBACHT member, I am dedicated to contributing to Pakistan's BSBS efforts. Objectives are:

- Raise awareness of BSBS practices
- Provide practical training sessions for healthcare workers
- Foster collaborations with organizations

Methodology: As a professional at NIH Pakistan, a reference center for laboratories nationwide, I support implementation of National BSBS Policy. I conducted BSBS training sessions during COVID-19 pandemic, MPox pandemic, cholera outbreaks. As Project Director I set up 14 mycology labs to execute *Candida auris* diagnostics while ensuring BSBS measures. I contributed to developing national biosafety manual and ISO certifications. I developed National Genomic Surveillance Strategy. As the PBSA Chapter Head for Islamabad Capital Territory, I conducted sessions to create awareness on BSBS. I actively participated in 'Responsible Conduct of Genomics Workshops', AANSO MAP PAS, COMSATS Sandia laboratory, 58-APAN. I collaborated with COMSTECH and the Government of Kazakhstan, to promote BSBS at national and international levels. I contributed to finalization of BSBS JEE score during national IHR review.

Results: I have successfully generated workforce of over 600 trained professionals in BSBS. I have played a pivotal role by implementing ISO standards, conducting training sessions, developing guidelines. I have facilitated dialogues to foster a culture of collaboration in advancing Pakistan's health security agenda.

Discussion: I remain committed to developing a network of BSBS-trained professionals across Pakistan. This initiative has shown concrete results, particularly during COVID-19, where our trained personnel were among first to handle COVID-19 samples in PCR labs. I'm now focused on aligning our approaches with IHR and GHSA to enhance Pakistan's health security. I'm confident this will improve the country's Joint External Evaluation scores in BSBS.



## Including Biosafety and Biosecurity Course into Academic Programs

**Ms Ekene Ezenduka**

*Researcher cum Lecturer*

*Veterinary Public Health and Preventive Medicine*

*University of Nigeria, Nsukka*

*GIBACHT Alumna from Cohort 6, 2020*

Introduction: The increasing biological threat from emerging infectious diseases most of which are of animal origin (zoonotic) has necessitated the need for biosafety and biosecurity awareness and implementation. The GIBACHT training on biosafety and biosecurity is a major infectious disease outbreak averting program of which I participated in Cohort 6, 2020. The strong conviction on the importance of the acquired knowledge and skills, motivated the move to include the biosafety and biosecurity program in the institutions I am involved with: Faculty of Veterinary Medicine, UNN and the Postgraduate College of Veterinary Surgeons, Nigeria (PCVSN).

Approach and Application: The idea to include the program in our curriculum was sold to members of my department which they bought with the trust that I have gained skill and knowledge from the GIBACHT training. A course on Biosafety and Biosecurity was developed and has been temporarily included in the undergraduate final year curriculum in the department of Veterinary Public Health and Preventive Medicine after the Faculty approval. In the same vein, a more robust course and content was also created for the Faculty of Public Health, PCVSN.

Result: With the successful incorporation of biosafety and biosecurity course in the department albeit awaiting final approval by the University senate, students have undergone the course as part of pre-clinical and laboratory exposure. A biennial training of colleagues and laboratory staff of the department on the subject matter was instituted. Biosafety manual for the departmental laboratory has been successfully developed and integrated in livestock management in the Faculty Teaching Farm.



## Gamification in Medical Education: Enhancing Biosafety and Biosecurity Training in Kazakhstan Background

**Dr Gaukhar Mergenova**

*Head of the Epidemiology Department*

*Asfendiyarov Kazakh National Medical University*

*GIBACHT Alumna from Cohort 8, 2023*

Introduction: Biosafety and biosecurity are critical components of medical education, particularly in preparing healthcare professionals to respond to infectious disease outbreaks. Traditional lecture-based learning often lacks engagement and practical application. Gamification-integrating game design elements into education-offers an innovative solution by enhancing student motivation, improving knowledge retention, and fostering critical thinking.

Objective: This initiative aims to implement gamification strategies in the training of medical students in Kazakhstan, with a specific focus on biosafety and biosecurity. By integrating simulation-based learning, problem-solving tasks, and role-playing scenarios, this approach seeks to equip future healthcare professionals with hands-on skills in epidemiological investigation and outbreak response.

Methodology: This gamification model will be developed based on EpiSherlock, a digital simulation game designed for training in infectious disease control. We will use scenarios based on real outbreak in Kazakhstan and tailored to specific problems in infection diseases control in the country. The framework includes: (1) Scenario-Based Simulations - Students navigate real-world infectious disease outbreaks, making critical decisions on containment and response; (2) Interactive Role-Playing - Participants take on roles such as epidemiologists, policy advisors, and healthcare workers, fostering decision-making under pressure; (3) Progressive Learning and Challenges - Adaptive difficulty levels ensure continuous skill development and mastery of biosafety protocols; (4) Gamified Assessment Metrics - Leaderboards, rewards, and badges motivate engagement and track learning progress.

Expected Outcomes: Enhanced practical understanding of biosafety and biosecurity measures. Increased student engagement and knowledge retention. Strengthened preparedness for pandemic and epidemic responses. A scalable model for integrating gamification into Kazakhstan's medical education system. Conclusion: By incorporating gamification into biosafety and biosecurity education, Kazakhstan can improve medical training, ensuring that future healthcare professionals are well-equipped to handle infectious disease threats effectively and proactively.



## Case Study as An Instructional Training Tool

**Prof Lamech Mwapagha**

*Associate Professor Biochemistry and PhD Programme Coordinator*

*Faculty of Health, Natural Resources and Applied Sciences*

*Namibia University of Science and Technology*

*GIBACHT Alumnus from Cohort 8, 2023*

Introduction: As a cohort 8 fellow in the GIBACHT biosafety and biosecurity training, I was able to develop a table-top case study focused on lab implementation of biosafety and biosecurity risk assessment. The aim of this case study is to be used as an instructional training tool for health practitioners, and postgraduate students on how to implement suitable laboratory risk mitigation procedures for controlling infections that can cause disease outbreaks with a high case-fatality rate.

Methods: First, an implementation strategy was developed for incorporating tabletop case studies into the institution's curriculum as an elective module. This entailed making submissions to the university senate via faculty board meetings and the academic program committee. Due to the anticipated financial implications, it was proposed to include case studies as a short course in the faculty of health, natural resources, and applied sciences.

Results: The case study sessions were very interactive, focused on biosafety and biosecurity in the context of disease outbreaks and investigations. The exercises revealed weak implementation of existing lab Sop's and protocols with unclear coordination mechanisms in the case of lab emergency response.

Conclusion: Lab Biosafety and biosecurity policy reforms are expected to improve coordination, sustainability, and professionalism among lab personnel and students. This has included mandatory training for all lab personnel and students; the development and implementation of guidelines for biosafety, biosecurity, and biorisk management; and the provision of additional materials in the departmental budget at the start of the fiscal year to accommodate biosafety and biosecurity training sessions. Benefits: The audience will learn on how to develop a tabletop case study and the process for having it included in a university curriculum and how to develop the same as a short course. The audience will also learn on how to deliver a case study to a diverse audience.



### Impact of GIBACHT Training on Infectious-Disease Detection, Response, and Biosafety Practices in Sindh-Pakistan: A Cross-Sectional Mixed-Methods Study, 2024

**Dr Muhammad Asif Syed**

*Additional Director of Surveillance and Response; Directorate General Health Services Sindh  
Department of Health Government of Sindh, Pakistan; GIBACHT Alumnus from Cohort 3, 2017*

Background: Human-animal interface facilitate the emergence of new infections. Increased international trade and travel infectious-disease can spread globally, require trained public-health-personnel for investigation and response. GIBACHT is a training program for healthcare-workers from low-middle-income-countries; to strengthen capacities against infectious-disease threats and their control. In Sindh-Pakistan, GIBACHT teaching materials (case-study and lecture) were used to train public-health-professionals (n=124) from 2020 to 2023. This study evaluates the effectiveness of GIBACHT in strengthening disease-surveillance, response, and biosafety-practices.

Methods: A cross-sectional mixed-method study was conducted in Sindh from August to December 2024. Target participants (n=124) included surveillance-officer (n=64), risk-communication-officer (n=30). laboratory-personnel (n=30). List of trained persons was obtained from provincial office. Structured questionnaire and key-informant-interviews with focus-group-discussions was done for quantitative and qualitative part respectively. Previous reports and outbreak data were reviewed. Descriptive-statistics and Chi-square tests were applied. Thematic analysis was done for qualitative-data.

Results: The median-age of participant were 37 years (range 29-41). Median experience years was 7 years (range 5-15). After-training, 87% of surveillance-officers reported increased capacity to detect, report and respond to infectious-disease. Outbreak-detection-time (median) shifted from 11 to 3 days ( $p < 0.01$ ). Sixty-nine-percent stated improved coordination with one-health-stakeholders and 73% demonstrated good adherence with specimen handling protocol. Among risk-communication-officers, 78% enhance epidemiological risk-assessment skill. Seventy-four-percent of lab-worker conveyed improved compliance with biosafety-protocols and 52% described increase ability to identify and mitigate biosecurity-risks. Key-informant-interviews revealed that (n=27/30) district-level-laboratories lacked in biosafety cabinets and poor decontamination practices which increased risk of laboratory-acquired infections.

Conclusion: GIBACHT significantly contributed to strengthen the health-security of Sindh-province by improving disease surveillance, outbreak-response, and biosafety-practices. Lack of biosafety-cabinets and inconsistent decontamination-practices may be corrected by domestic-financing and refresher-trainings respectively. Urgent need to expand same training model in other provinces of Pakistan.



### Enhancing bio-risk disaster preparedness and management through application of GIBACHT-learned concepts and competences in two Sub-Saharan-global-hotspot countries, 2018-2025

**Dr Wilbrod Mwanje**

*Epidemiologist/FETP mentor; Field Epidemiology Training Program, National Public Health Institute, South Sudan; African Field Epidemiology Network (AFENET); GIBACHT Alumnus from Cohort 4, 2018*

Introduction: The Global Partnership Initiated Biosecurity Academia for Controlling Health Threats (GIBACHT) aims to strengthen national capacities in disaster management and preparedness. We participated in the fourth GIBACHT-cohort-2018 after which the unprecedented Corona-virus-disease 2019 (COVID-19) pandemic emerged. Uganda a country in the Congo-Albertine-global-hotspot and shares borders with South Sudan experienced further epidemics including M-pox and Viral-Hemorrhagic-fevers between 2018-2025. GIBACHT-alumni documented our experiences participating in country-epidemics-preparedness and management.

Objective: To demonstrate practical application of GIBACHT-learned disaster management concepts and competences before, during and post emergency of these epidemics in the two countries.

Methods: We cataloged preparedness and Incident management interventions supported by GIBACHT-alumni both in Uganda and South Sudan between 2018 and 2025. We defined preparedness as systematic interventions implemented to avert potential emergence-of-disasters and limit severity. Incident management referred to systematic interventions implemented to-mitigate-grave consequences after emergence-of-the-disaster. We displayed the timeline of events.

Results: GIBACHT alumni supported nine disaster-management-interventions six of which were preparedness including review of Uganda Biosecurity policy-and-bill plus list of select-biologic-agents, risk-assessments for COVID-19, Ebola-virus-disease (EVD), M-pox, publication of the GIBACHT-case-study, piloting FETP-frontline (FETP-F) and training nine cohorts in South Sudan, two simulation-exercises including polio and EVD in Uganda, adaptation of the One-Health FETP-F-curriculum and its subsequent pilot-testing in South Sudan. Incident management interventions were development of national guidelines for COVID-19 surveillance in quarantine centers, validation of SARS-COV2 Antigen-Rapid-Diagnostic-Tests, epidemiological-data-analysis and risk-profiling of COVID-19 and Yellow fever epidemics to prioritize individuals and districts for anti-COVID-19 and Yellow fever vaccinations in Uganda and South Sudan respectively, and integration of DHIS2-COVID19-vaccine-module into South Sudan FETP-F-curriculum.

Discussions/Conclusions: GIBACHT alumni demonstrated practical and rapid application of GIBACHT learned concepts and competences in reinforcing country bio-risk disaster preparedness and mitigation.



## Post-GIBACHT-fellowship initiatives at the Central Lab for Evaluation of Veterinary Biologics (CLEVB) in Egypt

**Mr Ahmed Helal**

*Associative professor*

*Viral Poultry Vaccines Departement*

*Central Laboratory for Evaluation of Veterinary Biologics, Egypt*

*GIBACHT Alumnus from Cohort 6, 2020*

Introduction: The GIBACHT fellowship equips professionals with essential skills in biosecurity, biosafety, and antimicrobial resistance (AMR) mitigation. This presentation highlights post-fellowship initiatives at the Central Lab for Evaluation of Veterinary Biologics (CLEVB) in Egypt, the institute which evaluate vaccines by challenging viruses in animal (chickens, mice, rats and large animals) focusing on training, research, and policy advocacy to enhance biosafety and biosecurity in veterinary laboratories. In terms of circumvention disease outbreaks, there is a significant threat of the release of infectious agents or their accidental release during handling or transportation.

Methods: A structured training program was developed to address biosecurity risks in veterinary laboratories. The training program will positively impact fellows' behavior, enabling them to apply their newly acquired knowledge and skills in their workplace. Twenty professionals were trained in biosafety and biosecurity protocols, with each responsible for transferring their knowledge to their respective teams or colleagues. Research initiatives focused on strengthening biosecurity surveillance systems. Collaboration with governmental institutions facilitated policy improvements regarding microbial handling and laboratory safety. Impact was assessed through training evaluations and policy adoption metrics.

Results: The training program led to increased adherence to biosafety protocols, improved laboratory risk management, and wider knowledge dissemination through the participant-led training model. Implementing biosecurity surveillance enhanced early detection and response capabilities. Policy changes reinforced best practices in microorganism handling, ensuring both personnel safety and containment of biological threats. Discussion: The continued application of GIBACHT principles demonstrates the fellowship's long-term impact. Key lessons include the effectiveness of peer-to-peer knowledge transfer, the importance of integrating research with policy, and the necessity of sustained capacity-building efforts to enhance biosecurity.

Conclusion: This initiative underscores the role of GIBACHT alumni in strengthening global health security through localized interventions. Attendees will gain insights into scalable training models, biosecurity research applications, and policy advocacy strategies for veterinary and public health sectors.



## Optimizing Biosecurity in South Africa with Predictive Analytics: A GIBACHT Graduate's Initiative

**Mr Cornelius Nattey**

*Senior Researcher*

*Key population program*

*Wits Health Consortium*

*GIBACHT Alumnus from Cohort 1, 2015*

Introduction: South Africa's unique biosecurity challenges necessitate innovative approaches to manage and mitigate health risks. This project builds on the GIBACHT fellowship's training by implementing predictive analytics to improve biosecurity measures, specifically targeting diseases with significant public health implications such as tuberculosis and HIV/AIDS.

Methods: Leveraging data from over 300 healthcare facilities and environmental monitoring systems across South Africa, we developed predictive models using advanced machine learning algorithms. These models integrate diverse datasets, including incidence of disease, population mobility, and environmental factors, to forecast potential outbreaks with enhanced precision.

Results: The predictive models have successfully identified potential disease outbreaks with an accuracy rate of 75%. Since the implementation of these models, public health response times have improved by 40%, demonstrating significant advancements in managing biosecurity threats. The project has directly impacted the lives of millions, particularly by focusing on diseases that affect approximately 300,000 (tuberculosis) and 7.7 million (HIV/AIDS) South Africans.

Discussion: This initiative not only exemplifies the application of GIBACHT training in real-world settings but also promotes broad debate on its impact and the lessons learned. By showcasing the integration of technology and epidemiological data, the project highlights the benefits of predictive analytics in resource allocation and epidemic preparedness. The audience will gain insights into the practical challenges of implementing such technologies in diverse settings and the strategic benefits of predictive modeling in public health.



## A One-Health Approach to Crimean-Congo Hemorrhagic Fever: Lessons from a Nosocomial Outbreak and Zoonotic Surveillance in Balochistan, Pakistan 2023

Dr Ehsan Ahmed

*Assistant District Health Officer  
District Health Office Naseerabad, Pakistan  
GIBACHT Alumnus from Cohort 1, 2015*

**Background:** Crimean-Congo hemorrhagic fever (CCHF) remains a major public health problem in endemic regions. The nosocomial CCHF outbreak at Sandeman Provincial Hospital Quetta, 2023, highlighted critical gaps in infection prevention and control (IPC) practices. A One-Health approach was implemented to investigate disease transmission within the hospital and assess zoonotic risk at a livestock farm linked to the index case in Balochistan.

**Methods:** A case-control study (1:4) was conducted among healthcare workers and CCHF cases. RT-PCR confirmed clinical cases, and epidemiological data were analyzed using EPI-Info. Environmental, animal, and tick samples were collected for molecular detection of the CCHF virus. Additionally, IPC compliance, including personal protective equipment (PPE) use and hand hygiene was evaluated. The blood samples from cattle and goats and ticks from infested animals at Karbala Cattle farm were tested for CCHFV genome using real-time RT-PCR.

**Results:** The CCHF outbreak had a 20% prevalence of 25% case fatality rate. Univariate analysis identified ICU contact (OR: 14.14, 95% CI: 3.14-63.52) and exposure to body fluids (OR: 10.75, 95% CI: 3.53-32.71) as major risk factors. Multivariate analysis revealed environmental contact (aOR: 10.25, 95% CI: 2.33-47.10) as a key transmission route. At the Karbala cattle farm, 5% of cattle serum samples tested positive for CCHFV, while all goats were negative. Tick infestation was found in 100% of cattle, and 28% of Hyalomma ticks carried the CCHFV genome.

**Conclusion:** The nosocomial CCHF outbreak was confirmed and exposure identified. This necessitates integrating hospital-based IPC measures with zoonotic surveillance. The presence of CCHFV in farm animals and ticks emphasizes the ongoing risk of spillover events. This study demonstrated how GIBACHT alumni can drive sustainable public health improvements through a One-Health approach. Our recommendations include increased vigilance for endemic diseases and comprehensive disease screening.



## Development of the Monitoring and Evaluation Framework of the Biosafety and Biosecurity Initiative of the Africa Centres for Disease Control and Prevention, 2022

**Dr Freda Aceng**

*Senior Epidemiologist*

*Integrated Epidemiology, Surveillance and Public Health Emergencies*

*Ministry of Health, Uganda*

*GIBACHT Alumna from Cohort 6, 2020*

The Africa Centres for Disease Control and Prevention (Africa CDC) in collaboration with regional and global partners launched the Biosafety and Biosecurity Initiative (BBI) in 2019 with the goal to strengthen the biosafety and biosecurity systems of African Union Member States (AU MS) so that they are able to comply with international requirements and regulations such as the International Health Regulations (IHR) (2005) and corresponding Joint External Evaluation (JEE) requirements under the IHR Monitoring and Evaluation (M&E) framework, the Biological Weapons Convention (BWC), and United Nations Security Council Resolution (UNSCR) 1540. I was the consultant that supported the development of the BBI M&E Framework that provided a mechanism to track implementation of the Africa CDC's BBI in line with the noted Strategic Plan. Consequently, it tracked the commitments and progress toward the goals outlined under the Initiative, gathering inputs at the national, regional, and global levels. I did the consultation with support from individuals at Africa CDC and the Nuclear Threat Initiative. The M&E framework was developed together with the Standard Operating Procedures (SOP) that included a framework that provided Africa CDC with a way to regularly and accurately report on progress made across all priority areas within the BBI, utilizing reports, data, and public information as available. Currently the 5-Year Strategic Plan (2021-2025) has ended and plans are underway to conduct its evaluation. The experience I had with the Global Partnership Initiated Biosecurity Academia for Controlling Health Threat (GIBACHT) enabled me to successfully apply for the consultancy. The knowledge that I gained during the fellowship enabled me to complete the assignment appropriately and hence contribute to the biosafety and biosecurity efforts in Africa.



## Continuing the GIBACHT program in Tunisia: Novel Applications and Insights from Hedia Bellali's Post-Fellowship Contributions

**Prof Hedia Bellali Beni Amor**

*Medical Faculty of Tunis*

*Habib Thameur Hospital*

*GIBACHT Alumna from Cohort 2, 2016*

Introduction: Following my training in Biosafety and Biosecurity under the GIBACHT program in 2016, I joined the The German Biosecurity Programme for Excellence in Biosafety and Health Security in Tunisia in collaboration with GIZ, RKI, ONMNE, IPT, and DSSB. This work will detail my activities and the results achieved from 2016 to the present.

Methods: As a biosafety and biosecurity expert, I had to apply the lessons learned during the GIBACHT program to participate in preparing my country to face health threats and crises.

Results: In 2016, I was involved in developing the 2P2R mpeT plan (Plan for Preparation, Response, and Resilience to Diseases with Epidemic Potential in Tunisia) and its procedures. I also participated in preparing, implementing, and evaluating the tabletop simulation exercise. Subsequently, I contributed to workshops for developing the national communication strategy. In April 2018, I actively participated in training on risk communication organized by Africa CDC for the benefit of African countries. My involvement included teaching and facilitating case studies. In June 2019, I participated in planning and preparing another tabletop simulation exercise (developing the scenario, identifying participants) and executing it (presenting injects, moderating, facilitating). Parallel to this, I was involved in developing the curriculum for the "EWAR" (Early Warning and Response) training, which aims to acquire skills in surveillance, alert, and management of health crises related to infectious diseases with epidemic potential. This training includes five modules (Introduction, Surveillance and Alert, Response and Resilience, Crisis Preparation, and Risk Communication) and was taught and coordinated by me in a Master Class format at the Faculty of Medicine in Tunis, evolving into a Continuing Education Course (CEC) from 2025-2026. During the COVID-19 crisis, I participated in training and informing hospital staff about the virus, transmission modes, and prevention measures.



## Application of Disease Ecology to Map Disease Transmission Risks in Tanzania

Dr Jared Bakuza

*Senior Lecturer*

*Faculty of Science/Department of Biological Sciences*

*Dar es Salaam University College of Education, Tanzania*

*GIBACHT Alumnus from Cohort 1, 2015*

Introduction: Disease ecology looks at interactions between diseases, hosts and their environment, and how each of them influences spread of diseases. Results and conclusions from four case studies are highlighted to map transmission risks for neglected tropical diseases (NTDs) and promote One Health approach in disease prevention and control. Methods: Urine and stool were analyzed and water bodies mapped to establish spatial relationships between human residence and the risk for schistosomiasis and soil-transmitted helminthiases among 1750 residents in southern Tanzania. Furthermore, quality of handwashing water at various user points was assessed and its implications on strategies for tackling COVID-19 pandemic made in several Tanzanian cities. In addition, vegetables were washed and sediment centrifuged and concentrated to assess parasite loads. Finally, physical and biological characteristics of water were assessed using standard water quality analysis procedures to determine macroinvertebrate potential as early warning systems for water pollution and risk for water-borne diseases in selected rivers in Dar es Salaam City, Tanzania.

Results: Firstly, hookworm and *Schistosoma haematobium* prevalence was aggregated at village level and choropleth maps indicated localized distribution of the infections. Secondly, faecal coliform bacteria were detected in COVID-19 handwashing water. Thirdly, parasites of major public health importance were observed in vegetables including hookworms, *Ascaris* and *Strongyloides* regardless of farms' quality. Fourthly, highly polluted streams were dominated by pollution-tolerant macroinvertebrates like certain worms and midge larvae while pollution-sensitive organisms were rarely present in those areas.

Discussion: Disease mapping can clearly indicate NTD infection at focal level and guide mass drug administration and other control measures. Coliform presence in handwashing water used for COVID-19 prevention suggest human or animal waste contamination hence the water was unfit for human use. Interventions to improve sanitation and hygiene should be implemented across water.



## Sustaining the GIBACHT Agenda: Enhancing Biosecurity and Biosafety through Capacity Building and Risk Mitigation Strategies

**Prof Dr Maged Ghobrial**

*Chief Researcher*

*Large Animal Viral Vaccines Evaluation Department*

*The Central Laboratory for Evaluation of Veterinary Biologics (CLEVB) - Agricultural Research Center (ARC), Egypt*

*GIBACHT Alumnus from Cohort 4, 2018*

Introduction: The 2018 GIBACHT fellowship initiated crucial biosecurity and biosafety enhancements which, expanded to Egypt. Post-fellowship efforts focused on capacity building, risk frameworks, and disease preparedness across different sectors. This presentation highlights initiatives to improve practices against emerging threats. Methods: A multi-faceted approach was employed, including workshops, international dialogues, infectious disease research, community programs. Impact was measured through stakeholder engagement and awareness campaigns. The GIBACHT case study on febrile illness in Upper Egypt was expanded to assess emerging disease trends. Also, there were efforts to integrate GIBACHT fellowship contents with synthetic biology.

Results: Post-fellowship activities have yielded several key outcomes: (1) Improved biorisk management practices through local laboratory training; (2) Active participation in international conferences, including the ABSA conference, presenting on biomedical waste management (USA, 2019); (3) Expansion of the GIBACHT case study into a published research article in the PAMJ; (4) COVID-19 public awareness campaigns and vaccine advocacy (2020); (5) Dissemination of knowledge on Hierarchy of controls for COVID-19 (NRC International Conference, Egypt, 2021), Emerging infectious viral diseases (ESV International Conference, Egypt, 2022), and the One Health and vaccination concept (Cairo Uni., International Conference, Egypt, 2024); (6) Implementation of a small-scale bio-risk mitigation project following a GIBACHT RSI workshop (Uganda, 2022); (7) Participation in a Synbio Africa workshop on pandemic preparedness (Uganda, 2022).

Discussion: These initiatives underscored the importance of sustained GIBACHT alumni engagement in biosecurity and biosafety advancement. Challenges such as resource constraints and stakeholder collaboration were addressed through adaptive learning models. Key lessons highlighted the role of continuous education in mitigating biological threats.

Conclusion: This presentation demonstrated the ongoing influence of the GIBACHT agenda biosecurity and biosafety. As, attendees gained insights into effective risk mitigation, cross-sector collaboration, and community-based initiatives.



## Institutionalizing Biosafety and Biosecurity in Veterinary Systems: Policy Development, Capacity Building, and One Health Integration in Jordan

**Dr Majed Alhawaosha**

*Head of Livestock Division*

*Veterinary and Animal Health Directorate*

*Ministry of Agriculture, Jordan*

*GIBACHT Alumnus from Cohort 6, 2020*

Introduction: Building upon my GIBACHT fellowship, I have spearheaded efforts to institutionalize biosafety and biosecurity (BS&S) standards in Jordan's veterinary sector, through policy innovation, workforce training, and international collaboration, addressing systemic gaps in biological risk management.

Methods: Key initiatives: 1. Policy Development: Spearheaded the development of Jordan's inaugural National Biosafety and Biosecurity Guidelines for Veterinary Practices (2021-2023), with DTRA and FAO assistance to align with WOAHA standards; 2. Capacity Building: Designed and delivered intensive training for 150+ veterinary professionals before Jordan's inaugural nationwide livestock vaccination campaign (2022), emphasizing BS&S protocols for (FMD) vaccine handling; 3. Surveillance Innovation: Deployed the Pathogen Asset Control System (PACS), a digital traceability platform for biological samples, to facilitate the work with samples in central laboratories; 4. International Assessments: Evaluated slaughterhouses and quarantine facilities in exporting countries to ensure compliance with OIE standards for live animal and meat imports.

Results: - A project funded by DTRA with outcome BS&S guidelines, to be published and accessible via the Official Gazette. - Knowledge Transfer and Improved compliance with BS&S protocols among veterinary teams, reducing occupational exposure risks during FMD campaigns. - Strengthened inter-ministerial coordination through simulation exercises (e.g., DTRA-led avian influenza outbreak response, 2023).

Discussion: These initiatives illustrate how the GIBACHT Fellowship enhances knowledge dissemination and facilitates its practical application in-country. Modular training programs, customized to field-specific contexts, address resource limitations while strengthening biosafety and biosecurity (BS&S) systems. Strategic collaborations (e.g., with DTRA and FAO) and technological integration (e.g., [PACS]) further enable scalable surveillance solutions. Audience Takeaways: gain actionable insights into: - Advocating BS&S policy adoption in resource-limited settings. - Integrating One Health principles into veterinary BS&S training.



## The COST-19 Initiative in Ghana, 2021

**Ms Maria Anyorikeya**

*PhD Candidate*

*Social Science*

*Navrongo Health Research Centre, Ghana*

*GIBACHT Alumna from Cohort 3, 2017*

Introduction: During the COVID-19 peak in Ghana, health facilities faced challenges managing critical cases, making public education on preventive measures vital, especially as adherence to protocols fell due to misconceptions. In 2021, I collaborated with the Navrongo Health Research Centre and Nabina community radio station to deliver risk communication for COVID-19 control and prevention.

Objectives: The primary objective was to assess community members' knowledge, misconceptions, and concerns about COVID-19. The secondary objective was to provide personal protective equipment to market women in the Kassena Nankana Districts. These objectives were part of the 2021 COVID-19 microproject outputs

Method: Purposive sampling was employed to select traders and community members willing to share their opinions on radio. A vox pop was conducted to assess the perceptions and depth of knowledge of market women and shoppers regarding COVID-19, which aided in understanding and designing the content of the messages that would be communicated by experts. Consequently, a 45-minute audio summary was created, along with a 30-minute slot for community feedback. Expert messages tackled negative COVID-19 perceptions and highlighted safety protocols. Discussions included testing and reporting procedures.

Results: About, twelve traders and 10 shoppers were interviewed. Radio discussions reached a wider audience, with 38 people contributing via phone; 40% expressed willingness to be vaccinated. Others encouraged the community to overcome fears and get vaccinated. Approximately 110 traders received cloth masks, and Veronica buckets were placed around the market for everyone.

Discussion: The project increased awareness and compliance with safety protocols. The team's presence in market squares motivated sellers and shoppers to wear masks. Market women who heard COVID-19 messages on the radio felt inspired to follow protocols and promote the safety campaign. This risk communication demonstrates how we can leverage local resources such as the media as an effective tool in risk communication in biosecurity.



## Enhancing Biosafety and Biosecurity Practices of District Rapid Response teams (RRTs) through SectorConnect: Field Epidemiology Program (FEP) in One health

**Dr Meera Dhuria**

*Public Health Specialist / Medical Epidemiologist*

*Ministry of Health and Family Welfare India*

*National Centre for Disease Control*

*GIBACHT Alumna from Cohort 7, 2021*

Introduction: Multi sectoral Rapid Response Teams (RRTs) are essential in managing zoonotic public health threats requiring strong biosafety and biosecurity measures. This study presents the development and implementation of the SectorConnect module to strengthen biosafety and biosecurity practices among RRTs.

Methods: This module was developed through stakeholder engagement consultations conducted for SectorConnect with participation of different sectors; human health, animal health, wildlife, environment, food safety, international health representing public health surveillance, laboratory, regulatory, academia and biosafety/ biosecurity experts. Needs assessment of RRT training frameworks informed integration of biosafety best practices. Training methods included case studies (developed as part of GIBACHT), demonstration of sample collection, packaging and transportation, Personal protective equipment and interagency mock drills. Pre and post training assessments evaluated module's effectiveness.

Results: This module was piloted as part of SectorConnect in Gujarat, India during Jan 2024-March 2025 on 147 district level officers representing multisectoral Rapid response teams. Post-training assessments showed improved knowledge in risk management, enhanced inter-agency coordination and adherence to biosafety protocols.

Discussion: Multi-sectoral collaboration enhances biosafety and biosecurity preparedness by fostering coordinated responses to public health threats. Challenges included interagency engagement, varying degrees of knowledge sustainability. Participants highlighted the importance of multi sectoral approach and cross learning opportunities for enhancing pandemic preparedness and response.

Conclusion: The SectorConnect module effectively enhances biosafety and biosecurity practices of RRTs. Continuous sectoral engagement, policy integration, and capacity building efforts are essential for long-term sustainability. Sharing best practices and scaling up this initiative at national and regional level is recommended to strengthen emergency response frameworks. Benefits to the audience: Learn from India's experiences- using field Epidemiology programs to enhance biosafety and biosecurity practices of the frontline workers (RRTs) with multisectoral one health approach.



## GIBACHT-Driven Resilience: From Pandemic Response to Long-Term Capacity Building in Pakistan

Dr Muhammad Nadeem Shah Syed

*Immunization Epidemiologist*

*National Emergency Operation Center*

*N-STOP Pakistan*

*GIBACHT Alumnus from Cohort 4, 2018*

Introduction: GIBACHT, a leading global training program in biosafety and biosecurity, proved to be an invaluable asset in my public health journey. As an alumnus of fourth cohort and working in immunization program, my key contributions have focused on surveillance, risk assessment, field biosafety practices and capacity building. This study aims to show participants how the GIBACHT principles were used in the adaptation of polio campaigns during COVID-19 and in building long-term capacity.

Methods: Applying GIBACHT principles during the COVID-19 pandemic, polio campaigns were adapted through the development of field biosafety SOPs, provision of infection prevention supplies, and training of 60 National STOP Transmission of Polio (NSTOP) officers across high-risk districts. This training also supported COVID-19 response and established biosafety focal points. Post-pandemic efforts include partnership with multiple universities, utilizing case study methodologies, developing a curriculum for interneers and integrating biosafety components in regular trainings.

Results: Applying enhanced field biosafety practices, Pakistan successfully implemented two SNIDs and two NIDs in August, September, October, and November of 2020, vaccinating approximately 32-39 million children in each campaign. NSTOP officers, from 1st March to 31st July, 2020, facilitated the collection of samples from 57,193 suspected COVID-19 cases and the dispatch of 54,712 samples using established protocols. They conducted 1,204 sessions reaching 11,030 healthcare providers with 828 sessions on PPE donning and doffing, equipping 4,811 HCPs with essential skills. Post-pandemic training initiatives reached over 500 students and approximately 53 interneers.

Discussion: Results showed that field biosafety SOPs, provision of essential PPEs, and correct donning and doffing techniques played a critical role in the success of vaccination campaigns. Furthermore, the long-term capacity building of district staff ensured a trustworthy structure for public health initiatives and established a valuable and sustainable resource for Pakistan.



## Leveraging GIBACHT Training to Strengthen Biosecurity and IHR Core Capacities at Pakistan's Points of Entry

**Dr Nadia Noreen**

*Technical Lead Public Health for IHR & GHSA/ Director coordination*

*Border Health Services Pakistan*

*Ministry of National Health Services, Regulations and Coordination*

*GIBACHT Alumna from Cohort 8, 2023*

**Introduction:** The Global Partnership Initiated Biosecurity Academia for Controlling Health Threats (GIBACHT) Fellowship provided a multidisciplinary foundation in International Health Regulations (IHR 2005), biosecurity, biosafety, and outbreak response. As a GIBACHT alumnus, I have leveraged this training to strengthen biosecurity and IHR core capacities at Pakistan's Points of Entry (POEs), including seaports, land crossings, and airports.

**Methods:** Building on my GIBACHT-acquired expertise, I designed and implemented training modules on IHR and biosecurity for POE staff, focusing on emergency preparedness, surveillance, and risk assessment. The curriculum was tailored for frontline worker (FLW) including health and non-health to enhance their capacity in early detection, disease reporting, and response coordination. The pre-post knowledge assessment and an impact assessment survey was undertaken among the participants at the six-month post-training period. Data was analyzed using SPSS version 24. A fixed effect panel-data regression model was used to assess variables that could affect FLW's practices.

**Results:** A total of 430 FLWs were trained through 12 two-day pieces of training for six months (July-December 2024). The mean age of participants was  $39.6 \pm 5.6$ . The mean improvement in knowledge score was significant ( $p < 0.001$ ) with a mean knowledge score of  $22.4 \pm 6.2$  in the pre-test and  $27.2 \pm 4.5$  in the post-test out of 30. The fixed effect regression model showed that the attitude [OR = 3.9,  $P < 0.02$ , competence [OR = 4.2,  $P < .001$ ], and Practice [OR = 2.5,  $P < .001$ ]. The impact assessment survey suggested a significant improvement in knowledge.

**Conclusion:** Leveraging GIBACHT training to strengthen biosecurity and IHR core capacities at Pakistan's POEs exemplifies best practices for integrating biosecurity and IHR training into national public health strategies. By emphasizing capacity building and multi-sectoral collaboration, this initiative reinforces sustainable biosecurity practices at critical border points. This work highlights the lasting impact of the GIBACHT Fellowship in enhancing global health security and resilience against emerging biosecurity threats.



## Global Partnership-Initiated Biosecurity Academia for Controlling Health Threats (GIBACHT) Program Impact in Georgia

Mrs Nino Modebadze

*Biosafety Chief Specialist*

*Biosafety and Especially Dangerous Pathogens Department*

*National Center for Disease Control and Public Health, Georgia*

*GIBACHT Alumna from Cohort 8, 2023*

**Introduction:** The GIBACHT program provides partner countries in Africa, the Middle East, South Asia, Central Asia, and Eastern Europe with an opportunity to enhance their theoretical knowledge in biosafety and biosecurity. Through simulation exercises, participants develop practical skills to effectively respond to public health challenges within their respective countries. Additionally, the program fosters knowledge exchange and cultural interaction among professionals from diverse backgrounds.

**Methods:** As part of the program, a case study titled "Biosafety and Biosecurity Challenges in the Context of One Health Approaches" was developed. The case study development process included the following steps: • Collecting feedback from facilitators and GIBACHT fellows to refine content and teaching methodologies; • Conducting two pilot tests in Georgia and Uganda to evaluate the case study's effectiveness and gather participant feedback; • Translating the finalized case study into Georgian language.

**Results:** The GIBACHT program has had a significant impact on biosafety and biosecurity education in Georgia. The adapted case study was successfully integrated into various training programs across the country: • It was incorporated into National Center for Disease Control and Public Health (NCDC)-accredited biosafety courses; • It became part of the annual biosafety and biosecurity refresher training sessions for NCDC/Lugar Center staff; • Training materials were integrated into academic programs at Ivane Javakhishvili Tbilisi State University, under the Faculty of Exact and Natural Sciences.

**Discussion:** Biological threats remain a major challenge for the public health sector. Strengthening biosafety and biosecurity education is essential for ensuring preparedness and effective response to emerging threats. Looking ahead, I aim to develop a PhD research proposal based on the case study in collaboration with, and with contributions from, GIBACHT partner institutions to further advance biosafety and biosecurity initiatives in Georgia and beyond.



## Global Partnership-Initiated Biosecurity Academia for Controlling Health Threats (GIBACHT) Program Impact in Bosnia and Herzegovina

**Prim. Dr Vesna Lučić-Samardžija**

*Medical Doctor, Epidemiologist*

*Primary health care center Banja Luka, Bosnia and Herzegovina*

*GIBACHT Alumna from Cohort 8, 2023*

This case study, titled "The Challenge of Managing Tuberculosis Spread During Crisis Situations: Highlighting the Role of Biosafety and Biosecurity Measures," examines the vulnerabilities present in nursing homes regarding tuberculosis (TB) during the COVID-19 pandemic, particularly within the framework of public health responses and potential bioterrorism threats. It includes a thorough analysis of past TB outbreaks in long-term care facilities, focusing on infection control practices, staff training, emergency response protocols, and the risks associated with potential incidents in microbiological laboratories. Key findings revealed that enhanced surveillance, proactive screening, and collaboration between healthcare providers and emergency management organizations are crucial for safeguarding vulnerable populations, especially in high-risk environments. The presentation was delivered over seven distinct sessions to an audience of 75 medical professionals at various levels of the healthcare system. A separate workshop conducted for 29 civil protection personnel aimed to bolster their knowledge of infectious diseases, transmission methods, biosafety in microbiological laboratories, and the proper use of personal protective equipment (PPE). This workshop included hands-on training sessions on PPE usage and simulated exposure scenarios to reinforce learning outcomes. Feedback from participants indicated a high appreciation for the content, leading to increased confidence in managing infectious disease situations and awareness of laboratory safety practices. Evaluations revealed that the learning methodology presented was new and engaging for doctors, regardless of their years of experience. Overall, this case study and accompanying workshop serve as a call to action for improved preparedness measures in nursing homes and microbiological laboratories, underscoring the need for both immediate responses during crises and long-term strategies to protect vulnerable populations. By fostering a collaborative approach and adhering to robust laboratory protocols, we can enhance resilience against both natural and man-made public health threats.

Keywords: case study methodology, Public Health, Emergency Preparedness