

**Map showing outbreak investigations carried out by Fellows over the Fellowship period, 2020 - 2021**

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## **DISCLAIMER**

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## PREFACE

The Uganda Public Health Fellowship Program (PHFP) has enrolled 108 Fellows in Advanced Field Epidemiology since its inception in 2015; with the highest ever enrollment of 15 in 2022. Over the past 8 years, Fellows have contributed immensely to disease detection and control by conducting outbreak investigations, analyzing public health surveillance data, evaluating public health surveillance systems, conducting epidemiological studies and developing quality improvement projects. The last 3 years of COVID-19 interspersed with Ebola outbreak has witnessed the value of having frontline responders deployed within short notice in the Ministry of Health. In the process of response, Fellows have generated valuable information which shall be used to streamline detection and response to future outbreaks in the country.

In addition, Fellows have made numerous presentations at national and international conferences, winning awards. Fellows have made significant appearances in the local media, contributing feature articles on key topics of public health importance.

The production of policy briefs and publication of the Uganda Public Health Bulletin, where Fellows have participated very effectively as editors and article contributors is another tremendous achievement. Twenty eight volumes have so far been produced since commencement of the program. In addition, PHFP has continued to contribute to the production of the Malaria Quarterly Bulletin, National TB and Leprosy Program Bulletin, and Weekly Epidemiological Bulletin where the fellows and other MoH epidemiologists and officers publish valuable public health information for consumption by the public and the scientific world.

The program has produced over 225 manuscripts, majority submitted to reputable peer-reviewed journals; 93 of which have so far been published and the other remaining ones are undergoing peer reviews at various levels.

In this report, we present to you the profiles of Cohort 2021 Fellows and their achievements over the two-year period of training in-service while placed within priority programs or institutions of the Ministry of Health.

Dr. Henry G. Mwebesa

**Director General Health Services**





### **Hildah Tendo Nansikombi**

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Advanced-FETP (UPHFP)

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**Host site:** Department of Integrated  
Epidemiology, Surveillance and Public  
Health Emergencies (IES&PHE),  
Ministry of Health

### **Host mentors:**

Dr. Freda Loy Aceng

Dr. Stella Lunkuse

### **Hildah's profile**

Hildah Tendo Nansikombi is a field epidemiologist with a Master of science in Clinical Epidemiology and Biostatistics, and a background in Medical Laboratory Science. Before the fellowship, she worked with the Uganda Ministry of Health as an Epidemiologist during the COVID-19 response. During her time as a fellow, she was attached to the Department of Integrated Epidemiology, Surveillance and Public

Health Emergencies (IES&PHE), Ministry of Health. At IES & PHE she developed skills in surveillance and response coordination.

She was an editor, and drafted reports in the National Weekly Epidemiological, and National Institute of Public Health (UNIPH) bulletins.

She led projects on a Rift Valley Fever Outbreak, COVID-19 vaccine uptake among people with non-communicable diseases and improving weekly surveillance reporting on epidemic prone diseases in Jinja District. She also actively participated in eleven other investigations of public health importance. These engagements coupled with surveillance and preparedness strengthening sharpened her knowledge on International Health Regulations (IHR), and Integrated Disease Surveillance and Response (IDSR) implementation in Uganda. She has advanced her understanding of Uganda's health information systems and their role in guiding public health interventions. Routine surveillance data analysis polished her skills in using data collection tools like ODK, KoboCollect and statistical packages like STATA, EpiInfo and QGIS.

### **Achievements at the Host site**

- Led the drafting of the national weekly epidemiological bulletin which serves to inform all stakeholders at district, national, and global levels.
- Participated in the automation of the national weekly epidemiological bulletin.



- Participated and facilitated IHR monitoring and evaluation activities.
- Participated in the monitoring of the NAPHS 2021/2022 and development of the NAPHS 2022/2023.
- Participated in editing, roll out and evaluation of the third edition of the national technical guidelines of the Integrated Disease Surveillance and Response (IDSR).
- Participated in the review and amendment of the Public Health Act to align it with the national technical guidelines of the IDSR.

### **Fellowship program specific achievements**

#### **Outbreak investigations and other projects**

- Led one outbreak investigation: Rift Valley Fever outbreak in Kiruhura District.
- Participated in other outbreak responses including: Ebola Virus Disease outbreak, COVID-19 cases at Mulago and Entebbe hospitals,
- Participated in other activities of public health importance including:
  - Readiness of health facilities to respond to second wave of COVID-19
  - Plague risk and readiness assessment in six border districts of West Nile Region
  - Evaluating the performance of laboratory services in

- COVID-19 response in Uganda,
  - Integrated Community Case Management (iCCM) endline survey in Moyo District
  - Training on malaria normal channels and malaria data quality audit (DQA) dissemination in Teso Region
  - Evaluation of mosquito nets ownership and coverage in Buikwe District
- Conducted descriptive analysis of timeliness and completeness of weekly surveillance reporting on epidemic prone diseases in Uganda, 2020–2021 using data from the District Health Information System version 2 (DHIS2).
- Conducted an HIV project on Description and determinants of testing recent on a rapid test for recent infections among people newly diagnosed with HIV, Uganda, 2019-2021 using Electronic Medical Records (EMR) data.
- Implemented a quality improvement project on improving timeliness and completeness of weekly surveillance reporting on epidemic prone diseases in Jinja District, June–November, 2022.
- Conducted an epidemiological study on factors associated with COVID-19 vaccine uptake among people with non-communicable diseases, Uganda.

Trained two cohorts of FETP-frontline whose goal is to improve the MoH's epidemiologic capacity at district and local level.

## Written Communication

- Wrote 8 manuscripts; led 3 (titles list here) and co-authored 5 others
  - 'Timeliness and completeness of weekly surveillance data reporting on epidemic prone diseases, Uganda, 2020–2021'
  - 'The necessity of One Health approach in preventing human Rift Valley Fever infections, Uganda'
  - 'Description and determinants of testing positive on a rapid test for recent infections among people newly diagnosed with HIV, Uganda, 2019-2021'
- Published two articles in the New Vision newspaper:
  - 'Sickle cell disease is preventable'
  - 'Protect your mental health amidst COVID-19 pandemic'
- Edited and published in the Uganda National Institute of Public Health epidemiological bulletin volume 7 issue 1.
  - 'Rift Valley Fever Outbreak in Kiruhura District, May-June 2021'
  - 'Weekly surveillance data reporting on epidemic prone diseases, Uganda, 2020–2021'.

## Conference presentations

- Presented at national and international conferences:
  - 7<sup>th</sup> and 8<sup>th</sup> National Field Epidemiology Conference
  - 8<sup>th</sup> East African Health Scientific conference

- 16<sup>th</sup> Joint Annual Scientific Health Conference

## Key lessons learnt during the fellowship

During the fellowship, I learnt and developed the following skills:

- Outbreak investigation and institution of interventions
- Scientific communication: abstracts, manuscripts, newspaper articles
- Editorial and writing skills for scientific articles
- Data management, analysis and interpretation
- Presentation skills and dissemination of findings
- Designing and management of scientific projects
- Networking and lobbying
- Leadership and team management skills

## Next Steps

I hope to apply skills gained during the Public Health Fellowship Program to serve in relevant public health organizations. I am interested in applying my expertise and experience in surveillance and infectious diseases control, and activities that contribute to Uganda's health security objectives.

## Summary of Human and Animal Rift Valley Fever outbreak investigation,



## Kiruhura District, Uganda, May–June, 2021

**Background:** Rift valley fever (RVF) is an endemic viral zoonosis in Uganda. Sporadic outbreaks have been reported to occur in the cattle corridor. On May 14, 2021, a 19-year-old female from Kasaana Village, Kiruhura District died; testing by reverse transcription polymerase chain reaction (RT-PCR) was positive for RVF. We investigated to determine the magnitude of the outbreak, source of infection, and recommend evidence-based control measures.

**Methods:** A confirmed case was defined as detection of RVF virus nucleic acid by RT-PCR or serum IgM antibodies by enzyme-linked immunosorbent assay (ELISA) in a resident of/visitor to Kasaana Village from April 24–June 24, 2021. We tested blood samples from 25 persons (3 with RVF symptoms, 2 neighbors of the index case, and 20 randomly-selected villagers) using RT-PCR or ELISA, and 57 livestock (33 randomly-selected cows and 24 goats from 4 village farms reporting any animals with RVF symptoms) by ELISA. We collected data on demographics, history of RVF symptoms, and animal-related activities. We characterized cases epidemiologically.

**Results:** We identified 6 confirmed case-patients in Kasaana village (2 RT-PCR-positive, 4 IgM-positive); one died (case fatality rate=17%). Four (67%) were female; median age was 23 years (range, 19–42 years). All cases kept cows and goats. Two case-patients reported headache, fever, and hematemesis. The index case-patient, who milked cows

on her family farm, had hemorrhagic symptoms consistent with RVF starting 1 week before death. She presented to six health facilities during that week but was only diagnosed after death. Eight case animals; three (9%) cows and five (21%) goats were IgM-seropositive for RVF.

**Conclusion:** This RVF outbreak likely resulted from contact with infected animal products. Earlier diagnosis might have prevented the index case-patient's death. We conducted health education among Kasaana villagers, and recommended training of health workers at facilities within the region to emphasize the importance of early diagnosis of haemorrhagic fevers.

## Pictorial and Narrative



*Hildah Tendo Nanskombi (with a scoop) with other Advanced-FETP fellows examining stagnant water for mosquito larvae during the malaria outbreak in Iganga District, 2021*



*Hildah Tendo Nanskombi (in blue mask near the tree) interviewing one of the family members to a case in the Rift Valley Fever Outbreak, Kiruhura District, 2021*



*Hildah Tendo Nanskombi (in pink dress) with her colleague interviewing*

*health workers about health facilities' preparedness to respond to the second wave of COVID-19 at a health facility in Gulu District, 2021*



*Hildah (standing in checked trouser) during map annotation with participants in the preparedness and risk assessment for plague in West Nile Region, 2021*



*Presentation of the Rift Valley Fever Outbreak investigation at NFEC, 2021*



## THE UGANDA PUBLIC HEALTH FELLOWSHIP PROGRAM – PHFP FIELD EPIDEMIOLOGY TRACK – COHORT 2021



### Dr Patience Mwine

MBChB (Mak), MPH (Mak), Field Epidemiology Fellowship (UPHFP)

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**Host site:** STI/AIDS Control Program

### Host Mentors:

Miss Juliet Cheptoris

Dr Joshua Musinguzi

### Fellow's Profile

Patience holds a Master of Public Health from Makerere University with a background in human medicine. She joined the Public Health Fellowship Program in 2020.

During the fellowship, she was attached to the STI/AIDS Control Program (ACP) where she supported the HIV prevention arm of Adolescent Girls and Young Women (AGYW) Program. During this time, she performed large dataset analyses, scientific writing and presentations, project designing and implementation, participated in high level national meetings, coordination of training and mentorship activities, review and editing national documents,

responded to various disease outbreaks to mention but a few. Outside her host site, Patience participated in various outbreak investigations. These engagements have greatly built her capacity and complemented the skills and experience she had achieved from my previous trainings. With this fellowship, she has the ability to serve in any capacity with a spirit of excellence and a great sense of leadership as an epidemiologist.

### Key achievements at ACP

1. Participated in review and editing of various national documents including the Education Plus Initiative for the AGYW as the chief editor, Gender Based Violence (GBV) treatment guidelines, and consolidated guidelines for prevention and treatment of HIV in Uganda, and the national HIV Health Management Information System (HMIS) tools among others.
2. Participated in the development of the monitoring and evaluation of GBV/VAC frame work.
3. Participated in the planning, budgeting, coordination, preparations, concept writing and report writing of the national pre-world AIDS day conferences for adolescents and young people (AYP), 2021 and 2022.
4. Participated in planning and organisation of national adolescents and young people pre- world AIDS day dialogue

meetings, 2022.

5. Developed concepts and budgets for the AGYW program mentorship and supervision activities.
6. Led a team to conduct systems mapping and evaluation of SGBV individual tracking and systems mapping for the police stations and health facilities in Kampala and Rwenzori regions and developed a report to guide development of an inter-linked GBV reporting system.
7. Participated in several mentorship, supervision and training activities of health facilities on group antenatal care (GANC), safe spaces for AGYW, validation of the GBV data, integration of non-communicable disease management into HIV care and treatment, and many others.
8. Attended various host site meetings, including program meetings and high-level technical meetings with the implementing partners and development partners.
9. Engaged in the evaluation of the performance and scoring process of the AGYW program in the country using the HIV Prevention Self-Assessment Tool (PSAT) and development of the HIV prevention road map for the AGYW program.
10. Participated in writing monthly, quarterly and annual performance reports for the AGYW program.
11. Trained the national trainers on

management of SGBV assault kit.

### **Program-specific deliverables**

#### **Outbreak investigations and other projects**

- Designed and led an investigation to evaluate the readiness of health facilities to manage the second wave of COVID-19, June 2021, a public health emergency issue.
- Co- investigated in various public health emergencies including:
  - Malaria outbreak in Iganga district,
  - Malaria deaths in Napak District,
  - Cholera outbreak in Nakivale refugee settlement
  - Jiggers infestation in Sheema Districts
  - Ebola Virus Disease outbreak in Kampala city.
- Conducted other investigations of public health importance:
  - Evaluation of readiness and preparedness to manage Plague in West Nile region,
  - Readiness of laboratory to manage COVID-19 in Uganda,
  - Assessment of ownership and use of long-lasting insecticidal nets three months after a mass distribution campaign in Uganda
- Analyzed program surveillance data to determine the trends of HIV positivity rate among Children 0-14 years diagnose with TB, (2017-2020), a descriptive analysis project.
- Designed and implemented a quality improvement project to improve PrEP uptake among



adolescent girls and young women (15-24) years in selected health facilities, Mbarara District, Uganda, Jan-Jun 2022.

- Designed and implemented an epidemiological study to determine factors associated with Sexual Gender-based Violence (SGBV) among adolescent girls and young women during the main COVID-19 period in Eastern Uganda.

### Conference presentations

- Oral presentation on readiness of health facilities to manage the second wave of COVID-19, June 2021, a public health emergency evaluation study at the National Field Epidemiology Conference, Kampala, 2021.
- Oral presentation on readiness of health facilities to manage the second wave of COVID-19, June 2021, a public health emergency evaluation study at the 1<sup>st</sup> International Conference of Public Health in Africa (CPHIA) 2021.
- Oral presentation on sexual and gender-based violence among adolescent girls and young women during the main COVID-19 period in Bukedi Region, Eastern Uganda, at the Joint Annual Scientific Conference (JASH Conference), 2022, Kampala.
- Oral presentation on HIV test positivity and testing for recent infections among adolescent girls and young women aged 10-24 years in Uganda, 2017 – 2021, at the National Field Epidemiology

Conference, Kampala, 2022.

### Written communication

#### • Manuscripts:

##### Lead author

- “Readiness of Health Facilities to Manage COVID-19, Uganda, June 2021” Submitted to the Health services BMC Journal for peer review and publishing.
- “HIV positivity and recent rates among Adolescent girls and young women aged 10-24 years in Uganda 2017-2021”. Undergoing review by the resident advisor.
- “SGBV among adolescent Girls and young women during the main COVID-19 period in Eastern region”. Undergoing review by the resident advisor.

##### Co-authored

- *Barriers and facilitators to retention in HIV care for persons on community differentiated service delivery (DSD) models in Uganda, 2021*
- *Malaria Outbreak in Nabitende Subcounty, Iganga District, Uganda 2021*
- *Investigation of Jiggers Outbreak, Sheema District, Uganda 2022*
- *Ownership and use of Long-lasting Insecticide Nets Three months after a Mass Distribution campaign, Uganda 2021*
- Editor of Volume 7 issue 1 January-March 2022 Uganda National Institute of Public Health (UNIPH) Epi bulletin.
- Authored three articles in the UNIPH Epi bulletin

- *Readiness of health facilities to manage the second wave of COVID-19, Uganda, June 2021*
- *HIV positivity and recency rates among Adolescent Girls and Young Women, 2017-2021, Uganda.*
- *Sexual Gender-based Violence among adolescent girls and young women during the main COVID-19 period in Bukedi region, Uganda”*
  - Policy brief: Injectable Cabotegravir should be part of the PrEP program.
  - Newspaper articles:
    - *Stop multidrug-resistant TB and save the future*
    - *The battle of HIV/AIDS and depression amidst COVID-19*
    - *COVID-19 Impact on persons with HIV/AIDS*
    - *What to do when one tests HIV positive*

### Skills/ Lessons learnt

During the fellowship, I learnt and developed the following skill sets:

- Conducting outbreak investigations
- Evaluating and strengthening surveillance systems
- Project designing, implementation monitoring and evaluation
- Scientific writing and presentation; manuscripts, abstracts and policy briefs
- Editorial skills for scientific articles
- Public speaking
- Data collection and analysis with different soft ware

- Networking skills
- Balancing work and family and multitasking
- Time management

### Next steps

I hope to use all the knowledge and skills to contribute to the surveillance and control epidemics in Uganda and beyond. I also want to mentor those after me in this program.

### Abstract

#### Readiness of Health Facilities to Manage COVID-19 in Uganda, June 2021

Patience Mwine<sup>1\*</sup>, Immaculate Atuhaire<sup>1</sup>, Benon Kwesiga<sup>1</sup>, Daniel Kadobera<sup>1</sup>, Sherry R. Ahirirwe<sup>1</sup>, Hilda T. Nansikombi<sup>1</sup>, Shaban Senyange<sup>1</sup>, Sarah Elayeete<sup>1</sup>, Veronicah Masanja<sup>1</sup>, Alice Asio<sup>1</sup>, Allan Komakech<sup>1</sup>, Rose Nampeera<sup>1</sup>, Edirisa J. Nsubuga<sup>1</sup>, Petranilla Nakamya<sup>1</sup>, Andrew Kwiringira<sup>1</sup>, Stella M Migamba<sup>1</sup>, Lillian Bulage<sup>1</sup>, Paul E. Okello<sup>1</sup>, Sandra Nabatanzi<sup>2</sup>, Fred Monje<sup>1</sup>, Alex R. Ario<sup>1</sup>, Julie R. Harris<sup>2</sup>

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**Background:** The COVID-19 pandemic has overwhelmed the capacity of health facilities globally, emphasizing the need for readiness. The first wave of COVID-19 in Uganda peaked in late



2020, uncovering challenges with facility readiness. In mid-2021, we assessed the readiness of health facilities in Uganda to manage the second wave of COVID-19.

**Methods:** We assessed 17 RRH and 71 lower-level health facilities from all subregions of Uganda during June 2021. In each of the facilities, we interviewed the director about challenges faced during the first COVID-19 wave. We inspected COVID-19 treatment units (CTUs) and other facility service delivery points using a WHO observational checklist with infection prevention, equipment, medicines, personal protective equipment (PPE) and CTU surge capacity. We used the “ReadyScore” criteria to classify level of preparedness as >80% (‘better prepared’), 40–80% (‘work to do’), and <40% (‘not ready’). Readiness was assessed using facility-level-specific parameters.

**Results:** All 17 RRH assessed were managing COVID-19 patients at the time of the visit. Of these, 15 (88%) were in the “work to do” category, and two (12%) were “better prepared”. Most 13 (82%) had an inadequate supply of essential medicines, 12 (71%) lacked oxygen, and 11 (65%) lacked space to expand CTUs. Fifty-five (77%) of the 71 lower-level health facilities assessed were “not ready”, and 16 (23%) were in the “work to do” category. Seventy (99%) lacked medicines, 64 (90%) lacked PPE, and 53 (75%) lacked an emergency plan for COVID-19.

**Conclusions:** Few health facilities were ready to manage a second wave of COVID-19 in Uganda during June 2021. The largest gaps were in essential

medicines, PPE, oxygen, and space for CTU expansion. Adequate preparedness for future waves of COVID-19 requires additional support and action in Uganda.

**Keywords:** COVID-19, Preparedness, Second wave, Health facilities, Uganda

## Pictorial and Narrative



*Dr. Patience (standing) with the DREAMS focal persons, AGYW peers, and IP representative revising the PrEP screening tool and discussing the PrEP guidelines in Mbarara, Western Uganda, January 2022*



*Dr Patience Mwine (on the left) conducting GBV data validation and on-site mentorship on data reporting to health workers in one of the health facilities Isingiro district, Western Uganda, 2021*



*Dr Patience Mwine (bending) scooping malaria larvae in a rice field during malaria outbreak in Iganga district, Uganda, 2021*



## THE UGANDA PUBLIC HEALTH FELLOWSHIP PROGRAM – UPHFP FIELD EPIDEMIOLOGY TRACK – COHORT 2022



### Fellow's Final Portfolio

#### Immaculate Atuhaire

BScPH; MScPH, Advanced-FETP

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**Host site:** Public Health Emergency  
Operations Centre

**Mentor:** Dr. Issa Makumbi

### Fellow's profile

**Immaculate Atuhaire** is a field epidemiologist with a master's degree in Public Health and a Bachelor's degree (Hons) in Public Health from International Health Sciences. She has particular interest in public health emergencies and response. Immaculate was hosted at the National Public Health Emergency Operations-Ministry of Health (PHEOC), the hub for coordinating preparedness, response, and recovery from public health emergencies.

At her host site, she was involved in a number of activities that helped her gain a better understanding of disease preparedness, detection and response. This also equipped her with skills in public administration and training. She has participated in a number of outbreak investigations such as Malaria outbreaks, Yellow fever outbreaks, COVID-19 outbreak, Jigger infestation outbreak and Ebola outbreak. She has conducted an evaluation of the health interventions such as Home-Based care for COVID-19 and quarantine services in Ebola. She also participated in risk assessment and preparedness of six border districts in West Nile and drafted a national rapid preparedness plan for Plague.

### Achievements at the host site

- Led contact tracing pillar during the Ebola response in Mubende District
- Participated in yellow fever outbreaks in Masaka City, Malaria outbreak in Iganga District, jigger infestation in western Uganda and the COVID-19 outbreak.
- Participated in risk assessment, preparedness and POPCAB in West Nile region.
- Participated in drafting a concept for SIMEX exercise for EVD.
- Drafted a national rapid preparedness plan for plague.
- Coordinated COVID-19 surveillance activities in Rwenzori region including school-based surveillance and COVID-19 vaccination.

- Supervised Arua Region polio vaccination in January-March 2022.
- Led the vaccination defaulter tracking team in Hoima District.
- Participated in capacity building activities
  - IDSR in greater Masaka region
  - Malaria normal channels in Acholi and Lira regions.
  - Inter Action Review for COVID-19 as a facilitator for community engagement pillar.
- Participated in Data management and data analysis for daily situation report for the country.
- Participated in Data Quality Assessment (DQA) in Ankole and Teso regions.
- Participated in internal review assessment for NAPHS implemented by Prime Minister's Office.
- Participated in the
- Perused leadership courses among which include: Public leadership with American embassy-Kampala, Relationships, equipping, attitude and leadership success, and invaluable laws of growth
  - Jigger infestation outbreak
  - Assessment for readiness for health facilities in Uganda
  - ITN use in Uganda
  - Effects of COVID-19 on TB case notification and treatment success rate in Uganda, January 2019-June 2021
  - Evaluate the performance of Laboratory Services in the COVID-19 Response in Uganda
- Reducing eMTCT missed appointments in Soroti city. Risk assessment and preparedness of districts and health facilities to respond to plague in West Nile district.
- Led a quality improvement project in Kabelebyong on reducing eMTCT missed appointments.
- Geospatial and economic index of HIV recency in Uganda

### Capacity building

- Participated in training the frontline epidemiologists for cohort 16 and cohort 17 and their mentorship.
- Took part in Training of Trainers in East Africa about POPCAB
- Coordinated the field epidemiologists of Cohort 2021 as a cohort president

### Fellowship program specific achievements

#### Outbreaks and other studies

- Led one outbreak investigation 'Malaria outbreak in Iganga district, 2021'
- Participated in the other outbreaks and studies
  - Yellow fever outbreak in five districts

### Written communication

- Manuscripts
  - 'Malaria Outbreak facilitated by agricultural activities, residing near water logged areas and participating in late night campaign activities: Nabitende Subcounty, Iganga District, December 2020-February 2021'
  - 'Assessment of preparedness of



border districts to respond to plague-West Nile Region, Uganda-August, 2021’

- Epidemiological bulletin articles
  - ‘Malaria Outbreak facilitated by agricultural activities, residing near water logged areas and participating in late night campaign activities: Nabitende Subcounty, Iganga District, December 2020-February 2021’
  - ‘Assessment of preparedness of border districts to respond to plague-West Nile Region, Uganda-August, 2021.’
- Newspaper articles in the New Vision
  - Why the fight against malaria in Uganda must continue
  - Broaden women’s health agenda beyond maternal child health
  - Could haemophilia be an invisible cause of the death of mothers

### Conference presentations

- National Conferences
  - 7<sup>th</sup> and 8<sup>th</sup> National Field Epidemiology Conference
  - The 16<sup>th</sup> Joint Annual Scientific Health Conference (JASH) 2022
- International conferences
  - TEPHINET global conference in Panama in September, 2022
  - Conference on Public Health in Africa, 2022

### Key lessons learnt

- Outbreak investigation and response
- Coordination skills
- Presentation skills
- Scientific writing for concepts,

abstracts, manuscripts and bulletins

- Advanced analytical skills
- Development of research tools
- QGIS for maps and using other tools like kobo collect to make electronic questionnaires

### Next steps

With the skills I have gained and enhanced during this fellowship, I hope to be a great resource in public health leadership both in developing countries and developed countries in developing strategies in fighting against outbreaks and pandemics and handling complex emergencies.

### Summary of the evaluation study

#### Assessment of preparedness of border districts to respond to plague-West Nile Region, Uganda- August, 2021.

**Background:** Ituri Province in Democratic Republic of Congo (DRC) is a hotspot for plague, with occasional crossing of case-patients into Uganda. As of June 2021, 117 cases were reported in Ituri Province, DRC. In August 2021, we evaluated the risk of plague importation into West Nile region of Uganda and assessed the level of preparedness to respond.

**Methods:** We used the Population Connectivity Across Borders toolkit to assess risk of plague introduction in 6 West Nile districts and one city. We categorized risk in districts based on previous cases, volume of cross-border movements, and proximity to the outbreak epicenter in DRC. We assessed districts’ preparedness to respond

using an adapted WHO checklist and Readyscore criteria (scores <40%= 'not prepared'). We assessed 47 health facilities across six West Nile districts for response readiness in terms of healthcare worker training, availability of standard operating procedures, and training of village health teams.

**Results:** Two districts (Arua and Zombo) in West Nile were in the highest-risk category for plague importation. All districts scored as 'not prepared', although Zombo and Arua scored higher (both 39%) than other districts. Of 47 health facilities assessed, 21 were 'not ready', and no facility was 'prepared'. Only 10 had staff who had been trained in plague-related activities.

**Conclusion:** No districts or health facilities in the area assessed were prepared to respond to potential plague importation. The risk of importation is high, especially in Arua and Zombo Districts. Arua and Zombo Districts should be prioritized for preparedness activities for a potential plague outbreak.

### **Pictorial and narrative**

Being a field epidemiology fellow is the best thing that has ever happened to me! My journey was great and exciting. Being a Cohort president for C2021 will forever be my pride. It was a journey full of learning, fun, exposure and wins!



*Cohort 2021 1<sup>st</sup> photo during our classes at MUK-Kololo campus*



*Cohort 2021 after receiving their service jackets in preparation of our 1<sup>st</sup> outbreak in Iganga district*



*Immaculate Atuhairu (at the podium) presenting at JASH conference at Speke resort, Munyonyo in September, 2022*



*Cohort 2021 president, Immaculate Atuhairu (maroon blouse) together with the Cohort 2022 president at the US Independence Day celebrations, 2022*





### **Dr. Allan Komakech**

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**Host institution:** Ministry of Health, Reproductive Health Department.

### **Host mentors:**

Dr. Robert Mutumba

Dr. Irene Mwenyango

Dr. Robert Mugahi

### **Fellow's Profile**

Dr. Allan Komakech is a medical doctor, a public health specialist and now a qualified field epidemiologist. Before joining the fellowship, he pursued a medical degree in medicine and surgery (MBChB) from the University of Constantine, Algeria and Masters degree in Public Health (MPH) from Clarke International University, Kampala, Uganda. He is also currently pursuing a post graduate diploma in program planning and management.

Prior to joining the fellowship, he served as a practicing medical doctor in both private and public facilities, a program coordinator for the viral hepatitis program at Lugei foundation and also as a lecturer at the school of public health of Clarke International University.

During the fellowship, he was attached to the Reproductive Health Department (RHD), Ministry of Health (MoH). Consequently, his time at the host site has helped to improve my understanding of maternal and child health issues as well as adolescent and school health.

The fellowship has helped Allan gain skills in advanced outbreak detection and investigation (including during the recent Ebola outbreak), scientific writing, grant and proposal writing, grant management, and oral presentation. He also developed skills in data analysis using Epi info, STATA, R and QGIS. His leadership skills have greatly improved through the situations encountered during the two years that required me to be a leader.

In addition to his competencies, Allan is respectful, honest, and culturally-tolerant. The fellowship has reinforced these values and qualities of being a team player, flexible and hardworking, qualities that will help him excel as a public health specialist and field epidemiologist.

Dr. Allan Komakech won the best oral presentation award at the Uganda society for health scientists conference, 2022 on the abstract presented on “Adverse events following AstraZeneca COVID-19 vaccination in Uganda, March-April, 2021”.

### Host site achievements:

- Participated in high level meetings for the proposed national roll-out of Sayana Press, a self-injectable contraceptive, in April 2021.
- Led the writing team of the MPDSR Costed Implementation Plan, 2021-2025 in June, 2021
- Supported the writing and dissemination of the MPDSR reports for FY 2020/2021 and FY 2021/2022.
- Led several teams to district health facility MPDSR support supervisions to Butambala, Mpigi, Bukomansimbi and Lwengo Districts
- Supported the formulation of guidelines for improved antenatal care for pregnant mothers in Uganda, August 2021
- Led the evaluation of the availability of COVID-19 SOPs and surveillance in preparation for the re-opening of schools in Hoima District, October 2021.
- Supported the formulation and dissemination of the communication and action plan for safe motherhoods
- Participated in the National Training of Trainers and Finalization of a Guide on Medical Forensic Evidence Management and Filling of Medical Police Forms with the Objective of Improving Quality of Medico-Legal Support to the Victims/ Survivors- September, 2021.
- Part of the organizing committee of the first national safe motherhood conference, October 2021
- Participated in the formulation of reproductive health department integrated work plan, November 2021
- Conducted an assessment to understand experiences, perceptions & attitude towards antenatal care and integrated community case management (iCCM) services in Adjumani and Moyo, December 2021
- Co-edited the first edition of the Reproductive and Infant Health Quarterly bulletin, Jan-March 2022 edition
- Represented MoH reproductive health department at a round table discussion on “Increasing financing for family planning in Uganda”, January 2022
- Supported the development of a health facility based MPDSR and results-based financing mentorship tool with in collaboration with LifeNet International, February 2022
- Led teams for health facility malaria in pregnancy mentorship in Serere and Moroto Districts, Eastern Uganda, February-March, 2022
- Participated in the formulation of hospital Maternal and Child health Quality of Care Results Based Financing tool, March 2022
- Contributed in the formulation of the post-partum haemorrhage (PPH) intervention framework, March-June 2022
- Participated in the preeclampsia awareness campaign- May 2022 and the official launch of the maternal and newborn guidelines in Mbale, May 2022,
- Engaged with different stakeholders to establish the school health guidelines, Sept 2022



## Program-specific achievements:

### Outbreak and other projects

- Participated in 5 outbreaks and public health emergencies including: COVID-19 in Kampala, outbreak of malaria in Iganga, 2021, Multidrug resistant tuberculosis in Mbarara and Kabale regions, 2021 and most Outbreak of Ebola in Mubende, Kampala and Kassanda Districts, 2022.
- Conducted a descriptive analysis of surveillance data on “Trends and distribution of birth asphyxia in Uganda, 2017-2020.
- Led an HIV study on “Maintenance of HIV viral load suppression at six months post-antiretroviral therapy regimen optimization among treatment-experienced clients aged ≤19 years, Kampala, Uganda, 2020–2021”.
- Led a study on “Assessment of the performance of laboratory services during the COVID-19 response in Uganda, September-October 2021”.
- Led a study on “Post COVID-19 condition (PCC) among individuals hospitalized during Wave 1 and Wave 2 at Mulago National Referral Hospital and Entebbe Regional Referral Hospital, Uganda, 2020-2021”.
- Implemented a quality improvement on improving reporting of adverse events following COVID-19 vaccination at Mbale Regional Referral Hospital.
- Led a study on Ebola Super spreaders during the Ebola virus disease outbreak in Uganda, 2022.

## Written communication

- Manuscripts
  - ✓ Lead author
    - Assessment of adverse events following AstraZeneca COVID-19 vaccination in Greater Kampala, Uganda, March-April 2021
    - Trends and distribution of birth asphyxia in Uganda, 2017-2020.
    - Ebola super spreaders during the Ebola virus disease outbreak, September-December, 2022
  - ✓ Co-author
    - Outbreak of malaria in Iganga district, April 2021
    - Ownership and utilization of long-lasting insecticide-treated nets 3 months following a mass distribution, May 2021
    - Trends and distribution of neonatal sepsis in Uganda, 2016-202
    - Trends and distribution of stillbirths in Uganda, 2012-2020
    - District leader community dialogues improved willingness to receive COVID-19 vaccines in Western Uganda, May 2021
    - Readiness of health facilities to manage COVID-19, Uganda, June 2021
    - Risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020 to August 2021

- Rotavirus vaccine introduction into the routine immunization schedule reduced incidence of watery diarrhea among children under five years, Uganda, 2016-2021
  - Trends and spatial distribution of all cause pneumonia among children under five years in Uganda, 2016-2021: analysis of surveillance data
  - Notes from the Field: Outbreak of Ebola Virus Disease Caused by Sudan ebola virus, Uganda, August–October 2022
- health emergencies
  - Scientific writing skills: Abstracts, manuscripts, policy briefs, editing of bulletins
  - Data analysis using Epi info, STATA, R, SPSS, QGIS, NVivo
  - Oral presentation skills: scientific conferences (national and international), colloquiums, synopses
  - Designing and implementing quality improvement projects
  - Media usage: News briefs, newspaper articles, radio and TV talk shows
  - Social networking and community engagement
  - Capacity building in field epidemiology

### Conference presentations

- Presented my work at several conferences including:
  - ✓ Oral presentation on “Adverse events following AstraZeneca COVID-19 vaccination in Greater Kampala, Uganda, March-April 2021”-
  - ✓ 8<sup>th</sup> East African Health and Scientific Conference 2021, 21<sup>st</sup> Uganda society of health scientists (USHS) conference, 2022
  - ✓ Poster presentation on “Trends and distribution of birth asphyxia in Uganda, 2017-2020: an analysis of surveillance data”-JASH 2022

### Key lessons learned during the fellowship

During the fellowship, I learnt and developed the following competencies:

- Logically conducting outbreak investigations
- Best practice approaches to public

### Next steps

I hope to further my career in field epidemiology through roles in national and international organizations in disease surveillance, global health security and health program designing and implementation and building capacity. I will also ensure that all the work done during the fellowship will be published in reputable peer-reviewed journals. I will continue supporting FETP frontline and intermediate trainees as part of my capacity building roles.

### Summary of epidemiological study

#### Assessment of adverse events following COVID-19 AstraZeneca vaccination in Greater Kampala, Uganda, March-April 2021

**Background:** Tracking adverse events helps to assess vaccine safety. Uganda rolled out AstraZeneca vaccination in March 2021 primarily targeting teachers, health workers, security



personnel, and older persons. However, information about adverse events following the nationwide rollout of the AstraZeneca vaccination in Uganda is limited. We, therefore, assessed adverse events following AstraZeneca vaccination among adults in the Greater Kampala region in Uganda.

**Methods:** We used routinely collected data about AstraZeneca vaccination to identify persons who received  $\geq 1$  dose of the vaccine. Data were collected between March 10 and April 30, 2021 through telephone interviews on a random sample of vaccinated individuals. We defined adverse events as any untoward medical occurrence after vaccination and serious adverse events as any event leading to hospitalization, persistent disability 28 days, death, or congenital anomaly. We summarized data descriptively, performed bivariate analysis, and determined factors independently associated with adverse events using a multivariable logistic regression.

**Results:** We studied 374 participants aged 20-85 years and found 235 (62.8%) had received only the first dose of Astra-Zeneca vaccine while 139 (37.2%) received two doses of the vaccine. The prevalence of adverse events was 76.5% and the common adverse events included injection site redness, pain, or itching, and headache but no serious adverse event was reported. Participants aged 20-29 years (AOR 4.58; 95% CI: 1.92-10.95), 30-39 years (AOR 3.69; 95% CI: 1.81-7.51) and 40-49 years (AOR 2.78; 95% CI 1.26-4.90) were more likely to develop adverse events compared to those aged  $\geq 50$  years.

**Conclusion:** Adverse events is prevalent among persons vaccinated with Astra-Zeneca vaccine, largely among those below 50 years old. However, serious adverse events are rare. Persons  $< 50$  years old should be targeted for surveillance of adverse events and receive appropriate health education and counseling.

## Pictorial and Narrative



*Allan Komakech (striped shirt) and Veronica Masanja (dark blue dress) training Tororo district surveillance teams on malaria normal channels and their importance in malaria prevention and control in the district, December 2021*



*Dr. Allan Komakech (in white shirt, carrying black bag) during the Ebola case investigation team planning meeting in Mubende District, October 2022*

*Dr. Allan Komakech (extreme right), conducting an Ebola virus disease risk communication session at Bonjour Kampala, a radio station that uses French to reach the Francophone community in Uganda.*



*Award for best oral presentation award on abstract presented during the Uganda society for health scientists conference, August 2022*





### **Veronica Masanja**

DCM (SOCO-Mbale), Bsc PH (CIU),  
MEPI (UA), Advanced-FETP (UPHFP)

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**Host Site:** National Tuberculosis and  
Leprosy Program, Ministry of Health

#### **Host Mentors:**

1. Dr. Staviah Turyahabwe
2. Dr. Majwala Robert

#### **Fellow's profile**

Veronica Masanja, a Field Epidemiologist with a clinical and public health background. She holds a Master of Science degree in Epidemiology from Universiteit Antwerpen, Belgium. She has overtime gained special interest in antimicrobial resistance and Tuberculosis surveillance.

During the fellowship, she was attached to the National TB and Leprosy program (NTLP), Ministry of Health. At the NTLP, she provided technical support at both national and sub-national levels as a

facilitator in TB and Leprosy surveillance and Electronic case-based surveillance system. She has participated in planning, implementation and monitoring of community awareness, screening, testing and treatment to end tb and leprosy (cast tb) campaign strategies. She conceptualized, designed and implemented projects like the "Patterns of tuberculosis case notification and treatment outcomes in the context of COVID-19 pandemic: analysis of national surveillance data, January 2019 - June 2021".

Veronica has led and coordinated different projects both at the fellowship and host site ranging from outbreak investigations to epidemiological studies. She participated in the COVID-19 and Ebola responses in various capacities: contact tracing, case investigation, alert management. She led the Ebola surveillance pillar in Kassanda District. This improved her leadership, coordination, training, disease surveillance and response skills.

She is skilled in data analysis, and interpretation using statistical and spatial packages like Epi Info, STATA, and QGIS.

#### **Achievements at the Host site**

- Conducted descriptive analysis and presented a report on the impact of COVID-19 on the TB case notification and treatment success rates
- Participated in the training of health workers on Electronic Case Based Surveillance system (eCBSS) in Soroti, Kumi, Ngora, and Katakwi districts leading to improved reporting and data use.

- Participated in planning, training and supervision of the CAST TB campaigns in Soroti, Katakwi, Kumi, Ngora and Hoima as a National facilitator to enhance case finding for missed TB cases.
- Conducted TB data quality assessments in Masaka, Kassanda, Bukomansimbi, Katakwi, Mbale, Amuria, Bukedea, Moroto, Jinja, Iganga, Mayuge and Kamuli districts.
- Participated in the conceptualization and drafting of the upcoming National TB survey in Uganda prisons.
- Participated in the conceptualization, designing and implementation of the quality improvement study on TB-LAM utilization in Uganda as a Co-coordinator and study Epidemiologist
- Led analysis and dissemination of data on digital X-ray and conducted support supervision for the same in Katakwi, Sironko, and Kamuli districts.
- Participated in the production of one National TB and leprosy program quarterly bulletin thus improving awareness about TB and Leprosy.
- Conducted a training on Active TB case finding as a national trainer in Rubirizi district
- Participated in other outbreak investigations: Anthrax in Madi-Okolo District, Malaria in Iganga District, COVID-19 pandemic, and Ebola in Mubende and Kassanda districts.
- Analyzed surveillance data from DHIS on TB case notification and treatment success rates in Uganda between 2019 to 2021
- Designed and implemented a QI study on improvement of Linkage into care of newly diagnosed TB patients at Jinja Regional Referral Hospital
- Conducted an HIV study on the impact of COVID-19 on retention in HIV care in Uganda, 2020-2022
- Led the Data Quality assessment and training on Normal Malaria Channels in Tororo, Butaleja, Pallisa, Kibuku, Busia, and Budaka districts.
- Participated in the training and mentorship of trainees from the Frontline and Intermediate FETP programmes

### Written Communication

- Wrote 2 manuscript; led 2 (titles list here) and co-authored 4 others
  - “Patterns of tuberculosis case notification and treatment outcomes in the context of COVID-19 pandemic: analysis of national surveillance data, January 2019 - June 2021,”
  - ‘Self-Medication in the context of COVID-19: Experience from Uganda, 2020-2021’.
- Published two articles in the New Vision newspaper:

### Fellowship program specific achievements

#### Outbreak and other projects

- Led (principal investigator) the Jiggers outbreak investigation in Rukungiri District, 2022.



- 'TB-CATCHUP Campaign and Infodemic'
- 'A ruthless pandemic within COVID-19 pandemic'
- Edited and published in the Uganda National Institute of Public Health epidemiological bulletin volume 6 issue 6.
- 'Patterns of tuberculosis case notification and treatment outcomes in the context of COVID-19 pandemic: analysis of national surveillance data, January 2019 - June 2021'.
- 'The Joint External Evaluation Self-Assessment, Uganda 14th-28<sup>th</sup> May'.
- 'The Upcoming Public Health Events in Uganda, 2021'.

### Conference presentations

- Presented at three National conferences
  - 7<sup>th</sup> and 8<sup>th</sup> National Field Epidemiology Conferences
  - 16<sup>th</sup> Joint Annual Scientific and Health Conference (JASH)

### Key lessons learnt during the fellowship

During the fellowship, I learnt and developed the following skill sets:

- Outbreak detection, Investigation and response and control
- Scientific writing; concepts, project proposals, bulletin articles, Abstracts, Manuscripts, Policy Briefs and News paper articles
- Development and evaluation of surveillance systems

- Leadership, management and coordination skills
- Conducting Data Quality Assessments
- Designing and implementation of Quality Improvement Projects
- Data management, analysis and interpretation using STATA, R, EpiInfo and QGIS
- Training and mentorship
- Communication skills including Presentation and written skills
- Networking, negotiation and lobbying skills

### Next Steps

I hope to leverage on the knowledge, skills and networks gained before and from my FETP training, to further my career in field epidemiology and research through service at Subnational, National and international levels.

### Summary of Descriptive Study

#### **Patterns of tuberculosis case notification and treatment outcomes in the context of COVID-19 pandemic: analysis of national surveillance data, January 2019 - June 2021**

**Background:** Tuberculosis case notification and outcomes monitoring are critical for TB control but can both be disturbed by interruptions to normal health system functioning. The first major wave of COVID-19 in Uganda occurred during August-December 2020. The government-imposed lockdown measures during March-June 2020 in which residents were

required to stay at home. Kampala was particularly affected by the lockdown. We investigated trends and distribution of TB case notification rates (CNR) and treatment success rates (TSR) during January 2019-June 2021 to determine the effect of COVID-19 epidemic and associated lockdown.

**Methods:** We analysed TB case notification and treatment success data for January 2019-June 2021 from the Uganda District Health Information Software version2 (DHIS2) and disaggregated them by region. We also collected data on the COVID-19 cases and compared COVID-19 cases with the TSR, and CNR trends over the period. We computed the CNR per 100,000 population, defined as number of notified TB cases/100,000 population. TSR was defined as the proportion of patients initiated on TB treatment that successfully completed treatment or cured. We described the quarterly trends and distribution of CNR and TSR pre (January 2019-March 2020) and during COVID-19 (April 2020-June 2021). We used interrupted time series analysis to determine the significance of the trends before and during COVID-19. We defined time periods by year (2019, 2020, or 2021) and quarter (Q).

**Results:** The overall TB CNR between January 2019 and June 2021, was 165/100,000; TSR was 79.4%. CNR ranged from 166.2/100,000 pre COVID-19 to 164/100,000 during COVID-19. CNR declined significantly by 22% ( $p=0.042$ ,  $CI= [-41.4, -1.1]$ ) from January 2020 to April 2020, concurrent with the lockdown and

rising COVID-19 cases and was primarily driven by the sharp decline from 426/100,000 to 265/100,000 in Kampala City. This was followed by a significant quarterly increase in the national CNR of 16/100,000 ( $p<0.001$ ,  $CI= [10.0,21.6]$ ), and 39/100,000 ( $p=0.01$ ,  $CI= [15.66,62.32]$ ) in Kampala. TSR increased significantly by 1.6% ( $p<0.0001$ , 95%CI 1.3-1.9%) quarterly.

**Conclusion:** CNR appeared to be affected by the initial lockdown but recovered quickly. However, this decline was heavily driven by declines in CNR in Kampala District. Kampala CNR trends are not reflective of the rest of the country during 2019-2021 and should be examined separately. TSR increased over time but was still below the 90% target. There is need to focus on continuity of TB care interventions in future in areas heavily affected by lockdowns.

**Keywords:** TB case Notification, Treatment success rates, Trends, COVID19, Uganda



## Pictorial and Narrative



Veronica Masanja (black and white blouse) during an Anthrax outbreak investigation in Madi-Okollo, February 2022 with WHO officials and the District surveillance focal person



Veronica Masanja (grey T-shirt) extracting data during investigating Anthrax outbreak in Kween District, April 2019 with Infectious Diseases Institute officials and the District surveillance focal person



Veronica Masanja (wearing spectacles) and other responders during morning debrief with the surveillance pillar team in Kassanda district, November 2022



Veronica Masanja (standing in black and white sweater) Jiggers Outbreak Investigation in Rukungiri District, February 2022



**Alice Asio,**

BNS (CIU), MPH (CIU)

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**Host site:** National Malaria Control  
Division (NMCD), Ministry of Health

**Host mentor:**

**Fellow's profile**

Alice Asio is a field epidemiologist with a master's degree in public health and a bachelor's of nursing both from Clarke International University. She has special interest in the implementation of the One Health approach to public health.

During her fellowship, she was hosted at the Ministry of Health's National Malaria Control Division (NMCD). While here, she contributed to the drafting of a number of national documents, such as the National Action Plan for Health Security, the Malaria Response Plan, the Malaria Vaccine Strategic Plan, the Malaria Issue Paper, and One Health Strategic Documents (NAPHS).

Through in-service training, Alice gained

valuable skills in leadership, outbreak investigation and response, data analysis, interpretation, and utilization, grant writing and surveillance system setup, monitoring and evaluation. She has led three outbreaks and participated in four others. During the Ebola outbreak, she oversaw case investigations and contact tracing.

Alice has won two grants from TEPHINET to conduct studies.

**Achievements at the Host site**

- Led writing and dissemination of the malaria weekly, monthly and quarterly bulletins.
- Led preparation of district weekly malaria channels to monitor the malaria situation in the country.
- Led the immunization defaulter tracking project that aimed at ensuring that all children.
- Led the Mukono team in the deep dive activity to assess the surveillance system.
- Participated in the recent (2022) development malaria epidemic response
- Attended technical working groups meetings.
- Made a presentation to NMCD scientific committee on black water fever in Uganda and related works by Fellowship Program.
- Participated in the preparation of National malaria day under the theme; "domesticating the malaria fight" which took place on 25<sup>th</sup> April 2022.
- Participated in the baseline survey for malaria reduction activity.
- Participated in the malaria vaccine



preparatory meetings and writing of the issue paper.

### **Fellowship program specific achievements**

#### **Outbreak investigations and other projects**

- Led three outbreak investigations:
  - Black water fever outbreak in Eastern Uganda, June 2021
  - Ebola outbreak in districts of Kagadi, Bunyangabu, Kyegegwa and Mubende, 2022
  - Suspected food poisoning in Kasese District, October 2022
- Participated in other outbreak investigations:
  - Anthrax outbreak in Madi-Okollo District
  - Unusual deaths in Kyotera District
  - Malaria outbreak in Iganga District
  - Malaria Outbreak in IRS districts, Bukedi and Teso Regions
- Analyzed surveillance data from DHIS on Malaria in Uganda between 2016 to 2021
- Designed and implemented a QI study on improvement of Malaria Mortality Audits in Hoima Regional Referral Hospital
- Conducted an HIV study on Utilization of the Orphan Vulnerable Children Screening and Enrollment Indicators in identifying children and

adolescents living with HIV (C/ALHIV).

### **Conference presentations**

- Presented at three local and one international conferences
  - Adherence to malaria test, treat and track policy in Uganda at 7<sup>th</sup> National Field Epidemiology Conference and National malaria conference at Hotel Africana 2022
  - Black water fever outbreak investigation in Eastern Uganda at the 16<sup>th</sup> Joint Annual Scientific and Health Conference
  - Black water fever outbreak investigation in Eastern Uganda and Establishing sentinel surveillance for Black water fever in Uganda at 11<sup>th</sup> Global Health Conference
  - “Compliance with the malaria test, treat and track policy among health workers in Uganda, January–June, 2020” at the national malaria conference conducted in April 2022

### **Written publications**

- Manuscripts: Submitted two manuscripts for publication as lead author
  - ‘Investigation of Black Water Fever Outbreak among Children in Eastern Uganda, January 2019 – July 202’ and ‘Covid-19 related stigma among survivors in Soroti

District, Uganda, March 2020 to December 2021

- 
- Lead editor of Issue 7 Volume 2 of the Uganda National Institute of Public Health bulletin
- Published three articles in the Uganda National Institute of Public Health bulletin
  - Black water fever outbreak investigation in Eastern Uganda, June 2021
  - COVID-19 related stigma among survivors in Soroti District, 2020-2021
  - Malaria Vaccine
- Published one newspaper article
  - Use of mentor mothers to improve outcomes of malaria in pregnancy

### Grants won from TEPHINET

- Establishing Sentinel surveillance for Black water fever in Uganda.
- Establishing community surveillance system for Black water fever in Uganda

### Key lessons learnt during the fellowship

During my fellowship, I learned and honed the following skills:

- Outbreak investigation and response, including designing control measures
  - Evaluation of surveillance systems
- Establishment of surveillance systems

- Designing and implementing quality improvement projects

- Data management, analysis, and interpretation using software such as STATA, EpiInfo, and QGIS

- Presentation skills and dissemination of findings

- Grant writing

- Integrated outbreak analytics (IOA) during Ebola outbreak in Uganda, 2022

### Next Steps

I will continue serving in the Ministry of Health or a comparable organization with the acquired competencies in order to realize enhanced global health and quick response to public health emergencies and threats.

### Black water fever abstract

### Investigation of Black Water Fever Outbreak among Children in Eastern Uganda, January 2019 – July 2021

**Background:** Blackwater fever (BWF) is extensive hemolysis that typically occurs after repeated falciparum malaria infections or use of antimalarial drugs. In May 2021, districts in Eastern Uganda reported an increase in suspected BWF affecting mostly children <12 years of age. We investigated to confirm the outbreak, assess scope, and identify factors associated with BWF.

**Methods:** We defined a suspected case as onset of dark-coloured urine with at least one of the following: fever >37°C, anorexia, fatigue, abdominal pain, abdominal distention, anemia, jaundice, headaches, or vomiting in a



patient attending Mbale, Soroti or Jinja Regional Referral Hospitals (RRHs) of Eastern Uganda during January 2019 to May 2021. We abstracted medical records data for cases identified from January 2019–May 2021 and conducted an unmatched case-control study to identify risk factors in Soroti and Mbale RRHs, June-July 2021. Controls were randomly-selected pediatric patients admitted in the same ward as a case who had never passed dark-coloured urine. We interviewed caretakers of 87 cases and 87 controls on clinical picture, medical history, and exposures. We randomly selected 20 cases and 20 controls from the case-control study group and collected samples of urine, blood, and stool samples. We conducted ten different tests including pathogen discovery to find-out the causative organism. We calculated attack rates and conducted multivariable logistic regression to identify factors associated with BWF.

**Results:** From the review of records, we identified 4,913 case-patients. Of these, 2,617 (53%) presented with high-grade fever, and 2,295 (47%) with anaemia; two-thirds (65%) were from Soroti RRH. Attack rates were similar in 2019 (AR=2.3/10,000) and 2020 (AR= 2.5/10,000). Males [2019: AR=3.2/10,000, 2020: AR= 3.3/10,000, and 2021(Jan-May): AR=1.5/10,000] were more affected than females in all the years of the study period.

Among 87 cases and 87 controls, the mean age was 6.8 years (SD=3.9) for cases and 6.0 years (SD=) for controls. Delaying >24 hours between malaria symptom onset and receiving care

increased odds of BWF (aOR=33.22, 95% CI: 4.34 – 254.4), having one or more malaria episodes before the first episode of BWF lowered odds of experiencing BWF (aOR=0.01, 95% CI: 0.007 – 0.11). Having sickle cell anaemia, hepatitis B, or HIV were not associated with BWF.

**Conclusion:** BWF caused substantial morbidity among children in Eastern Uganda during our study period. Case-patients experienced repetitive episodes. Delaying >48 hours between malaria symptom onset and receiving care was associated with BWF. Future studies should focus further on the causative agent(s), triggers of BWF, and expand case capture sites to identify geographic boundaries of this problem in Uganda. Immediate care-seeking should be emphasized for children with a history of BWF.



## Pictorial and Narrative



*Alice Asio (far right) with Her Excellency, the US Ambassador to Uganda, after giving a well-received presentation of my work on BWF in Eastern Uganda.*



*Alice (standing) conducting Ebola case investigation in Madudu Subcounty, Mubende District, September 2022*



*Reviewing medical records in Budaka HCIV in Budaka District, October 2021 with PMI Vector link staff*



*Training Lira regional referral hospital staff during establishment of Black Water Fever sentinel surveillance, March 2022*



*Alice (standing) training of VHTs on immunization defaulter tracking in Hoima District, July 2022*





### **Stella Martha Migamba**

BSN (MUST), MPH (MUK), Advanced Field Epidemiology Fellow (UNIPH)

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**Host Site:** Reproductive and Infant Health Division, Ministry of Health

**Host mentor:** Dr. Robert Mutumba

### **Fellow's profile**

Stella Martha Migamba is a field epidemiology fellow with special interest in Maternal and Child health, as well as disease emergency preparedness and response. She holds a Master of Public Health from Makerere University and a Bachelor of Science in Nursing from Mbarara University of Science and Technology. Before joining the fellowship programme, she worked with the Infectious Diseases Institute and University Research Co., LLC, USAID RHITES EC where she implemented projects in HIV and Maternal Child Health.

During the fellowship, she was attached to the Reproductive Health Department of the Ministry of health where she conducted mentorships, support supervisions, and contributed to writing of national reports, workplans, and guidelines. She has authored a number of documents that demonstrate advanced scientific writing skills, including bulletin articles, newspaper articles, manuscripts, and website articles which enhanced her writing skills. She is also a mentor and trainer with the FETP Intermediate Program, and a trainer with the FETP Frontline Program.

### **Achievements at the Host site**

- Led a team in mentorship on malaria in pregnancy in health facilities in Bukedea District, Eastern Uganda, February 2022
- Participated in writing the Maternal Perinatal Deaths Surveillance and Reporting (MPDSR) Costed Implementation Plan (FY 2020/21 – FY 2024/25), May 2021
- Participated in writing the annual Maternal Perinatal Deaths Surveillance and Reporting (MPDSR) report for FY 2019/20
- Participated in national MPDSR and National Safe Motherhood Committee weekly coordination meetings
- Participated in National Maternal Death Review Committee weekly meetings
- Participated in discussions on the roll out of heat stable Carbetocin and tranexamic for postpartum haemorrhage prevention and management, May 2021

- Participated in creating the Reproductive and Infant health communication strategy, July 2021. Its aim was to provide partners with a roadmap of how to support advocacy for safe motherhood.
- Reviewed the MPDSR facility-based mentorship concept and terms of reference for the regional MPDSR mentorship, August 2021
- Participated in a National Training of Trainers in provision of medical-legal support to Sexual Gender Based Violence victims/survivors and finalisation of a guide on medical forensic evidence management, 22-24 September 2021
- Participated in a joint ministerial dialogue by the Association of Obstetricians and Gynaecologists of Uganda (AOGU) on Sexual Reproductive Health and Rights with representatives of line ministries (MoH, MoES, and MoGLSD) to discuss RH policies and desired data capture and utilization changes
- Participated in workplan harmonization meetings for the Reproductive and Infant Health Division of the Ministry of Health in July, 2021 aimed at streamlining the Division's activities
- Participated in organization of the second National Safe Motherhood Conference, September-October 2022
- Part of the team that reviewed SEMA RH's (Shaping Equitable Market Access for Reproductive Health) workplan and defined country priorities for

implementation, September 2022

### **Fellowship program specific achievements**

- **Surveillance data analysis:** Conducted a descriptive analysis to determine the trends and spatial distribution of in-patient neonatal sepsis in Uganda from 2016 to 2020
- **Quality improvement project:** Implemented a quality improvement project in Iganga Hospital to improve perinatal deaths notification and review (June to November 2022).
- **HIV Project:** Conducted an HIV project to assess the effect of point-of-care (POC) early-infant diagnosis testing (EID) on HIV results turnaround time and linkage to antiretroviral therapy at 10 health facilities.

### **Epidemiological studies**

- Did an epidemiological study to determine risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020 to August 2021
- Protective factors against Ebola virus infection among high risk contacts during an outbreak in Mubende and Kassanda districts, Uganda, 2022

### **Outbreak investigations**

- Team lead for the yellow fever break investigation in Wakiso, Masaka, Kasese and Buikwe Districts in March, 2022; presented investigation findings



in Incident Management Team (IMT) and National Task Force (NTF) meetings

- Co-investigated:
  - Black water fever in Mbale, Soroti, and Jinja from 14 June to 6 July 2021
  - Cholera outbreak investigation in Nakivale Refugee Settlement in Isingiro district in November, 2021
  - Malaria in Iganga in March 2021
  - Ebola outbreak investigation in Mubende and Kassanda districts in October and November 2022

### Other projects

- Conducted malaria normal channels training among district health team members in six districts of Bukedi Region, Eastern Uganda and disseminated malaria data quality assessments.
- Supervised the catch-up vaccination project under Africa Field Epidemiology Network (AFENET) in Nakasongola District, June to September, 2022.
- Facilitated workshops for FETP Frontline and currently trainer and mentor of the FETP Intermediate Program of UNIPH
- Participated in a grant writing workshop, 16- 20 August, 2021
- Participated in the Uganda scientific communications training, 30 August- 3 September, 2021
- Participated in a 4- weeks Public

Health Bulletin Writing (PHBW) workshop from 31 January- 28 February, 2022

- Editor of UNIPH Quarterly Epidemiological bulletin, Volume 7/Issue 1/ January- March, 2022

### Public Health evaluations

Participated in:

- Assessment of readiness of health facilities to manage the second wave of COVID-19
- Evaluation of the performance of laboratory services in the COVID-19 response in September 2021
- Evaluation of the implementation of Xpert MTB/RIF Ultra assay testing, September 2021
- Supervision of data collection for the integrated community case management endline survey from 31 October - 19 November, 2021
- Investigation of malaria deaths in eight selected districts, June 2022

### Conference presentations

- Oral presentation: Trends and Spatial Distribution of Neonatal Sepsis, Uganda, 2016-2020, at the National Field Epidemiology Conference, Kampala, 2021
- Oral presentation: Trends and Spatial Distribution of Neonatal Sepsis, Uganda, 2016-2020, at the 16<sup>th</sup> Joint MAKCHS and 28<sup>th</sup> UNACOH Annual Scientific Health Conference, September 2022
- Oral presentation: Risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020

to August 2021, at the National Field Epidemiology Conference, Kampala, 2022

- Poster presentation: Trends and Spatial Distribution of Neonatal Sepsis, Uganda, 2016-2020, at the second international Conference on Public Health in Africa (CPHIA) 2022 in Kigali, Rwanda, 13-15 December 2022
- Poster presentation: Risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020 to August 2021, at the second international Conference on Public Health in Africa (CPHIA) 2022 in Kigali, Rwanda, 13-15 December 2022

## **Written Communication**

### **Bulletin articles**

- Trends and Spatial Distribution of Neonatal Sepsis, Uganda, 2016-2020: UNIPH Quarterly Epidemiological Bulletin, Volume 7, Issue 2, April- June 2022
- Risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020 to August 2021: UNIPH, Volume 7, Issue 4, October- December 2022
- Rapid Antiretroviral Therapy initiation following roll out of Point-of-Care Early Infant Diagnosis Testing in Uganda, 2018-2021: UNIPH, Volume 7, Issue 4, October- December 2022

### **Newspaper articles**

- “Hepatitis can’t wait: A call for elimination” published as

letter of the day in The New Vision on Thursday 22 July, 2021. This article was written to commemorate world hepatitis day 928 July, 2021) and aimed at raising awareness about vaccination for hepatitis B.

- “Newborn infections: A preventable cause of neonatal deaths” was published in The New Vision on 1 June, 2021. The intention was to explain the importance of preventing newborn infections in the prevention of newborn deaths.

### **Website article**

- “The role of field epidemiologists in ensuring resilient health systems” was published on TEPHINET’s website to commemorate World Field Epidemiology Day on 7ptember, 2022

## **Manuscripts**

### **Lead author**

- Trends and spatial distribution of neonatal sepsis, Uganda, 2016-2020– under peer review
- Risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020 to August 2021 –under peer review
- Rapid Antiretroviral Therapy initiation following roll out of Point-of-Care Early Infant Diagnosis Testing in Uganda, 2018-2021–undergoing review

### **Co-author**

- Ownership and use of long-lasting insecticidal nets



- three months after a mass distribution campaign in Uganda, 2021- published in BMC Malaria Journal
- Trends and geospatial distribution of stillbirths in Uganda, 2014-2020- submitted to BMC Pregnancy and Childbirth journal
- Trends and distribution of birth asphyxia incidence in Uganda, 2017-2020- submitted to PLOS One journal
- Readiness of Health Facilities to Manage COVID-19 in Uganda, June 2021- submitted to BMC Health Services Research journal
- Black Water Fever among children in Districts of Bugisu, Bukedi, and Busoga Regions in Eastern Uganda, January 2019 – July 2021- under review
- Loss to Follow-up Among People Living with HIV on Tuberculosis Preventive Treatment at Four Regional Referral Hospitals, Uganda, 2019–2021- under review
- Malaria Outbreak facilitated by agricultural activities, residing near water logged areas and participating in late night campaign activities: Nabitende Subcounty, Iganga District, December 2020-February 2021- under review

### Key skills/ lessons learnt

I gained and improved the following skills

- Grant writing

- Scientific communication using abstracts, manuscripts
- Public speaking
- Mentoring
- Data presentation / graphical data presentation
- Programming of data collection tools onto software
- Bulletin writing and editing skills
- Responding to disease outbreaks
- Designing, implementing and monitoring projects
- Mentorship
- Support supervision

### Next Steps

In the next 3 months after graduation, I will lead a team to implement a project to improve perinatal death notification and review in 9 districts of Bunyoro Region. In addition, I will mentor health workers in various areas of maternal child health, and on the surveillance data analysis and use to improve health programs. Furthermore, I intend to continue training and mentoring frontline and intermediate field epidemiology training program fellows.

### Summary of Epidemiological Study

#### Abstract

**Risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020 to August 2021**

**Authors:** Stella M. Migamba<sup>1</sup>, Bruno Ssemwanga<sup>2</sup>, Allan Komakech<sup>1</sup>, Benon Kwesiga<sup>1</sup>, Daniel Kadobera<sup>1</sup>, Lilian Bulage<sup>1</sup>, Alex R. Ario<sup>1</sup>, Julie R. Harris<sup>3</sup>

## Affiliations

<sup>1</sup>Uganda Public Health Fellowship Program, Uganda National Institute of Public Health, Kampala, Uganda

<sup>2</sup>Reproductive and Infant Health Department, Ministry of Health, Kampala, Uganda

<sup>3</sup>Division of Global Health Protection, U.S. Centers for Disease Control and Prevention, Kampala, Uganda

## Background

Pregnant women are at higher risk than other COVID-19 patients for severe COVID-19 disease. Few studies have been done to understand risk factors for death among COVID-19-infected pregnant women in Africa. We investigated risk factors for death among hospitalized pregnant women with COVID-19 in Uganda.

## Methods

We abstracted demographic and clinical characteristics from files of pregnant women admitted during any trimester with confirmed SARS-CoV-2 infection at eleven hospitals in Uganda. We conducted an unmatched case-control study among hospitalized pregnant women with COVID-19 during June 2020-August 2021; cases were those who died while controls were those who recovered and were discharged during the same period. We enrolled 33 cases and 109 controls. We analysed risk factors for death using multivariable logistic regression adjusted for age, trimester, parity and presence of comorbidities because these factors have previously been associated with COVID death or maternal death.

## Results

Of 33 cases and 109 controls, 32 (97%) cases and 73 (67%) controls were hospitalised in 2021 ( $p=0.01$ ). Thirty-two (97%) cases and 85 (78%) controls had COVID-19 symptoms at admission ( $p=0.04$ ). Nineteen (58%) cases and nine (8%) controls had severe or critical COVID-19 disease at admission ( $p<0.001$ ). The median length of hospitalisation for cases was 3 days (IQR: 1-6) while that for controls was 7 days (IQR: 4-11) ( $p<0.001$ ). Odds of seeking care from another medical facility before admission were higher among cases than controls ( $OR_{unadjusted}=3.0$ , 95% CI: 1.1-7.9). Having severe disease at admission increased odds of death ( $OR_{adj}=16$ , 95% CI: 4.0-69), while admission for  $\geq 6$  days was protective ( $OR_{adj}=0.15$ , 95% CI: 0.03-0.81).

## Conclusion

Pregnant women with COVID-19 who died had higher odds of being admitted with symptomatic, severe disease compared with those who survived. Earlier facilities cases visited could have delayed referral to the hospitals where they died few days after hospitalisation. Orienting facilities on referral of pregnant women with COVID-19 could improve their clinical outcomes.

**Keywords:** COVID-19, pregnant, hospitalized, death, risk factors, Uganda



## Pictorial and Narrative



*Stella (centre, with laptop) training Kibuku District Health Team members on how to draw malaria normal channels, November 2021, in Eastern Uganda*



*Stella (in purple dress) sharing her work at second international Conference on Public Health in Africa (CPHIA) in Kigali, Rwanda in December 2022.*



*Stella (standing) training Frontline-FETP participants during workshop two in Jinja City, July 2022*



*Stella (standing) retrieving patient files at Entebbe Regional Referral Hospital during data collection for the study to evaluate risk factors for deaths of hospitalised pregnant women with COVID-19.*



### **Sherry Rita Ahirirwe**

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**Telephone:** +256 707 064 889/+256 777 955 921

**Host site:** Division of health information

**Host mentors:** Mr. Paul Mbaka

### **Fellow's profile**

Sherry Rita Ahirirwe is an experienced epidemiologist with a Master of Science Degree in Public Health. She has experience in monitoring and evaluation with a demonstrated history of working with non-profit organizations. She is skilled in digital data collection and management using Kobo toolbox as well as exploratory data analysis with R in addition to mapping skills in QGIS. She has a strong passion for community empowerment.

During the fellowship program, Sherry was attached to the Division of Health Information within the department of

Planning, Financing and Policy in the Ministry of Health.

Through the fellowship program, Sherry has attained skills in leadership, outbreak investigation and response including data analysis, visualization, interpretation and use. She led two outbreak investigations and participated in four others. She is a national trainer of Monitoring & Evaluation officers and district biostatisticians on generation of knowledge products and populating indicators in the national health observatory.

### **Achievements at the Host site**

- Supported the data management needs of the Points of Entry pillar
- Participated in the Health Information, Innovation and Research (HIIRE) TWG monthly meetings
- Provided technical support to Biostatisticians on use of the COVID-19 Vaccination eRegistry to help improve capture and reporting of COVID-19 vaccination data
- Conducted various data quality assessments of vaccination data in selected districts
- Supported UNEPI in documenting COVID-19 vaccination challenges in districts
- Extracted and collated geospatial data from DHIS2 and other sources for the upcoming population data for action GRID3 project
- Facilitated training of VHTs on Community Based Disease Surveillance,
- Participated in the roll out of Points of Entry preparedness and



response plans

- Participated in the biannual and annual health sector performance report writing.
- Through partnership with WHO:
  - Facilitated training of M&E officers and District Biostatisticians on generation of knowledge products and populating indicators in the national health observatory
  - Trained data collectors on the assessment of continuity of health services tool
- Completed online training on DHIS2 fundamentals which advanced my skills in data abstraction and visualisation within DHIS2
- Trained as a National Rapid Responder by WHO, July 2022

### **Fellowship program specific achievements**

Led 2 outbreak investigations (listed here) and participated in 10 others

- Investigation of a strange illness in Kyotera district, December 2021
- Investigation of human tungiasis cases in Sheema District, November 2021-February 2022

Provided support to the Uganda Rapid Mortality Surveillance Project through

- Abstraction and analysis of mortality data from DHIS2
- Abstraction and analysis of data from NIRA's mobile civil registration and vital statistics system

Analyzed public health surveillance

data

- Increased all-cause mortality at regional referral hospitals in Uganda, during the pandemic period (2020-2021)

Implemented two quality improvement projects

- Improving capture and reporting of HIV testing data at Kitalya Maximum Security Prison
- Improving reporting malaria deaths data via the district health information system (DHIS2), Agago District

Trained 42 district officials in Toro and Bunyoro regions on development of malaria normal channels for monitoring of malaria upsurges and response measures

### **Written communication**

Published one newspaper article titled:

- "Let's be mindful of the environment as we fight COVID-19"
- 

Published two articles in the Uganda national institute of public health (UNIPH) quarterly bulletin:

- Investigation of human tungiasis cases in Sheema District, Uganda, November 2021 to February 2022
- Increased all-cause mortality at regional referral hospitals in Uganda during the COVID-19 pandemic (2020-2021)

Edited Issue 3 volume 6 of the UNIPH bulletin

Wrote two manuscripts as lead author and co-authored 5 others.

## -Conference presentation

### International conferences

- Second International Conference on Public Health in Africa (CPHIA), Kigali, December 2022.
  - 'investigation of human tungiasis cases, in Sheema District was presented orally.
  - 'increased all-cause mortality at regional referral hospitals in Uganda during the COVID-19 pandemic (2020–2021)'

### National conferences

- 7<sup>th</sup> National Field Epidemiology conference
- 8<sup>th</sup> National Field Epidemiology conference

## Key lessons learnt during the fellowship

During the fellowship, I learnt and developed the following skill sets:

- Outbreak investigation and response including institution of interventions
- Evaluation of surveillance systems
- Designing and implementing quality improvement projects
- Data management, analysis and interpretation using such software as EpiInfo, STATA, R and QGIS
- Facilitating trainings
- Scientific writing (for Abstracts, Manuscripts and short articles)
- Presentation skills and dissemination of findings

## Next Steps

- I hope to further develop my skills in exploratory data analysis and visualization with R for reproducible analyses. Perhaps begin an R ladies chapter in Uganda.
- Continue championing public health by contributing to planning and development of health policy in Uganda.

## Summary of my descriptive project

### Increased all-cause mortality at regional referral hospitals in Uganda during the COVID-19 pandemic (2020–2021)

Authors: Sherry Rita Ahirirwe <sup>1\*</sup>, Andrew Kwiringira<sup>1</sup>, Benon Kwesiga<sup>1</sup>, Lilian Bulage<sup>1</sup>, Daniel Kadobera<sup>1</sup>, and Alex Riolexus Ario<sup>1</sup>

**\*Corresponding author:** Sherry Rita Ahirirwe, +256707064889, [sahirirwe@musph.ac.ug](mailto:sahirirwe@musph.ac.ug)

### Affiliations

<sup>1</sup>Uganda Public Health Fellowship Program, National Institute of Public Health, Ministry of Health, Kampala, Uganda

**Background:** Understanding the true burden of deaths associated with the COVID-19 pandemic is challenging in Uganda due to testing limitations and inadequate mortality surveillance systems. One approach to estimating pandemic-associated deaths is to calculate excess mortality (EM) at hospitals. We described temporal trends in all-cause mortality at regional referral hospitals (RRHs) in Uganda and estimated EM during two years of the



pandemic compared with five years of historical data (2015–2019).

**Methods:** Monthly aggregate deaths, admissions, and reporting rates data were abstracted for 15 RRHs from the Ministry of Health (MOH) District Health Information System (DHIS2) from 2015–2021. We used logistic regression to model temporal trends in all-cause mortality from 2015–2021. We estimated EM by calculating actual in-hospital deaths/10,000 admissions in 2020 and 2021 and comparing them to expected rates using the upper bound of the 95% confidence interval of historical average (2015–2019). Excess deaths were divided by the expected deaths upper threshold to calculate EM percentage.

**Results:** With reference to 2015, there was a significant increase in all-cause mortality at RRHs in 2020 (AOR=1.20, 95%CI 1.16–1.23;  $p<0.001$ ) and 2021 (AOR=1.46, 95%CI 1.42–1.50;  $p<0.001$ ). Mortality significantly exceeded the upper threshold of expected deaths at RRHs during 2020 in April (7%), May (2%), June (25%), August (10%), October (4%), and November (4%). From June to November 2021, EM was recorded each month (57%, 25%, 22%, 1%, 10%, 6%, respectively). The highest EM peaks were recorded in June for both years, but the excess deaths proportion during the peak in 2021 was double that of 2020. Statistically significant EM was recorded at 11 (73%) of the 15 RRHs in 2020 and 13 (86%) in 2021.

**Conclusion:** All-cause mortality at RRHs increased during the pandemic period (2020–2021). We observed EM at RRHs during the pandemic period when

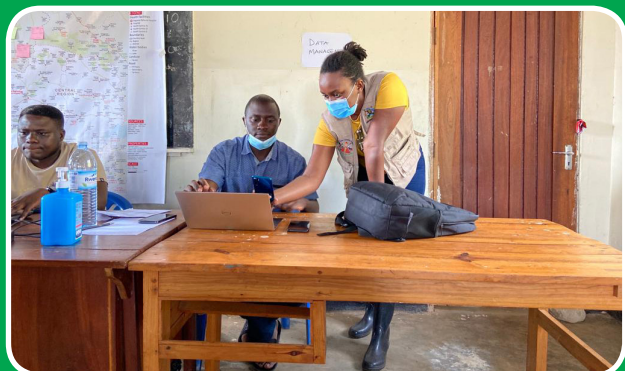
compared to historical data. MOH can track the mortality burden using EM to inform targeted control measures that avert preventable deaths.

**Keywords:** Trends, all-cause mortality, excess mortality, COVID–19, Uganda

## Pictorial and narrative



*Sherry (in boots) investigating human tungiasis cases in Sheema District, February 2022*



*Sherry (in yellow blouse) taking on data management and building transmission trees in go.data during the EVD outbreak in Mubende District, October 2022*



*Sherry (in green) conducting laboratory record review at Atutur hospital, Kumi District, September 2021*



### **Sarah Elayeete**

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[selayeete@gmail.com](mailto:selayeete@gmail.com)

**Tel:** +256782948872/+256 703138801.

Sarah Elayeete is a fully-fledged field epidemiologist with a master's degree in Public health and a background in community Health Science. Sarah has particular interest in HIV project implementation.

During the Field Epidemiology fellowship training, Sarah was attached to the National AIDS Control Program (ACP), a department within Uganda Ministry of Health.

Through the in-service training she attained skills in leadership, outbreak investigation and response. She led two outbreak investigations and participated in one other. She was involved in case investigations during the 2022 Ebola outbreak.

### **Achievements at the Host site**

- Participated in the development of the drop-In centre guidelines and assessment data tools for key and priority populations.

- Supported the review of the 2022 consolidated guidelines for HIV prevention and treatment.
- Participated in mid-term development of the peer training manual for key and priority populations.
- Participated in the assessment of the drop-in centre operation exercise in Busia District
- Participated in support supervision of health facilities providing key population services in Northern region
- Participated in the development and review of KP tools for key and priority populations data collection.
- Led the assessment of pre-exposure prophylaxis eligibility and uptake among people at substantial risk of HIV infection.
- Evaluated the Voluntary male medical circumcision service uptake during flexi hours verse regular
- Designed and implemented a QI Project on Improving PrEP uptake among pregnant and breast-feeding women at increased risk for HIV acquisition at Katakwi General Hospital
- Participated in quarterly review meetings for the TWGs

### **Fellowship program specific achievements**

Led two outbreak investigations:

- Investigation of severe illness among vaccinated hospitalized and non-hospitalized COVID-19 patients during the second wave of COVID-19 in Uganda, 2020-2021
- Food borne outbreak in Obongi district, August, 2021.



Participated in three other outbreak investigations:

- Malaria investigation in Iganda District, 2021
- Health facility preparedness to COVID-19 management during the second wave, Karamoja region, 2021
- EVD outbreak in Central region, 2022

Trained health workers in West Nile region on normal channels development

Facilitated frontline training of cohort 14 in Soroti and Mbale District

Participated in the EVD outbreak response in Central region

Supervised immunization defaulter tracking exercise in Hoima and Bukomasibi Districts August-October.

Participated in the EVD outbreak response and data analysis

### Conference presentations

International

- In the 2022 FETP International night
- 1<sup>st</sup> Conference on Public Health in Africa (CPHIA), 2021

National

- 7<sup>th</sup> national field epidemiology conference 2021 held in Kampala
- 8<sup>th</sup> national field epidemiology conference 2022 held in Kampala
- 16<sup>th</sup> Joint Annual Scientific Health Conference, 2022 held at Speke Resort Munyonyo.

### Written Communication

- Published a manuscript in

the International journal for Infectious diseases regions titled: “Comparative epidemiologic analysis of COVID-19 Patients during the first and second waves of COVID-19 in Uganda”

- Published two newspaper articles in the new vision
  - Protect breastfeeding
  - Smoking an enemy to HIV drugs
- Edited volume 6 issue 3 and published articles in the Uganda National Institute of Public health bulletin
  - PrEP eligibility and uptake among people at substantial risk of HIV infection in Uganda, 2017-2021
  - Voluntary Male Medical Circumcision among Men over 20 years during flexi and regular hour clinics, Central Uganda, 2018-2019
  - “Comparative analysis of COVID-19 Patients during the 1<sup>st</sup> and 2<sup>nd</sup> waves of COVID-19 in Uganda” manuscript at the NIHP bulletin

### Key lessons learnt during the fellowship

During my two years in the fellowship program, I learnt and developed the following skills:

- Outbreak Investigation skills and initiation of control measures
- Case investigation skills and tracing of exposures
- Designing and implementing Quality Improvement Projects
- Data management and analysis

skills using STATA, EpiInfo and QGIS softwares as well as interpretation of results

- Budgeting and accountability skills
- Project design, implementation, monitoring and evaluation skills
- Program evaluations
- Scientific writing including Manuscripts, abstracts, and press release
- Presentation skills and dissemination of findings
- Networking and lobbying skills

### Next Steps

With the skills and competencies gained, I hope to continue serving within the Ministry of Health or related organizations. I aspire to work to realization of improved health for key and priority populations and prompt response to public health emergencies and threats.

### Summary of Epidemiological Study:

#### Comparative epidemiologic analysis of COVID-19 Patients during the first and second waves of COVID-19 in Uganda, 2020-2021

**Background:** Uganda has had two major waves of COVID-19, the first in late 2020 and the second in mid-2021. In March 2021, the country began offering Astra-Zeneca COVID-19 vaccine. In late April 2021, the country entered a larger, second wave caused primarily by the SARS-CoV-2 Delta variant. Anecdotal reports suggested that younger persons were more prone to develop severe

disease during the second wave than the first. We compared epidemiologic characteristics of hospitalized (HP) and non-hospitalized (NHP) COVID-19 patients in the two major COVID-19 waves in Uganda.

**Methods:** We defined 'Wave 1' as November-December 2020, and 'Wave 2' as April-June 2021. At each of two major Kampala hospitals, we collected medical records data for 100 randomly-selected HP in Wave 1 and 100 in Wave 2. We retrieved contact information for randomly-selected, PCR-confirmed NHP (200 for each wave) from laboratory records and interviewed them by phone. Demographic, clinical, and self-reported vaccination data were collected from patients or next-of-kin.

**Results:** A higher proportion of HP in Wave 2 than Wave 1 were female (46% vs. 27%,  $p=0.0001$ ), and more Wave 2 than Wave 1 had severe disease or died (65% vs. 31%,  $p<0.0001$ ). NHP in Wave 2 were younger than those in Wave 1 (median age 27 vs. 35 years,  $p=0.08$ ). Median age of HP was significantly older than NHP in Wave 2 (median age 47 vs. 27 years,  $p<0.0001$ ) but not Wave 1 (median age 42 vs. 35 years,  $p=0.15$ ). Increasing age was associated with hospitalization in both waves, but the association was stronger in Wave 2 than Wave 1 ( $p<0.0001$ ). No patients were fully vaccinated.

**Conclusion:** Demographic and epidemiologic characteristics of hospitalized and non-hospitalized patients between and within Waves 1 and 2 of the pandemic in Uganda differed. Different variants of COVID-19 should be studied independently.



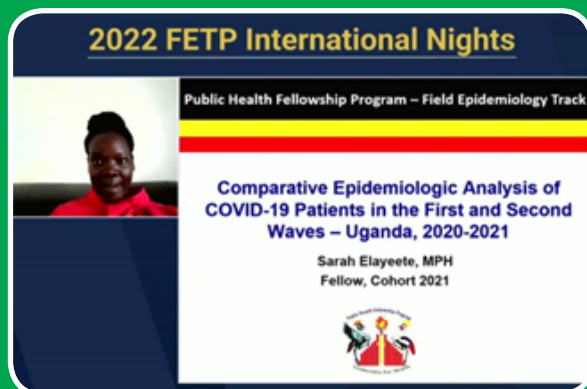
## Pictorial and Narrative



*Sarah Elayete (in red) with supervisor Daniel Kadobera (blue shirt) and other fellows during the first field deployment; a Malaria outbreak investigation in Iganga District, 2021*



*Sarah Elayete with another fellow and the health inspector Obongi District during a food borne outbreak investigating in Obongi District, August 2021*



*Sarah (in photo) making an oral poster presentation at the 2022 FETP International night held virtually, April, 2022*



*Sarah (green dress) facilitating a training FETP-Frontline participants in Soroti City, 2022*



*Sarah (floral dress) orienting Village Health Teams on community tracking and reporting of immunization defaulters in Hoima District, August 2022*



### **Petranilla Nakamya**

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**Tel:** +256 773464431 / +256 740913480

Petranilla Nakamya is a happy fully fledged field epidemiologist. She holds a master's degree in public health with a background in pharmacy. She has particular interest in maternal and child health.

During the fellowship Petranilla I was attached to the Public Health Emergency operation Centre (PHEOC), the information and coordination centre for public health events in Uganda.

The training has empowered her with knowledge and skills in outbreak investigation and response, scientific writing and better knowledge on the public health system on Uganda. She served her country using the platforms granted.

At the PHEOC, Petranilla was part of the team that enhanced capacities to manage and respond to the public health emergencies through strengthening the surveillance systems. She was involved

in development of documents and systems that support surveillance.

This training also exposed her broadening her outlook towards life and her network.

### **Achievements at the Host site**

- Participated in organizing for consensus meeting on 2021 internal multi-sectoral self-assessment on the JEE score card and operational planning.
- Coordinated Mbale Regional team during the COVID-19 response
- Reviewed the sustainability plan for withdraw of indoor residual spraying in Alebtong and Otuke.
- Participated in the 2021 NAPHS annual review monitoring and evaluation training
- Took part in the assessment of antibiotic use and consumption in 6 regional referral hospitals in Uganda
- Participated in organizing for the AMR awareness week in November 2021
- Participated in week's training on Evidence Based by Africa CDC where I chaired the sessions on one of the days
- Participated in organising the Uganda biosecurity and biosafety stakeholders' meetings.
- Supervised research assistants and IDSR focal person in the study on follow-up on adverse events following immunisation for NOPV2
- Updated the 717-monitoring tool for outbreak response and wrote a policy brief on the piloting of the 717 matrix



- Joined the IMT for managing the yellow-fever outbreak in 2022
- Participated in the Events Management System building workshop and facilitated the trainings.
- Chaired the COVID-19 Inter-Action Review (IAR) for Kampala response
- Reviewed signals on the EIDSR system and forwarded them to the respective districts for verification.
- Coordinated Deep dive implementation and conducted key informant interviews
- Participated in the review of standard operating procedures for the EOC
- Facilitated Ebola virus disease preparedness in Health facilities in the Kampala Metropolitan area
- Participated in planning for an EVD simulation exercise
- Supported the National Malaria Control Program in assessing of the exit plan for Indoor Residual Spraying (IRS) project for districts Alebtong and Otuke.

### **Fellowship program specific achievements**

- Led an epidemiological investigation which compared hospitalized and non-hospitalized patients among the three waves of COVID-19 in Uganda.
- Participated in other outbreak investigations:
  - Malaria outbreak investigation in Iganga District
  - EVD outbreak in Kampala Metropolitan Area

- COVID-19 pandemic

Participated in other investigations of public health importance:

- An evaluation of laboratory services in the COVID-19 response in Uganda
- end line survey on evaluation of mosquito nets utilization in Uganda
- Evaluation of the Implementation of Xpert MTB/RIF Ultra assay Testing in Uganda, 2019-2021
- Investigation of hospitalised COVID-19 cases at Mulago NRRH
- Analyzed surveillance data from DHIS on stillbirths in Uganda between 2014 to 2020
- Designed and implemented a QI study to improve reporting mortality in Jinja Regional Referral Hospital, Uganda
- Conducted an HIV evaluating retention and risks of adolescent girls and young women receiving a package of services from the DREAMS program, 2016 to 2021 in Uganda

### **Written communication**

Manuscript: 'Trends and geospatial distribution of stillbirths in Uganda, 2014-2020'.

Newspaper article in the New Vision: 'advice on the use of herbal medicines during the COVID-19 pandemic'

Edited the Issue 1 Volume 7 of the Uganda National Institute of Public Health epidemiological bulletin and published 3 articles in the same:

- Still births in Uganda
- COVID-19 inter-Action Review, June 2022
- 6<sup>th</sup> Graduation ceremony of the Uganda public fellowship program

Published in the one health bulletin on Uganda Multi-Sectoral Self-Assessment, 2021

### Conference presentations

Presented at three national and one international conferences

- National Field Epidemiology Conference (NFEC) 2021 and 2022
- Uganda Society for Health Scientists conference (USHS) 2022
- Africa Mortality Symposium

### Key lessons learnt during the fellowship

During the fellowship, I learnt and developed the following skill sets:

- Outbreak Investigation and response including institution of interventions
- Evaluation of surveillance systems
- Designing and implementing Quality Improvement Projects
- Data management, analysis and interpretation using such software as STATA, EpiInfo and QGIS
- Scientific writing (for Abstracts, Manuscripts, Policy Briefs and short articles)
- Presentation skills and dissemination of findings

- Networking and lobbying skills

### Next Steps

I have been equipped with knowledge and skills to enable me serve with various agencies/implementing partners or Ministry of health to combat public health emergencies and threats, improve the public health system of Uganda, as well as Globally.

### Summary of Epidemiological Study

**Background:** Uganda has experienced three major waves of COVID-19 since March 2020, driven by the Alpha variant (wave 1; W1), Delta variant (wave 2; W2), and Omicron variant (wave 3; W3). We compared the epidemiology of cases across the three waves to inform decision-making in pandemic control.

**Methods:** We compared W3 cases to previously published results for W1 and W2 cases in Uganda. We collected medical records for 200 PCR-confirmed hospitalized patients (HP) from Entebbe and Mulago Referral Hospitals during W3 from December 2021 to February 2022. We interviewed by phone 200 randomly selected, PCR-confirmed non-hospitalized patients (NHPs) identified from lab records. Data on demographics, clinical characteristics, and vaccination status were collected from patients or next-of-kin (for fatal cases).

**Findings:** There was no difference in median age between patients in any wave. Among HP, the proportions female in W1, W2, and W3 were 27%, 46%, and 36%, respectively; all comparisons were significantly different ( $p < 0.05$ ). Among NHP, the proportions female in W1, W2, and W3 were 42%, 48%, and 43%, respectively, none significantly



different. Among HP and NHP, the commonest comorbidity in all 3 waves was hypertension. W1, W2, and W3 had 18%, 28%, and 17% of HP with hypertension (significantly different between W3 and W2 ( $p=0.009$ ) but not W3 and W1 ( $p=0.79$ )). There were no differences in the proportion of NHP with hypertension between any of the waves. No patients were vaccinated in W1. Among HP, more were fully vaccinated in W3 than W2 (46% vs 1%,  $p<0.001$ ). Among HP, 6%, 26%, and 11% died in W1, W2, and W3, respectively, with W3 having significantly lower proportions of HP dying than W2 ( $p<0.001$ ), but not W1 ( $p=0.073$ ).

**Conclusion:** The characteristics of HP and NHP with COVID-19 were modestly different in three COVID-19 waves in Uganda. Overall, W3 cases were somewhat more similar to those in W1 than W2. However, disease appeared to be less severe in W3 and W1 than W2. As the SARS-CoV-2 pandemic continues to evolve, monitoring waves and new variants should remain a priority to inform response.

## Pictorial and narrative



*Petranilla with a colleague during a malaria outbreak investigation in Iganga district, 2021*



*Petranilla (red band) mentoring cohort 16 trainees of the FETP-Frontline*



*I was awarded best abstract at the USHS conference*





*Petranilla supervising polio mass vaccination in Mbale Regional Referral Hospital*



*Petranilla shares a jolly moment with the children in Iganga during one of her field investigations*



### **Nampeera Rose**

MBChB (MUK), MCEB (MUK)

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**Tel:** +(256) 704 902 283

**Host site:** Uganda Cancer Institute (UCI)

**Host mentors:** Dr. Nixon Niyonzima, Dr. Noleb Mugisha,

### **Fellows profile**

Nampeera Rose holds a Master of Clinical Epidemiology and Biostatistics and a Bachelor's degree in Medicine and Bachelor's degree in surgery from Makerere University. Before joining the Fellowship program Rose worked for the Ministry of Health as an epidemiologist in COVID-19 pandemic response.

During her time as a Field epidemiology fellow, she was attached to the Uganda Cancer Institute where she gained skills/experience in community cancer screening and sensitization, leadership and public health response. The fellowship program has enabled Rose to gain technical expertise in field epidemiology skills that include: outbreak detection, investigations



and response, evaluation of public health surveillance systems, project development and implementation, leadership and management, capacity building, scientific writing and communication skills.

### **Achievements at host site**

- Analysed surveillance data for the Comprehensive Community Cancer Program (CCCP) at the Uganda Cancer Institute
- Participated in community cancer awareness programs of the CCCP on cervical and breast cancer.
- Trained the data team at the CCCP on cancer data management.
- Evaluated of the cancer surveillance system with the data staff at the CCCP.

### **Fellowship program specific deliverables**

#### **Outbreak investigation and other projects**

- Led 2 outbreak investigations
  - Hospitalized Covid-19 cases in Mulago Hospital, Dec –Jan, 2022.
  - Assessment of COVID-19 treatment availability and prescribing practices in Uganda, December 2021 to January 2022.
- Participated in other outbreak investigations:
  - Ebola outbreak in Mubende and Kassanda districts, October 2022.
  - Cholera Outbreak in Nakivale Refugee Settlement in Isingiro District.

- Yellow Outbreak in Wakiso District, March 2021.
- Participated in other investigations of public health importance
  - Comparing hospitalized and non-hospitalized patients in wave 1 versus wave 2 and versus wave 3.
  - Unusual deaths in Kijonjo Parish, Kyotera District.
  - baseline evaluation of Malaria Insecticide treated bed net ownership and utilisation in Mukono district following a mass distribution, March-2021
- Led the training District Health Teams (DHTs) on developing and interpreting malaria normal channels to detect malaria outbreaks in West Nile region, Uganda – 2021.
- Trained and mentored Cohort 17 and 18 Frontline-FETP participants
 

Conceptualized and implemented an epidemiological study to assess the predictors of follow up for cervical cancer and cervical lesions treatment among women living with HIV in Uganda.
- Conducted a quality improvement project “Improving cervical cancer screening in Fort portal Regional Referral Hospital, 2022.”
- Conceptualised and implemented an HIV study entitled “Predictors of follow up for cervical cancer and cervical lesions treatment among women living with HIV in Uganda.”

### **Manuscripts**

- “Unveiling Global Inequality in

COVID-19 Treatment Availability and Prescribing Practices in Two Uganda General Hospitals, December 2021–January 2022: A Mixed Method Model.”

- “Factors associated with death among hospitalized COVID-19 patients in Mulago Hospital, Uganda Dec 2021 –Jan 2022”
- “Spatial and Temporal Trends of Cervical Cancer, Uganda, 2012-2021: an Analysis of Surveillance Data”
- “Predictors of follow up for cervical cancer and cervical lesions treatment among women living with HIV in Uganda.”

### Epidemiological bulletins

- ‘Factors associated with death among patients hospitalized with COVID-19 during Uganda’s third wave’
- ‘Spatial and Temporal Trends of Cervical Cancer, Uganda, 2012-2021: an Analysis of Surveillance Data’

### Newspaper articles in the New Vision

- “Continue the fight against cervical cancer”
- “Men go test for prostate cancer”

### Conference presentations

- The 7<sup>th</sup> National Field Epidemiology conference: “Trends of cervical cancer 2017 –2020”
- The 8<sup>th</sup> National Field Epidemiology conference: “Trends of cervical cancer 2017 –2020”

### Summary of the COVID-19 project:

### Factors associated with death among

### hospitalized COVID-19 patients in Mulago Hospital, Uganda Dec 2021 – Jan 2022

### Background

On 7 December 2021, the first SARS-CoV-2 Omicron variant was confirmed in Uganda. By 14 December 2021, COVID-19 cases had risen sharply in Uganda’s third wave of COVID-19 cases, largely driven by the Omicron variant. Analysis of hospitalized patients in the first and second waves of COVID-19 in Uganda identified age and male sex to be associated with death. We described factors associated with death among hospitalized patients with COVID-19 in Mulago Hospital during W3 of the COVID-19 pandemic in Uganda.

### Methods

We retrieved treatment files for all hospitalized patients with confirmed SARS-CoV-2 infection at Mulago Hospital in Kampala, Uganda from 14 December 2021 to 14 January 2022. We extracted data on age, sex, vaccination status, underlying conditions, and severity of COVID-19 disease, and interviewed patients or next-of-kin to obtain additional information. We used modified Poisson regression to identify factors associated with mortality.

### Results

Among 206 patients, 112 (54%) were females and median age was 53 years (range, 0-98 years). In total, 127 (62%) had comorbidities, 38 (18%) were fully vaccinated ( $\geq 2$  doses of SARS-CoV-2 vaccine), and 40 (20%) died. The median age of persons who died was 63 years (range, 23-88 years), compared with 51 years (0-98 years) in survivors. Seven



(18%) persons who died were fully vaccinated, compared with 31 (19%) survivors (OR=0.90, 95%CI=0.43-1.9). Compared to patients aged 0-40 years, the odds of death were 4.1 (95%CI 1.4-12) times higher among patients aged 45-65 years and 4.4 (95%CI 1.6-12) times higher for patients aged ≥66 years. The presence of comorbidities was not associated with death.

### Conclusion and recommendations

Among persons hospitalized with COVID-19 in Uganda's third wave of infections, only increasing age was associated with death. There is need to continue to emphasize COVID-19 prevention and appropriate care for COVID-19 among older persons and continue studying new variants of COVID-19 independently.

### Key lessons learnt during the fellowship

- Outbreak detection, investigation, response and control
- Scientific writing; concepts proposals, manuscripts, abstracts, policy briefs, epidemiological bulletins and newspaper articles
- Leadership and management skills acquired from various projects led and assigned
- Designing and implementation of continuous quality improvement projects
- Interpersonal skills with personnel of different cadres and race
- Communication skills including scientific presentation.

### Next steps

- Publish pending work done during the fellowship in peer reviewed journals
- Use the knowledge, skills and experience gained to nurture a career in epidemiology and impact society nationally and internationally through available institutions of government and international organisations.

## Pictorial and narrative



*Nampeera Rose (left) with a health worker at the COVID-19 isolation and treatment unit at Fort portal Regional Referral Hospital.*



*Nampeera Rose(left) abstracting data in Mulago National Referral Hospital*



**Dr. Andrew Kwiringira**

MBChB, MPH (MUK), Advanced-FETP

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**Email:** [akwiringira@musph.ac.ug](mailto:akwiringira@musph.ac.ug)

**Host site:** AIDS Control Program

**Host mentor:**

**Summary of portfolio**

Andrew Kwiringira holds a Bachelor in Medicine and Bachelor Surgery, a Master of Public Health and a certificate in Implementation science. Andrew has extensive experience in conducting complex analyses of epidemiological, healthcare data and preparing related reports. Instrumental in supervising the design and administration of surveys to collect and report epidemiological, healthcare data; overseeing the development, maintenance, and quality of major epidemiological and healthcare databases. Thorough knowledge of the basic principles and methods of epidemiology; sound understanding of biostatistics as applied to epidemiology. Expertise in working with District Health Teams and community health

workers in the implementation of health projects.

**Achievements at the Host site**

- Produced and published malaria weekly bulletin
- Led a survey of mosquito net ownership and utilization in 14 districts following a national mass distribution campaign
- Conducted an evaluation of effect of seasonal malaria chemoprevention on malaria incidence among children under five years in Kotido and Moroto District
- Developed capacity of District Health Teams (DHTs) in:
  - Analyzing surveillance data and developing visualizations to improve malaria data use.
  - Establishing the Malaria Epidemic Early Detection System (MEDS) in epidemic-prone districts
- Developed and delivered oral public health communications
- Conducted malaria risk communication activities

**Program-specific deliverables**

1. Led an investigation of cutaneous anthrax outbreak linked with handling dead animals, Madi-Okollo District, Uganda, January–February 2022
2. Led a quality improvement project to improve Management of Patients with Suspected Seizures Presenting at Hospital Emergency Departments in Uganda, 2021



3. Led an assessment of Uganda Public Health Fellowship Program's Contributions to the US President's Malaria Initiative Targets and the Ministry of Health Malaria Control Strategy, 2015 - 2022
4. Led a survey of prevalence of hypertension and risk factors in island districts of Lake Victoria in Uganda
5. Led an evaluation of effectiveness of a group-based education and monitoring program, delivered by health workers to improve control of hypertension in island districts of Lake Victoria, Uganda 2022
6. Led an investigation of adherence to an HIV testing program protocol of testing all prisoners at entry, interim and at exit in prison health facilities in Uganda, 2022
7. Led a survey of mosquito net ownership and utilization in 14 districts following a national mass distribution campaign
8. Conducted an evaluation of effect of seasonal malaria chemoprevention on malaria incidence among children under five years in Kotido and Moroto District
9. Participated in the following outbreak investigations:
  - A malaria outbreak in Iganga District facilitated by agricultural activities and residing near water logged areas, December 2021-February 2021
  - An outbreak of Black Water Fever among children in Districts of Bugisu, Bukedi, and Busoga Regions in Eastern Uganda, January 2019 – July 2021
  - Assessment of performance of laboratory services during the COVID-19 response in Uganda, October-December, 2021
  - Assessment of preparedness of border districts to respond to plague-West Nile Region, Uganda- August, 2021
  - Readiness of Health Facilities to Manage COVID-19 in Uganda, June 2021

### Conference presentations

- Oral presentation on a survey of mosquito net ownership and utilization in 14 districts following a national mass distribution campaign in the National Field Epidemiology Conference, Kampala, 2021
- Oral presentation evaluation of effectiveness of a group-based education and monitoring program, delivered by health workers to improve control of hypertension in island districts of Lake Victoria, Uganda in the National Field Epidemiology Conference, Kampala, 2022
- Oral presentation on evaluation of effect of seasonal malaria chemoprevention on malaria incidence among children under five years in Kotido and Moroto District in the global TEPHINET conference in Panama, 2022

## Written communication

### Manuscripts

- Ownership and Use of Long-lasting Insecticidal Nets Three Months after a Mass Distribution Campaign in Uganda, 2021
- Uganda Public Health Fellowship Program's Contributions to the US President's Malaria Initiative Targets and the Ministry of Health Malaria Control Strategy, 2015 – 2022
- Effectiveness of a Group-based Education and Monitoring Program Delivered by Community Health Workers to Improve Control of High Blood Pressure in Island Districts of Lake Victoria, Uganda, 2022
- Effect of Seasonal Malaria Chemoprevention on Incidence of Malaria Among Children Under Five Years in Kotido and Moroto Districts, Uganda, 2021: Time Series Analysis

### Other publications

1. Ownership and Use of Long-lasting Insecticidal Nets Three Months after a Mass Distribution Campaign in Uganda, 2021: Epibulletin article published in the National Institute of Public Health quarterly bulletin
2. Effect of Seasonal Malaria Chemoprevention on Incidence of Malaria Among Children Under Five Years in Kotido and Moroto Districts, Uganda, 2021: Time Series Analysis: Epibulletin article in the National Institute of Public Health quarterly bulletin

3. Effectiveness of a Group-based Education and Monitoring Program Delivered by Community Health Workers to Improve Control of High Blood Pressure in Island Districts of Lake Victoria, Uganda, 2022: Epibulletin article in the National Institute of Public Health quarterly bulletin

### Summary of epidemiological study

#### Effect of Seasonal Malaria Chemoprevention on Incidence of Malaria Among Children Under Five Years in Kotido and Moroto Districts, Uganda, 2021: Time Series Analysis

Andrew Kwiringira<sup>1</sup>, Benon Kwesiga<sup>1,2</sup>, Richard Migisha<sup>1,2</sup>, Lilian Bulage<sup>1,2</sup>, Daniel Kadobera<sup>1,2</sup>, Damian Rutaazana<sup>3</sup>, Julie R. Harris<sup>4</sup>, Alex R. Ario<sup>1,2</sup>, Julius Ssempiira<sup>4</sup>

<sup>1</sup>Uganda Public Health Fellowship Program, Kampala, Uganda

<sup>2</sup>Uganda National Institute of Public Health, Kampala, Uganda

<sup>3</sup>National Malaria Control Division, Ministry of Health, Kampala, Uganda

<sup>4</sup>US Centers for Disease Control and Prevention, Kampala, Uganda

**Background:** Seasonal malaria chemoprevention (SMC) refers to monthly administration of full treatment courses of antimalarial medicine to children <5 years during high malaria transmission seasons. SMC has demonstrated effectiveness in Sahel and sub-Sahel countries in Africa. However, it was not implemented in Uganda until April 2021, when the country began SMC in the highly malaria-endemic Kotido and Moroto Districts. We assessed the effect



of SMC on malaria incidence among children <5 years of age in Kotido and Moroto Districts.

**Methods:** We conducted an interrupted time-series analysis using monthly national health data from the Uganda Ministry of Health District Health Information System 2. We extracted monthly data for outpatient (uncomplicated) malaria among children <5 years, for the 52 months before SMC implementation (Jan 2017-Apr 2021), and 8 months during SMC implementation (May-Dec 2021). We computed monthly incidence per 1,000 children <5 years. We evaluated the incidence of uncomplicated malaria among children <5 years before and during SMC implementation.

**Results:** In Kotido District, malaria incidence was 693/1,000 during SMC implementation period, compared to an expected 1,216/1,000 if SMC had not been implemented. The mean monthly malaria incidence was 87/1,000, compared to an expected mean of 152/1,000 if SMC had not been implemented. This represents a statistically significant mean monthly change of -65.4 [95% CI=-104.6, -26.2] malaria cases/1,000 during SMC implementation, or a 43.0% decline. In Moroto District, malaria incidence was 713/1,000 during SMC implementation period, compared to an expected 905/1,000 if SMC had not been implemented. The mean monthly malaria incidence was 89/1,000, compared to an expected 113/1,000 if SMC had not been deployed. This represents a statistically significant mean monthly change of -24.0 [95% CI=-41.1, -6.8] malaria cases/1,000

during SMC implementation, or a 21.2% decline.

**Conclusion:** Implementation of SMC substantially reduced incidence of uncomplicated malaria among children <5 years in Moroto and Kotido Districts. Scaling up SMC in other districts with high malaria transmission could reduce malaria on a large scale across Uganda.

**Keywords:** Malaria, High Malaria Transmission, Seasonal Malaria Chemoprevention, Uganda

### Lessons learnt

During the fellowship, I learnt and developed the following skill sets:

- Data analysis skills
- Designing an epidemiological study
- Evaluating a surveillance system
- Presentation skills
- Outbreak investigation
- Writing skills
- Networking skills

### Next steps

I hope to further my career in the field of Epidemiology or surveillance



### Shaban Senyange

Bsc. Wildlife Health and management,  
Msc. Safety, Health and Environment

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**Host site:** Department of Integrated  
Epidemiology, Surveillance & Public  
health emergencies

### Host site mentors:

Dr. Freda Loy Aceng

Dr. Stella Lunkuse

### Fellow's profile

Shaban Senyange, self-proclaimed #Nature-Boy is an Award-winning Wildlife Health and Conservation Media Specialist. He holds a master's degree in Occupational Health, Safety

and Environment with a background in Wildlife Health and Management. Before joining the fellowship, Shaban paired his dedication towards wildlife conservation and passion for media to create TV Show "ECO-ZONE" that seeks to create awareness about wildlife conservation through travel, and worked with several organizations at the forefront of biodiversity and environmental conservation. Shaban has a keen interest in the human-wildlife, particularly the implementation of the One Health approach to public health.

During the two-year training in service fellowship, Shaban has grown an appreciation of the importance of several statistical methods and research designs in field epidemiology and public health interventions. He has gained vast knowledge and skills and hands on experience in outbreak investigations, emergency preparedness and response, project management and planning, public health surveillance, scientific writing, large database management and analysis, presentation and public speaking skills, leadership skills and capacity building. Additionally, Shaban is particularly proud of the improvement in his research skills, and data analysis (Epi Info and STATA) and GIS mapping.

Shaban led 2 outbreak investigation and participated in 9 other outbreaks and public health emergencies. He implemented several projects including a quality improvement project, an HIV project, a descriptive analysis of surveillance data, and an epidemiological study, among others. He has published newspaper articles, published a bulletin article and written manuscripts.



## Achievements at the Host site

I was attached to the Department of Integrated Epidemiology, Surveillance and Public Health Emergencies, Ministry of Health. I worked within the department to support surveillance, preparedness, detection and response to priority diseases, conditions and events in the country. In addition, offered support to improve IHR/IDSR capacity including disease reporting mechanisms, participate in timely investigation of disease outbreaks and a number of projects and activities including but not limited to:

- Supported production of the weekly epidemiological bulletin: Participated in publishing summaries of weekly national surveillance data that monitors the occurrence and trends of national priority diseases, conditions and events, contributed to data analysis, report writing and editing of articles that are published in the bulletin.
- Participated in the third Edition of the Integrated Diseases Surveillance and Response (IDSR) national training of trainers, March 2021: A pool of 50 national trainers was trained and provided input for further revision into the current drafts of IDSR technical guidelines and Training.
- Contributed to the Integrated Disease Surveillance and Response Needs Assessment concept: It was imperative to conduct a needs assessment to identify the system challenges and provide

baseline data for monitoring the implementation of 3rd edition of IDSR.

- Assessment of preparedness of border districts to respond to plaque in West Nile and Albertine Region. August, 2021. I was part of the national rapid response team that was constituted to define risk in 6 districts; Koboko, Maracha, Arua, Zombo, Nebbi and Pakwach, and assess their capacity to respond to plaque.
- I moderated sessions on the first day of the Integrated Disease Surveillance and Response (IDSR) Review Workshop; 26th – 27th July 2022. The purpose of the workshop was to review indicators and implementation of IDSR, third edition aimed at attainment of 100% countrywide roll out by December 2022.
- I designed and implemented a Quality Improvement Project on Improving monthly reporting of animal disease surveillance in Kween District, Eastern Uganda.
- Led an anthrax outbreak response and support in Kween District, October 2022.

## Fellowship program specific achievements

### Outbreak investigation and other projects

- Led two outbreak investigations:
  - Cholera Outbreak Investigation in Nakivale Refugee Camp, Isingiro

- District, 14th – 22nd November 2021
- Anthrax outbreak in Kween District, October 2022
- Co-investigator on several other outbreak investigations and projects:
  - Malaria Outbreak Investigation in Nabitende Sub county, Iganga District, March 2021
  - Baseline survey on ITN Utilization and Ownership, Kagadi District, April 2021
  - An Epidemiological Investigation of risk Factors Associated with Malaria Deaths in 08 Districts in Uganda, January 2020 - May 2021
  - Evaluation of readiness of health facilities to deal with the 3rd wave of COVID 19 in 7 Regions in Uganda, June 2021
  - Adverse Events following COVID-19 Immunization in Kampala Metropolitan areas, June 2021
  - Assessment of preparedness of border districts to respond to plaque in West Nile and Albertine Region. August, 2021
  - Evaluating the performance of lab services in the COVID-19 response in Uganda. September, 2021
  - Evaluating the utilization of GeneXpert ultra in testing for TB in Uganda. September/October, 2021
- Conducted a descriptive analysis of surveillance data from DHIS2; “Comparison of the incidence of mental health before and during the COVID-19 pandemic in Uganda, 2018-2021”
- Conducted an epidemiological study on Knowledge, attitude and practices regarding Anthrax among affected communities in Kazo District, South-western Uganda, May – June 2021
- Conceptualized and implemented an HIV study on “Religion and associated HIV prevalence and HIV health related outcomes in Uganda
- Designed and implemented a Quality Improvement Project on Improving monthly reporting of animal disease surveillance in Kween District, Eastern Uganda
- Completed a 5-week scientific writing workshop for Public Health Bulletins by CDC (16th May – 13th June), where I enriched my skills of writing public health bulletins.
- Other activities involved in:
  - Malaria Normal Channels Training
  - Data Quality Assessment in Ntoroko, Kabarole, Kibaale, Hoima, Masindi and Kiryandongo districts
  - Follow up on the sustainability plan for withdraw of indoor residual spraying in Alebtong and Otuke

### Conference presentation

- Oral presentation at the 7th Uganda National Field Epidemiology Conference, 29th October 2021; “Investigation of Malaria Outbreak in Nabitende Subcounty, Iganga District, Uganda, March 2021”

### Written communication

- Manuscripts written



- Knowledge, Attitudes and Practices regarding Anthrax among affected communities in Kazo District, South-western Uganda, May 2022 – under internal review
- “Comparison of the incidence of mental health before and during the COVID-19 pandemic in Uganda, 2018-2021” – under internal review
- Bulletin: Editor of the Uganda National Institute of Public Health (UNIPH) Quarterly Epidemiological Bulletin; Volume 6 Issue 3 July – September 2021
- Published an article in Volume 7 Issue 3 July – September 2022 titled “Knowledge, Attitudes and Practices regarding Anthrax among affected communities in Kazo District, South-western Uganda, May 2022
- Newspaper articles
  - Depression, substance abuse: A silent monster amidst the COVID-19 pandemic, September 15, 2021
  - The next pandemic is already coming!!! Unless we change how we interact with wildlife - scientists warn, Nov 2021.

### **Key lessons learnt during the fellowship**

PHFP has presented an opportunity to gain hands-on learning experience in field epidemiology and public health leadership with the skills and competencies acquired from this practical experience and mentorship

- Conducting outbreak investigations
- Leadership skills and teamwork

- Project design, planning, implementation, monitoring and management
- Improved Scientific writing skills; proposals, protocols, report, abstract and manuscript writing
- Improved my public speaking and communication skills
- Large database management and data analysis skills especially advanced analysis with different software (Epi Info and STATA)
- Expanded my professional network
- Evaluating and strengthening surveillance systems

### **Next Steps**

- Leveraging on my knowledge, experience and skills obtained before and during the public health fellowship period, I hope to further my career in applied field epidemiology and continue working at the human-animal nexus.
- I plan on publishing all the pending work done during the fellowship period in peer review journals.

### **Summary of Epidemiological study**

#### **Knowledge, Attitudes and Practices regarding Anthrax among affected communities in Kazo District, Southern Uganda, May, 2022**

#### **Background**

Despite health education about the risks of anthrax from eating meat from carcasses, some districts in Uganda, including Kazo District, experience repeated anthrax outbreaks associated with this risk factor. We assessed knowledge, attitudes, and practices

(KAP) around anthrax in previously-affected communities in Kazo District.

## Methods

We conducted a mixed-methods study in six villages in Kazo District from May 23–June 4, 2022. We administered structured questionnaires to 200 systematically-sampled community respondents aged  $\geq 18$  years about anthrax-related KAP and experiences with livestock loss. We conducted three KAP-based focus group discussions with community members identified as anthrax case-patients in previous outbreaks and those whose animals died suddenly in the previous year. We assessed overall knowledge through a set of eight questions on anthrax; species affected, signs and symptoms, transmission and prevention in humans and animals. We scored participants' responses to KAP questions as "1" (correct) or "0" (incorrect); adequate knowledge score was  $\geq 4$ . Qualitative data were analyzed using content analysis.

## Results

Among respondents, 65% were female; mean age was 45 years. In total, 94% had heard of anthrax and 73% knew transmission could occur through eating meat from carcasses. Overall, 77% of respondents had adequate knowledge about anthrax. Only 16% had lost their livestock suddenly in the last year; of these, 21% consumed the meat and 53% buried the carcasses. Qualitative data indicated that farmers did not vaccinate livestock against anthrax due to cost and difficulty accessing vaccine and veterinary services. Poverty and limited access to protein were cited as drivers

for consuming meat from carcasses despite the risk.

## Conclusion

Good awareness about anthrax among residents of a repeatedly-affected community in Uganda did not translate to safe practices. Alternative preventive approaches, such as compensating farmers for anthrax-positive carcasses in exchange for permitting safe animal disposal, might reduce risk in high-risk communities.

**Key words:** Anthrax, Knowledge-attitude-practice, Kazo District, Uganda



## Pictorial and Narrative



*Shaban (standing) hosting the Launch of the N\*Gen Youth TV Show at the Uganda Virus Research Institute organized by the US Mission in Uganda. Episode 1: Viruses and Vaccines*



*Shaban working with the community to dig a grave to bury an animal suspected to die of anthrax during an outbreak in Kween District*



*Shaban representing FETP at the US Exchange Program Alumni round table discussion with Ambassador Brown (right – first row), U.S. Ambassador to the United Nations Linda Thomas Greenfield (centre) and Assistant Secretary Molly Phee (left – first row)*



*Shaban examining eschars of a confirmed anthrax case during an anthrax outbreak investigation in Kween District*



### **Edirisa Juniour Nsubuga**

BSc. HND (KYU), MPH (MUK), DCMCH (Fort Portal-SOCO), Enhancing Academic Qualifications in Teaching and Research in Public Health (HIGH-Universität Heidelberg), Planetary Boundaries and Public Health (HIGH-Universität Heidelberg), Advanced Field Epidemiology (UPHFP),

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**Host Institution:** Ministry of Health, Uganda National Expanded Program on Immunization

### **Host Mentors:**

Dr. Fred Nsubuga

Dr. Immaculate Ampaire

## **FELLOW'S PROFILE**

Edirisa Juniour Nsubuga is a certified Advanced Field Epidemiology Fellowship graduate. He holds a master's degree in Public Health Nutrition (MPHN) from Makerere University (School of Public Health), a bachelor's of science (Hons) degree in Human Nutrition and Dietetics (BSc. HND) from Kyambogo University, a Diploma in Clinical Medicine and Community Health (DCMCH) from Fort Portal School of Clinical Officers, a Postgraduate Certificate in Enhancing Academic Qualifications in Teaching and Research in Public Health and a Postgraduate Certificate in Planetary Boundaries and Public Health from the Heidelberg Institute of Global Health (HIGH), Universität Heidelberg.

As an epidemiologist, he has interest in disease outbreak investigations and response, vaccine preventable diseases, global health security, maternal and child health, and nutritional epidemiology.

During his time as a fellow, he was attached to the Uganda National Expanded Program on Immunization (UNEPI) at the Ministry of Health. Through the advanced field epidemiology training, he has networked and attained skills and competencies in interpersonal and effective communication in leadership, strategic thinking in leadership, management and leadership, mentoring, coaching and support and supervision in leadership, outbreak investigation and response including data analysis, interpretation and use.

### **Achievements at the host site**

- Attended and actively participated in the weekly Immunization National



#### Coordination Committee meetings

- Compiled weekly vaccine preventable disease (VPD) case and death data reported in the DHIS2; identified abnormal figures and issues that needed further investigation on VPD reporting; and called the district EPI and surveillance focal persons to rectify the abnormal data and confirm the reported numbers.
- Attended the COVID-19 vaccine national/central supervisor's training from 2 to 3 September 2021 and subsequently conducted weekly COVID-19 vaccination supportive supervision activities in Kassanda District on three occasions.
- Attended the training of Trainers' of Trainers (TOT) on the new Immunization in Practice (IIP) guidelines from the 14<sup>th</sup>–19<sup>th</sup> August 2022 and subsequently conducted a one-week training of all facility in charges and EPI focal persons in Mitoma District in September 2022 on the new vaccines that were introduced in the national routine immunization schedule
- Participated in the development and launch of the Second COVID-19 vaccine deployment plan organized by UNEPI and CHAI from 24–27 August 2021
- Attended the National Trainer of Trainers (TOT) on the role out of the Smart Paper Technology (SPT) for Immunization Services in Uganda
- Supervised the Type 2 Novel Oral Poliovirus Vaccine (nOPV2) Adverse Events of Special Interest (AESI) Sentinel Site Surveillance Monitoring in Moroto Regional Referral Hospital
- Supervised the Safety Evaluation of the Type 2 Novel Oral Poliovirus

Vaccine (nOPV2) during a Supplemental Immunization Activity (SIA) in Abim, Kaabong, Kotido, Moroto, and Napak districts

- Participated in the investigation of yellow fever cases in Wakiso, Masaka and Kasese districts in March 2022
- Lead the investigation of a measles outbreak in August 2021 among children aged 6–9 years in Semuto Subcounty, Nakaseke District
- Participated in the one-day engagement with city authorities on urban immunization and national immunization strategy on 28 July 2022.
- Participated in the one-day COVID-19 round 3 national feedback meeting on 27 July 2022.
- Attended training on organized defaulter tracking of routine immunization

#### **Fellowship program-specific achievements**

#### **Outbreaks and other public health emergency response investigations led:**

- Evaluating the effect of community dialogue meetings on self-efficacy, willingness to receive and attitudes towards the COVID-19 vaccine among district leaders in Rwenzori and Bunyoro regions of Uganda
- Measles Outbreak in Semuto Subcounty, Nakaseke District, Uganda, June-August 2021
- Trends in watery diarrhea among children under 5 years before and after introduction of rotavirus vaccine in Uganda, 2016–2021: analysis of surveillance data
- Tuberculosis Preventive Treatment

(TPT) care cascade among People Living With HIV/AIDS and factors associated with TPT completion in Uganda: Analysis of Surveillance Data, 2019–2020

- Trends and Spatial Distribution of All Cause Pneumonia Among Children Under-Five Years in Uganda, 2016–2021: Analysis of Surveillance Data
- Factors associated with Acute Watery Diarrhea among children under 5 years of age in Obongi District, Uganda: a case control study
- Improvement of Infection Prevention and Control Practices Using a Quality Improvement Approach in Lwampanga and Nakayonza Health Centers, Nakasongola District, Uganda

### **Outbreaks and other public health emergency response investigations participated in:**

- Ebola Virus Disease Outbreak Investigation and response in Mubende, Kassanda and Kampala in September–December 2022
- Investigation of Hospitalized and Non-Hospitalized COVID-19 Cases in Mulago and Entebbe Hospitals
- Assessment of ownership and utilization of insecticide-treated mosquito nets and associated barriers immediately after a mass ITN distribution campaign in 14 districts in Uganda
- Evaluation of readiness of health facilities to deal with the 3rd wave of COVID-19 in 7 regions in Uganda, June 2021
- Assessment of Adverse Events Following Covid-19 Immunization in Uganda
- Risk Factors for Malaria Deaths in

the 8 Selected Districts in Uganda

- Malaria outbreak in Nabitende subcounty, Iganga district, March 2021
- Plague Risk and Readiness Assessment in six border districts of West Nile Region, Uganda, August 2021
- Evaluation of the Implementation of Xpert MTB/RIF Ultra Assay Testing in Uganda, 2019–2021
- Assessment of the Impact of Point-of-Care Technology on Early Infant Diagnosis Testing and Linkage to Antiretroviral Therapy among HIV-positive Infants in Uganda, 2018–2021
- Training on developing malaria normal channels and malaria Data Quality Assurance dissemination in 6 districts of West Nile (Nebbi, Zombo, Arua, Maracha, Moyo, and Adjumani districts)
- End-line Integrated Community Case Management survey, Moyo District
- Investigation of yellow fever cases in Wakiso, Masaka and Kasese Districts, Uganda
- Knowledge, attitude and practices regarding anthrax among affected communities in Kazo District, southwestern Uganda

### **1. Community dialogue meetings among district leaders in Rwenzori and Bunyoro regions**

Baylor College of Medicine, Uganda, conducted dialogue meetings among district leaders from the Rwenzori and Bunyoro regions on self-efficacy, willingness to receive and attitudes towards the COVID-19 vaccines in May 2021. I led the study that assessed the self-efficacy, attitudes and willingness



to receive the COVID-19 vaccines by the district leaders pre and post the meetings.

### Written communication

**a) Manuscripts:** First authored 4 (listed here) and co-author on six others

- Measles outbreak in Semuto Subcounty, Nakaseke District, Uganda, June–August 2021. Published in the International Journal of Infectious Diseases Regions (IJID Regions)
- Community Dialogue Meetings among District Leaders Improved Their Willingness to Receive COVID-19 Vaccines in Western Uganda, May 2021. Under peer review in BMC Public Health
- Loss to Follow-up Among People Living with HIV on Tuberculosis Preventive Treatment at Four Regional Referral Hospitals, Uganda, 2019–2021.
- Factors Associated with Acute Watery Diarrhea among Children Aged 0–59 Months in Obongi District, Uganda, April 2022: A Case–Control Study.

### b) Epidemiological bulletin articles:

Edited and published articles in the Uganda National Institute of Public Health epidemiological bulletin

- Investigation of a Measles Outbreak, Semuto Subcounty, Nakaseke District, Uganda, June–August 2021
- District Leader Community Dialogue Meetings Improved Willingness to Receive COVID-19 Vaccines in Western Uganda, May 2021: A Pre-Post Study
- Loss to Follow-up Among People

Living with HIV on Tuberculosis Preventive Treatment at Four Regional Referral Hospitals, Uganda, 2019–2021.

- Factors Associated with Acute Watery Diarrhea among Children Aged 0–59 Months in Obongi District, Uganda, April 2022: A Case–Control Study.

### c) Newspaper Articles Published:

“Celebrating the World Immunisation Week at the time of COVID-19” in the New Vision on 24 April 2021

### Conference presentations

- Oral presentations
  - 8<sup>th</sup> East African Health and Scientific Conference (EAHSC) in November 2021
  - 7<sup>th</sup> and 8<sup>th</sup> National Field Epidemiology Conference (NFEC)
  - 16<sup>th</sup> Joint Annual Scientific Health Conference (JASH) 2022,
  - 20<sup>th</sup> DR. Mathew Lukwiya Memorial Lecture
  - 1<sup>st</sup> National Antimicrobial Resistance Symposium
  - 28<sup>th</sup> UNACOH Conference
  - 3<sup>rd</sup> MINOSH International
- Poster presentation at the 3<sup>rd</sup> International Conference on Emerging Infectious Diseases 2022 (ICIED) in Atlanta, Georgia

### Mentorships and trainings

#### conducted:

- a) Participated in the training of Cohort 16 and 18 frontline FETP fellows
- b) Mentored 10 frontline fellows (3 in cohort 16, 2 in cohort 17, and 5 in cohort 18) for a duration of 12 weeks

- c) Trained District Health Team Members in 6 Districts of West Nile (Zombo, Nebbi, Arua, Maracha, Adjumani, and Moyo) on a malaria case study, drawing of the malaria Normal Channel and its use in determining malaria outbreaks

**12. Trainings undertaken:** I completed a one-month course on writing for public health bulletins training, from 1<sup>st</sup>–28<sup>th</sup> February 2022, conducted by Bloomberg philanthropies, data for health initiative, and the CDC foundation

### **Key lessons learned during the fellowship**

During the fellowship, I learned and developed the following skills:

- Leadership and management
- Outbreak detection, investigation, response and control
- Grants proposal and budget writing
- Accountability and financial management
- Data analysis using Excel, Epi info, STATA, and QGIS
- Editorial skills for epidemiological bulletins and journal articles
- Scientific writing of SITREPs, concepts, protocols, reports, abstracts, posters, PowerPoint slides, manuscripts, policy briefs, bulletins and newspaper articles
- Designing and use of electronic data collection tools such as KoBoCollect and ODK
- Designing and implementing quality improvement projects
- Written, oral, visualization, electronic, and interpersonal

communication

- Evaluation of public health surveillance systems
- Mentorship, coaching, facilitation, teaching, and training
- Multitasking with a high level of efficiency
- Networking

### **Next Steps**

- To continue advancing my knowledge and skills in epidemiology, outbreak investigations, public health leadership and management
- To apply the skills and competencies gained from the fellowship program through government/implementing partners operating nationally/internationally on global health security and public/global health emergencies
- To complete writing up and continue sharing the findings of all studies and projects conducted during the fellowship program through presentations, bulletins and manuscript publications
- Participation in any public health emergency response and mentorship of fellows at all levels once called upon by the fellowship program

### **Summary of Outbreak Investigation:**

#### **Measles Outbreak in Semuto Subcounty, Nakaseke District, Uganda, June–August 2021**

**Background:** Despite a nationwide measles-rubella vaccination campaign conducted in late 2019 in Uganda,



Semuto Subcounty reported rubella/measles outbreaks in 2020 and 2021. We investigated the measles outbreak in 2021 to determine the scope, assess factors associated with transmission, estimate vaccine coverage and effectiveness, and recommend evidence-based control measures.

**Methods:** We defined a probable case as acute onset of fever and generalized maculopapular skin rash with  $\geq 1$  of cough, cold, or red eyes in a resident of Semuto Subcounty, Nakaseke District, from June 1–August 31, 2021. A confirmed case was a probable case with a blood sample positive for measles-specific IgM. We reviewed medical records and used snowballing to identify cases. We conducted a 1:4 village-matched case control study to identify associated factors. A control was a randomly sampled person aged 6 months–9 years without signs/symptoms of measles from June 1–August 31, 2021, residing in the same village as the case. We used Epi Info to obtain adjusted Mantel Haenszel odds ratios ( $OR_{MH}$ ) and confidence intervals (CIs) and calculated vaccine coverage and effectiveness.

**Results:** We identified 30 case persons (3 confirmed); 16 (53%) were male, and none died. The overall subcounty attack rate (AR) was 3.2/1000. Children aged 5–9 years were the most affected (AR=5.0/1,000). Twenty-two (79%) case-persons and 116 (97%) control-persons had ever received measles

vaccine ( $OR_{MH}=0.13$ , 95% CI: 0.03–0.52). Interaction with symptomatic persons at water collection points ( $OR_{MH}=4.4$ , 95% CI: 1.6–12) and playing at community playgrounds ( $OR_{MH}=4.2$ , 95% CI: 1.7–11) during the exposure period increased the odds of infection. Vaccination coverage was 97% (95% CI: 92–99%), and vaccine effectiveness was 87% (95% CI: 48–97%).

**Conclusions:** Socializing and congregating at water collection points and community playgrounds facilitated measles transmission in this outbreak. Measles vaccination was protective. We recommended mass community vaccination (or re-vaccination) for children in Semuto Subcounty to capture unvaccinated children and act as a second dose in those who received only one dose. We urged parents/guardians to recognize, isolate, and keep children with measles-like symptoms at home.

## Pictorial and narrative



*Edirisa Juniour Nsubuga and Sarah Elayete investigating an EVD case in the Mubende ETU Red Zone during the Ebola Disease Outbreak in October 2022*



*Edirisa Juniour Nsubuga and Stella Martha Migamba extracting data from EID registers as part of the Rapid Antiretroviral Therapy Initiation following Rollout of Point-of-Care Early Infant Study*



*Edirisa Juniour Nsubuga (dotted shirt) and Shaban Senyange (seated down) taking notes during a focus group discussion of anthrax survivors in Kazo District as part of the Anthrax KAP study*