



THE UGANDA PUBLIC HEALTH FELLOWSHIP PROGRAM



FIELD EPIDEMIOLOGY TRACK 2017/ 2019



Disclaimer

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PREFACE

The Uganda Public Health Fellowship Program (PHFP) has enrolled 55 Fellows in Advanced Field Epidemiology since its inception in 2015; 11 in 2017 and the highest enrollment of 14 in 2019. Over the past 4 years, Fellows have conducted more than 90 outbreak investigations on high priority diseases of public health importance; thereby contributing to their effective management and control. They have also analyzed public health surveillance data and conducted evaluation of public health surveillance systems with the aim of improving detection of disease epidemic alerts and prompting early response. Within this short span, Fellows have implemented a total of 256 projects.

In addition, Fellows have made 193 presentations at national and international conferences, winning six awards including the prestigious CDC Director's Award for Excellence in Public Health and Response at the 2017 EIS conference. Fellows have made significant appearances in the local media, contributing feature articles on key topics of public health importance.

The rejuvenation of the Ministry of Health Epidemiological Bulletin code named Uganda National Institute of Public Health Quarterly Epidemiological Bulletin where Fellows have participated very effectively as editors and article contributors is another tremendous achievement. Twelve volumes have so far been produced since commencement of the program four years ago. In addition, PHFP has continued to contribute to production of the Quarterly Malaria Bulletin as well as initiating three completely novel bulletins i.e. Neglected Tropical Diseases Bulletin, National TB and Leprosy Program Bulletin and Non Communicable Diseases Bulletin, where the fellows and other MoH epidemiologists and officers publish valuable public health information for consumption by the public and scientific world. In 2019, the HIV/AIDS Program Bulletin is planned to hit the scientific and program platform waves.

The program has produced a total of ninety two manuscripts, 67 have been submitted to reputable peer-reviewed journals; 30 of which have so far been published and the other remaining 37 have either been accepted or undergoing peer reviews at various levels.

In this report, we present to you the profiles of the Cohort 2017 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. Patrick Tusiime

Commissioner Health Services, National Disease Control, Ministry of Health and Program Co-Director, Uganda Public Health Fellowship Program

DEAN'S MESSAGE TO GRADUATING FELLOWS

On my own behalf and on behalf of Makerere University School of Public Health and the Public Health Fellowship Program, I would like to congratulate you individually and collectively on your great accomplishment! We are very proud of your achievements during your training on the Public Health Fellowship Program, and we wish you the very best as you begin this next phase in your careers as Field Epidemiologists.

Your contributions at the host sites, your dedication to achieving your deliverables, and your enthusiasm to continuously learn, innovate and contribute to addressing public health needs in the country have been invaluable to the country at large, and we are grateful for that.

I have no doubt that you have been well-prepared to face the world at another level, and we implore you to uphold the values of the program and provide excellent leadership wherever you will be whether in the Ministry of Health, international agencies or academia. Continue to excel and be an inspiration to others to steer through the challenges of the contemporary world of today.

We encourage you to remain an active member of the FETP family. We urge you to remain active alumni and contribute to the network for your continued growth and networking. We also encourage you to support the program by mentoring those who will come after you to sustain the image and legacy of the program.

We do hope that you enjoyed your time with us at the School of Public Health and we are always glad to see you again. Congratulations once more!

Prof. Rhoda Wanyenze

**Dean, Makerere University School of Public Health and Program Principal Investigator, Uganda
Public Health Fellowship Program**



Biribawa Claire

MPH, BSC in Human Nutrition and Dietetics, Field Epidemiology Fellow (UPHFP)

HOST SITE: Trauma Injury and Disability Program (TRIAD)

Host Mentors:

Dr Olive Kobusingye,

Mr. John Kissa

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Fellow's Profile

I have conceptualized, designed and implemented injury research projects like Epidemiology of Road Traffic Injuries in Kampala, Uganda. I have also written a grant as Principal Investigator and succeeded in getting funding for the research project. These have built my competence in designing research protocols and implementing them. I underwent the Global road safety leadership course which further equipped me with skills and knowledge to tackle road traffic injury problems.

I have been able to lead two outbreak investigations and participate in six more outbreak investigations. I have undertaken a number of short courses and improved my skills data analysis using statistical and spatial

packages like STATA, SPSS, EPI Info and QGIS; conducting a TB operational research; rapid health assessment in complex emergencies; and Estimation of Burden of disease.

Fellows' achievements

During the fellowship, I was able to have the following achievements:

Host site

1. Produced a maiden Newsletter on Road Traffic Injuries
2. The fellow drafted and completed data extraction protocols for a pedestrian safety project at the host institution, Trauma Injury and Disability Program
3. The fellow was part of a writing group on a concept of Emergency Medical Services; Improving of Human capacity in the service delivery in Kampala, which was later implemented.
4. Trained Traffic Officers and other road safety stakeholders in risk factors and interventions for road safety and Vulnerable road Users
5. The fellow was part of a writing group on a grant proposal on Strengthening Emergency Medical Services human capacity in post-crash care along roads servicing oil rich districts in Uganda. a grant that was awarded to the host site.
6. Participated in writing the protocol and proposal on a national survey of the capacity of Emergency Medical Services in Uganda (Host site).
7. The fellow facilitated a training on Violence, Weapons and Trauma in Public Health Complex Emergencies
8. Participated in the National assessment of Emergency Medical Services
9. Facilitated a training of road safety for rapidly motorizing countries on Road traffic injury risk factors and vulnerable road users

Program-specific deliverables

1. The fellow has also been an editor on two issues of the Uganda National Institute of Public Health (UNIPH) bulletin.
2. Conducted analysis on data from DHIS2 to on the burden of injuries in Uganda
3. Team lead/Principal Investigator in the investigation of a measles outbreak in Lyantonde District
4. Team lead/Principal Investigator in the investigation of a Rift Valley Fever Outbreak in Buikwe District
5. Team lead on the study of epidemiology of road traffic injuries in Kampala, Uganda
6. Attended a 2 week course on Summary measures for Population health and 1 week training on Managing District Health Systems at John Hopkins University, School of Public Health, USA.
7. Participated in the following outbreaks:
 - A cholera outbreak in Nebbi District associated with drinking unsafe water from the lake
 - Mysterious Deaths Caused by Consumption of Alcohol Adulterated with High Concentrations of Methanol, Wakiso District- Uganda, June 2017
 - Tumors in Isingiro
 - Leptospirosis in Kabale
 - Participated in an acute watery diarrhoea investigation in Kyaka Refugee Camp, in Kyegegwa District, January 2018
 - Outbreak of mumps among children in a children's home in Wakiso District, which was associated with close contact among children
8. Conducted a TB operational research study on Nutritional status and TB treatment outcomes among TB/HIV co-infected patients at Mubende Regional Referral Hospital, 2014 – 2017

9. Led a quality improvement project “Improving human capacity of lifeguards to improve water safety and response to drowning victims at recreational water sites in Kampala and Entebbe”
10. HIV study: Sexual Violence, HIV Infection and other Sexually Transmitted Diseases among Male Prisoners in Uganda
11. Conducted a study on the Incidence and Trends of Road Traffic Injuries in Kampala District, Uganda 2012 - 2016



Claire Biribawa (white top) conducting a case finding interview under Lilian Bulage's supervision (stripped dress) during a measles outbreak investigation in Lyantonde District, 2017

Conference presentations

1. Oral presentation on Incidence and Trends of Road Traffic Injuries in Kampala, 2018 at the National Field Epidemiology Conference, Kampala, 2018
2. Oral presentation on Measles Outbreak Propagated by Hospitalization at a Pediatric Ward: Lyantonde District, Uganda – August 2017 in the National Field Epidemiology Conference, Kampala, 2017
3. Oral presentation on Incidence and Trends of Road Traffic Injuries in Kampala, at the 7th Africa Field Epidemiology Network Conference, Maputo, 2018

4. Oral presentation on Measles Outbreak Propagated by Hospitalization at a Pediatric Ward: Lyantonde District, Uganda – August 2017, at the 7th Africa Field Epidemiology Network Conference, Maputo, 2018
5. Oral presentation on Incidence and Trends of Injuries due to Gender Based Violence 2012 – 2016 in Uganda, at the Joint Annual Scientific Conference (JASH Conference), 2017, Kampala Uganda

Publications and manuscripts written

1. Burden of Injuries due to Gender Based Violence in Uganda, 2012 - 2016 : Epi-bulletin article published in the National Institute of Public Health quarterly bulletin
2. Incidence and trends of Road traffic injuries in Kampala District, 2012 – 2016,: Epi-bulletin article in the National Institute of Public Health quarterly bulletin
3. Co-authored four articles in the Uganda National Institute of Public Health (UNIPH) bulletin, volume 3, Issue 4 namely:
 - Mysterious Deaths Caused by Consumption of Alcohol Adulterated with High Concentrations of Methanol, Wakiso District- Uganda, June 2017
 - Malaria morbidity following Indoor Residual Spraying in Eastern and Northern Uganda: A comparative analysis of IRS and non-IRS districts 2013-2016
 - Outbreak of Leptospirosis in Kabale and Rubanda District , March-July 2017; Uganda, March-July 2017
 - A Falsely Reported Cluster of Tumors in Isingiro District
4. Policy brief: Prevent hospital-acquired infections through vaccination of all

children seeking care during measles outbreaks

5. Newspaper article in the New Vision “It has been said do not drink and drive but drunk walking is just be as lethal”:
6. Manuscript on Burden of Injuries due to Gender based Violence in Uganda, 2012 - 2016: Submitted to Injury Epidemiology Journal for peer review and publishing
7. Manuscript on Measles Outbreak Propagated by Hospitalization at a Pediatric Ward: Lyantonde District, Uganda – August 2017: Under internal review
8. Manuscript on the Prevalence and Determinants of Sexual Violence among Male Prisoners in Uganda: Under internal review
9. Manuscript on Estimation of Incidence and Trends of Road Traffic Injuries in Kampala, 2012 - 2016: Under internal review

Title: Estimation of Incidence and Trends of Road Traffic Injuries in Kampala District, Uganda (2012–2016)

Authors: Claire Biribawa^{1*}, Phoebe Hildah Alitubeera¹, Alex Riolexus Ario¹, Benon Kwesiga¹ Merissa Yellman², Olive Kobusingye³

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Abstract

Background

Annually, road traffic injuries (RTIs) kill 1.3 million people and cause 20-50 million serious injuries globally. Uganda's estimated rate of RTIs is high, and 50% of these RTIs occur in Kampala District (KD). Understanding the burden of RTIs, especially in the country's capital, is crucial for effective allocation of resources and for setting up targeted effective interventions.

This study aimed to describe the burden of RTIs in KD by determining the fatal and non-fatal rates of RTIs, prevalence of RTI risk factors, and RTI trends from 2012-2016.

Methods

We conducted a retrospective descriptive analysis using Uganda Traffic Police Department surveillance data. Annualized RTI death and injury rates per 100,000 population were calculated and compared between different population segments and time periods. Type of road user and police-reported causes of road traffic crashes (RTCs) were also assessed.

Results

In 2016, RTCs resulted in 493 deaths and 2,528 injuries in KD. Males aged 25-34 years and 35-44 years had the highest rates of fatal RTIs (90.6 and 90.5 per 100,000 population, respectively). Pedestrians were the most commonly affected road users for both fatal and non-fatal RTIs (50% and 36%, respectively). Among types of vehicles involved in RTCs with at least a death or injury, motorcycles were the most common (37%). Reckless driving was the most common cause of RTCs (48%). The rate of fatal RTIs declined from 44.6 in 2012 to 31.7 in 2016 per 100,000 population.

Conclusion

From 2012-2016, the fatal RTI rate decreased by 29% in KD. However, the fatal RTI rate in KD is still almost twice as high as the global rate (17.4). There is a need to establish interventions to curb RTIs and reduce reckless driving. RTI prevention strategies in KD should emphasize vulnerable road users (pedestrians/motorcyclists) and young adult males, who bore the highest proportional burden of RTIs.

Key terms: Road traffic Injuries, traffic accidents, Uganda

Lessons learnt

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

- Outbreak Investigation
- Scientific writing; Manuscripts, Abstracts, Policy Briefs and Newspaper article
- Editorial skills for scientific articles
- Data analysis skills
- Designing and implementing Quality Improvement Projects
- Evaluating a surveillance system
- Presentation skills
- Writing skills
- Networking skills
- Balancing work and family

Next steps

I hope to further my career in the field of during the Public Health fellowship. I plan on publishing all the work done during the fellowship in peer review journals. Epidemiology through service in an organisation that will allow me leverage my knowledge, experiences and skills obtained



Claire Biribawa receiving an award for 2nd runner up – Best Oral Presentation at the 7thAFENET Conference, Maputo Mozambique, 2018

**Birungi Doreen**

MSc (International Infectious Diseases Management) BBLT, Field Epidemiology Fellow (UPHFP)

HOST SITE: Uganda National Expanded Program on Immunization (UNEPI)

Host Mentors:

Dr Opar Bernard Toliva,

Dr. Immaculate Ampaire,

Dr. Henry Luzze

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Fellow's Profile

Birungi Doreen holds a bachelor of Biomedical Laboratory Technology and Master of International Infectious Diseases Management from Makerere University

During her two year of the fellowship, she has gained skills in coordination, management and leadership, evaluation of public health surveillance systems, systematic outbreak investigation and response, use of QGIS, policy brief writing, technical reports and manuscript writing, good communication skills and conducting operational research activities.

Prior to joining the fellowship, Doreen worked extensively in disease investigations and response with Epidemiology and Surveillance Division, Ministry of Health.

- Conducted analysis on Trends of Rubella positivity from blood samples tested at Uganda Virus Research Institute, 2012 to 2016
- Led a quality improvement project on Reducing Routine Immunization drop-out rates using a defaulter tracking system in Kaliro District
- Led supervision activities of Rota Virus vaccine introduction in Kisoro district, June, 2018

Program Deliverables

- Led an investigation on Fatal Methanol Poisoning Caused by Drinking Adulterated Locally-Distilled Alcohol: Wakiso District, Uganda, June 2017
- Led an investigation on Meningococcal Meningitis Outbreak in Bunyangabu District, Western Uganda: October, 2017
- Policy Brief on the Urgent need to introduce Measles Mumps Rubella (MMR) vaccine into Uganda's Routine Immunization Schedule
- Conducted a TB operational research on factors associated with Treatment Outcomes among Pediatric Tuberculosis Patients at Jinja Regional Referral Hospital, Uganda, 2016-2017
- Conducted data analysis on Seroprevalence and risk factors associated with HIV infection among women prisoners in Uganda Prisons 2013/2014
- Participated in the following outbreak investigations:
 - Participated on Investigation of suspected Meningitis in Mukono District, February, 2018
 - Participated in Fatal Rift Valley Outbreak in Western Uganda, 2018
 - Participated in the investigation of Anthrax in Kiruhura

- Participated in Cost Analysis of a Measles Outbreak in Islands of Buvuma, March 2017
- Participated in the investigation of an outbreak of multidrug-resistant TB in Arua District associated with poor adherence to TB treatment and delayed initiation of TB treatment
- Participated in the investigation of Multidrug-resistant Tuberculosis in Arua District, 2013-2017
- Rift Valley Fever in Kiruhura District, Western Uganda, November, 2017
- Participated in Tetanus Evaluation in Uganda, 2017
- A cholera outbreak in Nebbi District associated with drinking unsafe water from the lake, 2017
- Manuscript: Fatal Methanol Poisoning Caused by Drinking Adulterated Locally-Distilled Alcohol: Wakiso District, Uganda, June 2017:
- Manuscript: Factors associated with Treatment Outcomes among Pediatric Tuberculosis Patients at Jinja Regional Referral Hospital, Uganda, 2016-2017
- Manuscript: Seroprevalence and risk factors associated with HIV infection among women prisoners in Uganda Prisons 2013/2014
- Epibulletin article in the National Institute of Public Health quarterly bulletin: Rift Valley Fever Outbreak Caused by Handling a Dead calf: Kiruhura District, 2017-2018

Conference Presentations

- Oral presentation on Fatal Methanol Poisoning Caused by Drinking Adulterated Locally-Distilled Alcohol: Wakiso District, Uganda, June 2017 at the National Field Epidemiology Conference, Kampala, 2017
- Oral poster presentation on Fatal Methanol Poisoning Caused by Drinking Adulterated Locally-Distilled Alcohol: Wakiso District, Uganda, June 2017 at the 7th Africa Field Epidemiology Network Conference, Maputo, 2018
- Oral Presentation of Meningococcal Meningitis Outbreak in Bunyangabu District, Western Uganda: October, 2017
- Oral presentation on Fatal Methanol Poisoning Caused by Drinking Adulterated Locally-Distilled Alcohol: Wakiso District, Uganda, June 2017 at the Joint Annual Scientific and Health (JASH) Conference, Kampala, 2017

- Epibulletin article in the National Institute of Public Health quarterly bulletin: Fatal Methanol Poisoning Caused by Drinking Adulterated Locally-Distilled Alcohol: Wakiso District, Uganda, June 2017

Summary of Epidemiologic Study

Background: Methanol, an industrial solvent, can cause severe illness and death if ingested. In June 2017, Wakiso District notified the Uganda Ministry of Health (MoH) of a cluster of seven deaths. Case-patients presented with sudden loss of eyesight, headache, vomiting, and other symptoms before death. All illness reportedly occurred after drinking alcohol. We conducted an epidemiological investigation to determine the cause of the outbreak, identify risk factors, and recommend evidence-based control and prevention measures.

Methods: We defined a probable case as acute loss of eyesight and at least one of the following: profuse sweating, vomiting, dizziness, or loss of consciousness in a resident of either Nabweru or Nangabo Sub-county from 1-30 June 2017. We reviewed medical records and conducted active community case-finding. In a case-control study, we compared exposures of case-

Publications and manuscripts written

patients and controls selected among asymptomatic neighbors who drank alcohol, matched by age, and sex. We conducted a trace-back investigation to identify the source of the implicated alcohol and conducted key informant interviews about alcohol distillation and distribution. We collected locally-distilled alcohol from implicated bars and Wholesaler X for testing.

Results: We identified 15 cases; 12 (80%) died. Among case-patients, 12 (80%) were men; the median age was 43 (range: 23-66) years. Thirteen (87%) of 15 case-patients and 15 (25%) of 60 controls last drank alcohol at one of three bars supplied by Wholesaler X ($OR_{M-H}=15$; 95%CI: 2.3-106). Key informant interviews revealed that alcohol sellers sometimes added methanol to drinking alcohol to increase their profit margin. Among the 10 alcohol samples from Wholesaler X, the mean methanol content (1200mg/L, range: 77-2711mg/L) was 24 times higher than the safe level (<50 mg/L).

Conclusion: This outbreak was caused by drinking locally-distilled alcohol adulterated with methanol from Wholesaler X. Authorities closed the implicated bars and confiscated the implicated alcohol. Wholesaler X was arrested and prosecuted. We recommended enforcing existing laws governing alcohol manufacture and sale and use of methanol test strips by sellers to ensure product safety. We recommended timely administration of IV ethanol to victims of methanol poisoning and promotion of public health campaigns to create awareness of the dangers of methanol to human health.

Lessons learned

- Improved scientific writing competencies (proposal/protocol writing, manuscript writing)
- Management of Projects (gained experience in implementing projects)
- Collaborative approach of Implementing different programmes
- Ability to Multitask

- Scientific presentations i.e preparation of iposters
- Analytical skills (Deeper understanding of elements)
- Supervisory roles
- Consolidated data analysis skills and management, use of electronic data capture applications such as ODK, and use of QGIS
- Public speaking (with a lot of opportunity to present to different fora and researchers)



Doreen conducting an Ebola Virus Disease training session of health workers in Kasese, December, 2018. This was part of EVD preparedness following an outbreak in Democratic Republic of Congo near the Ugandan border.



Dr. Freda Loy Aceng

MSC (International Infectious Diseases Management)(Mak), BVM(Mak), Field Epidemiology Fellow (UPHFP)

Host Site: National Tuberculosis and Leprosy Program-MOH

Host Mentors:

Dr. Frank Mugabe

Dr. Ekuka Godfrey

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Fellow's Profile

Dr. Freda Loy Aceng is a Veterinary Doctor strongly interested in Infectious Diseases Management. She has a Bachelor's degree in Veterinary Medicine from Makerere University, Uganda and a Master's degree in from Makerere University and North Dakota State University. She has been a Uganda Field Epidemiology fellow, cohort 2017. She has investigated multiple disease outbreaks most notably 'Cutaneous anthrax outbreak investigation in Arua district Uganda district' and 'Rift Valley Fever outbreaks in Kiboga and Mityana districts.' In addition she was attached to the Uganda National Tuberculosis and Leprosy Program where some of her activities included; writing of

the quarterly bulletin which showcases the program's activities and TB research.

Achievements at the host site

I have enjoyed my time at the National Tuberculosis and Leprosy Program (NTLP) where I was attached for the two years of my fellowship. It has been an interesting experience where I have learnt a lot especially about programming. The greatest satisfaction for me comes from the fact that I achieved all the activities in my Terms of Reference (ToR).

- I pioneered the NTLP quarterly bulletin where we have published 6 issues to date. The NTLP Quarterly Bulletin aims to display the functional achievements of the program by presenting the past, present and future activities.
- I was a part of the Structured Operational Research and Training Initiative (SORT IT) which is an intensive training program that seeks to build a critical mass of operationresearchers within public health institutions especially programs of the Ministries of Health. The focus was Tuberculosis (TB) Operational Research where my topic was, 'Tuberculosis case notifications among health care workers at public health facilities in Uganda from 2015 to 2017.'The findings of the study will influence policy and practice and improve program outcomes especially enhancement of the program goal to find missing TB cases.
- My quality improvement project was titled, 'Improving Tuberculosis reporting in Lira district using continuous quality improvement science.'

- My epi-study which was another fellowship deliverable was titled, 'Extra pulmonary Tuberculosis cluster Investigation in Napak District, June 2018.' My descriptive study, 'Spatial Distribution and Temporal Trends of Leprosy in Uganda, 2012-2016: a Retrospective Analysis of Public Health Surveillance Data' informed leprosy programming and I submitted the manuscript to a scientific journal.
- I successfully coordinated the District TB and Leprosy Supervisors training in Buluba where we had the highest number of trainees ever. The training is critical in capacity building for TB and Leprosy prevention and control in the country.
- I also led the coordination of several leprosy activities at the program.

Program-specific achievements

The Field Epidemiology training is what I describe as 'bringing epidemiology to life!' It has been an exciting and challenging journey where I got a number of achievements. I was able to achieve all the key deliverables.

- My descriptive analysis on Leprosy was successfully completed and a manuscript developed.
- I led the investigation of two outbreaks; cutaneous anthrax outbreak in Arua district and Rift Valley Fever outbreak in Kiboga and Mityana districts. In addition I participated in a number of other investigations such as cholera in Nebbi District, measles in Kampala District and fatal methanol poisoning outbreak in Wakiso District.
- I published articles and a policy brief in the epidemiological bulletin. My newspaper article, 'The Fallacy of No-Man's Land at border points in Disease Transmission and Control' was published in the New Vision. I

have submitted my manuscript for the study, 'Spatial Distribution and Temporal Trends of Leprosy in Uganda, 2012-2016: a Retrospective Analysis of Public Health Surveillance Data' to the BMC infectious diseases journal.

- My HIV study was 'Analysis of the data from the Prevention of Mother to Child Transmission (PMTCT) program to identify demographic, health and social characteristics of HIV+ mothers who were lost to follow up.'
- I had abstracts presented at various conferences both locally and internationally which included the International Conference on Emerging Infectious Diseases (ICEID) 2018, 7th African Field Epidemiology Network scientific conference, 3rd and 4th Uganda National Field Epidemiology Conference and the 4th Global Health Security Agenda High Level Ministerial Conference. I was also honored to present during the FETP International Night 2018 at the 67th Annual Epidemic Intelligence Service Conference in Atlanta, Georgia.

Summary of epidemiologic study

Outbreak of Cutaneous Anthrax Associated with Handling Carcasses of Animals that Died Suddenly – Arua District, Uganda, January 2015-August 2017

Freda Loy Aceng^{1*}, Phoebe Hilda Alitubeera¹, Daniel Kadobera¹, Musa Sekamatte², D. Okethwangu¹, Lilian Bulage¹, A. R. Ario¹, B.P. Zhu¹

¹Uganda Public Health Fellowship Program, Kampala, Uganda

²Zoonotic Disease Coordination Office (ZDCO), Kampala, Uganda

Background: During May–June 2017, three persons with suspected cutaneous anthrax were reported from Arua District to the

Uganda Ministry of Health; one died. All had recently handled carcasses from animals that died suddenly. A skin lesion from a deceased person and a blood sample from a recently-deceased bull in same area tested positive for *Bacillus anthracis*. Informal community reports suggested cases since 2015. We investigated the outbreak to establish the scope, exposures for transmission, and recommend evidence-based control measures.

Methods: We defined a probable case as acute onset of a papulo-vesicular skin lesion subsequently forming an eschar in an Arua District resident during January 2015–August 2017. A confirmed case was a probable case Polymerase chain reaction (PCR)-positive for *B. anthracis*. We identified cases by medical record review and active community search. In a case-control study, we compared exposures between case-patients and frequency-matched asymptomatic village controls.

Results: We identified 68 case-persons of which 67 were probable, one confirmed, and two died [case fatality rate (CFR=2/68=2.9), from two neighboring sub-counties: Rigbo (AR=20.1/10,000) and Rhino Camp (AR=2.1/10,000). Males (AR=17/100,000) were more affected compared to females (0.52/100,000). Age-group 30-39 (AR=26/100,000) was most affected. Cases occurred throughout the three-year period, peaking during dry seasons. In the case-control study, 84% (57/68) of case-persons compared to 53% (72/136) of control-persons skinned animals that died suddenly (OR_{M-H}=5.0, 95%CI: 2.3–11), 96% (65/68) of case-persons compared to 56% (76/136) of control-persons butchered meat of those animals (OR_{M-H}=22, 95%CI: 5.5–89) while 90% (61/68) of case-persons compared to 54% (74/136) of control-persons carried the meat (OR_{M-H}=6.9, 95%CI: 3.0–16). All cases occurred following sudden animal deaths.

Conclusions: The cutaneous anthrax outbreak was associated with handling

carcasses of animals that died suddenly in Arua District. Investigations to establish the magnitude and exposures for anthrax transmission in animals have been done and revealed that skinning/butchering animals in the grasslands and animal deaths along riverbanks were risk factors. The district set up a One Health structure to facilitate epidemic preparedness and response. We recommended only consuming meat from slaughtered healthy animals, safe disposal of animals that died suddenly, and animal vaccination.

Lessons learned and skills acquired

During the fellowship, I have learned a lot of lessons and acquired various skills. I learned that field epidemiology requires patience, perseverance and dedication based on the unpredictable field challenges that I encountered. However despite all of them I managed to achieve my objectives and that was always the driving force. I acquired several skills including leadership, analytical, communication and computer skills. I am now confident and equipped to work as an epidemiologist in a reputable organization.



Freda entering into a manyatta (homestead) during an investigation of extra pulmonary TB cluster in Napak District, Karamoja, 2018



Freda interviewing an anthrax case- person during an outbreak of Cutaneous Anthrax Associated with Handling Carcasses of Animals that Died Suddenly – Arua District, Uganda, January 2015-August 2017



Dr. Innocent Harbert Nkonwa

MMED, MBCHB (MUST), MPhil, Field Epidemiology Fellow (UPHFP)

HOST SITE: Reproductive Health Division, Ministry of Health

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About the Fellow

Dr. Innocent H Nkonwa, is a graduate holder of Master of Medicine (Obstetrics and Gynecology) and Master of Public Health Leadership from Uganda Christian University. Prior to joining the program, he was the Medical Director of St Charles Lwanga Buikwe Hospital and also in charge of Katikamu South Health Sub District Luwero District. While on the program, Innocent was hosted at Reproductive Health Division within the Community Health Department.

Achievements at the host site institution

While at the host site, Innocent was involved in the Emergency Obstetric and Neonatal care activities

1. Assessed current system of data collection for maternal mortality and provided recommendations to improve and expand surveillance

coverage, at the community and facility levels.

2. Analyzed HMIS data on key RHMNH outcomes and recommended ways to ensure improved reporting and data usage.
3. Assessed functionality of community-based tracking system to identify pregnancies and deaths. Provided recommendations on how to improve community-based tracking.
4. Provided technical support to the Maternal and child mortality surveillance desk including compilation of the annual MPDR report
5. Participated in the National orientation of Health workers on the BABIES MATRIX
6. Participated as a resource person on RHD led events including Workshops, Conferences and International days.
7. Participated in Maternal and Prenatal Death Surveillance and Response training Bududa District
8. RBF assessment for Kampala, Sironko and Mityana districts
9. Facilitated in the RBF orientation of Buikwe, Kampala, Wakiso, Masindi, Kole, Amolator
10. Participation in the annual maternal and prenatal death surveillance report
11. Trained health workers on result based financing in Kampala, Buikwe and Luwero

Program-specific achievements (key deliverables)

Emergency Response

Lead investigator:

- Marburg outbreak in Kween District, 2018
- Suspected Meningitis in Mukono District, February 2018
- Cassava Flour poisoning in Kasese, January 2018
- Evaluation of Disease surveillance system in Adjuman District, April 2017

Participated in;

- Measles outbreak response in Kampala and Wakiso
- Cholera outbreak in Nebbi District
- Methanol poisoning investigation
- Rift Valley fever outbreak in Buikwe, Mityana, Kiboga and Kiruhura

Public health Surveillance

- Improving identification and Management of Hypertensive disorder in Pregnancy, labour and puerperium in Bududa Hospital October 2017
- Descriptive analysis on trends and Aetiologies of Maternal death in Uganda from 2012 to 2016
- Bacteriologic Sputum Non-conversion among TB /HIV co-infected Smear Positive patients in Luwero District, Uganda.
- Participated in data analysis and writing of the National Annual Health Performance report 2017/18
- Participated in data analysis and writing of the National Annual Maternal and Prenatal Death Surveillance and Response report 2017

Leadership and Management

1. National Trainer for Integrated Disease Surveillance and Response
2. National Trainer for MPDSR and Result Based Financing

Scientific Communication**Abstracts and Manuscripts**

1. Using Quality Improvement Approaches to improve Maternal and Neonatal death Surveillance in Luwero District Health Centers, Uganda 2018
2. Investigation of Cassava Flour Poisoning Outbreak in Kasese District, January 2018
3. Rift Valley Fever Outbreak: western and central Uganda, October 2017-January 2018

4. Evaluation of the Disease Surveillance System in Adjumani District Refugee Settlements, Uganda, April 2017
5. Bacteriologic Sputum Non-conversion among TB /HIV co-infected Smear Positive patients in Luwero District, Uganda.

Presented at

1. Joint Annual Scientific conference, Uganda
2. International Conference for emerging Infectious Diseases, Atlanta-Georgia, USA
3. Uganda National Field Epidemiology Conference

Using Quality Improvement Approaches to improve Maternal and Neonatal death Surveillance in Luwero District Health Centers, Uganda 2018**Background**

Comprehensive Emergency Obstetric and Neonatal Care (CEmONC) services are an essential component of maternal and child health care. When failures or inadequacies exist in CEmONC systems, poor outcomes such as high rates of maternal mortality and fresh stillbirth tend to persist. Currently, an alarmingly high number of stillbirths, 40,000 per year, occur in the Republic of Uganda. Maternal mortality ratio has slowly declined from 506 to 336 maternal deaths per 100,000 live births while neonatal mortality rate has almost stagnated at 29 per 1000 live births (UDHS 2016). Maternal and prenatal death surveillance and review is important in reduction of maternal and prenatal death

Objectives: To increase the maternal and prenatal death audits done in Luwero District and to improve maternal and prenatal death notification of the done audits to MoH.

Method: We reviewed, abstracted and summarized data to identify gaps in delayed identification and reporting of both maternal and prenatal deaths. Health

workers in maternity had knowledge gaps in administering treatment in maternal and prenatal audits. We conducted a problem outcome analysis using the root cause method and prioritized the possible interventions to the identified problems basing on their impact value for the patient outcome, is the proposed change under control of the team, is it easy to do, and what resources are required to implement it. We used the Plan Do Study and Act (PDSA) approach to set objectives, indicators, targets, activities, assign tasks and executed the plan. We observed the effect of implementation which is increased auditing and reporting of maternal. We shared progress in weekly and monthly QI meetings.

Results: From April 2018 to June 2018, auditing of the maternal death increased from 0% for maternal audits to 100% at the end of June. Prenatal deaths audits increased from 0% before April to 100% by end of June. MPDSR committee was functionalized at the facilities visited and the district level.

Conclusion and Recommendations
Functionalizing the MPDSR committee and Capacity building for health providers improved the MPDSR process in Luwero District. Use of data through reviews, display and analysis helped to track progress. We recommend adoption of the QI methodology used to improve service delivery in other sectors in the district. The model and lessons learnt, could be used to implement and spread the strategy to improve maternal health services in Luwero District and beyond.

Key skills/competences acquired

1. Conducting outbreak investigations
2. Establishment and strengthening of surveillance systems for both communicable and non-communicable diseases
3. Analyzing both surveillance and secondary data
4. Conducting Quality improvement projects

5. Building partnerships and collaboration with other agencies
6. Capacity building of health workforce
7. Communication and presentation in both national and international audiences

Next Steps and Career path

I intend to continue building my career in epidemiology, surveillance with emphasis on maternal and child health.

I also plan to be actively involved in research in MCH, HIV and communicable diseases.



Fig 1: Active case finding during cassava floor poisoning outbreak in Kasese District.



Innocent with samples of suspected poisonous cassava being dried, Bwera Kasese district.



Joyce Nguna Tusaba

MScIDM,(Mak) BBLT (Mak), Field Epidemiology Fellow (UPHFP)

HOST SITE: Uganda National Expanded Program on Immunization (UNEPI), Ministry of Health

Host Mentors:

Dr Opar Bernard Toliva,

Dr. Immaculate Ampaire,

Dr. Henry Luzze

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Fellow's Profile

Joyce graduated with a Master of Science in International Infectious Diseases Management from Makerere University, Uganda. She's a competent public health epidemiologist with a passion for infectious Diseases.

In her own words *'I am naturally very dynamic, with a hunger to learn and experience. I posses very strong interpersonal skills, organisational skills, excellent at multi-tasking and passionate about the implimentation of effective and efficient interventions that make a difference among vulnerable populations'.*

Joyce has over the years gathered broad experience in working with Government and non-governmental organizations that equipped her with cutting edge experience in various disciplines that include areas of

One Health, HIV&AIDS and its co-infetions, health advocacy, Global Health Security, health systems strengthening and coordination and outbreak investigations. Preceding joining the Fellowship, Joyce worked with the Infectious Diseases Institute, Mulago where she contributed to various HIV/AIDS related research projects and capacity building. In 2014, Joyce joined the Ministry of Health, Epidemiology and Surveillance division and where her keen interest in Infectious Diseases Epidemiology was further nurtured.

During the Fellowship training, Joyce was attached to the Uganda Expanded Program for Immunization (UNEPI), Ministry of Health. UNEPI's mission is to contribute to the reduction of morbidity and mortality due to childhood disease to levels where they are no longer of public health importance and the goal is to fully vaccinate every child and high-risk groups.

While at the UNEPI, Joyce used her leadership and writing skills to contribute to the division's mandate of developing immunization guidelines and standards; she coordinated the writing and implementation of the Evaluation of Tetanus surveillance system project in Uganda, participated in outbreak investigations, supported the development of guidelines and roll out of the Rota Virus Vaccine introduction. Joyce also engaged in vaccine campaigns in refugee settlements and across the country and has consequently supported training of regional and district teams on implementation of the Integrated Disease Surveillance and Response guidelines for Vaccine Preventable Diseases. She also participated in building individual and program capacity to effectively execute a high impact quality improvement project that resulted in the increased surveillance of Tetanus in Mayuge District. Joyce was also a member of the National Task Force Surveillance and Vaccination subcommittees for Ebola Virus Disease preparedness. This experience placed her in a position towards achieving her career developmental goal and

acquiring competencies to develop, execute and monitor cutting-edge life saving strategies. UNEPI gave me numerous opportunities to work on diverse areas where health policy and science intersect. Joyce engaged in numerous other activities that resulted into significant accomplishments during her fellowship period as highlighted below;

Projects undertook during the Advanced Field Epidemiology Training; Project

Costing of a measles outbreak in Buvuma, Islands, Lake Victoria, March, 2017 Lead
 Descriptive analysis of trends of Tetanus in Uganda, 2012-2017 (Participant)
 Investigation of a measles outbreak in Kampala and Wakiso District, 2017 (Lead)
 Evaluation of the Tetanus surveillance system in Uganda, 2017 (Lead)
 Investigation of a malaria outbreak in Kisoro District, January, 2018 (Lead)
 Investigation of a malaria outbreak in Nwoya District, 2018 (Participant)
 Policy brief; Increasing uptake of Tetanus Toxoid vaccine among males, 2018 (Lead)
 Investigation of an unknown illness in Mubende District, 2017 (Participant)
 Investigation of a meningitis outbreak in Masindi District, April, 2018 (Participant)
 Quality improvement to improve Tetanus data management in Mayuge District, 2018 (Lead)
 HIV among pregnant mothers attending antenatal care at Tororo Hospital (Lead)
 Investigation of a Cholera outbreak in Nebbi District, 2017 (Participant)
 Investigation of Methanol Poisoning in Wakiso District, 2017 (participant)
 Oral Cholera Vaccination introduction in Kyangwali Refugee Settlement (Lead)
 Treatment outcomes of TB patients in Kyangwali Refugee settlement, 2018 (Lead)
 Ebola Virus Disease Preparedness assessment and risk Mapping, 2018 (Participant)

Leadership and management

- National trainer for Integrated Disease Surveillance and Response
- National Stop Transmission of Polio (NSTOP) trainer
- Supervised and mentored District Health Teams during vaccination campaigns and introduction of new vaccines
- Mentored a team of Frontline Health Workers and non-health staff on Point or Entry surveillance in response to Ebola preparedness in Western Uganda

Scientific communication

- 4 Presentations at national (3) and international (1)
 - Evaluation of the Tetanus Surveillance System in Uganda, 2017
 - Investigation of a Malaria outbreak in Kisoro District, Uganda, 2018
 - The Cost of Responding to a Measles Outbreak on Buvuma Islands, 2017
 - 1 manuscript submitted to a peer reviewed journal and 2 currently under review

Project title: Malaria Outbreak Facilitated by Increased Human Activities around Swamps: Kisoro District, Uganda, December 2017-March 2018

Introduction

Malaria is a life-threatening febrile illness caused by *Plasmodium* parasites that are transmitted to people through bites of infected *Anopheles* mosquitoes. The global focus on malaria is now shifting away from smaller-scale control towards efforts to eliminate and later eradicate malaria. The Ugandan Ministry of Health (UMOH), with several implementing partners, have supported various strategies for malaria control, including enforcing adherence to national case management guidelines for simple and severe malaria at health facilities and communities, distribution of long-lasting insecticide-treated nets, indoor residual

spraying, and prevention of malaria in pregnancy. This has led to a decline in national malaria prevalence from 45% in 2010 to 19% in 2016. However, most areas of Uganda are still highly endemic, and not approaching elimination of malaria.

On 19 December 2018, a malaria outbreak was reported in two of the sub-counties of Kisoro District, Kanaba and Murora sub-counties. The outbreak was detected through routine analysis of malaria surveillance data reported in the District Health Information System 2 (DHIS2) for December 2017 (weeks 49-52, 2017) and January 2018 (weeks 1-2, 2018) [16]. This analysis showed a sudden increase in malaria cases (>200 cases/month from DHIS2 during this time period) compared to the previously low reported cases from DHIS2. Malaria cases diagnosed by malaria rapid diagnostic test or microscopy in the district in this time period exceeded the action thresholds established by the Malaria Control Program. We investigated this outbreak to determine its magnitude and scope, identify factors associated with transmission in this usually low-endemic area, and recommend evidence-based control and prevention measures.

Methods

We defined a confirmed case as a positive malaria rapid diagnostic test or microscopy from December 2017–March 2018 in a person in Kisoro District, where the outbreak was reported. We reviewed medical records in all health facilities in the affected Kanaba and Murora sub-counties to find cases. We calculated attack rates (AR) by age, sex, and village using the projected 2016 population. In a case-control study, we compared potential exposures between case-persons, selected randomly from the line-list, and village- and age-matched asymptomatic controls. We conducted an entomological and environmental assessment of the affected sub-counties.

Results: We found 3,130 malaria cases (compared with 879 cases during the same period the previous year). Persons in the age groups 10-19 (AR: 14/1,000) and 20-29 (AR: 12/1,000) years were the most affected. In the case-control study, 89% (129/145) of case-persons and 73% (106/145) of controls reported that they usually went to bed after 9:00pm ($OR_{M-H}=2.9$; 95%CI: 1.6-5.7); 22% (32/145) of case-persons and 15% (21/145) of controls reported not sleeping under a mosquito net ($OR_{M-H}=3.9$; 95% CI: 1.2-13). Villages closest to the Sereri and Mpundu swamps were more affected than those further away. Investigation revealed that in July 2017, the Sereri and Mpundu swamps began being used for agricultural and brick-making activities, which might have increased mosquito density as well as human exposure to mosquitos. Further research revealed that a heavy rainfall had occurred in the area in early January 2018. *Anopheles gambiae sensu lato* was identified in breeding places around Sereri and Mpundu swamps. In total, 64% (23/36) of female adult *Anopheles* captured in case-persons' households by pyrethrum spray catches were fed, suggesting low mosquito net usage the previous night.

Conclusion and Recommendations: This malaria outbreak occurred in an area that had already reached pre-elimination levels of malaria. It was likely propagated by favorable breeding conditions, including recent heavy rainfall, and exacerbated by new human activities around two swamps. In the context of progress towards elimination, low-endemic areas should be particularly aware of activities that can lead to resurgences in malaria, such as night-time exposures, lack of mosquito net usage, and human activities focused around breeding sites. We recommended increased awareness about mosquito net usage, and use of larvicides in the residential area and swamps to break the breeding cycle. Additionally, persons working in the swamps or other

high-risk areas should use protective clothing.

investigation of a strange disease in Mubende District, 2018

Field in pictorial



Figure 1: Joyce and the co-investigators (Denis and Godfrey) together with the Vector Control Officer conducting an environmental assessment during a malaria outbreak investigation in Nwoya district, 2018



Figure3: Joyce conducting a training of Point of Entry surveillance and infection prevention and control in Bunyangabo District following the Ebola outbreak in Democratic Republic of Congo, 2018



Figure 2: Joyce and Daniel interviewing a mother to a suspect case during the



Dr. Miriam Nakanwagi

MPH (University of Manchester), MBCHB (Mak), Field Epidemiology Fellow (UPHFP)

HOST SITE: AIDS Control Program (ACP) MOH

Host Mentors:

Dr Shaban Mugerwa

Dr Joshua Musinguzi

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Motivation for joining the program

I joined the Public Health Fellowship Program in January 2017. I had previously worked as a program officer in a CDC supported health systems strengthening project on Prevention of Mother to Child Transmission of HIV/AIDS. Having always been passionate about numbers, I knew that I would thrive and shine when the medicine and mathematics in me met. And to this end, epidemiology was the answer. I henceforth embarked on the program with a deep seated desire to sharpen my skills in epidemiology. The two years on the program gave me a platform to achieve this and so much more.

During the Fellowship Program, I was placed at the STI/AIDS Control Program (ACP) for the hands on training. I joined the team at

ACP and contributed to the national efforts towards HIV/AIDS epidemic control.

Key achievements at ACP

- A National mentor in HIV Prevention and Care and treatment services
- Led teams for various ACP trainings, support supervision and mentorships such as the revised National consolidated guidelines for HIV/AIDS treatment, National PMTCT Evaluation Exercise and the National eMTCT validation exercise
- Led the eMTCT National Validation Report writing exercise
- Chaired weekly Option B+ meetings with implementing partners
- Assessed eMTCT service provision in hard to reach areas such as Buvuma islands
- Participated in various technical working groups in ACP and these included: workshop on preparation of tools, Standard Operating Procedures and implementation guidelines for Pre-Exposure Prophylaxis (PrEP), curriculum development for training of health workers on the Differentiated Service Delivery Model (DSDM), Optimization of HIV treatment access in South Western Uganda, HIV self-testing, the development of the Health Sector HIV/AIDS Strategic Plan (2018 – 2022/3), national review of the DREAMS project for adolescent girls and Young women and review of HIV/AIDS related HMIS tools
- Participated in different high level meetings including: Implementing partner coordination meeting with MoH on review of HIV care and treatment services in Uganda, monthly viral load performance and data review meetings, WHO-AFRO meeting on optimising HIV diagnosis and treatment for children living with HIV/AIDS, improving early infant diagnosis performance meeting, National Stakeholder Meeting on HIV

Testing Services, Integration of adolescent services into routine HIV care

- Facilitated a Focus Group Discussion with health workers during piloting of Dolutegravir, a new first line antiretroviral drug

Key deliverables on the Fellowship Program

Outbreak investigations and other projects

- Led a rapid HIV service delivery assessment of Bidibidi Refugee settlement
- Co-investigated the rapid health assessment of service provision in Bidibidi refugee settlement
- Led an investigation of a suspected anthrax outbreak in Isingiro District
- Participated in the investigation of outbreaks including: An outbreak of cholera in Nebbi district, Poisoning due to adulteration of alcohol with Methanol in Kampala, Meningitis Outbreak in Bunyangabo, and an investigation of skin burns among people harvesting grasshoppers in Uganda
- Analyzed District Health Information Software 2 (DHIS2) data on women that come with known HIV status at their first antenatal care visit and also data to compare TB treatment outcomes in children that are HIV positive with those that are HIV negative
- Designed and implemented two projects: “Addressing low proportions of repeat HIV testing in Maternity in Kayunga Hospital: A Quality Improvement Project” and “Assessing conversion to HIV-positivity among babies on Option B+ Program for Prevention of Mother To Child Transmission of HIV: Kampala and Wakiso Districts, 2013-2017”

Scientific communication and writing

1. Suboptimal HIV Service Delivery in Bidibidi Refugee Settlement, Yumbe district, March 2017, presented at the

13th Joint Annual Scientific and Health Conference, 27th – 29th September 2017

2. Outbreak of Gastrointestinal Anthrax Following Consumption of Beef of Suspicious Origin – Isingiro District, Uganda, 2017 presented at the 3rd Uganda National Field Epidemiology Conference, November 2017 and presented on my behalf at the 2018 Field Epidemiology Training Program International Night, 16th- 19th April 2018
3. Low Proportions of Women Coming with Known HIV status at First Antenatal Visit, Uganda, 2012-2016, Uganda, presented at the 4th Uganda National Field Epidemiology Conference, 2nd November 2017 and at the 7th AFENET Conference, 12th -16th November 2018
4. Low HIV Seroconversion Proportions on Repeat Testing in Maternity in Kayunga Hospital, Uganda, 2018, accepted for the 9th International Workshop on HIV and Women, 2nd- 3rd March 2019

Written Communication

1. Editor of Issue 2, Volume 4, September 2017 of the Uganda National Institute of Public Health (UNIPH) Epibulletin
2. Elimination of Mother to Child Transmission of HIV – We all have a role to play; Newspaper article, published in The New Vision, Tuesday 4th July as a commentary
3. Rapid Health Assessment of HIV Service Delivery: Epibulletin article, published in the UNIPH Epibulletin, Issue 2, Vol 3, April – June 2017
4. Highlights of the Uganda Population HIV Impact Assessment, published in the UNIPH Epibulletin, Issue 2, Volume 4, September 2017
5. Policy brief: Increase Vaccination Against Meningococcal Meningitis to areas outside the Meningitis Belt: Lessons from a cluster of Meningitis in Bunyangabo, Published in the UNIPH

Epibulletin, Issue 1, Volume 3, January-March 2018

6. Outbreak of Gastrointestinal Anthrax Following Eating Beef of Suspicious Origin – Isingiro District, Uganda, 2017: Manuscript submitted for review and publication
7. Low Proportions of Women Coming with Known HIV status at First Antenatal Visit, Uganda, 2012-2016, Uganda: Manuscript submitted for review and publication

Abstract for the Quality Improvement Project

Low HIV Seroconversion Proportions on Repeat Testing in Maternity in Kayunga Hospital, Uganda, 2018

Miriam Nakanwagi^{1*}, Mathias Kigozi², Suzan Nakazibwe², Benon Kwesiga¹, Lilian Bulage¹, Daniel Kadobera¹, Steven Ndugwa Kabwama¹, Alex Riolexus Ario¹

¹Uganda Public Health Fellowship Program

²Kayunga Hospital

Introduction: A previously HIV-negative woman during antenatal care can seroconvert to an HIV-positive status later during pregnancy which necessitates HIV re-testing in maternity. An HIV re-test is done three months after the previous test. Generally, HIV re-tests are hardly done in maternity. We used Quality Improvement (QI) approaches and aimed to increase the proportion of HIV re-testing in maternity in Kayunga hospital to 95% and to determine the proportion of women that seroconverted to HIV positive status on a re-test.

Methods: We established the baseline metric by ascertaining the proportion of women that had had an HIV re-test in maternity in Kayunga hospital from January to June 2018. We trained the maternity staff on the correct eligibility for an HIV re-

test and the correct Prevention of Mother to Child Transmission of HIV (PMTCT) codes. We also created a column for eligibility for re-test in the integrated maternity register. We analyzed the proportions of women that had an HIV re-test done in maternity during July to October 2018 and compared with the baseline proportions. We also analyzed the proportions of women that seroconverted on a re-test in maternity.

Results: At baseline, of 447 women attending maternity from January to June, 324 (72%) were eligible for a retest. Of these, 61 (19%) had had a retest done in maternity. The re-testing proportions increased from 31 of the 35 eligible (87.5%) at the start of the intervention to 70 of the 71 eligible (98%) at the end of the intervention. Overall, 206 (93%) of the 221 eligible women had had an HIV re-test in maternity during this period. Of 206 women that re-tested in maternity, two women (1%) seroconverted to an HIV positive status.

Key skills/competences acquired

1. Outbreak investigation and response
2. Emergency public health surveillance
3. National level HIV/AIDS programming and coordination
4. Program/project design, implementation and monitoring and evaluation
5. Scientific writing and communication: Newspaper articles, policy briefs, manuscripts, bulletin articles, power point presentation
6. Leadership
7. Innovation

Next steps

I will use my expertise in epidemiology to contribute towards improving the health indicators in Uganda and elsewhere in the world in the field of Public health emergencies and/or HIV/AIDS.



Dr. Miriam Nakanwagi (Dotted dress) with the core QI team in Kayunga hospital discussing the baseline QI data and the targets for the QI project



Opio Denis Nixon

MSc. (Clinical Epi and Biostat) (Mak) BSc. (Qualitative Economics) (Mak)

Host Site: National Health Information (NHI) MOH

Host Mentors:

Ms. Carol Kyoziira

Mr. John Kissa

Email: dnixon@musph.ac.ug

Phone No: +256-785291383

About the Fellow:

Denis Nixon Opio, has completed an advanced fellowship in Field Epidemiology with Uganda Public Health Fellowship Programme, Ministry of Health Uganda. As an FETP fellow, Denis completed the following deliverables which are very relevant to his career; Participated in Mentoring and giving technical support to other Advanced Fellows on Bio statistical/Epidemiological methods and Research design, supporting fellows in analysing and interpreting outbreak investigation data and other scientific studies. Led the following projects; Designed and implemented TB Operations Research Project titled Predictors of treatment outcome of TB patients age ≥ 8 years enrolled on Directly Observed Treatment (DOT) at Lira Regional Referral Hospital, Conducted Descriptive analysis of the Trends, and spatial distribution of Multi Drug Resistant Tuberculosis (MDR-TB) in Uganda, 2010-2016, a Principal Investigator (PI) of Health Assessment in Kiryandongo Refugee Settlement, April 2017, a PI of an Evaluation of surveillance

system in Kiryandongo Refugee Settlement, April 2017 as well as leading a training in Emergency Prevention and Response in Kiryandongo district and refugee settlement. He worked as a PI of an investigation of suspected Cholera outbreak in Kyaka II Refugee settlement, Kyegegwa district, March 2018, PI of an Investigation of Mumps outbreak in Children's home X, Wakiso district, August 2017, a PI of an investigation of suspected Mercury Exposure among Artisanal Gold Miners, Amudat district, Jan 2018. He participated as Co-Investigator in 5 other outbreak investigations in Uganda. Denis also implemented an HIV Research project titled "Comparison of District Health Information System 2, Central Public Health Laboratory and Health Facility Datasets to Assess Early Infant Diagnosis Program Performance in Uganda, 2015-2018. He designed and implemented a Quality improvement project titled "Improving newborn health outcomes using Birth Weight Age at Death Boxes for Intervention and Evaluation System (BABIES) Matrix. From the above projects, he made 3 presentations at National Conferences, presented one International conference organized AFNET in Maputo Mozambique, and published 4 Epi bulletins, 1 Newspaper article and 1 Policy brief. I have also submitted 4 Manuscripts for publication; one to Pan African Medical Journal and 3 still under peer review. **Achievements in Deliverables**

- Mentoring and giving Technical support to other Advanced Fellows on Bio statistical methods, Research design
- Supporting fellows in designing data collection forms in EpiInfo and Kobo Collect open data kit
- Supporting fellows in analysing outbreak investigation data and other scientific studies
- A principal investigator (PI) of an HIV research project titled "Comparison of District Health Information System 2, Central Public Health Laboratory and Health Facility Datasets to Assess Early Infant Diagnosis Program Performance in Uganda, 2015-2018". This study will

- cover 2 Health facilities per region giving a total of 20 facilities
- A PI of TB Operations Research project titled: Predictors of Treatment Outcome of Tuberculosis patients aged ≥ 8 years accessing Treatment under Directly Observed Treatment (DOT) Strategy in Lira Regional Referral Hospital, Uganda.
 - Conducted and submitted a manuscript titled “Descriptive analysis of the Trends, and spatial distribution of Multi Drug Resistant Tuberculosis (MDR-TB) in Uganda, 2010-2016, a descriptive analysis of HMIS data”
 - Implemented a Quality Improvement project titled “Improving New born health outcomes using BABIES matrix in Pentecostal Assemblies of God Health Centre Four, Lira District, January 2017
 - Conducted a rapid health assessment in Kiryandongo Refugee Settlement in Kiryandongo Refugee Settlement, 27th March to 1st April 2017
 - Conducted a training on Integrated Disease Surveillance and Emergency Preparedness and Response in Kiryandongo district local government, 10th to 13th April, 2017
 - He participated as Co-Investigator in 5 other outbreak investigations in Uganda (i.e., Cholera in Nebbi district, Mysterious deaths among children in Sironko district, Methanol Poisoning in Kawempe division Kampala, Marburg outbreak in Kapchorwa and Kween districts, October 2017 and Rift Valley Fever Outbreak in Buikwe district)
 - Presented an abstract on surveillance system evaluation in Kiryandongo Refugee Settlement in Kiryandongo district, 27th March to 1st April 2017 to Uganda National Field Epidemiology Conference and Joint Annual Scientific Health conference.
 - Authored an NIPH bulletin article on Improvement in reporting and monitoring of Public Health Events following introduction of electronic-based surveillance systems, January - March 2017, UNIPH Epidemiological Bulletin, volume 2, Issue 2, March 2017, page 4-7.
 - Authored an NIPH bulletin article on an Evaluation of the Disease Surveillance System in Kiryandongo Refugee Settlement, Kiryandongo District, April 2017, UNIPH Epidemiological Bulletin, volume 3, Issue 2, June 2017, page 11-12
 - Authored a policy brief in NIPH bulletin titled “Reducing Mercury Exposure among the Artisanal Gold Miners using a modern gold processing technology: A case of Amudat District in Uganda”
 - Published a quarterly Epi Bulletin Titled “Mumps outbreak in Watoto Children’s Home, Nabuzinga Village, Wakiso District, August 2017”
 - Submitted a newspaper article titled “Schools remain a hotspot for Mumps transmission in Uganda”
 - Editor of MoH Weekly Epidemiological Bulletin Week 12 of 2017 to Date
 - Led an investigation of Mumps outbreak in Watoto Children’s Home, Nabuzinga Village, Wakiso District, August 2017 and produced a report
 - Submitted a Manuscript Titled: surveillance system evaluation in Kiryandongo Refugee Settlement in Kiryandongo district, 27th March to 1st April 2017 to Pan African Medical Journal
 - Made a presentation titled “Evaluation of Disease Surveillance System in Kiryandongo Refugee Settlement, April 2017” to JASH Conference
 - Submitted a Manuscript for Review titled “Trends, and Treatment Outcome of Multi Drug Resistant Tuberculosis, Uganda, July 2015-June 2017, a descriptive analysis of Health Information
 - In the October-December 2017 quarter, He led an Investigation of Suspected Mercury Exposure among the Artisanal Gold Miners in Karita Subcounty,

Amudat District- 2017 and produced a report and draft abstract, yet to be published.

- The Fellow also co-investigated Mysterious Deaths in Nakilimbwa village, Sironko District- December 2017 and participated in investigating Marburg outbreak in Kapchorwa and Kween districts, October 2017.
- Participated as an Editor of MoH Weekly Epidemiological Bulletin Week12 to date, and as an Editor of Uganda National Institute of Public Health bulletin.
- The fellow participated in an Investigation of Suspected RVF outbreak in Buikwe district- Feb 2018
- Led an an investigation of Cholera outbreak in Kyaka II Refugee settlement, Kyegegwa District-Feb-March 2018.
- Finally, the fellow submitted 2 abstracts for AFNET Conference Mozambique, where one was accepted for presentation.

Host Site Achievements

- I have participated as a team lead in conducting Missed Opportunity for Vaccination survey organized by WHO and MoH
- Regularly attended monthly eHealth meetings with the host institution (Division of Health Management Information)
- Contributed to the finalization of Maternal and Perinatal Death Audit Guidelines
- Participated in Joint External Evaluation Meeting
- Led the training of Health workers in Hoima District on DHIS2, 23rd to 25th May 2017
- Participated in a one-week training workshop on Monitoring and Evaluation of Programmes, organised by Uganda Civil Service College, Jinja, June 2017
- Led Data Quality Assessment in 16 Health Facilities located in 4 districts of Masaka, Rakai, Kalungu, and Lwengo

- Participated in Monthly Data Management Technical Working group (TWG) and eHealth TWG
- Conducted a Data Quality Assessment in 12 Health Facilities in Nwoya district, December 2017.
- Prepared an analysis of weekly epidemiological reports up week 38, 2018 and other surveillance activities
- Led data Cleaning Exercise for July-Sept 2018 quarter for Acholi Sub region
- Led monthly data Cleaning Exercise for Oct-Dec 2018 quarter for South Western Uganda
- Attended Monthly meetings for DHI
- Completed 2018 Vaccination coverage survey indicators: analysis and interpretation (WHO Survey Scholar Module A3 Workshop) (Completed Community Assignment1, Survey Manager Assignment1, Analyst Qualifying Assignment, and Survey Managers Qualifying Assignment, a Creator Project and attended a graduation on 3rd Oct 2018

Summary of Epidemiologic Study

Mumps outbreak in Watoto Children's Home, Nabuzinga Village, Wakiso District, August 2017

Introduction

On the 28th July 2017, Public Health Emergency Operations Centre in Uganda received an alert of 12 suspected cases of mumps among children in Watoto Children's Home (WCH), an orphanage with a school in Wakiso district. We investigated to determine the scope, identify exposures, and recommend control interventions for future outbreaks.

Methods

We defined a suspected case as acute onset of swollen/painful salivary glands in a person living in Wakiso district from 1st June-September 15, 2017. Cases were identified through medical record review at

the school clinic; controls were asymptomatic children at the school. We administered a questionnaire to the children, teachers, and parents about children's exposures and hygienic behaviors.

Results

We identified 25 case-children. Case-children had parotitis (100%) and reported poor appetite (67%), jaw pain and fever (56% each), general body weakness (44%), and headache (44%). Overall, the attack-rate (AR) for mumps among children <10 years at WCH was 21%. The AR was highest in nursery class (64%) and Primary1 (46%) and lowest in Preparatory (6.3%) and Primary2 class (4.6%). Both Nursery and Primary1 classes had 5-6 children per table, while Preparatory and Primary2 classes had 2-3 children per table. Being in Primary1 [(OR=9.6(95% CI; 2.7-34.2)] and talking or playing with a sick child [OR=15.5 (95% CI; 3.4-70.1)] were associated with case status.

Conclusions

A mumps outbreak affected children in lower primary classes at WCH. The findings of our investigation suggest that crowding in the classroom and poor recognition of mumps clinical characteristics may have contributed to the outbreak. We recommended vaccination of all asymptomatic children <10 years in WCH, isolation of symptomatic children for 5 days after symptom onset, and reducing the number of pupils per table in classes where possible. The Uganda Ministry of Health should consider including MMR vaccine in routine vaccination schedules.

Lessons learned

- Learnt to work under pressure and completed assignments in time
- Gained good presentation, writing and communication skills
- Created a network of professionals and friends
- Authored bulletins and publications for the first time

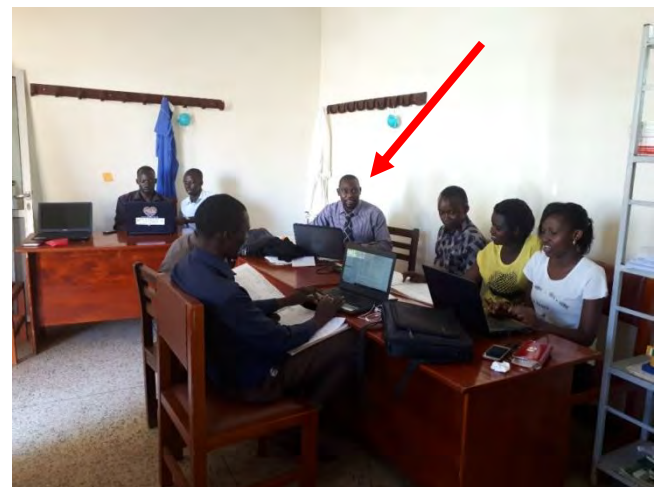
- Now planning to work in a senior position in the MoH and its partners or as a consultant in a reputable organization

Pictorial:



Investigating suspected Cholera outbreak in Kyakall Refugee camps, Kyegegwa district, Feb-March 2018

A team compiling TB Operations Research data in Lira Regional Referral Hospital, 2018





Denis Okethwangu

MSc.HSM(UMU) BBLT (Mak), Field Epidemiology Fellow (UPHFP)

Host site: National Malaria Control Program- MOH

Host Mentors:

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About the Felloiw

Denis Okethwangu holds a Bachelors Degree in Biomedical Laboratory Technology from Makerere University and a Masters in Health Services Management from Uganda Martyrs University. Before admission to the Fellowship Program, he served as Staff Officer in the Ministry of Defense and Veteran Affairs, working under the supervision of the Director of Medical Services and Quality Assurance. Prior to his appointment in the Directorate of Medical Services, he served as healthcare worker involved in service provision, including in difficult and hard-to-reach areas both within the country and beyond. He has undertaken a number of short courses, including data analysis using statistical and spatial packages like STATA, SPSS, EPI Info and QGIS; conducting a TB operational research; rapid health assessment in complex emergencies; and monitoring and evaluation.

Fellows' achievements

During the fellowship, Denis had the following achievements:

Achievements at the Host site: National Malaria Control Program (NMCP)

10. Produced and published several issues of the malaria quarterly bulletin
11. Trained district Rapid Response Teams (RRT) in Soroti and Lira regions in outbreak detection, investigation and response
12. Investigated malaria outbreaks in Kisoro and Nwoya Districts, and wrote reports with recommendations to stop the outbreak
13. Conducted analysis on data from District Health Information System v2 to inform malaria control interventions
14. Conducted analysis of the Demographic and Health Survey to identify factors associated with uptake of Intermittent Preventive Treatment for malaria in pregnancy

Program-specific deliverables

12. Led a rapid health assessment of Bidibidi refugee settlement in Yumbe District
13. Was principal investigator in the investigation of an outbreak of multidrug-resistant TB in Arua District associated with poor adherence to TB treatment and delayed initiation of TB treatment
14. Took lead in investigating a meningitis outbreak in Masindi District caused by *Neisseria meningitidis* subgroup W, which was facilitated by close contact
15. Conducted an epidemiological study to assess the predictors for severe malaria in Kabarole District, January 2017 to April 2018
16. Conducted an epidemiological study to assess the predictors of malaria-related mortality among patients attending Fort Portal Regional Referral Hospital, Jan 2017-May 2018
17. Conducted a TB operational study on Unfavorable Treatment Outcomes among Multidrug-resistant Tuberculosis Patients attending Lira and Arua Regional Referral Hospitals, 2013-2017

18. Led a quality improvement project to improve healthcare workers' adherence to the malaria test and treat policy in two health facilities in Iganga District, 2018
19. Participated in the following outbreak investigations:
 - A cholera outbreak in Nebbi District associated with drinking unsafe water from the lake
 - Assessment of HIV services in Bidibidi refugee settlement
 - Outbreak of mumps among children in a children's home in Wakiso District, which was associated with close contact among children
 - Investigation of malaria outbreak in Kisoro and Nwoya Districts

Conference presentations

6. Oral presentation on A Rapid Health Assessment of Bidibidi Refugee Settlement in the National Field Epidemiology Conference, Kampala, 2017
7. Oral presentation on Multidrug-resistant Tuberculosis in Arua District, 2013-2017 in the National Field Epidemiology Conference, Kampala, 2017
8. Oral presentation on Malaria outbreak Associated with Human Activities around Regenerated Swamps in Kisoro District, in the National Malaria Scientific Colloquium, 2018
9. Oral presentation on Prevalence and Risk Factors for HIV among Men who have Sex with Men in Ugandan Prisons, 2014-2015 in the National Field Epidemiology Conference, 2018
10. Oral poster presentation on Malaria outbreak in Kisoro District, 2018 in the 7th Africa Field Epidemiology Network Conference, Maputo, 2018
11. Poster presentation on Multidrug-resistant Tuberculosis in Arua District, 2013-2017 in the International Conference on Emerging Infectious Disease, Atlanta, 2018
12. Poster presentation on Multidrug-resistant Tuberculosis in Arua District, 2013-2017 in the High Level Conference on Global Health Security Agenda, Munyonyo, 2017

Publications and manuscripts written

Manuscripts

10. Manuscript on an outbreak of multidrug-resistant TB in Arua District associated with poor adherence to TB treatment and delayed initiation of TB treatment, 2013-2017: Submitted to BMC Infectious Diseases for peer review and publishing
11. Manuscript on unfavorable treatment outcomes among multidrug-resistant tuberculosis patients attending Lira and Arua Regional Referral Hospitals, 2013-2017: Under internal review
12. Manuscript on the predictors for severe malaria in Kabarole District, January 2017 to April 2018: Under internal review
13. Manuscript on factors associated with uptake of optimal doses of intermittent preventive therapy for malaria among pregnant women in Uganda: analysis of data from the Uganda Demographic and Health Survey, 2016: Under internal review
14. Manuscript on prevalence and factors for HIV among men who have sex with men in Ugandan prisons, 2014-2015: Under review

Other publications

1. A Rapid Health Assessment of Bidibidi Refugee Settlement, March 2017: Epibulletin article published in the National Institute of Public Health quarterly bulletin
2. Outbreak of multidrug-resistant tuberculosis associated with poor adherence to TB treatment and delayed treatment initiation, Arua District, Uganda, 2013-2017: Epibulletin article

in the National Institute of Public Health quarterly bulletin

3. Combating Resistance to Mosquito Net Insecticides: Alternative Approaches in Sustaining the Relevance of Vector Control Strategies: Policy brief published in the National Institute of Public Health quarterly bulletin

Factors associated with severe malaria and delayed healthcare seeking behavior in Kabarole District, 2017-2018

Denis Okethwangu¹✉, Godfrey Nsereko¹, Daniel Eurien¹, Claire Biribawa¹, Carol Nanziri¹, Daniel Kadobera¹, Jimmy Opigo², Alex R. Ario^{1,3}

¹Uganda Public Health Fellowship Program

²National Malaria Control Program, Uganda Ministry of Health

³Uganda National Institute of Public Health

Introduction

Death due to malaria-related causes among children can go as high as thirty per cent. These deaths can be avoided as progression of malaria to its severe forms is preventable. Kabarole District is one of districts that have reported high rates of malaria-related deaths. We investigated to find out the magnitude of severe malaria, assess associated risk and evaluate factors associated with delayed healthcare seeking among patients attending Bukuuku Health Center IV.

Methods

We defined severe malaria according to the WHO criteria. We identified our cases from Bukuuku Health Center IV from 1 January 2017 to May 2018. We then described cases by person, place, time and clinical characteristics. We conducted a case-control study to evaluate association between risk factors and severe malaria. We randomly selected controls from uncomplicated malaria patients who attended the same facility during the same period as cases. Controls were matched by age group and village of residence in a ratio of 1:1. In a sub-

group analysis, we identified factors associated with delayed healthcare seeking.

Results

We identified 115 severe malaria cases from January 2017 to May 2018. This constituted 8.6% of all malaria cases in the facility. Children <5 years old were more affected, with an attack rate of 21/1,000 (50/2,335) compared with 5.7/1,000 (65/11,395). Compared to males with an attack rate of 7.9/1,000 (53/6,350), females were more affected (AR: 8.9, 62/6980). Karago and Kazingo parishes were the most affected with attack rates >4.0/1,000. The highest number of cases was observed in May and December, 2017. We found that seeking care beyond 24 hours of developing symptoms of malaria (aOR=15, 95%CI: 3.0-77) was associated with severe malaria. We also found that getting the first treatment from a drug shop (aOR=16, 95%CI: 5.3-47) and from home (aOR=26, 95%CI: 4.1-163) were associated with delayed healthcare seeking.

Conclusion

The proportion of severe malaria relative to the total number of malaria cases is high. Severe malaria in the district is associated with delayed health care seeking, which is further associated by receiving first treatment either from a nearby drug-shop or home.

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



Patricia Eyu

BBLT (Mak), MPH (Mak), Field Epidemiology Fellow (PHFP)

Host site: Neglected Tropical & Vector Borne Diseases Control Program, Ministry of Health

Host mentors:

Dr. EdridahTukahebwa

Dr. Wamboga Charles

Tel: +256783199694, +256701591402

Email: patricia.eyu@musph.ac.ug
[/eyupatricia@gmail.com](mailto:eyupatricia@gmail.com)

About the fellow

Patricia Eyu holds a master's degree in Public Health and a Bachelor of Biomedical Laboratory Technology all from Makerere University Kampala, Uganda. Patricia has worked in a number of clinical laboratories, the most recent being the African Air Rescue laboratories as a laboratory technologist. Patricia is currently hosted at Neglected Tropical & Vector Borne Diseases Control Program of the Ministry of Health. The major focus of the Program is to scale up the Neglected Tropical disease control efforts with the eventual aim of achieving prevention, control, elimination and/or eradication of Neglected Tropical diseases in line with the World Health Organization roadmap for elimination of Neglected Tropical diseases from Africa. Patricia has developed skills in Applied Epidemiology,

effective communication and emergency public response and has interest in using epidemiologic methods in solving global health challenges.

Achievements

a) Host site achievements

Bilharzia advocacy, training of trainers and micro planning for Buyende, Gulu, Tororo, Kaberamaido, Serere, Kasese, Ntoroko, Kagadi, Mubende, Mityana and Kabarole districts.

Support supervision for Bilharzia mass drug administration in Budaka district and registration of communities in Arua district.

Participant in NTD Control Programme Data Review and National Planning Meeting; NTD Regional review meeting in Gulu; Bilharzia and Worm Control Program data review meeting for schistosomiasis low and high endemic districts in Uganda; High level advocacy for NTDs in Kitgum district; NTD secretariat meeting; Reviewing the Pest and vector control guidelines of Uganda among others.

b) Fellowship specific achievements

- Descriptive analysis

Analysis of Surveillance Data to Determine Distribution of Human Brucellosis: Uganda, July 2015 - June 2017

- Field investigations

(Led)- Cholera Outbreak associated with Drinking Unsafe River Water in Panyimur and Parombo Sub-counties, Nebbi District, Uganda-2017

(Led)- Epidemiology Investigation of a Fatal Outbreak due to Eating Fried Rice Balls Intentionally Tainted with Quinalphos, Uganda, a case report

(Led)- Investigation of Grasshopper-related Illness in persons Handling Edible Grasshoppers in Kampala and other districts

(Participated)-An investigation of increasing Schistosomiasis cases in Oyam district, Northern Uganda, 2017

(Participated)-Fatal Methanol Poisoning Outbreak Caused by Drinking Adulterated Alcohol, Uganda-2017

(Participated)-Mumps outbreak in Children's Home X, Wakiso district-2017

(Participated)-Cassava food poisoning in Kasese, Uganda-2017

(Participated)-Marburg Outbreak in Kween district, Uganda-2017

(Participated)-Cassava flour poisoning outbreak in kasese district, Uganda-2018

(Participated)-Anthrax outbreak investigation in Arua district, Uganda-2018

(Participated)-Cholera and Shigellosis outbreak in Kyaka II settlement camp, Kyegegwa district, Uganda-2017

- Bulletin articles

(Lead author)- Analysis of Surveillance Data to determine Distribution of Human Brucellosis in Uganda, July 2015 to June 2017

(Lead author)- Cholera Outbreak associated with Drinking Unsafe River Water in Panyimur and Parombo Sub-counties, Nebbi District, Uganda-2017

(Lead author)- Epidemiology Investigation of a Fatal Outbreak due to Eating Fried Rice Balls Intentionally Tainted with Quinalphos, Uganda, a case report

- Quality improvement project

Improving diagnosis, management and reporting of Schistosomiasis using a Quality

Improvement approach at health facilities around Lake Albert basin in Buliisa District, Uganda-2018

- Abstracts presented

Analysis of Surveillance Data to Determine Distribution of Human Brucellosis in Uganda, July 2015 to June 2017 (National Field Epidemiology Conference 2017)

Cholera Outbreak associated with Drinking Unsafe River Water in Panyimur and Parombo Sub-counties, Nebbi District, Uganda-2017(National Field Epidemiology Conference 2017)

- Epidemiology
Investigation of a Fatal Outbreak due to Eating Fried Rice Balls Intentionally Tainted with Quinalphos, Uganda, a case report (National Field Epidemiology Conference 2018)
- An investigation of increasing Schistosomiasis cases in Oyam district, Northern Uganda, 2017 (African Field Epidemiology Network Conference 2018)
- Policy brief
Increasing Bilharzia Morbidity in Oyam District- Northern Uganda, 2017
- HIV project
Seroprevalence and Factors Associated with Hepatitis B Virus Infection among Prisoners and Prisons Staff in Uganda Prisons, 2013/2014
- TB operational research

Deaths among Tuberculosis Patients compared with TB/HIV co-infected Patients ≥ 15 years in Lira Regional Referral Hospital, Uganda January 2012 to December 2017

- Newspaper articles

Bilharzia, the neglected killer in Oyam District-Northern Uganda

Careful inspection of imported cassava at border points can prevent cassava food poisoning

- Manuscripts

Seroprevalence and Factors Associated with Hepatitis B Virus Infection among Prisoners and Prisons Staff in Uganda Prisons, 2013/2014 (*under review by co-authors*)

Deaths among Tuberculosis Patients compared with TB/HIV co-infected Patients ≥ 15 years in Lira Regional Referral Hospital, Uganda January 2012 to December 2017 (*under review by co-authors*)

Epidemiology Investigation of a Fatal Outbreak due to Eating Fried Rice Balls Intentionally Tainted with Quinalphos, Uganda, a case report (*submitted to peer review journal*)

Summary of epidemiologic study

Title: Deaths among Tuberculosis Patients compared with TB/HIV co-infected Patients ≥ 15 years in Lira Regional Referral Hospital, Uganda January 2012 to December 2017

Introduction: Tuberculosis (TB) is the ninth leading cause of death worldwide. In Uganda between 2014 and 2016, TB prevalence and incidence was at 253/100,000 and 234/100,000 persons. We aimed to compare the difference in proportion of, and median time to death comparing HIV positive and HIV negative patients, and determine the trend, mortality

rate and predictors of death among TB patients receiving care at Lira Regional Referral Hospital (LRRH) between 2012 and 2017.

Methods: We used a retrospective cohort study design to review data of 3547 TB patients, from the Health Management Information System (HMIS) form 096a, which is the TB register at LRRH between 2012 and 2017. We analysed data using STATA. Univariate descriptive analysis was conducted using a non-parametric procedure, Kaplan Meier method, and Cox proportional Hazard model was used for multivariable analysis to determine possible predictors and to obtain adjusted hazard ratios.

Results: The proportion of deaths is similar comparing HIV positive and HIV negative patients [HIV positive (338/2297, 14.7%), HIV negative (180/1251, 14.4%)]. The median time to death was similar comparing HIV positive to HIV negative patients [HIV positive (median=145, IQR=57-247), HIV negative (median=246, IQR=52-246)]. The mortality rate was 68 deaths/ 10,000 person days. The deaths rate declined over the years ($p=0.018$). The Kaplan Meier curves differed significantly for type of patient, treatment model, and disease class [(log rank statistic, p -value), (0.0063), (<0.01), (<0.01)]. Multivariable Cox regression showed patients undergoing facility DOTs had a hazard of 0.69 compared to those on community DOTs (Adj HR: 0.69, 95% CI: 0.6705-0.835). Patients clinically diagnosed and those with extra pulmonary TB had a hazard of 1.44 and 2.13 compared to those with Pulmonary bacteriologically confirmed TB [(Adj HR: 1.44, 95% CI: 1.19-1.73), (Adj HR: 2.13, 95% CI: 1.51-3.015)].

Conclusions and recommendations: The proportion of deaths in TB patients compared with TB/HIV co-infected patients was similar. Median time to death comparing TB patients to TB/HIV co-

infected patients was the same. The death rate was declining over the years. Deaths lower in patients attending facility DOTS compared to community DOTS, and higher in clinically diagnosed and extra pulmonary TB patients compared to pulmonary bacteriologically confirmed patients. We recommended strengthening community DOTS, and increasing efforts on bacteriological diagnosis of TB.

key skills and competencies

- Practical skills in disease outbreak investigation, response and control.
- Scientific writing and presentation skills to various audiences.
- Analysis, interpretation and evaluation of surveillance data to improve health.
- Leadership and management skills attained from the different assignments at the host site and the Quality Improvement project conducted in Buliisa district.

Next steps

- With the knowledge and skills I have acquired in field epidemiology, I desire to build a career in infectious disease epidemiology and mainly the neglected tropical diseases.
- I also intend to transfer the knowledge and skills I have gained to persons with interest in field epidemiology.



Patricia (standing) training data collectors during the TB operational research data collection activity at Lira Regional Referral Hospital



Patricia (standing left) during training of trainers in Ntoroko district on ebola cross border risk preparedness



Dr. Alitubeera Phoebe Hilda

MSc.HSR (Mak), BDS (Mak), Field Epidemiology Fellow (UPHFP)

Host Site: Mental Health and Substance Abuse- MOH

Host Mentors:

Dr. Sheila Ndyabangi (RIP)

Dr. Hasfa Lukwata

Tel: 0772 565590

Email: akuzehilda@musph.ac.ug

About the Fellow

Phoebe has a Bachelor of Dental Surgery, and a Masters in Health Services Research from Makerere University. She was attached to the Mental Health and Substance Abuse Control division at the Ministry of health.

She has extensive knowledge in epidemiology, biostatistics and qualitative research. Keen on employing evidence-based approach to all projects including grant writing, data collection, data analysis, report writing, manuscript writing. Skills in organizing and conducting training workshops and seminars, effective communication skills with ability to disseminate research findings through captivating presentations.

She is highly motivated, energetic, hardworking research fellow with a consistent and successful track record of achieving of required outputs. A meticulous

research manager with excellent capacity to function autonomously but also as part of a team with great interpersonal skills. Flexible with demonstrated ability to multitask to manage competing priorities while ensuring timely delivery of required outputs.

FELLOW'S ACHIEVEMENTS

Host site

- A policy brief "*Integration of Maternal Depression Screening and Treatment into Maternal Health Programs in Uganda*". Response to requirement by host site to prepare an article on depression for World Health day celebrations, 2017
- Descriptive study "*Prevalence and trends of common mental neurological disorders in Uganda: an analysis of surveillance data, 2012-2016*". In direct response to host site requirement to participate in mapping and surveillance of Mental neurological and substance abuse (MNS) disorders. This followed a presentation to by the division to parliament of a proposed mental health bill where they were asked about the prevalence of MNS disorders and they did not know.
- I drafted the structured questionnaire for quantitative data collection, the key informant guide for qualitative data collection and budget for study on "*Knowledge, attitudes and practices related to banned tobacco products according to the Uganda Tobacco Control Act 2015*". I also participated in writing of the report. The project aimed to assess the use of banned items such as e-cigarettes, shisha and other flavored tobacco products using data from enforcers.
- I spearheaded the start of the Uganda National Non-Communicable Diseases (NCDs) Quarterly Bulletin. I started it to

address the growing need for visibility of work on NCDs by researchers, practitioners, policy makers, advocates and implementers.

- I was the Editor-in-chief of Uganda National Non-Communicable Diseases (NCDs) Quarterly Bulletin.
- I participated in development of tobacco control regulations
- I participated in the review of the alcohol control policy and updated it.
- I participated in drafting Alcohol control bill
- Concept note on psychosocial support in event of an Ebola outbreak. Psychosocial support has been recognized as a key element for Ebola preparedness.

Key deliverables

- Descriptive study *“Prevalence and trends of common mental neurological disorders in Uganda: an analysis of surveillance data, 2012-2016”*.
- A policy brief *“Integration of Maternal Depression Screening and Treatment into Maternal Health Programs in Uganda”*.
- Newspaper article *“Stop stigma against mentally ill people”*
- Led outbreak investigations *“Leptospirosis Outbreak in Kabale District, July 2017”, “Fatal Cyanide Poisoning Outbreak Caused by Consumption of Cassava Flour, Kasese District, September 2017”*
- Participated in outbreak investigations *“Cutaneous Anthrax outbreak investigation in Arua district, June, 2017”, “Methanol poisoning in Kawempe Division, Wakiso”*.
- Participated in Evaluation of surveillance systems *“Evaluation of tetanus surveillance in Uganda”*

- Quality improvement project *“Improving Alcohol and Drug Dependence Surveillance Data System using a Quality Improvement Initiative in Butabika National Referral Hospital, 2018”*
- Presented at 2 international conferences, EIS, Atlanta, USA- *“Fatal Cyanide Poisoning Outbreak Caused by Consumption of Cassava Flour, Kasese District, September 2017”*, NCD symposium, Uganda- *“Prevalence and trends of common mental neurological disorders in Uganda: an analysis of surveillance data, 2012-2016”*. Presented at 3 National conferences, 2PHFP conferences and at JASC
- Manuscripts: 1 submitted to a peer reviewed journal, 1 under review by the secretariat, 2 still in the works.
- HIV project *“Burden and correlates of mental health among HIV positive prisoners in Uganda, 2015”*
- Epidemiological study/TB-OR *“Prevalence and outcomes of TB infection by HIV status in Kampala city, Uganda- 2016”*

SUMMARY OF OUTSTANDING STUDY

Background

Surveillance of neuropsychiatric and substance abuse co-morbidity and mortality is essential for monitoring mental health and evaluating health care delivery with the overall aim of improving patient care for estimating population impact of neuropsychiatric disorders. Resource mobilization for mental health services is dependent upon demonstration of need using routine statistics from data. In spite of this, population estimates of substance abuse hardly exist in our setting. We set up a functional electronic surveillance system at Butabika hospital ADU that can determine the burden of alcohol and drug dependence

and associated factors, and assess the trends of alcohol and drug dependence.

Methods

We used a quality improvement model that addresses three questions; what are we trying to accomplish? How will we know that a change is an improvement? What changes can we make that will result in improvement? We also performed plan-do-study-act cycles. The PDSA cycles are an iterative improvement process by which an intervention is conceived (Plan), and applied on a limited scale (Do), after which the results of this application are assessed (Study) and alterations are made to the intervention (Act) for reapplication to the improvement problem in the next PDSA cycle

Results

Baseline assessment using qualitative interviews with staff at ADU revealed that the previous surveillance system at ADU had only summary statistics which are based on HMIS requirements and is useful for administrative purposes but inadequate to serve the needs of the primary care-givers at the unit. Quantitative baseline assessment revealed that Butabika hospital as a whole has an electronic surveillance system, however the electronic database consists of only a few elements of the patients' socio-demographic data and mainly serves to trace patient files. All sampled records in the electronic database had the patient name, age (128/128), while 61% had next of kin (N.O.K) although 75% (96/128) of corresponding files had this information. 7% (9/128) of records in electronic database had occupation but 63% (80/128) of the corresponding files had this information. All records in the electronic database lacked diagnosis, re-admission, co-existing neuro-psychiatric disorder, other co-morbidities, laboratory data and treatment received.

Conclusion

Setting up the electronic surveillance system at ADU improved;

- Completeness (100%;128/128): data on number of re-admissions, family history of substance abuse/neuropsychiatric disorders, existing neuro-psychiatric co-morbidity, other co-morbidities like hypertension, primary ADU diagnosis, treatment given, length of hospital stay, type of discharge (official or escapee) are now all readily available.
- Validity (98%; 125/128): Summary statistics can now be generated directly from patient data using the software thus minimising errors.
- Timeliness (100% 128/128) : We reviewed patient files and entered data from records dating from January 2015 to September 2018. We trained ADU personnel to use and enter data in the electronic database. The primary responsibility of data entry will be assumed by nursing officers based on their duty schedule.

LESSONS LEARNED, SKILLS/COMPETENCIES ACQUIRED

- Learnt how to use mapping software QGIS for epidemiological illustrations.
- Learnt how to use Microsoft office publisher which I used to create the NCD bulletin interface.
- Improved my scientific writing skills through drafting several proposals and a manuscript.
- Project management skills from TB-Operational Research and Quality Improvement studies.
- Outbreak investigation skills.

- Skills in evaluation of surveillance data.
- Skills in policy development from host site activities.
- Skills in scientific presentation from conferences at which I disseminated research findings.
- Skills in writing for non-scientific audiences through writing newspaper articles.

NEXT STEPS

An academican and epidemiologist with a keen focus on neuro-psychiatric and substance abuse disorders.

Action-based pictures



Phoebe and team collecting soil samples from where a suspected animal had been slaughtered during cutaneous anthrax outbreak investigation in Arua, 2017



Phoebe with the William H. Foege Award for best oral presentation at EIS International night, Atlanta, USA 2018. She was flanked by key TEPHINET and CDC personnel.



Dr. Kizito Susan,
 MBChB (MUST), MScIH (Charite
 Universitätsmedizin Berlin)
Host site: Neglected Tropical Diseases and
 Vector Control Division, Ministry of Health
Host mentors:
 Dr. Edridah Tukahebwa
 Dr. Wamboga Charles
Tel: +256 776222722/ +256 700 222722
Email: kirondesusan@gmail.com

About the Fellow

Dr. Susan Kizito joined the Uganda Public Health Fellowship Program in January 2017 and was hosted at the Neglected Tropical Diseases (NTD) program, Vector Control Division (VCD), Ministry of Health for the two year apprenticeship. While at VCD, Susan was part of the National team that strives to control, eliminate and eradicate neglected tropical diseases. In the two year apprenticeship, Susan has honed her skills in epidemiology including: investigation and mitigation of disease outbreak at the source, response to public health emergencies, establishment and evaluation of surveillance activities, design and implementation of operational research, program monitoring and evaluation, Scientific writing and communication among others.

Prior to joining the Fellowship Program, Susan worked as a medical officer at St.

Francis hospital Nsambya HIV/AIDS Home Care Department for over five years.

Dr. Susan Kizito, is a DAAD scholarship awardee for Master of Science degree in International Health from the Institute of Tropical Medicine and International Health - Charite University in Berlin, Germany and has a Bachelor of Medicine and Bachelor of Surgery degree from Mbarara University of Science and Technology, Mbarara, Uganda.

Achievements at the NTD Program, VCD-MOH

- Led an investigation of increased schistosomiasis morbidity and mortality in Oyam district
- Analyzed the distribution and incidences of Human African Trypanosomiasis as well as the incidence and distribution of scorpion and snake bite injuries in Uganda.
- Initiated efforts of having a Neglected Tropical Disease Epibulletin at the Vector Control Division
- Reviewed and updated the NTD Master Plan, 2017 – 2022
- Participated in NTD program data review and national planning meetings
- Active participant in the quarterly and annual VCD review meetings
- Central level supervisor of program activities in NTD endemic districts
- Reviewed checklists used for planning NTD activities
- Participated in NTD Technical Committee and High-level advocacy meetings
- Published a manuscript, “Trends and Spatial distribution of Human African Trypanosomiasis, Uganda, 2005 – 2015: A descriptive analysis of surveillance data” in the Journal of Interventional Epidemiology and Public Health, Issue 1, Volume 1, <https://afenet-journal.net/?p=903>

Fellowship program specific achievements

- Led and coordinated the investigation of Crimean Congo Hemorrhagic Fever and Schistosomiasis outbreaks
- Co-investigated disease outbreaks across the country including: An outbreak of cholera in Nebbi District, an outbreak of mumps in Wakiso, fatal poisoning following consumption of alcohol adulterated with methanol, and an outbreak of Influenza A (H1N1) virus in Kampala
- Part of the National Task Force responding to emergencies and presented and participated in the different National Task Force meetings
- Evaluated surveillance systems in Bidibidi Refugee Settlement
- Evaluated the tetanus surveillance data in Uganda.
- Part of the N-STOP team that conducted active surveillance of vaccine preventable disease like polio and measles in Kampala
- Designed an HIV Project, “Risk factors associated with HIV among young female-sex-workers in Kampala, Uganda”, using CRANE survey data
- Conducted a Quality Improvement project on, “Improving the screening of early cryptococcal disease among HIV positive patients at Nkozi Hospital, Mpigi district, Uganda, 2018”.
- Designed and implemented a TB/HIV Operational Research project
- Published 2 papers, “*Notes from the Field: Crimean-Congo Hemorrhagic Fever Outbreak — Central Uganda, August–September 2017*” in the *Mortality and Morbidity Weekly Report*, Volume 67, Number 22

[http://dx.doi.org/10.15585/mmwr.m6722a6](http://dx.doi.org/10.15585/mmwr.mm6722a6)

- Written abstracts accepted and presented at National and International Conferences. These include: “Crimean Congo Hemorrhagic Fever Outbreak in Central Uganda, July – August 2017”, “Trends and Distribution of Human African Trypanosomiasis in Uganda, 2005 – 2015”, “Increased Schistosomiasis Morbidity in Oyam District, Uganda, April 2017”, and “Descriptive Epidemiology of Snake Bites in Uganda, 2016 – 2017”.
- Written a policy brief on the control of tick-borne diseases among humans using the One Health Approach: A case of recurrent Crimean-Congo Hemorrhagic Fever Outbreaks in Uganda” published in the UNIPH Epi-bulletin volume 3, issue 3, September 2018
- Editor for the UNIPH Epi-bulletin volume 4, issue 2
- Published a Newspaper article, “Scorpion bites terrorise Bidibidi camp refugees” in the New Vision, dated May 26, 2017
- Published three other articles in the UNIPH Epi-bulletin

Summary of Epidemiological Study: Crimean Congo Hemorrhagic Fever Outbreak in Central Uganda, August – September 2017

Background: On August 20, 2017, two cases of Crimean-Congo Hemorrhagic Fever (CCHF) were reported in Kyankwanzi and Nakaseke Districts, central Uganda. CCHF is the most widespread and highly fatal tick-borne viral hemorrhagic fever (VHF) which represents a global health security threat. Humans are infected through tick bites or contact with blood or body fluids of infected animals or persons. Symptoms include fevers, fatigue, and spontaneous bleeding. We investigated to determine the

risk factors for the outbreak and to recommend control measures.

Methods: A suspected case was defined as sudden onset of fever ($>38^{\circ}\text{C}$) for ≥ 3 days between July 1 and September 30, 2017, plus any of the following: spontaneous bleeding or bruising, laboratory evidence of low leucocyte and platelet counts unexplained by other causes in a resident of the two affected districts. A confirmed case was a suspected case that tested positive for CCHF by both RT-PCR and IgM serology. Medical records review and active case-search was conducted in the affected community. A 1:4 case-control study was conducted to compare potential exposures of case-patients and controls (case-patients' asymptomatic neighbors, matched by sex and age). Blood samples of cattle and goats from farms where confirmed case-patients worked were tested for CCHF infection using IgG ELISA.

Results: In addition to the two initial confirmed case-patients (both survived), five patients met the suspected case definition among 23 medical records reviewed (two of whom died). All case-patients were men. Tick exposure (i.e., being bitten by ticks or squashing ticks bare-handed) was reported by 4/7 (57%) suspected and confirmed case-patients and 3/28 (11%) controls ($\text{mOR}=11$, $95\%\text{CI}_{\text{Fisher exact}}=1.1-112$). Sero-positivity for CCHF was found in 60% (37/62) of cattle and 24% (5/21) of goats.

Conclusions: Tick exposure was associated with developing symptoms consistent with CCHF. We recommended sensitization, health education, isolation of cases and tick-control reach-outs to farmers.

Key lessons learnt during the fellowship

- Outbreak investigation and response
- National level health programming
- Scientific writing and communication and editorial skills: abstract and manuscript writing in peer reviewed

journals, conference presentation, peer training, policy briefs, bulletin and Newspaper articles

- Evaluation of surveillance systems in stable and emergency settings
- Grant writing skills
- Epidemiological data presentation on maps using QGIS and EPI info
- Data collection using ODK software in epidemiology
- Leadership skills through implementation of projects (QI and operational research)

Next Steps

With the epidemiological skills and competences acquired coupled with hard work, Susan hopes to have a sterling career in an epidemiology related field responding to her country and the world's public health threats, writing and winning grants, conducting research in epidemiology and a public health leader. She also hopes to mentor the team she will work with using the skills she has acquired.

Pictorial: *Dr. Susan (seated) interviewing suspected schistosomiasis patients in Otwal Sub county, Oyam district, Northern Uganda, April 2017.*



Pictorial: Dr. Susan Kizito (examining child)
during a schistosomiasis investigation follow-
up in Minakuku Sub-county, Oyam district,
Northern Uganda-December 2018





FOR MORE INFORMATION ABOUT THE PROGRAM, PLEASE CONTACT

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