



Public Health Fellowship Program – Field Epidemiology Track Cohort 2019 Summary Book



THE REPUBLIC OF UGANDA MINISTRY OF HEALTH



CENTERS FOR DISEASE" CONTROL AND PREVENTION



Makerere University School of Public Health



Map showing outbreak investigations carried out by Fellows over the Fellowship period, 2019 - 2020

DISCLAIMER

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PREFACE

The Uganda Public Health Fellowship Program (PHFP) has enrolled 80 Fellows in Advanced Field Epidemiology since its inception in 2015; with the highest ever enrollment of 14 in 2021. Over the past 6 years, Fellows have conducted over 110 outbreak investigations most of them 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 several projects.

In addition, Fellows have made numerous 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 publication of the Uganda Public Health Bulletin, where Fellows have participated very effectively as editors and article contributors is another tremendous achievement. Twenty volumes have so far been produced since commencement of the program six years ago. In addition, PHFP has continued to contribute to the production of the Malaria Quarterly 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 the scientific world.

The program has produced over 100 manuscripts, submitted to reputable peer-reviewed journals; 45 of which have so far been published and the other remaining ones have either been accepted or undergoing peer reviews at various levels.

In this report, we present to you the profiles of Cohort 2019 Fellows and their achievements over the two-year period of training in service while placed within priority programs or institutions of the Ministry of Health.

Dr. Henry G. Mwebesa

Director General Health Services

DEAN'S MESSAGE TO GRADUATING FELLOWS

On behalf of MakSPH, I would like to take a moment to congratulate and recognize you – the 12 graduates who have successfully completed your fellowship in advanced field epidemiology this year. We are extremely proud of all the hard work and dedication you've put forth over the course of your didactics and field placement and are pleased to welcome you to the ranks of many field epidemiology alumni worldwide.

Each of you should be very proud not just of your achievement, but also your flexibility, resilience and determination in shifting to online learning to complete your deliverables this past year because of COVID-19. I sincerely commend Cohort 2019 Fellows for adapting so quickly in the face of unexpected challenges and unprecedented circumstances – and we cannot thank you enough for your support as we navigated uncharted territory together.

Throughout your stay with us, the strong work ethic, resourcefulness and creativity each of you has demonstrated has played a key role in your success, and I'm confident these attributes will continue to serve you well throughout your professional careers. While much has changed in our world over the past few months, I take great comfort

knowing that the you – our next generation of public health leaders, are well prepared to help us overcome the challenges of both today and tomorrow, and to find solutions that will address public health needs in the country.

I very much look forward to celebrating your success in person alongside family, friends, staff and fellows when circumstances permit. Until then, well done to each of you! Stay safe, stay connected, and take care.

Prof. Rhoda Wanyenze

Dean, Makerere University School of Public Health and Program Director, Uganda Public Health Fellowship Program



Doreen Nsiimire Gonahasa

BSc FST (Mak), MPH (IHSU), Advanced Field Epidemiology Fellow (UPHFP)

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Host Site: Infectious Diseases Institute (IDI)

Host Mentors:

Ms Lydia Nakiire, Dr. Larmode Mohammed

Doreen's Profile

Now a fully-fledged field epidemiologist, I hold a Master's degree in Public health with a background in Food Science and Technology. I have taken particular interest in implementation of One Health approach to public health.

During the Public Health Fellowship Program, I was attached to the Infectious Diseases Institute, a Ministry of Health implementing partner that has done tremendous work across the country in the areas of HIV care, Global Health Security, AMR surveillance, and training and mentorship of health care staff among other things.

Through the in-service training I have attained excellent skills in leadership, outbreak investigation, and public health response including data analysis, interpretation, and use. I have led two outbreaks and participated in seven others including the COVID-19 pandemic. I have also been involved in a number of national document formulations including the One Health strategic documents, the National Action Plan for Health Security (NAPHS) and the Integrated Disease Surveillance and Response Guidelines – 3rd Edition (IDSR)

Achievements at the Host site

At IDI I was attached to the Global Health Security Project in which I participated in and led activities. A subset of these is listed below:

- Participated in capacity building for EVD Preparedness and response at POEs in Arua District (25th -29th March)
- Participated in the National Simulation Exercise to assess Uganda's readiness for EVD
- Participated in review of Uganda's EVD Contingency Plan
- Participated in drafting of SOPs for Border Health
- Led Anthrax outbreak response and risk communication in Kween District
- Took part in review of the National Action Plan for Health Security in preparation for its launch due July 2019
- Participated in review of Pandemic Influenza Plan linkage to NAPHS and

EVD Plan

- Participated in organizing for and launch of National Action Plan for Health Security
- Supported EVD Risk Assessment readiness in Health Facilities and Population Connectivity Across Borders assessment in South Western Uganda
- Participated in the EVD outbreak After Action Review and report writing
- Took part in a ToT on One Health implementation at District level
- Trained Nakasongola District Local Government staff on One Health implementation
- Participated in development of the National Pandemic Influenza Preparedness Plan
- Took part in data collection and report writing for the national Food Safety Situation Analysis
- Undertook a COVID-19 ToT for District support in preparation for training in Soroti region
- Facilitated a District COVID-19 Orientation on identification, reporting and response in Soroti region
- Supported COVID-19 response through regional support in Busoga Sub region
- Trained Health Workers at Mulago Hospital on COVID-19 surveillance and Infection Prevention and Control
- Participated in follow up of returnees (Ugandan's that returned home from abroad following different measures for containment of the outbreak) under institutional quarantine
- Participated in an M&E exercise for the National Action Plan for Health Security (NAPHS) one year after its launch

- Supported National Inter-Action Review for COVID-19 Response
- Facilitated health worker training in Butaleja District in enhanced surveillance and reporting
- Designed and implemented a QI Project on Acute Febrile Illness surveillance at Jinja Regional Referral Hospital

Fellowship program specific achievements

- Led two outbreak investigations:
- Fatal cross-border outbreak of plague in Zombo District, March 2019
- Cluster of strange deaths in Katabi Town Council, Wakiso District
- Participated in several other outbreak investigations:
- Leprosy investigation in Lira District, March 2019
- EVD outbreak in Kasese District, June 2019
- CCHF outbreak in Kagadi District, 2019
- Food poisoning in Lamwo District, 2019
- COVID-19 pandemic, 2020
- Analyzed surveillance data from DHIS on the incidence and trend of bacterial meningitis in Uganda for the period between 2014 to 2018
- Presentations at conferences
- Fatal cross-border outbreak of plague in Zombo District at the 5th and 6th National Field Epidemiology Conference and the 4th Joint Annual Scientific and Health Conference
- International Airport screening for COVID-19 at Entebbe International Airport at the 6th National Field Epidemiology Conference

- Wrote and published four newspaper articles
- Why it is important to conduct a postmortem especially for people who die from unknown cause published in the New Vision of 17th August 2019
- Boots on the Ground for Uganda's Ebola
 Preparedness and Response Efforts
 published in the Tephinet bulletin for
 the period of July-September 2019
- One Health Day Celebrations published in the New Vision on 1st November 2019
- Healthy practices to maintain during and after the COVID-19 pandemic published on 29th August 2020 by New Vision
- Was lead author for the Issue 2 Volume
 4 National Institute of Public Health (NIPH) bulletin
- Wrote and published four articles in the National Institute of Public Health bulletin
- Fatal cross border outbreak of plague in Zombo District, March 2019
- EVD spill over into Uganda, June 2019
- Highlights of Cohort 2018 graduation in January 2020
- Cohort 2020 recruitment as they start the two-year in-service training
- Designed and implemented a Quality Improvement study on improvement of Acute Febrile Illness (AFI) surveillance at Jinja Regional Referral Hospital
- Conducted an HIV epi study on the factors associated with delay in 1st DNA PCR testing for HIV-exposed infants in Kyenjojo and Kyegegwa Districts for the period of July to December 2019.

 Submitted a manuscript for publication to peer reviewed journal titled 'Fatal cross border outbreak of plague in Zombo District, March 2019' and have another under internal review titled 'Factors associated with late 1st DNA PCR test among HIV exposed infants in Fort Portal Region, Uganda, July-December 2019'.

Summary of Epidemiological Study: Background:

Despite high access to ART among HIV infected pregnant women (>90%), early 1st PCR testing (within 2 months of birth) for HIV-exposed infants (HEI) born to these mothers remains low. There is limited understanding of factors associated with late 1st PCR testing of these infants in Uganda. Understanding these factors is important for guiding programmatic interventions to improve early infant testing and improving survival of HIV-infected infants. We determined the prevalence of and factors associated with late 1st PCR testing.

Methods:

We conducted a facility-based crosssectional study using routine clinic data from eleven health care facilities in Kyenjojo and Kyegegwa Districts in Fort Portal Region in Uganda. The selected health facilities contributed 30% (132/420) of all HIV-exposed infants (HEI) who tested late, that is beyond 8 weeks of age in the Fort Portal region during July to September 2020. We included caregiver-infant pairs for infants who received a 1st DNA PCR test between July – December 2019 at the study sites. Our outcome was HEI who had a late DNA PCR test. We computed the proportion of infants who tested late and used logistic regressions to determine significance of association.

Results:

Three hundred sixty-two mother-infant pairs were recruited for the study. Most of the mothers were married/cohabiting, were farmers, and had attained only a primary or lower level of education. Most had attended ANC and delivered at a facility for most recent pregnancy. The prevalence of late PCR testing was 9.9% (36/362). In univariate analysis, late 1st DNA PCR was associated with delivery at home (OR 5.0; 95% CI 2.6-12.13); ANC non-attendance for that pregnancy (OR 78.4; 95% CI 9.32-659.8) and feeding method being mixed or replacement (MF/RF) (OR 64.4; 95% CI 19.69-210.6). In multivariate analysis, it was associated with delivery at home (OR 3.54; 95% CI 1.24-9.99), ANC nonattendance (OR 11.0; 95% CI 0.70-173.25), and feeding method being MF/RF (OR 47.8; 95% CI 13.26-172.16)

Conclusions:

One in ten infants exposed to HIV were tested late in Kyenjojo and Kyegegwa Districts during the second half of 2019. Late testing was associated with home delivery, failure to attend ANC, and nonexclusive breastfeeding. Not attending ANC and delivering at home could imply that mothers are not aware of the need to have their children tested and started on treatment when need be. There is therefore need for the Ministry of Health and its relevant implementing partners to use some community focused interventions such sensitization to supplement efforts so far instituted to realize the goal of eMTCT of HIV/AIDS.

Key lessons learnt during the fellowship

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

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

Next Steps

With the competencies gained, I hope to be able to continue to serve within the Ministry of Health or related organization in realization of improved global health and prompt response to public health emergencies and threats.

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Pictorial and narrative



First field deployment with supervisors Dr. Bao Ping Zhu, Dr. Alex Ario and Daniel Kadobera in Lira District



Investigating Anthrax outbreak in Kween District, April 2019 with IDI official and DSFP



Dr. Rukundo B Gerald

MPH (Southern Medical University, Guangzhou, P.R China), MBChB (MUST), Field Epidemiology Fellow (UPHFP)

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Host Site:

National Malaria Control Division (NMCD)

Host Mentors:

Dr. Damian Rutazaana Dr. Daniel Kyabayinze Dr. Denis Rubahika

Fellow's Profile

Dr. Gerald Rukundo joined the Uganda Public Health Fellowship in January 2018 and was hosted at the National Malaria Control Division (NMCD), Ministry of Health for a two year apprenticeship. While at the Malaria division, Gerald was part of the team that strives to control malaria in Uganda. Gerald has horned his skills in Epidemiology including disease outbreak investigation, response to public health emergency, evaluation of surveillance systems, design and implementation of operational research, data analysis, scientific writing and communication among others.

Prior to joining the Fellowship program, Gerald worked as a senior medical officer at Kisoro Hospital, Fort portal Regional Referral Hospital under a USAID funded project of Strengthening Uganda's Systems of Treating AIDS Nationally (SUSTAIN) and Marie stopes Uganda, an organization responsible for providing reproductive health services.

Dr. Gerald holds a Master of Science degree in Public Health from Southern Medical University, Guangzhou, People's Republic of China and Bachelor of Medicine and Bachelor of Surgery degree from Mbarara University of Science and Technology, Mbarara, Uganda.

Achievements at the NMCD

- Designed and published malaria quarterly bulletin issues
- Investigated malaria outbreak in Butambala District and made recommendations to the ministry to stop the outbreak
- Regularly analyzed malaria data from District Health Information System to inform the program
- Trained health workers in Karamoja and Busoga sub-regions on Malaria Normal Channel graphs
- Trained several health workers on Malaria in Pregnancy
- Participated in the Universal Campaign of mosquito net distribution

- Participated in mentorships and supervisions on Integrated community case management(ICCM)
- Participated in the Malaria Control Program Review
- Participated in Global fund grant writing

Program- specific deliverables

- Led a malaria outbreak investigation in Butambala district
- Conducted an evaluation of community level malaria surveillance system under Integrated Community Case Management
- Conducted an Epidemiological study on factors associated with risk of malaria infection among pregnant women in Gulu City, Uganda
- Implemented a quality improvement project on Improving Uptake of Intermittent Preventive Therapy (IPT3) among Pregnant Women at Chahafi Health Centre IV, Kisoro District, Uganda, 2020
- Conducted a study on use of Viral load to identify advanced HIV disease
- Participated in the following outbreak investigations;
- Leprosy outbreak investigation in Lira district
- Malaria outbreak investigation in Oyam district
- Cholera outbreak investigation in Kyaka II refugee settlement, Kyegegwa district
- Yellow fever outbreak investigation in Buliisa district
- Suspected COVID19 cases in Kazo district
- COVID19 infections among prisoners at Gulu main prison

- Written abstracts accepted and presented at National Conferences. These include
- investigation Malaria outbreak in • Butambala district, Uganda, February Improving 2019 and Uptake of Intermittent Preventive Therapy (IPT3) among Pregnant Women at Chahafi Health Centre IV, Kisoro District, Uganda, 2020
- Manuscript on Malaria outbreak investigation in Butambala district, February 2019 is under review.
- Written a policy brief on Improving Malaria Reporting by Village Health Teams under Integrated Community Case Management
- I was the editor of the UNIPH Epi Bulletin Issue 3 Volume 4
- Published a Newspaper article," Everyone has a role to play in malaria control an prevention" in the New vision dated 2nd January 2020
- Published three articles in the UNIPH Epi bulletin.

Summary of Quality Improvement Study:

Improving Uptake of Intermittent Preventive Therapy (IPT3) among Pregnant Women at Chahafi Health Centre IV, Kisoro District, Uganda -2020

Introduction

Pregnant women are among the most vulnerable populations for severe malaria infection. Preventing malaria during pregnancy can be achieved through intermittent preventive (IPT) sulfadoxine treatment with pyrimethamine (SP). The Uganda Ministry of Health recommends pregnant women take ≥ 3 doses of IPT at the beginning of the second trimester, targeting 80% receiving the third dose (IPT₃) before delivery. However, 2019 data at Chahafi Health Centre IV (HCIV) in Western Uganda indicated that only 38% of pregnant women taking IPT_2 subsequently took IPT₃. We used quality improvement approaches to improve IPT₃ uptake at Chahafi HCIV.

Methods:

The quality improvement (QI) project spanned six months (March-August 2020), corresponding to three plan-dostudy-act (PDSA) cycles. The root causes for low IPT₃ uptake at Chahafi HCIV were identified using fishbone analysis, conducted with the antenatal clinic staff. These were subjected to a prioritization matrix by quality improvement committee based on ease of implementing remedial actions and perceived contribution to low uptake of interventional IPT₃; an plan was developed to address the root causes with the highest priority scores. Interventions were implemented and longitudinal data collected from March-August 2020 and learning sessions were held with antenatal clinic staff at the end of every two-month PDSA cycle. Data were analyzed using Microsoft Excel 2010.

Results: Highly prioritized root causes of poor IPT₃ uptake included poor

documentation of IPT commencement on patients' cards and antenatal registers (failure to document previous IPT₂ led to repeat IPT₂ documentation), SP stock-outs. and missed appointments. Staff were trained on proper documentation, ensuring timely ordering of SP, and appointment reminders for pregnant women. Overall IPT₃ uptake among pregnant women in their second trimester increased from 38% (32/84) during March 2020 to 93% (97/104) during August 2020.

Conclusion: QI approaches increased documented IPT₃ uptake among pregnant women at Chahafi HCIV. Health programmers are encouraged to empower health facilities to contextualize their problems and apply QI approaches to improve health service delivery in the country.

Key skills/competences

- Conducting outbreak investigations
- Analyzing surveillance data
- Evaluating surveillance systems
- Designing and implementing projects
- Communication and presentation at both national and international level
- Capacity building of health workers

Next steps

- I hope to transfer the knowledge and skills acquired to other health workers especially in the field of surveillance.
- I hope to further my career in Epidemiology
- Uganda Public Health Fellowship Program Field Epidemiology Track Cohort 2019 Graduation 13

Pictorial Narrative



Dr. Rukundo Gerald (White T-shirt) conducting an interview during investigation of malaria outbreak in Oyam district, June 2019.



Dr. Rukundo Gerald (Grey coat) together with US CDC staff and colleagues interact with a village health team(VHT) member during evaluation of community-level malaria surveillance system under integrated community case management



Gloria Bahizi

BLT (MUK), MPH (MUK), Field Epidemiology fellowship (UPHFP/NIPH))

Email: <u>gbahizi@musph.ac.ug</u> Tel: +256778 863679

Host Site: National Tuberculosis and Leprosy Program, Ministry of Health (NTLP/MOH)

Host Mentors:

Dr. Turyahabwe Stavia Dr. Majwala Robert

Fellow's Profile

Gloria Bahizi is a Field epidemiologist and holds a Master of Public Health from Makerere University, School of Public Health. During my time as a Public health Fellow, I was attached at the National Tuberculosis and Leprosy Division (NTLD), Ministry of Health. I conceptualized, designed and implemented Tuberculosis research projects like Epidemiology of Rifampicin resistant TB patients in Uganda. I was

able to carry out investigations to guide programme decisions. I have extensive knowledge in **HIV/AIDS** and **Tuberculosis** patient care capacity building and health systems strengthening. Through this experience, developed planning, budaetina, and mentorship, report writing leadership skills. I have built competence in designing research protocols, investigating disease outbreaks including Ebola and the COVID-19 data response, management and analysis, report, abstract, presentation, manuscript writing and publishing skills for articles in the local newspapers, international national bulletins and journals.

I have been able to lead three outbreak investigations and participate in three more outbreak investigations. I have undertaken several short courses and improved my skills data analysis using statistical and spatial packages like STATA, SPSS, EPI Info and QGIS; Event-Based Surveillance, and Case based surveillance.

Achievements at the Host site

- The fellow supported the monitoring and evaluation team at the program with TB performance reviews and mentorships in the country
- Conducted a descriptive analysis and presented a report on the profile of Rifampicin resistant TB in Uganda to NTLP and submitted a manuscript. This created awareness on the burden of resistant TB in Uganda since the last drug resistant survey was done in 2013.

It also highlighted the importance of using existing data.

- Participated in the revision of the Tuberculosis Health Information and Management Systems (TB- HIMS) tools which led to the incorporation of new indicators for in the national surveillance and reporting system
- Produced two National Tuberculosis and Leprosy Program guarterly bulletins of the Tuberculosis activities and highlights which were published widely thus improving awareness and sharing evidence-based knowledge on the investigations of drug resistant TB in Nakapiripirit and the burden of rifampicin resistance in the country
- The fellow was participated in the programme review of TB services with support from the World Health Organization
- Conducted support supervision in Gulu district to enhance TB case finding and better TB treatment outcomes and mentored health workers on TB performance in different indicators as analyzed from DHIS2.
- Conducted a data quality assessment and led the team in Kotido district which led to improved accuracy of reporting in Karamoja region.
- Participated in writing of the National Strategic Plan (Host site) and the patient centred approach for TB which was successfully launched.

Fellowship program specific achievements

• The fellow has also been an editor on

one issue of the Uganda National Institute of Public Health (UNIPH) bulletin

- Conducted analysis on data from NTLP on the profile of rifampicin resistant Tuberculosis in Uganda
- Team lead/Principal Investigator in the investigation of a malaria outbreak in Mbale District
- Team lead/Principal Investigator in the investigation of drug resistant Tuberculosis in Nakapiripirit district in Karamoja region
- Team lead on the evaluation of Isoniazid adverse event reports in Kampala, Uganda
- Attended a 1week course on eventbased surveillance
- Participated in the following outbreaks:
- A yellow fever outbreak in Bukakata, Masaka District associated with sylvatic transmission to a susceptible population
- Assessment of Tuberculosis diagnostic test discordance in selected prisons of Uganda, 2020
- Leprosy investigation in Lira district, 2019
- Conducted an HIV study with CDC mentorship on the Progress towards 90-90-90 for prisoners in prisons providing direct HIV services versus services via referral, Uganda: A cascade analysis for 2017-2018
- Led a quality improvement project "Improving TB Case Detection Rates in Bumanya HC IV and Nawaikoke HC III in Kaliro District"

Conference presentations

• Oral presentation on the Malaria

Outbreak in Mbale district June 2019 at the National Field Epidemiology Conference, Kampala, 2019

- Oral presentation on the Epidemiological profile of Rifampicin-Resistant TB Patients in Uganda 2014– 2018: Analysis of laboratory at the National Field Epidemiology Conference, Kampala, 2020
- Poster presentation on the Malaria Outbreak in Mbale district June 2019 at the Joint Annual Scientific Conference (JASH Conference), 2019, Kampala Uganda
- Poster presentation on the Progress towards 90-90-90 for prisoners in prisons providing direct HIV services versus services via referral, Uganda: A cascade analysis for 2017-2018 at the AIDS 2020 Virtual conference

Publications and manuscripts written

- Epidemiological profile of Rifampicin-Resistant TB Patients in Uganda 2014– 2018: Analysis of laboratory data, submitted to journal
- Progress towards 90-90-90 for prisoners in prisons providing direct HIV services versus services via referral, Uganda: A cascade analysis for 2017-2018, still under review
- Malaria Outbreak Facilitated by Increased Vector-Breeding Sites sustained by Intermittent Rainfall: Mbale District, Uganda, June 2019, published in the National Institute of Public Health quarterly bulletin
- Drug resistant Tuberculosis assessment in Nakapiripirit district in Karamoja region, published in the National

Tuberculosis and Leprosy Division bulletin

 Newspaper articles published in New Vision about a TB Free Uganda-Missed cases and Not all cough is COVID-19, don't forget Tuberculosis

Summary of Epidemiological Study:

Progress towards 90-90-90 for prisoners in prisons providing direct HIV services versus services via referral, Uganda: A cascade analysis for 2017-2018 Background:

Ugandan prisoners have higher-thannational HIV prevalence (14% v. 6.2%) and are a key population for epidemic control efforts. Uganda's prisons provide HIV testing and Antiretroviral Therapy (ART) through in-house models (testing and ART directly provided within prisons by prison health staff) or referral models (services from external providers entering the prison or at nearby public facilities with health or without prisoners). We characterized the cascade of HIV care among prisoners for the two models and described barriers to favorable outcomes at key cascade steps.

Methods:

We conducted a retrospective cohort analysis from January 2017 to December 2018. Data were collected from four prisons, two with referral services and two with in-house services. Prisoners were identified in HIV testing registers and ART registers. Viral loads (VL) were obtained from patient files and the Uganda national VL database. HIV cascade achievements measured at vear-end were: Testing completeness (proportion of all inmates who knew their HIV status), Treatment initiation (proportion of completeness HIVpositive inmates who had initiated ART), and VL suppression (proportion of HIVpositive inmates on ART with ≥1 VL result who were virologically suppressed copies/mL)). Structured (<1000 interviews were conducted in the 4 facilities with health workers charged with HIV service provision to identify barriers to HIV care for prisoners.

Results:

identified.

Conclusions: In-house services yielded better performance than referral. Both had gaps in VL testing. Limited human resources and uncoordinated prisoner transfers and releases were barriers to comprehensive HIV services. We recommend in-house testing and ART in prisons where possible, all and electronic medical records to improve continuity of care.

Key lessons learnt during the fellowship

The PHFP has presented an opportunity for hands on learning experience in field epidemiology and public health leadership. The skills and competencies

Cascade step		All prisoners		ouse a contraction of the contract in the state of the contract of the contrac
	N=6803		Treatr N=592	$\frac{ment}{22}$ and mentors with supervision from $N = 881$
HIV Testing Completeness	87%	(5924)	91%	(53tecchnical expects) in the Ministry of
HIV-Positive	12%	(717/5924)	10%	$(546(5380))$ and $the^{(172)}$
Treatment Initiation	70%	(503/717)	79%	(429/546) $(74/171)$ $(74/171)$
Completeness				invaluable. During the fellowship, fleatht
Viral Load Testing Completeness	30%	(151/503)	32%	⁽¹³ 3/42 ⁹⁾ developed the following skills:
Viral Load Suppression	92%	(139/151)	98% •	• (135) URD reak I Westingation; National disease

prisons Barriers in operating both models included inadequate clinic space, staff staffing, and training, and uncoordinated prisoner releases and transfers (often before ART initiation or VL testing; limited paper records inaccessible to future providers). For referral-model prisons, limited outside funding organization and staffing, security challenges in transporting prisoners to outside clinics, and limited opportunities for outside organization staff to prisons were enter also

98% • (13Outbreak Investigation; National disease outbreak investigations and response as part of the MOH National rapid Response Team (NRRT) and the National Task Force (NTF) to establish causes of outbreaks and inform early prevention and control interventions. With this we were able to participate in the COVID-19 response supporting different regions

 Scientific writing; Manuscripts, Abstracts, Policy Briefs and Newspaper article which created avenues to share information with the public and National stakeholders building presentation and networking skills

- Leadership skills in rapid response and control of disease outbreaks, analysis and evaluation of national surveillance systems, quality improvement and program implementation
- Evaluation and analysis of data from surveillance systems to generate information for action to improve program implementation strategies

Next Steps

I hope to further my career in the field of Epidemiology through service with the Ministry of Health, National and international agencies that will allow me to leverage my knowledge, experiences and skills obtained.

international agencies that will allow me to leverage my knowledge, experiences and skills obtained.

Pictorial and narrative



Gloria Bahizi with her host site mentors Dr. Robert Majwala and Dr. Stavia Turyahabwe, Assistant commissioner NTLP (Centre) after a meeting with delegates from CDC China.



Gloria Bahizi conducting interviews with Tuberculosis patients during an investigation of Drug resistant TB in Nakapiripirit district in Karamoja region



Dr. John Kamulegeya MBChB (M.U.S.T), MPH (Mak), Field Epidemiology Fellow (UPHFP)

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Host Site: Uganda Expanded Program on Immunization (UNEPI)

Host Mentors:

Dr. Alfred Driwali Dr. Immaculate Ampaire

Fellow's Profile

John Kamulegeya is a cohort 2019 advanced field epidemiology fellow and holds a Master of Public Health from Makerere University, School of Public Health and a Bachelor of Medicine and Bachelor of Surgery degree from Mbarara University of Science and Technology. I have over time gained special interest in vaccine preventable diseases (VPD). During my time as a Public Health Fellow, I have been attached to Uganda National Expanded Program on Immunisation (UNEPI) at the

Ministry of Health. At UNEPI, I have been involved in providing technical support at both national and sub national levels in the areas of; 1) routine Immunisation, 2) VPD disease surveillance, 3) outbreak investigations and response, 4) planning, implementation, monitoring and evaluation of yellow fever sub national immunisation days (SIA) and Measles-Rubella / Polio national mass campaigns. I was involved in developing of national operational field guidelines for 2020 Yellow Fever and 2019 Measles-Rubella and polio Vaccination Campaigns and supported national investigations and analysis of Adverse Events Following Immunisation (AEFIs) in both campaigns. I supported national wide 2019/2020 districts analysis of routine immunisation performance data using RED categorisation and writing of UNEPI Newspaper pull out which was published as a New Vision September 2019. I have been coopted as a member of the National AEFI committee, UNEPI data and surveillance subcommittee and the COVID-19 Vaccination National Coordination Committee. My attachment and exposure at UNEPI has greatly improved my public Health professional capacity in the area of vaccine preventable diseases.

In addition, I supported national COVID 19 response in 17 districts in Ankole and Eastern regions of Uganda to effectively carry out COVID 19 surveillance and contact tracing, case management, risk communication, infection control prevention and districts readiness

assessment. I have been able to lead two outbreak investigations and participate in four other outbreak investigations and response. The fellowship has greatly improved my practical skills in scientific writing, presentation, outbreak investigation and response, estimation of burden of disease and data analysis using packages such as STATA, EPI Info and QGIS. I have also under taken short course in International Program in Public Health Leadership-IPPHL to improve my managerial and leadership skills.

Fellows' achievements

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

Host site

- Supported writing and editing of UNEPI New paper pull out on Measles-Rubella vaccine roll out plan and districts immunisation performance for FY 2018/2019
- Supported/ Lead nationwide • epidemiological investigations and analysis of Adverse Events Following Immunisation (AEFIs) in the October 2019 Measles-Rubella(M-R) and Polio national mass campaign during which ministry of health introduced M-R vaccine into Uganda routine immunisation schedule
- Lead Measles outbreak investigations in Nakasongola district
- Supported bnational and districts planning, trainings, implementation and monitoring of Sub national yellow fever immunisation campaign in west Nile-August 2020 and Measles-Rubella/Polio

national campaign in October 2019

- Supported development of national operational field guidelines for Yellow Fever and Measles-Rubella and polio Vaccination Campaigns
- Supported national trainings for district officers on routine immunisation, surveillance and outbreak investigations and response
- Participated in districts EPI technical support supervision
- Supported national level training and GAVI grants proposals
- Supported national training of trainers for districts Rapid Response Teams (RRT)
- Supported districts of Nakasongola, Nakaseke, Moyo and Obongi to analyse and use their immunisation data using RED categorisation.
- Member/supported EPI data and surveillance technical sub committee
- Member /supported national Adverse
 Events Following Immunisation committee
- Participated in weekly UNEPI meetings
- Participated in COVID-19 Vaccines National Coordination Committee planning meetings

Program-specific deliverables

- Editor on one issues of the Uganda National Institute of Public Health (UNIPH) bulletin.
- Conducted descriptive analysis of Regional distribution and trends Rubella Cases in Uganda, 2007-2017 using data from DHIS2
- Team lead/Principal Investigator of Cholera Outbreak in Congested Kyaka II Refugee Settlement, Kyegegwa District:

Uganda, July 2019

- Team lead/Principal Investigator, Adverse events following Measles-Rubella and polio mass immunization campaign, December 2019
- Participated in the following outbreaks: Rubella outbreak investigation in Semuto Sub county, Nakaseke district.; Malaria outbreak investigation in Kole district.; Measles outbreak investigation in Nakasongola district.; Leprosy out break investigation in Lira
- Participated in study "Using the BABIES Matrix to Determine Patterns of Pregnancy Birth Outcomes in Naguru Regional Referral Hospital, Kampala, Uganda, Nov 2018-March 2019"
- Lead a quality improvement project "Improving knowledge and Reporting of Adverse Events Following Immunisation (AEFI) by Health Care Workers in Nakasongola District "
- Conducted HIV study on "Uptake of Voluntary male medical circumcision in Uganda, 2014-2018" using DHIS2 data
- Supported national COVID 19 response including surveillance, risk communication, and infection control prevention and districts readiness assessment in western (11 districts) and Eastern regions (5 districts) of Uganda.
- Facilitated in post EIS conference training of BABIES Matrix story Board methodology at Emory University, Atlanta. Trainees included Masters of global health students at Notre Dame University and FELTP graduates from Uganda, Nigeria and Kenya.
- Facilitated training on use of a B.A.B.I.E.S matrix (Birth weight by Age-at-Death

Boxes for Intervention and Evaluation System), a Maternal and perinatal death audit mechanism that links pregnancy outcome with intervention process to participants from 11 African countries at Suez canal University, Egypt

- Supported writing of grant proposal for AFENET/Global Collaborating Center in Reproductive Health to operationize BABIES matrix in Africa
- Participated in a Vaccine hesitance grant proposal
- Wrote a policy brief on Uptake of Human Papilloma Vaccination (HPV) in Uganda: Barriers and Opportunities
- Attended a 2 weeks training on International Public health leadership and policy analysis conducted by Evans School of Public Policy at University of Washington ,Seattle, USA in June

Conference presentations

- Poster presentation on Cholera Outbreak Investigation in Congested Kyaka II Refugee Settlement, Kyegegwa District at the
- Oral presentation on Adverse events following Measles-Rubella and polio mass immunisation campaign, December 2019 at the National Field Epidemiology Conference, Kampala, 2020
- Oral presentation on Cholera Outbreak Investigation in Congested Kyaka II Refugee Settlement, Kyegegwa District: Uganda, July 2019 at the National Field Epidemiology Conference, Kampala, 2019

Publications and manuscripts written

- Cholera Outbreak in Congested Kyaka II Refugee Settlement, Kyegegwa District: Uganda, July 2019: Epibulletin article published in the National Institute of Public Health quarterly bulletin
- Uptake of Human Papilloma Vaccination (HPV) in Uganda: Barriers and Opportunities,: Epibulletin article in the National Institute of Public Health quarterly bulletin
- Co-authored four articles in the Uganda National Institute of Public Health (UNIPH) bulletin: On-going transmission of Leprosy and inadequate control measures in Lira and Alebtong Districts, Uganda Issue2 vol4 April- june 2019.; Malaria outbreak investigation in Kole district.; Using the BABIES Matrix to Determine Patterns of Pregnancy Birth Outcomes in Naguru Regional Referral Hospital, Kampala, Uganda, Nov 2018-March 2019
- Cholera Outbreak in Congested Kyaka II Refugee Settlement, Kyegegwa District: Uganda, July 2019: Under internal review
- Adverse events following Measles-Rubella and polio mass immunisation campaign, December 2019 : Under internal review

Published Newspapers articles

- Congenital Rubella Syndrome (CRS) -The silent cause of Congenital Heart defects and child delayed development.
- Health workers at increased
 Occupational risk for COVID 19

Summary of Epidemiology Study: Uptake of Voluntary Medical Male

Circumcision in Uganda, 2014-2018 Background

Medical male circumcision (MMC) has been shown to reduce female-to-male sexual transmission of HIV bv approximately 60%. It is recommended as a key component of combination HIV prevention in countries with a high HIV prevalence and low levels of male circumcision. In 2010, Uganda ministry of health adopted VMMC as part of the national comprehensive HIV prevention strategy. This study aimed to describe the national uptake of VMMC from 2014 to 2018 so as to make evidence based recommendations improve to its implementation in Uganda.

Methods

conducted We а retrospective descriptive analysis of VMMC data from the DHIS2 for the period 2014-2018. We described trends and analyzed VMMCs performance by circumcision method, client age group, pre-circumcision HIV and testing counseling (HTC), postoperative reviews, and postoperative adverse events (AEs).

Results

A total of 2,160,335 males (41%) of the targeted 5,000,000 circumcisions were done in the period 2014-2018. Majority of VMMCs were done by surgical circumcision (99.5%) while only 0.5% were by device method. Central region had the highest circumcision rate of 20/1000 males followed by Northern (18/1000) western (16/1000), and Eastern regions (12/1000) respectively.

There was a general steady increase in number of VMMC done from 4,984in 2014 to a maximum of 826,761 in 2017 with a slight decline to 602,577 in 2018. overall The post-operative adverse 6.7/1000 events (AE) rate was circumcisions. There was a general decline in AE following circumcision from 18.6 in 2015 to 4.9/1000 circumcisions in 2018

Overall HIV positivity rate among persons tested before circumcision was 0.8%, highest in 2014 (3.2%) and lowest in 218 (0.4%).

Conclusion

Despite a steady increase in number of person circumcised, the numbers were below the target. Central region had the highest circumcision rates followed by western, Northern and Eastern regions respectively. There is need to Enhance VMMC efforts in the country with special focus on East and Northern regions of Uganda

Lessons learnt

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

- Outbreak Investigation and respose
- Scientific writing; Manuscripts, Abstracts, Policy Briefs and Newspaper article
- Data analysis skills
- Designing and implementing Quality
 Improvement Projects
- Evaluating a surveillance system
- Presentation skills
- Writing skills
- Networking and leadership skills

Next steps

Leveraging knowledge, on my experiences and skills obtained before and during the Public Health fellowship period, I hope to further my career in the field of Epidemiology through both National service at and international levels. I plan on publishing all the work done during the fellowship period in peer review journals

Pictorial and narrative



John Kamulegeya and Dr. Mwesigwa conducting investigation on advance events following mass Measles-Rubella and polio vaccination campaign in Lyantonde district, October 2019



John Kamulegeya and Prof McCathy facilitating during the Post EIS conference BABIES matrix workshop at Rollins School of public Health, Emory University, USA



Conducting community search for cholera cases during the Cholera outbreak in Kyaka II refuge settlement



Dr. Irene B. Kyamwine MBChB (MUST), MSc (ULB), Field Epidemiology Fellow (UPHFP)

Email: <u>ikyamwine@musph.ac.ug</u>

Tel: +256 781711102

Host Site: Nutrition Division, Ministry of Health

Host Mentor:

Ms Samalie Namukose

Fellow's Profile

Dr. Irene B. Kyamwine Field а epidemiologist with a background in Medicine. I hold a Master of Public Health from Université Libre de Bruxelles, school of public health. During my time as a public health fellow, I have been attached to the Nutrition Division, Ministry of Health. I have developed confidence in myself and learnt to work in a dynamic environment.

I have conceptualized, designed and implemented projects like the "Patterns of malnutrition among pregnant women in Apac District, Uganda". These have built my confidence and competence in designing research protocols and implementing them.

I have led two outbreak investigations and participated in 4 others. I have also, been part of the COVID 19 response and control activities. These have developed my competences in responding to emergences and working in a fast-paced environment. Throughout this two year period, I have led and coordinated projects both at the fellowship program and my host site. This has improved my leadership, training and coordination skills. Undertaking these activities and a number of data analysis projects improved my skills in data analysis using statistical and spatial packages like STATA, EPI Info and QGIS.

Achievements at the Host site

- The fellow coordinated and trained on International Classification of Diseases
 11 (ICD 11) for National and regional teams across the country.
- Led the information, education and communication (IEC) and secretarial team in the commemoration of world breastfeeding week 2019.
- Coordinated and participated the Maternal and Child Health Nutrition Leadership.
- Led National COVID-19 training teams for National, Regional Referral, Prisons and other stakeholders across the country.
- Participated in revision of the Maternal Infant Young Child and Adolescent

Nutrition (MIYCAN) and Micronutrient guidelines and prepared costed action plans for the same.

- Participated in the development of the President's Initiative on Healthy eating and Physical activity.
- Participated in Fitness and Nutrition project conception activities.
- Participated on the revision of the regulations for marketing of breastmilk substitutes.
- Participated in the nutrition e-health preparedness assessment for Karamoja region.
- Conducted district orientation of the District health teams, and District Task Force on COVID-19 in the Eastern region and Supported these districts to set up alert management and rapid response teams.
- Participated in Lira Region surveillance and contact tracing activities for COVID-19.

Fellowship program specific achievements

- The fellow conducted analysis on data from DHIS2 to assess the patterns of malnutrition among pregnant and lactating women in Uganda, 2015-2018.
- Team lead/Principal investigator in the investigation of a malaria outbreak investigation in Zombo District.
- Team lead/Principal Investigator in the investigation of Rubella Outbreak in Nakaseke District
- Participated in the following outbreaks: A Leprosy outbreak investigation in Lira district.; A Jimsonweed Poisoning outbreak due to consumption of contaminated humanitarian relief food.;

TuberculosisinvestigationinNakapiripiritDistrict.;Diagnosticdiscrepancy in Prisons

- Led a quality improvement project "Improving reporting for nutrition among pregnant women attending antenatal clinics in Teboke Health Centre III, Apac District."
- Conducted an epidemiological study on "Prevalence and predictors of malnutrition among pregnant women attending antenatal clinics in Apac District"
- The fellow has also been an editor of the Uganda National Institute of Public Health (UNIPH) bulletin.
- Participated in the following studies: ; Epidemiological Analysis of the cholera situation in Uganda.; Yield of HIV testing in pregnancy and postnatal period.; COVID 19 feasibility and acceptability study of the Ministry of Health case report form
- Participated in screening for COVID 19 at Entebbe international airport.
- Participated in screening for Ebola during the Uganda Episcopal Conference of 2019 in Namugongo, Wakiso District.
- Attended a one week course on Public Health in Emergencies organized by World Health organization and TEPHINET.
- HIV study: "Breastfeeding patterns and mother-to-child transmission of HIV in Uganda, PMTCT Impact evaluation study 2017-2019."

Summary of Descriptive Analysis: Patterns of Malnutrition among

Pregnant and Lactating Women in Uganda, 2015-2018: Analysis of Nutrition Surveillance Data

Background

Maternal nutrition is closely linked to survival and development of children during the first 1000 days of life. The Uganda Nutrition Action Plan (UNAP), implemented from 2011 to 2016, was aimed at ensuring adequate nutrition for all with a focus on infants, young children, and mothers. However, in 2019, the rate and distribution of malnutrition specific to pregnant and lactating women was still unknown. We described annual trends and distribution of malnutrition among pregnant and lactating women (PLW), Uganda, 2015-2018, to inform programming on targeted malnutrition interventions.

Methods

We analyzed nutrition surveillance data from the District Health Information System (DHIS2) for all PLW from 2015 to 2018. We WHO used standard thresholds to determine the severity of malnutrition in the population and calculated prevalence of malnutrition among PLW by year and region, drawing choropleth maps to demonstrate the geographic distribution of malnutrition among PLW. We used logistic regression to assess trends of malnutrition.

Results

During 2015-2018, 268,636 PLW had acute malnutrition (prevalence=5.5%). Of the 15 regions of Uganda, Karamoja

(prevalence=21%) and Lango (prevalence=17%) registered the highest prevalence while Toro (prevalence=2.7%) Kigezi and (prevalence=2.0%) registered the lowest prevalence. The national annual prevalence of malnutrition among PLW declined by 31% from 2015-2018 (OR=0.69, p<0.001). Regions in the had increasing north trends of malnutrition over the period [Lango (OR=1.6, p<0.001) and Acholi (OR=1.2, p<0.001)], as did regions in the east [(Bugisu (OR=3.4, p<0.001), Bukedi (OR=1.4, p<0.001), and Busoga (OR=1.3, p<0.001)]. The other 11 regions showed declines.

Conclusion

The trend of malnutrition among PLW nationally declined during the study period. Lango and Acholi regions, both of which were experiencing a state of emergency during this period, had both high and rising rates of malnutrition, as Karamoja did the region, which experienced the highest malnutrition rates. We recommended that Ministry of Health increases focus on nutrition monitoring for PLW and conduct an analysis to clearly identify the factors underlying malnutrition specific for PLW in these regions.

Key lessons learnt during the fellowship

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

- Outbreak Investigation
- Scientific writing; Manuscripts, Abstracts,

Policy Briefs and Newspaper article

- Critical thinking
- Editorial skills for scientific articles
- Data analysis skills
- Designing and implementing Quality Improvement Projects
- Evaluating a surveillance system
- Presentation skills
- Writing skills

Next Steps

After successfully completing the fellowship, I plan to continue my career in field epidemiology in the government or private sector to address public health disparities and influence policy. I plan on publishing all the work done during the fellowship period in peer review journals. In addition, I plan to continue my education by completing a doctoral degree in epidemiology.

Pictorial and narrative



Irene B. Kyamwine (yellow blouse) taking MUAC measurement of a pregnant woman during a study to assess prevalence and

predictors of malnutrition among pregnant women in Olelpek Health Centre III, Apac District, 2020.



Irene B. Kyamwine (white and black blouse) conducting larval scoops in breeding sites under Lilian Bulage's supervision (green and red blouse) during a malaria outbreak investigation in Zombo District, Uganda 2019.



Fellows cohort 2019: Irene Kyamwine (in black and white striped top), conducting Ebola screening during the Uganda Episcopal Conference in Namugongo in 2019.



Maureen Nabatanzi BSc FST (Mak), MPHN (Mak), Field Epidemiology Fellow

Email: <u>mnabatanzi@musph.ac.ug</u> Telephone: 0774474720

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

Host mentor:

Bernard Lubwama

Fellow's Profile

I am a Field epidemiologist with a Master of Public Health Nutrition from Makerere University, School of Public Health. During my time as a Public Health Fellow, I have been attached at the Integrated Epidemiology, Surveillance and Public Health Emergencies (IES & PHE) Department, Ministry of Health.

My role at IES & PHE involved district

surveillance strengthening activities, event-based disease surveillance, verification, and analysis of surveillance epidemic prone diseases data on according to the 2005 International Health Regulations (IHR). I wrote reports in the national weekly epidemiologic, and National Institute for Public Health (UNIPH) bulletins and gave presentations on surveillance at the Surveillance Subcommittee of the National Task Force.

As a fellow with IES & PHE, I led investigations on yellow fever and outbreaks malaria actively and participated in five more outbreak investigations. This involvement in response to disease outbreaks coupled simulation with engagements in exercises, action reviews, surveillance and preparedness strengthening sharpened my knowledge on Uganda's IHR and health security obligations. I have undertaken four short courses in surveillance and public health operation emergency center I have advanced my management. understanding of Uganda's health information systems and its role in guiding public health interventions and improving health security. Routine surveillance data analysis in my role has polished my skills in using electronic data collection tools like ODK. Kobocollect and GoData, and statistical and spatial packages like STATA, SPSS, EPI Info and OGIS.

Achievements at the Host site

- Contributed articles and edited the national weekly epidemiological bulletin which serves to inform national and international health stakeholders on priority epidemic prone diseases/conditions
- Conducted verification of national weekly surveillance data for the priority epidemic prone diseases/conditions
- Participated in surveillance data strengthening activities with a focus on weekly surveillance data (HMIS 033b). Through trainings, verifications and data quality checks, we improved use, consistency, completeness, timeliness of reporting across registers, HMIS forms and District Health Information System (DHIS2) at facility and district levels.
- Played active role in IHR monitoring and evaluation activities including: notification of public health events, simulation exercises, action reviews, Integrated Disease Surveillance and Response guidelines adaptation and implementation.
- As the secretary of the Surveillance • Subcommittee of the public health emergencies' National Task Force, I contributed documentation to of preparedness and response public interventions to health emergencies. This role enabled me to participate in discussions and planning for emerging public health events. During the COVID-19 outbreak, I was a member of the national Incident Management Team for coordinating the response.
- 6. I engaged in activities of the National Action Plan for Health Security (NAPHS).

These included: development of standard operating procedures for points of entry, situation analysis of food safety and, strengthening COVID-19 district surveillance.

 7. I received training in integrated disease surveillance and response (IDSR), event-based surveillance, Epidemic Intelligence for Open Sources (EIOS) and public health emergency operation center management.

Fellowship program specific achievements

- Actively participated investigations of: food poisoning in Napak and Amudat Districts, Yellow fever outbreaks in Bullisa, Maracha and Moyo Districts; Ebola Virus Disease outbreak in Kasese District; Malaria outbreak in Kole District; Leprosy in Lira District and case investigations of COVID-19
- Conducted a descriptive analysis of dysentery surveillance data (2014 – 2018) extracted from DHIS2
- Published the following articles in the UNIPH bulletin: Investigation of Yellow fever outbreak in Masaka District; Investigation of Malaria outbreak in Kole District; Highlights of the COVID-19 outbreak in Uganda, March to June 2020
- Published a Policy brief in the UNIPH bulletin titled, "Yellow fever vaccine should be added to the routine immunization program in Uganda".
- Conducted an HIV project comparing maternal and perinatal outcomes among HIV positive and HIV negative women in Saving Mothers Giving Life (SMGL) programs in Uganda using program

surveillance data from 2015 to 2016

- 6. Published four newspaper and media articles: Knowing when NOT to use Personal Protective Equipment during this Corona Virus Disease outbreak; Making smart dietary decisions during this Coronavirus Disease (COVID-19) outbreak; Diabetes, the role of society in improving care; When food becomes a poison
- 7. Implemented a quality improvement project on improving adherence to IDSR standard sase definition for Typhoid fever in Kitebi Health Center III in Kampala District
- 8. Presented the following abstracts at national conferences: Yellow fever outbreak in Masaka District; Comparison of maternal and perinatal outcomes among HIV positive and HIV negative women in SMGL programs in Uganda, 2015-2016; Malaria outbreak facilitated by cessation of indoor residual spraying, Kole District, 2019
- 9. Presented the following abstracts at international conferences: The role of contact tracing during an EVD outbreak, Kasese District, Uganda, 2019; Contact tracing during COVID-19 outbreak in Uganda, 2020
- 10. Wrote and submitted a manuscript titled, "Epidemiology of dysentery in Uganda, 2014-2018" to a peer reviewed journal. The following manuscripts are under review: Malaria outbreak facilitated by cessation of indoor residual spraying, Kole District, 2019; Comparison of maternal and perinatal outcomes among HIV positive and HIV negative women in SMGL programs in

Uganda, 2015-2016

Summary of Epidemiological study:

COVID-19 in East Africa and Democratic Republic of Congo: A Comparison of the Outbreaks, and Interventions in the First Four Months

Background:

In the East African Community (EAC) and Democratic Republic of Congo (DRC), the index case of COVID-19 was reported by DRC on 10 March 2020. These countries share borders which posed challenges in limiting COVID-19 spread across Points of Entry (PoEs) during trade and social travel. World Health Organization (WHO) recommends strategic preparedness and response for COVID-19. This calls for prompt analysis of available data to help characterize transmission and role of interventions. We described the COVID-19 outbreaks, preparedness status and interventions in EAC and DRC from March to June 2020 to inform response.

Methods:

The study was conducted among DRC and EAC member states: Uganda, Kenya, Tanzania, Rwanda, Burundi and South Sudan. We analyzed routinely-collected data from WHO-COVID-19 and Ministries of Healthdatabases. documents, and social and published media from March to June 2020. Variables included: total case and death counts, attack rates, tests per capita, preparedness and response status, and interventions. Preparedness and

response status were described using categorization WHO's based on International Health Regulations State Parties Annual Reporting tool and additional country specific information. Countries' response status was categorized based on their position in response to COVID-19. Using country specific population data, we computed attack rates (AR), case fatality rates (CFR) and tests per capita. We tabulated preparedness and response status. We drew maps of cases and deaths. We ploted trends of confirmed cases and interventions by country.

Results:

Between March – June 2020, 17,908 cases were reported in the region. DRC (6,938) and Kenya (6,366) reported more cases than South Sudan (2,007), Rwanda (1,025), Uganda (893), Tanzania (509) and Burundi (170). South Sudan had the highest AR (17.8/100,000) and Burundi, the lowest (1.4/100,000). The region reported 374 deaths; DRC had 166 (CFR = 2.4) and Kenya (148, CFR = 2.3). All countries implemented public health interventions to limit the spread. These included: limiting in-country and abroad travel, banning mass gatherings, schools and most workplaces, promoting hand hygiene and mask use, screening at PoEs, mass testing and nation-wide lockdowns. In preparedness, 5/7(71%) countries scored $\leq 60\%$ while 2/7(29%)scored ≤40%. Kenya, DRC and Tanzania were in response category 5 and had community already demonstrated transmission of COVID-19. Tanzania did not have adequate information on COVID-19.

Conclusions and recommendations:

Between March – June 2020, DRC, Kenya and Tanzania reported more cases and deaths than South Sudan, Rwanda, Uganda and Burundi. Kenya, DRC and Tanzania had large outbreaks and community transmission. All countries implemented multiple public health interventions to limit the spread. Despite most of the countries in the region scoring $\leq 60\%$ in preparedness, there was a slow increase in cases and deaths over the first four months of the pandemic which was likely supported by the prompt and strict public health interventions. EAC and DRC governments should strengthen interventions and adjust public health and social measures in response to COVID-19 infections. increasing Ministries of Health should ensure that accurate and complete information on COVID-19 is easily accessible on national and social media platforms to improve public awareness and guide interventions in the region.

Key lessons learnt during the fellowship

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

- Outbreak Investigation
- Scientific writing: Manuscripts, Abstracts, Policy Briefs and Newspaper articles
- Editorial skills for scientific articles
- Surveillance data analysis and presentation

- Designing and implementing Quality Improvement Projects
- Evaluation of surveillance systems
- Writing and presentation
- Networking with key players in the field of health security

Next steps

I hope to apply the skills gained during the Public Health Fellowship Program to serve in relevant public health organizations. I'm interested in applying my field epidemiology expertise and experience in surveillance and epidemic disease control in activities that contribute to Uganda's health security objectives.

Pictorial and narrative



Maureen Nabatanzi presenting at the 2020 PEPFAR science summit of study titled, "Comparison of maternal and perinatal outcomes among HIV positive and negative women in SMGL programs in Uganda, 20152016



Maureen Nabatanzi screening travelers at Entebbe International Airport for COVID-19 in February 2020



Katusiime Maureen BSN, MPH Ministry of Health

Telephone: +256 757 650195 Email: <u>mkatusiime@musph.ac.ug</u> <u>amreenlan@yahoo.com</u>

Host Site: Reproductive and Child Health Department – MOH (RCHD)

Host Mentors:

Dr. Dinah Nakiganda Dr. Mutumba Robert

Fellow's Profile

I am a Field epidemiologist with a Master's Degree in Public Health from Makerere University, School of Public Health with a background in nursing and midwifery. During my time as a Public Health Fellow, I was attached to the Department of Reproductive and Child Health at the Ministry of Health. I have conceptualized, designed and implemented research projects in the area of maternal and child health such as using the BABIES matrix to determine pregnancy birth outcomes in Naguru Regional Referral Hospital (RRH) in Kampala, Uganda. I have supported health facilities to establish and enhance surveillance systems to monitor and improve maternal and perinatal deaths. I have participated in several trainings that have built my competencies in designing and implementing research protocols, responding to public health emergencies, data analysis and scientific writing.

I have led one malaria outbreak investigation in Oyam District and coinvestigated four outbreak investigations including responding to COVID-19 pandemic.

Fellows' achievements Host site

- Led the adaptation and writing of the Sexual Reproductive Health (SRH), HIV/AIDS, Gender Based Violence (GBV) integration index report, 2019 for Uganda
- Conducted analysis of data on SRH, HIV/AIDS, and GBV Integration indicators from DHIS2, led the writing of annual SRH/HIV/GBV integration reports and work plans for 2019/20 in the 8 Joint Programme districts under UN Agencies and at National Level
- Team leader for various host site activities including; quarterly adolescent health friendly outreaches, mentorship and support supervision of health providers on Maternal Perinatal Death Surveillance and Response (MPDSR) implementation, SRH, HIV, GBV

integrated outreaches

- National trainer • and mentor for adolescent health, SRH, HIV, GBV MPDSR, integration, continuity of essential services amidst COVID-19 and led trainings of health workers in these areas
- Part of the core team that spearheaded development of guidelines for care of pregnant women, breastfeeding women and infants in the context of COVID-19, later incorporated into the national guidelines for continuity of essential services during COVID-19
- Part of the core team that developed • these key strategic documents: draft MPDSR costed implementation plan 2020-2025, MPDSR Annual Report 2019/20, draft implementation guidelines for health workers on use of contraceptives, emergency activity implementation framework to accelerate reduction of maternal mortality due to postpartum hemorrhage 2020/21 among others
- Part of the core team that reviewed and • harmonized these kev strategic documents: draft training guide on MPDSR and included the BABIES matrix as a topic of consideration, Form 12; notification of death and certification of cause of death form, the adolescent training guide for trainers and trainees, service standards for provision of friendly adolescent services, Information, Education and Communication (IEC) materials for adolescent health and various support supervision checklists such as the voucher programme under adolescent

health to mention but a few

- Conducted data quality assessments for MPDSR and SRH, HIV, GBV integration at selected facilities
- Currently a member of the secretariat and scientific committee organizing the scientific conference on SRH-HIV-GBV integration to be held on 4th-5th February 2021

Program-specific achievements

- Editor for October-December 2019 issue of the Uganda National Institute of Public Health (UNIPH) bulletin
- Principal Investigator for the Malaria Outbreak investigation conducted in Oyam District
- Co-investigated the following outbreaks: Rubella outbreak investigation in Nakaseke District.; Leprosy outbreak investigation in Lira District.; COVID-19 investigation in Mbale District.: Screening of travellers and worshipers for Ebola at Namugongo shrine.; Screening of travellers for COVID-19 at Entebbe International airport between March-June 2020.
- Participated in a 2-week workshop on Maternal Infant Matrix (MIM) storyboard Methodology at Emory University, USA
- Deployed as epidemiologist through the regional deployment arrangement of Ministry of health where I supported COVID-19 response, built capacity of district health teams in 7 districts under Bombo Region to respond to the pandemic
- Facilitated trainings of District trainers of trainees on COVID-19 preparedness and response including orientation,

identification, reporting in Eastern region

- Led a quality improvement project "Establishing BABIES matrix to improve surveillance and focus response measures to reduce perinatal deaths at Mubende Regional Referral Hospital in Uganda"
- Lead investigator for HIV study: Factors associated with uptake of HIV testing among adolescents and young people in Uganda
- Led an Evaluation on Implementation of Maternal Perinatal Death Surveillance and Response (MPDSR) to Inform Programming in Hoima District, Uganda, 2017-2019

Conference presentations

- Oral presentation on Factors associated with uptake of HIV testing among adolescents and young people in Uganda at East African Virtual Conference on COVID-19 in 2020
- Oral presentation on Using the BABIES matrix to determine Pregnancy Birth outcomes in Naguru RRH at East African Virtual Conference on COVID-19 in 2020
- Oral presentation of Using the BABIES matrix to determine Pregnancy Birth outcomes in Naguru RRH at National Field Epidemiology Virtual Conference, 2020, Kampala, Uganda
- Poster presentation on Anthrax outbreak in Kween District, at 68th EIS conference, Atlanta 2019
- Oral presentation of Malaria outbreak investigation in Oyam District at National Field Epidemiology Conference,

2019, Kampala, Uganda

 Poster presentation of Malaria outbreak investigation in Oyam District at the Joint Annual Scientific Conference (JASH Conference), 2019, Kampala Uganda.

Publications and manuscripts written

- Using the BABIES Matrix to Determine Patterns of Newborn Birth Outcomes in Naguru Regional Referral Hospital, Kampala, Uganda, Nov 2018 - March 2019: article published in the National Institute of Public Health quarterly bulletin
- The CORONA VIRUS DISEASE PANDEMIC: Uganda Holds the First Public Dialogue on Corona Virus Disease (COVID -19): article in the National Institute of Public Health quarterly bulletin
- UGANDA HOSTS THE FIRST PILOT TRAINING OF EPIDEMIOLOGY IN HUMANITARIAN EMERGENCIES FOR ALUMNI OF FIELD EPIDEMIOLOGY TRAINING PROGRAMS : article in the National Institute of Public Health quarterly bulletin
- Malaria outbreak Investigation in Oyam District : article in the National Institute of Public Health quarterly bulletin
- The Annual Maternal and Perinatal Death Surveillance and Response (MPDSR) Report FY 2018/19 highlighted a reduction in institutional maternal mortality ratio from 108 to 92 per 100,000 deliveries in Uganda: article in the National Institute of Public Health quarterly bulletin
- Policy brief: Guidelines for the management of pregnant women,

breastfeeding women, and infants in the context of Covid-19

- Newspaper article in the New Vision " Born to Soon: Your Role in Preventing Occurrence of Premature Births and Deaths"
- Manuscript on Factors associated with uptake of HIV testing among Adolescents and Young People, Uganda, 2016-2017: Under internal review
- Manuscript Malaria • on Outbreak Facilitated by Engagement in Activities following swamps increased near Rainfall and limited Preventive Measures: Oyam District. Uganda, January-June 2019: Under e-clearance

Summary of Epidemiological Study:

Using the BABIES Matrix to Determine Patterns of Pregnancy Birth Outcomes in Naguru Regional Referral Hospital, Kampala, Uganda, Nov 2018-March 2019 Background:

Uganda experiences perinatal high mortality rates (PMR) (38/1,000 births), occuring mostly at or soon after birth. The BABIES matrix (Birthweight and Age at Death Boxes for Intervention and Evaluation System) is a tool introduced in Uganda in 2013 to monitor and improve pregnancy outcomes; birth categorized outcomes are by birthweight, age-at-death, and other customizable variables in boxes indicative of different underlying causes and areas for interventions. We used the BABIES Matrix to determine overall and cause-specific PMR in Naguru Regional Referral Hospital (NRRH) and identify gaps in obstetric service quality.

Methods:

We abstracted data from maternity registers at NRRH from November 2018–March 2019. We cross-tabulated age-at-death counts (columns) with birthweight groups (rows) and used total births as denominators. We computed PMR by birthweight group, stage during pregnancy/birth/neonatal period when death occured, maternal age, referral status, and mode of delivery and evaluated using chi-square.

Results:

Of 4,122 births, 3,890 (94.4%) were live births, (overall PMR at NRRH: 43/1,000). Neonatal death rate <24 hours was 2/1,000 live births. Among 169 stillborns (rate: 41/1,000 births), 93 (55%) were intrapartum deaths while 76 (45%) were antepartum. Birthweight-specific PMR was highest among <1500g (368/1,000 births), followed by 1500-2499g (199/1,000 births) and >2500g (18/1,000 births). Maternal age was unassociated with PMR. Referred mothers had a higher PMR than walk-ins (87 vs 39/1,000 births, p<0.001), while vaginal births had a higher PMR than cesarean section births (49 vs 28/1,000, p=0.002).

Conclusion:

PMR at NRRH was above the national rate. This may relate to the quality of care or late presentation to NRRH. As per the BABIES matrix, the high stillbirth rate indicates opportunities for improvements in care during pregnancy and delivery. We recommended improving intrapartum monitoring, triaging laboring mothers on admission, managing low birth weight babies, and a deeper analysis of reasons for the high PMR.

Key words: Maternal and Perinatal Mortality, Still Births, Birth weight at death, BABIES matrix, 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 Epidemiology through service in local and international organisations that will allow me leverage my knowledge, experiences and skills obtained during the Public Health Fellowship Program. Additionally to publish all the work done during the fellowship period in peer review journals.

Pictorial and Narrative



On the Left; Maureen holding a laptop conducting a facility assessment for COVID-19 at Nyimbwa H/C IV, Luwero District, during her deployment as epidemiologist, Rapid Response to COVID-19, Regional deployment, Bombo Region, April, 2020



Maureen Katusiime (in the middle) conducting a data quality assessment during a mentorship session to a midwife in Mubende Hospital as part of her quality improvement project, Mubende District, 2020



Dr. Muwereza Peter MBChB (Mak), MPH (Mak), Field Epidemiology Fellow (UPHF)

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Host Site: STD/AIDS Control Program (ACP)

Host site mentors

Dr. Magongo Eleanor Namusoke Dr. Katurebe Cordelia Dr. Musinguzi Joshua

Fellow's Profile

I am a Field Epidemiologist with a Master of Public Health from Makerere University, School of Public Health and a Bachelor of Medicine and Surgery from Makerere University, College of Health Sciences. During my time as a Public Health Fellow, I was hosted at the Aids Control Program, Ministry of Health.

My roles included analysis of program generated data on key indicators to monitor trends in the HIV response and preparing reports for dissemination to stakeholders, participating in operational research and dissemination

of key findings, participation in Quality Improvement Projects to address service gaps identified, participation in the development of Program specific workplans and their implementation, participation in field-based activities including training, supervision and mentoring of district staff, and participation in formation of guidelines for HIV care and treatment and dissemination.

I implemented several projects on HIV care and treatment and participated in other research activities at the program. They include analysis of trends of Viral load non-suppression among children adolescents from 2017-2019, and Analysis of pharmacovigilance practices Uganda, rapid assessment of in Dolutegravir toxicity in Kampala and Wakiso. I participated in the generation of the 2020 HIV care and treatment guidelines, dissemination of the Health Information Management System (HMIS) tools, national annual integrated supervision, Pediatric support (ART) regimen antiretroviral optimization and national Electronic Medical (EMR) records review.

These activities built my capacity to conceptualize, design and implement program activities including research.

I lead five outbreak investigations and participated in six others. I published articles in local newspapers and epibulletins.

Fellows' achievements Host site

- Team lead; annual support supervision Kampala-Wakiso Sub-region
- Team lead Pharmacovigilance assessment for DTG rollout in Uganda
- Rapid assessment for DTG adverse events in Kampala and Wakiso
- Participated in the National EMR functionality Assessment
- Participated in the National Pediatric and adolescent ART regimen optimization guidelines revision
- Participated the National roll out of 2019 ACP-HMIS tools

Program-specific deliverables

- I was an editor on one issue of the Uganda National Institute of Public Health (UNIPH) bulletin.
- Conducted analysis of routine data on Viral load - Viral Load non suppression among Children and adolescents in Uganda, 2017-2019.
- Team lead Ebola Viral Disease Outbreak investigation in Kasese District, 2019.
- Team lead Yellow fever Outbreak investigation in Moyo, Buliisa and Maracha Districts, 2020.
- Team lead Dolutegravir Adverse events in Uganda, 2020
- Team lead Anthrax Outbreak Investigation in Rubirizi District, 2020.
- I participated in the following outbreaks:
- Leprosy in Lira District, 2019
- Relief Food Poisoning in Karamoja, 2019
- Covid-19 (Entebbe, Kabale), 2020
- Mysterious deaths in Katabi, 2019.
- INH (isoniazid) Adverse Events, 2020

- Ebola Viral Disease surveillance, Namugongo, 2020
- Led a quality improvement project "Improvement Viral Load coverage in Namayingo District, 2020.
- "The Impact HIV study: of the Strengthening Laboratory Management towards Accreditation Program in Implementing Quality Assured Laboratory Services, Uganda, 2010-2019"
- Conducted a study on Effects of transition to Dolutegravir based ART regimen on adherence, viral suppression and incidence of Opportunistic Infections among ART clients, Bugweri District, 2020.

Conference presentations

- Poster presentation The Impact of the Strengthening Laboratory Management towards Accreditation Program in Implementing Quality Assured Laboratory Services, Uganda, 2010-2019 – Science summit 2020
- Oral presentation Anthrax Outbreak Investigation in Rubirizi District, 2020 – NFEC 2020
- Descriptive Analysis of Dolutegravir (DTG) Adverse Events Surveillance data in Uganda, 2017-2019 – NFEC 2019

Publications and manuscripts written

- Yellow fever Outbreak in Moyo, Maracha and Buliisa - published in the National Institute of Public Health quarterly bulletin
- The 5th National Epidemiology Conference: Epibulletin article in the National Institute of Public Health

quarterly bulletin

 Co-authored articles in the Uganda National Institute of Public Health (UNIPH) bulletin,

Leprosy - Investigation in Lira District 2019

Namugongo Episcopal Ebola Viral Disease Surveillance. 2019

Ebola Outbreak in Kasese District, 2019

Policy brief: Counselors in Public sector for HIV care and treatment – under review

Newspaper article in the New Vision: "Use social media to promote good public health practices"

Newspaper article in Daily monitor: "It is time to take care of your health"

Manuscript on "The Impact of the Strengthening Laboratory Management towards Accreditation Program in Implementing Quality Assured Laboratory Services, Uganda, 2010-2019" in clearance

Manuscripts being prepared:

- Yellow fever Outbreak in Moyo, Bullisa and Maracha
- Viral load Non suppression among children and adolescents in Uganda 2017 – 2019
- Anthrax Outbreak in Rubirizi
- Effects of transition to DTG from NVP/EFV-based regimens

Summary of Epidemiological Study: Effects of transition to Dolutegravir based ART regimen on adherence, viral suppression and incidence of Opportunistic Infections among ART clients, Bugweri District, 2020

Introduction

In 2017, the world health organization transitioning recommended to first-line ART dolutegravir-based regimens (DTG), particularly in regions where pre-treatment drug resistance to non-nucleoside reverse transcriptase inhibitor first-line regimens reaches 10%, such as Southern and Eastern Africa. DTG has better side effects profile than Efavirenz (EFV) and is associated with a lower risk of virologic failure and resistance compared to EFV. Studies from predominantly high-income settings found that dolutegravir-based regimens have superior efficacy, tolerability and durability compared with existing first-line regimens. However, after the national wide roll out of DTG initiation on HIV patient care in 2019 in Uganda, reports on adverse events following initiation of DTG were received by National Drug Authority from mainly Kampala and Wakiso Districts and a few other regions. A case series from the Infectious Diseases Institute (IDI) raised initial concern that patients receiving DTG for HIV treatment were developing clinically significant hyperglycaemia/Diabetes Mellitus and/or other clinical adverse events at a higher-than-expected frequency.

This study aimed at establishing the effects of transition to Dolutegravir based ART regimen on; adherence, viral suppression, retention in care, incidence of Opportunistic Infections and adverse events among ART clients in Bugweri District, Uganda, 2020.

Methods

We collected data from all the six ART clinics in Bugweri District. Patients' files who had been transitioned to the Dolutegravir-based first-line ART regimens were reviewed for age, sex, regimen type, adherence, side effects, VL retention suppression, in care, Opportunistic infections, CD4 counts. Ttests, univariate, and bivariate analyses to make comparisons of characteristics before and after DTG transitioning were conducted.

Results

A total of 663 records were reviewed; 51% (337) were female and 49% (326) were male. The mean age was 48 years, ranging from 12 to 97 years. All the 663 were transitioned to Tenofovir/Lamivudine/Dolutegravir (TLD). Of the 663 patients, 93% (618) were virally suppressed while 7% (45) were not suppressed before transitioning to DTG, 96% (529) of those on DTG were virally suppressed while 4% (24) were not suppressed. The difference in suppression rate between regimens not statically significant, 95%CI -3580-2444, p-value 0.36. The adherence level for patients on other regimens before DTG was: 98% (650) had good adherence, 1.5% (10) had poor adherence, and 0.45% (3) had fair adherence. While on DTG-based 99% regimens, (659) had good adherence, while 0.3% (2) had fair and 0.3% (2) had poor adherence. The WHO staging was the same before and after the start of DTG-based regimens. While on non-DTG based regimens of the 663 patients, 34% (227) patients reported at least a side effect and 0.45% (3) patients reported side effects while on DTG. While on non-DTG based regimens, 5.1% (34) patients were at some point lost to follow up, but and 2.9% (19) of those on DTG-based regimens were lost to follow-up. Of the 663 patients on non-DTG based regimens 1.7% (11) had an OI before transitioning them to DTG while 0.45% (3) patients had at least an OI on DTG for at least 6 months.

Conclusion and Recommendations

DTG showed better side effects profile compared to other regimens. This is contrary to initial reports from earlier case studies in Uganda. We also observed that adherence, retention in care, and viral load suppression were better than that of other regimens. Whereas transitioning of patients from other regimens to DTG was supposed to be for stable virally suppressed clients first line ART, non-suppressed on patients were also transitioned in some health centres. No reports were sent to NDA on adverse events. Training of health workers to ensure appropriate implementation of ART guidelines as well as pharmacovigilance is recommended.

Competencies learned from the fellowship program

During the fellowship, I learnt and developed the following

skills/competencies:

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

Next steps

I will work towards ensuring that all the work that I have worked on during the fellowship is published in peer reviewed journals. I hope to use the skills gained to provide strong leadership to the health care sector in Uganda for improved health systems.

Pictorial and Narrative



Peter Muwereza sensitizing health workers of Moyo Hospital on surveillance and case

management of Yellow fever, March 2020.



Peter Muwereza demonstrating hand washing to residents of Katwe Town Council in Kasese District during the Ebola Viral Disease Outbreak, 2019.



Peter Muwereza (sitting on left) travelling to Sigulu Island (Sigulu Health Centre III) in Namayingo District for the QI project QI team leads of Sigulu HC III (lady) and

Buyinja HC IV (man sitting right)



Phoebe Nabunya BHUN (MaK); MPH (MaK) Email: pnabunya@musph.ac.ug Telephone: +256-789681757

Host Institution: National Malaria Control Program (NMCP)

Host Mentors:

Dr. Damian Rutazaana Dr.Daniel Kyabayinze Dr.Denis Rubahika

Fellow's Profile

Phoebe Nabunya is an epidemiologist with a special interest in disease outbreak investigations. She holds a Master's Degree in Public Health from Makerere University, School Of Public Health and has a background in Human Nutrition.

During her time as a Field Epidemiology Fellow, she has been attached to the National Malaria Control Division (NMCD), Ministry of Health. While in this position, she has led the investigation of four outbreaks and participated in three other outbreak investigations. She has also undergone a number of short courses in data analysis, scientific writing, and surveillance.

The short courses have improved her skills in data analysis using statistical packages including R, Stata, Epi-info, QGIS; manuscript writing, and writing of bulletins, which she used in supporting the Division to publish their routine (weekly and quarterly) malaria bulletins.

Achievements at the host site

- The fellow led a malaria outbreak investigation and response in Kyotera district in 2019 where she was in charge epidemiologists а team of and entomologists. The team conducted line health facility, listing from the environmental assessments, and community assessments to determine the factors associated with the observed increase in cases.
- Led the investigation of a malaria outbreak in Bugweri district in 2020 where she studied the spatial distribution of cases in the district and evaluated factors associated with the observed increase in malaria cases.
- Led the writing and publication of weekly, monthly, and quarterly bulletins at the National Malaria Control Division which are used as information sources and a basis for decision making at national and subnational levels as well as by malaria partners.
- Supported routine analysis of malaria data as reported in the DHIS 2 and shared weekly malaria status of districts

with the staff in NMCD.

- Developed and updated a weekly report on the malaria status of districts which was shared with all staff and key malaria partners to inform early intervention in case of malaria upsurges
- Part of the Malaria Surveillance Monitoring, Evaluation and Operational Research technical working group which discussed and shared experiences in the fight against malaria from different malaria partners. As part of the team, she championed the analysis of routine surveillance data from DHIS 2 and updating the team on the malaria status in the country.
- Participated in drafting the malaria Annual Report 2019/2020
- Participated in the Malaria Program Review (MPR) and subsequent strategic planning for the years 2020-2025.
- Conducted a trend analysis of malaria cases in Uganda between 2014 and 2018. This study was conducted to determine the trend and distribution of uncomplicated, severe, and malaria related deaths over the years. We anticipated that this study would inform the targeting of malaria interventions to areas where they are most needed.
- Lead editor for 4 quarterly malaria bulletins that were widely disseminated to malaria stakeholders in the country. The bulletin is based on data routinely collected from health facilities through the DHIS 2 platform. It gives highlights on malaria incidence, test positivity rate, mortality, malaria in pregnancy and other key malaria indicators at national level and district level.

- Participated in building capacity of districts in malaria surveillance, detection of malaria outbreaks using malaria normal channels, and coordination of responses to detected outbreaks.
- Carried out support supervision for districts in iCCM, and malaria surveillance activities
- Participated in training of health workers in the updated Malaria in Pregnancy guidelines in Hoima region.
- Participated in organizing the World Malaria Day Celebrations which were held in Alebtong District in 2019.
- Conducted a quality improvement project on use of malaria channels to detect malaria outbreaks at health facility level in Kyotera District. This was informed by the challenges identified form the outbreak investigation done in 2019, where the health workers were not aware of the outbreak due to lack of skills to monitor their cases using the malaria channels.
- Participated in building capacity of district staff in COVID-19 surveillance between January and April 2020.

Fellowship program specific achievements

Descriptive analysis

Described the distribution and trends of uncomplicated malaria, severe malaria, and malaria-related deaths in Uganda from 2014-2018. Findings revealed that malaria and malaria-related deaths in Uganda decreased between 2014 and 2018. It also showed that children under five, regions including west Nile, Karamoja, Lango and Busoga were the most affected. We recommended sustained efforts with a continuous focus on children <5 and particular attention to most affected areas such as to help the country achieve the targets on the malaria indicators as stipulated in the Uganda Malaria Reduction strategic plan of 2020-2025.

Outbreak investigations Lead Investigator:

- Malaria in Kyotera. The late detection of the malaria outbreak in the Kyotera informed her quality improvement project which focused equipping health workers with skills in constructing updating and interpreting malaria channels.
- Investigation of and response to an outbreak of Crimean-Congo Hemorrhagic Fever in Kagadi District, January 2020.
- Spatial distribution of cases in Bugweri district, during a malaria outbreak June 2020
- Investigated COVID clusters in Kampala and Wakiso district.
- Pilot Project to assess the feasibility and acceptability of the COVID-19 case report form in Gulu, Mulago and Entebbe Regional referral Hospitals
- Investigation of the sudden deaths in Ntoroko District, November 2019. Our findings reveled that there was no epidemiological link between the deaths. They were likely linked to chemical poisoning.

Co-Investigator

- Investigation of leprosy outbreak in Lira and Alebtong, 2019. Lira district had reported 38 Leprosy cases in the last quarter of 2018, and investigations into this revealed that most of the cases identified had lived in IDP camps where they were likely exposed.
- Assessment of Health facility readiness to handle infectious pathogen, Kampala and Wakiso, March 2020
- Malaria Outbreak associated with increased human activity in swamps and road construction, Butambala district, March 2019
- Screening of travellers for COVID-19 at Entebbe International airport between March-June 2020
- COVID-19 Case investigations in Ankole region, Wakiso and Kampala Districts
- COVID-19 in East Africa and Democratic Republic of Congo: A Comparison of the Outbreaks, and Interventions in the First Four Months

HIV project

The fellow analysed secondary data from the Dreams project with the aim of the layering assessing of HIV interventions given to adolescent girls and young women in the DREAMS project in Uganda. We found that giving a higher number of interventions to AGYWS on the DREAMS program was associated with a higher risk of seroconversion likely because of the program design where AGYWS with a higher perceived risk for seroconversion received more interventions. We also found that most commonly offered services were social protection

services for AGYW & their families followed by the Targeting male partner and Adolescent friendly health services strengthening while communities Interventions were the least offered. We recommended that the program revise the way interventions are given to emphasize the need for AGYWs to understand the purpose of each intervention given and how it can prevent them from acquiring HIV.

Quality Improvement

Following the investigation of a malaria outbreak in Kyotera District, the investigation team noted that the outbreak was detected 6 months late due to lack of data analysis at health facility level. We implemented а continuous improvement project in Kyotera district to identify the root cause for the late detection of malaria outbreaks. We found that health workers at health facility level did not have knowledge and skills of constructing malaria channels which are used to detect malaria outbreaks. We therefore, conducted training and onsite mentorship of records officers on how to construct malaria normal channels and updating them at 4 high volume facilities in the district between June 2020 and October 2020. The project demonstrated an improvement in the use of malaria channels by the 4 health facilities. This was attributed to equipping the health workers especially the records persons with skills in constructing malaria the normal channels, supporting them to print out

the channel for updating and sending them weekly reminders to update and report the channels to the district through the district biostatistician. We recommended that the trained health workers in Kyotera, cascade the training to other health workers not involved in the QI project.

Scientific writing

Articles in the MOH surveillance or Epidemiology Bulletin

- A policy brief titled "Using malaria channels based on percentiles to detect malaria epidemics in Uganda".
- Malaria situation update following a country wide malaria outbreak, January 2020
- Uganda FETP at the 10th TEPHINET Global Scientific Conference in Atlanta
- Commemorating the world malaria day in Alebtong, 2019
- Is Elimination of malaria in Uganda only a dream?

Newspaper articles

The following articles were published in the new vision

- Men can support breastfeeding by using pumped breast milk
- How to protect yourself and your family from Malaria this rainy season
- Maintain the Nutritional benefits that come with Ramadhan

Written Manuscripts

- Malaria Outbreak due to Increased Breeding Sites and Rainfall, Kyotera District, Uganda, January-July 2019
- Malaria Data Quality Assessment

Conducted in Selected Health Facilities in 15 Districts, Uganda, March 2020

 Improving the use of malaria channels to detect malaria upsurges at health facilities in Kyotera District, Uganda, 2020

Co-authored manuscripts:

- Malaria Outbreak associated with increased human activity in swamps and road construction, Butambala district, March 2019
- Assessment of Health facility readiness to handle infectious pathogen, Kampala and Wakiso, March 2020
- Food Poisoning Outbreak Caused by Consumption of Contaminated Food with Jimson Weed Lamwo District, Uganda, August 2019.
- Investigation of leprosy outbreak in Lira and Alebtong, 2019

Conference presentations

- Oral presentation on Malaria Outbreak due to Increased Breeding Sites and Rainfall, Kyotera District, Uganda, January-July 2019 at the National Field Epidemiology Conference, Kampala, 2019
- Poster presentation on Malaria Outbreak due to Increased Breeding Sites and Rainfall, Kyotera District, Uganda, January-July 2019 at the JASH conference, 2019
- Poster presentation on Malaria Outbreak due to Increased Breeding Sites and Rainfall, Kyotera District, Uganda, January-July 2019 at the ICRED conference, 2019

 Oral presentation on the distribution and trends of malaria in Uganda, 2014-2018 at the National Field Epidemiology Conference, Kampala, 2020

Summary of Epidemiological Study Spatial distribution of cases in Bugweri district, during a malaria outbreak June 2020

Background:

Bugweri District was one of the 34 districts reporting a malaria outbreak in 2020. The outbreak, which started in January 2020, persisted for over 5 months with Buyanga sub-county being the most affected. Buyanga reported the highest increase in cases between January–June 2020, having 32,663 cases compared with 20,000 in the same time frame in 2019. Investigations into the previous malaria outbreaks in the country have been linked to environmental risk factors such as rainfall and presence of breeding sites around households created by nature or human activity. However, the spatial distribution of these cases in relation to known environmental risk factors for malaria has not been done. This study aimed to investigate the malaria outbreak in Buyanga to assess the magnitude and the associated factors using a case control study as well as identify the hotspots for malaria transmission during the outbreak using a Bayesian model to document the spatial distribution of malaria cases in Buyanga Sub-county, Bugweri District. identification of The malaria transmission hotspots through the use

of spatial statistics is important to guide the targeting of interventions as residual malaria transmission is likely to persist in hotspots even after overall reduction of malaria in an area.

Methods:

We developed a line list of malaria cases reported in the sub-county from the health facility data. We then took a random sample of these cases and took the Geographic Positioning System coordinates of their residence. We also conducted a case control study to study the associations between identified exposures and disease status for a sample of the cases. This was done by selecting a proportion of the cases and interviewing them using a structured questionnaire with a proportion of the cases to collect information on their demographic and malaria risk factors for malaria transmission. We conducted matched pair analysis to measure the association between exposure variables and disease status.

Results:

Similar to other malaria outbreaks in the country, we found that females and children under 5 years had higher attack rates compared to males and older persons. The factors associated with the outbreak were living in close proximity to swamps, living near road ditches and using damaged nets. The fine-scale spatial maps were created to visualize the risk distribution of malaria in Buyanga sub-county at a resolution of 250m by 250m showed that most cases were concentrated in urban areas and along the roads which were being worked on since the end of 2019.

Conclusions:

There was increased transmission of malaria in Buyanga sub-county between January and June, 2020, likelv propagated by the presence of favorable breeding sites near people's homes by the road construction created activities coupled with use of torn mosquito nets that promoted exposure. We recommended use of larvicides to control mosquito breeding from identified breeding sites created by activities such human as road construction.

Key lessons learnt during the fellowship

- Outbreak detection, Investigation, response and control
- Scientific writing; concepts, proposals, manuscripts, abstracts, policy briefs, bulletin articles and Newspaper articles
- Editorial skills for scientific articles including weekly, monthly, quarterly e bulletins, and epidemiological bulletins
- Data analysis using Epi info, STATA, SPSS, R, and QGIS and interpretation of results
- Development of surveillance systems
- Leadership and management skills acquired from the various projects led and assignments
- Designing and implementation of Quality Improvement Projects

- Conducting Data Quality assessment
- Evaluating a surveillance system
- Communication skills including presentation, written and negotiation skills
- Networking skills

Next Steps

With the skills Phoebe has acquired throughout the period of the fellowship, she hopes to further her career in the field of Epidemiology through service in an organization that will leverage on her knowledge, experiences, skills, and networks.

Phoebe plans continue with writing abstracts, manuscripts and publishing all the work done during the fellowship period as well as the work she will do post the fellowship period.

Pictorial and narrative



Phoebe Nabunya (striped T-shirt) conducting an interview with a leprosy survivor in Lira district



Phoebe (center) mentoring a records person at Kasasa HC III in Kyotera District on how to draw malaria channels for the facility



Dr Mutebi Ronald Reagan MBChB(MUST), MPH(Mak), DPPM(UMI)

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Host Site: Division of Health Information Management, MOH (DHI)

Host Mentors:

Mr Mbaka Paul Mr Ogwal Jimmy

Fellow's Profile:

Ronald R. Mutebi holds a Post Graduate Diploma in Project planning and Management from UMI, Master of Public Health from Makerere University, School of Public Health and a Bachelor of Medicine and Bachelor of Surgery degree from Mbarara University of Science and Technology. Before joining the advanced program, Ronald completed the Medium term fellowship of both Quality Improvement and Leadership and Governance from Makerere School of Public Health and over time, he has gained experience in health systems leadership and Public Health practices. During my time as a

Public Health Fellow, I was attached to the Division of Health Information (DHI) at the Ministry of Health. While at DHI, I have been involved in providing technical support at both national and sub national levels in the areas of reporting, data management in context of district local government, weekly disease surveillance, revision of HMIS tools, setting up validation rules, making health facility inventory, and Service Availability and Readiness Assessment (SARA) data analysis and report writing. My stay in DHI coincided with revision of HMIS tools where my experience as a District Health Officer provide a much insight on strength needed and weakness of the existing HMIS tools and which enabled informed decisions on the various much needed changes . I was involved in support supervision and mapping out oral health services where I moved to various regions in the country, identifying best practices, providing solutions to emerging challenges as well recommendations as to key stakeholders.

I supported national Measles-Rubella Immunisation role out as a national trainer and supervisor in Western region. In addition, I supported COVID 19 response in greater Masaka Region of Uganda in areas of surveillance and contact tracing, case management, risk communication, infection control prevention and district readiness assessment.

I have been able to lead two outbreak investigations and participate in five

other outbreak investigations and response. The fellowship has greatly improved my practical skills in scientific writing, presentation, outbreak investigation and response, estimation of burden of disease and data analysis using packages such as STATA, EPI Info and QGIS.

Fellows' achievements

During the fellowship, I was able to support my host site in the following areas:

- Analysis and writing of weekly surveillance reports (033b) that enable timely detection of epidemics such Measles, Rubella, Cholera.
- Revision of HMIS tools, particularly providing my previous experience with the tools in District local Government. I further participated in development and setting of validation rules
- Quarterly analysis of data for the department of communicable diseases
- Training and supervision for the role out of new HMIS tools countrywide
- Analysis of SARA survey data base and was later part of the report writing team
- Generation of national wide health facility inventory

Program-specific deliverables

 Conducted descriptive analysis of dental caries and treatment procedures for dental cares in Uganda, 2015-2019. The analysis showed the spatial and temporal trends of dental caries in Uganda between 2015-2019. I subsequently developed a policy brief titled "A ground breaking opportunity to increase restorative oral health services in Uganda's Public Health facilities" published in the UNIPH quarterly bulletin.

- I further published a newspaper article; "Prevent tooth decay by eating the right foods" – New Vision, 30th December, 2019.
- Principal Investigator of "large food poisoning outbreak due to Jimson weed in Uganda's Karamoja region, 2019. This led to immediate withdraw of the implicated food which was replaced with another type that the investigation had showed to be safer. We recommended that organizations may consider strengthening their quality control checks in order to avoid future outbreaks
- Conducted aCOVID-19 assessment in fishing and border communities, Kyotera District. We found that there was COVID-19 community transmission in Ugandan fishing communities bordering Tanzania and the infections among women may have been acquired from sexual interactions while the males may have acquired through social, or business interactions with foreign fish traders. We concluded that early community screening enabled isolation of cases in time, contributing to control of COVID-19. We recommended that early screening in high risk communities may be the best way to control the spread of COVID-19.

Field Investigations conducted:

 Food poisoning outbreak in Lamwo District

- Malaria outbreak investigation in Kyotera district
- Measles outbreak investigation in Nakasongola district
- Leprosy out break investigation in Lira
- Led a quality improvement project "Improving a records and achieve system in Masaka Regional Referral Hospital. The project was aimed at a establishing a records and archival system so as to contribute to improved availability of medical reports. We streamlined communication flow and therefore movement of reports among stakeholders and achieve
- Conducted national TB Data Quality ٠ assessment in 32 TB treatment Centres from Wakiso, Mukono, Mbale, Tororo, Gulu, Kitgum, Masaka, Lyantonde, districts. Kabarole and Kasese We concluded that although TB data in DHIS2 was incomplete for all the reporting periods, the accuracy of available data was within the acceptable variation. We recommended that a nation TB data update exercise in DHIS2 may be done to enable availability of all reports
- Supported national COVID 19 response including surveillance, risk communication, and infection control prevention and districts readiness assessment in greater Masaka region
- Editor on one issues of the Uganda National Institute of Public Health (UNIPH) bulletin

Conference presentations

 Oral presentation on Large food poisoning outbreak in Karamoja region, March 2019 National Field Epidemiology Conference, Kampala, 2020

 Oral presentation on COVID-19 assessment among fishing and border communities Kyotera District: June, 2020 at the National Field Epidemiology Conference, Kampala, 2019

Publications and manuscripts written

- Large Outbreak of Jimsonweed (*Datura* stramonium) Poisoning due to Consumption of Contaminated Humanitarian Relief Food: Uganda, March-April 2019- submitted to the International Journal of Toxicology
- Evaluation of SARS-CoV-2 Transmission and Cross-Border Transmission Risk Factors among Fishing Communities in Kyotera District, Uganda: May-June, 2020 – Under internal review
- Spatial and temporal trends of dental caries and treatment services in Uganda" –under internal review
- Co-authored four articles in the Uganda National Institute of Public Health (UNIPH) bulletin : On-going transmission of Leprosy and inadequate control measures in Lira and Alebtong Districts, Uganda Issue2 vol4 April- june 201.; alaria outbreak investigation in Kyotera district

Summary of Epidemiological Study

Large Outbreak of Jimsonweed (*Datura stramonium*) Poisoning due to Consumption of Contaminated Humanitarian Relief Food: Uganda, March-April 2019 Background:

Jimsonweed (Datura stramonium)

contains toxic alkaloids that cause gastrointestinal and central nervous system symptoms when ingested. This can be lethal at high doses. The plant may grow together with leguminous with them crops, mixing during harvesting. Due to persistent famine in Uganda's Karamoja region, area residents receive humanitarian food relief. On 13 March 2019, more than 200 case-patients were admitted to multiple health centres for acute gastrointestinal and neurologic symptoms. We investigated to determine the cause and magnitude of the outbreak and recommend evidence-based control and prevention measures.

Methods:

We defined a suspected case as sudden of confusion, onset dizziness, convulsions, hallucinations, diarrhoea, or vomiting with no other medically plausible explanations in a resident of Napak or Amudat District from 1 March - 30 April 2019. We reviewed medical records and canvassed all villages of the 8 affected sub-counties to identify cases. In а retrospective cohort study conducted in 17 villages that reported the earliest cases, we interviewed 211 residents about dietary history during 11-15 March. We used modified Poisson regression to assess suspected food exposures. Food samples underwent chemical (heavy metals, chemical contaminants, and toxins), proteomic, DNA, and microbiological testing in one national and three international laboratories.

Results:

We identified 293 suspected cases; five Symptoms (1.7%)died. included (62%), confusion dizziness (38%). diarrhoea (22%), nausea/vomiting (18%), convulsions (12%), and hallucinations (8%). The outbreak started on 12 March, 2-12 hours after Batch X of fortified corn-soy blend (CSB+) was distributed. In the retrospective cohort study, 66% of 134 persons who ate CSB+, compared with 2.2% of 75 who did not, developed illness $(RR_{adi}=22,$ 95% CI=6.0-81). Samples of Batch X distributed 11-15 March contained 14 tropane alkaloids, including atropine (25-50ppm) and scopolamine (1-10ppm). Proteins of Solanaceae seeds and Jimsonweed DNA were identified. No other significant laboratory findings were observed.

Conclusion: This was the largest documented outbreak caused by contamination of food with tropane alkaloids. Implicated food was immediately recalled. Tropane alkaloids should be routinely tested during food safety and quality checks.

Keywords: Jimsonweed, Food poisoning, Outbreak, Humanitarian, Uganda

Lessons learnt

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

- Outbreak Investigation and respose
- Scientific writing; Manuscripts, Abstracts, Policy Briefs and Newspaper article
- Data analysis skills
- Designing and implementing Quality Improvement Projects
- Evaluating a surveillance system

- Presentation skills
- Writing skills
- Networking and leadership skills

Next steps

I plan on publishing all the work done during the fellowship period in peer review journals

Use my knowledge, experiences and skills obtained before and during the Public Health fellowship period to serve at National and Subnational level.

Pictorial and Narrative



Dr Mutebi R. Reagan (left). Mr Mwambazi Expedite (middle) the Wakiso DTLS and Dr Tabitha N(Program Officer, Mildmay)performing data quality assessment at Wakiso HC IV



Dr Mutebi R. Reagan interviewing one of the families affected by food poisoning in Karamoja region, Uganda, 2019. This was an extended family of 34 memebers and had lost two members; a baby of 2 years and female of 62 years



Dr Mutebi(Left), Dr Muluta, the ass Commisioner department of integrated surveillance and epidemiology, MoH, Dr. Edward Muwanga, the DHO- Kyotera and frontline health workers at Kasensero Landing site: August, 2020



Nabatanzi Sandra MSc CEB Public Health Emergency Operations Center, Ministry of Health Telephone: +256 776955322 Email: sandranabatanzi@musph.ac.ug / sandranabatanzi@gmail.com

Host Site: Public Health Emergency Operations Center- Ministry of Health (PHEOC)

Host Mentor

Dr. Issa Makumbi

Fellow's profile

Sandra Nabatanzi is holds a Master of Science in Clinical Epidemiology and Biostatistics degree from Makerere University, School of Medicine. Sandra joined the Uganda Public Health Fellowship Programme in January 2019 and was hosted at the Public Health Emergency Operations Center (PHEOC), Ministry of Health for two years. Sandra was part of the PHEOC team that enhanced overall capacities to manage and respond to public health emergencies; strengthen surveillance through improved surveillance structures for early detection, response and recovery of epidemics.

While at the PHEOC, Sandra coordinated simulation/ functional exercises; led outbreak assessments and evaluations; coordinated capacity building initiatives at national and district level on enhanced surveillance, incident management, rapid response among others; participated in development of National guidelines, standard operating procedures and emergency response plans; as a National rapid responder, she has led outbreak investigations for various infectious diseases as well as preparing outbreak response information products including situation reports and national outbreak analytical reports. During my stay at the PHEOC, I mentored five interns in response and of public health management emergencies using the incident management system.

Key Fellowship Responsibilities and Achievements

Outbreak management and response;

Sandra was a team member of the national rapid response team hence conducted outbreak investigations, contact tracing and alert management and verification roles. She led an outbreak investigation on suspected food poisoning in Palabek refugee settlement, Lamwo district which was later confirmed to have been caused by relief consuming food that was

contaminated with Atropine from Jimson weed. Immediate public health actions by the Ministry of Health and partners were mounted including confiscation of the implicated food. This drastically controlled the outbreak as there were no further cases reported. This investigation highlighted the urgent need for stringent controls on relief food inspections.

- She also took lead in the COVID-19 • health facility operational readiness assessment in the urban setting of Kampala and Wakiso Districts, Uganda in April 2020. Gaps in COVID-19 operational readiness in health facilities for patient management, logistics and surveillance in both Kampala and Wakiso were identified. The Ministry of Health undertook the following public health actions following the assessment; 1) provision of COVID-19 guidelines to health facilities; 2) continuous health worker orientations on surveillance, laboratory, case management, infection prevention and control and logistics; 3) provision of personal protective equipment to health facilities and provision of vehicles to districts. The assessment highlighted the need for continuous orientation of health workers and availability of critical supplies to manage COVID-19 as key in order to achieve reasonable readiness scores in health facilities.
- She also participated in 2 additional outbreak investigations;
- Leprosy in Lira District, 2019
- Ebola Virus Disease outbreak in Kasese

district, June 2020

Surveillance system analysis and evaluation

Conducted analysis an on epidemiological characteristics and trend of suspected measles in Uganda, 2011 – 2018 using routine surveillance data. This analysis identified greater Kampala as the most affected region. An overall increase of suspected measles was observed between 2011 and 2018; a decline in suspected measles cases was noted following mass immunization. Recommendations on regularizing mass measles-rubella vaccination in addition to routine schedules were made.

Surveillance activities

- Ebola screening and heightened surveillance at the symposium of episcopal conferences of Africa and Madagascar that was held at the Namugongo Catholic Shrine in 2019.
- COVID-19 screening at Namirembe Cathedral during the enthronement of the 9th Arch Bishop of the Church of Uganda, March 2020
- COVID-19 screening at Entebbe
 International Airport, April 2020
- Facilitated the African Regional Public Health Emergency Operations Center functional exercise in 2019. This intense exercise tested the functionality of the PHEOC's capacity to respond to emergencies.
- She was also the principal investigator on a study to determine factors associated with early sexual debut in

Uganda, 2017. The factors associated with early exposure to sexual initiation include; low wealth index; peer pressure from friends; absence of parents; history of physical violence; being female and low education level..

Communication, presentations, publications and awards

Sandra was an editor of the Uganda National Institute of Public Health (UNIPH) bulletin. The UNIPH bulletin provides health professionals and public health experts an authoritative, timely, and influential source of information and recommendations for actions to minimize public health threats.

Published Bulletin articles

- Epidemiological Characteristics and Trend of Suspected Measles, Uganda, 2011 – 2018 in the UNIPH bulletin
- Lessons learnt from the completed National Measles, Rubella and Polio Mass campaign, 16th - 20th October 2019 in the UNIPH bulletin
- Sustained vigilance, preparedness and response to all public health emergencies amidst COVID-19 Pandemic in the UNIPH bulletin
- Is Uganda ready for its next outbreak: Getting ahead of the next pandemic
- Automating early warning system for timely detection of outbreaks in Uganda. The solution to rapid response and containment of public health emergencies is early detection in the UNIPH bulletin
- COVID-19 Health Facility Operational Readiness Assessment in the urban

setting of Kampala and Wakiso district, April 2020" in the Kampala City Council Authority (KCCA) bulletin.

Published Newspaper article

Wash your hands to reduce the spread of infections" which was published in the New Vision on 15th September 2019.

Awards achieved

Runner up for the Heroes in Health Awards, 2020 under the category Ebola prevention and control.

Conference presentations:

- Epidemiological Characteristics and Trend of Suspected Measles, Uganda, 2011 – 2018 at the National Field Epidemiology Conference, Kampala, 2019
- COVID-19 Health Facility Operational Readiness Assessment in the Urban Setting of Kampala and Wakiso Districts, Uganda April 2020 at the National Field Epidemiology Conference, Kampala, 2020
- Preparedness efforts in Uganda and control of imported Ebola Virus Disesase, June 2019 at the Epidemic Intelligence Service (EIS) conference in Atlanta

Manuscripts

- Epidemiological Characteristics and Trend of Suspected Measles, Uganda, 2011 – 2018
- COVID-19 Health Facility Operational Readiness Assessment in the Urban Setting of Kampala and Wakiso Districts, Uganda April 2020
- Food Poisoning Outbreak Caused by

Consumption of Contaminated Food with Jimson Weed Lamwo District, Uganda

 Preparedness efforts in Uganda and control of imported Ebola Virus Disease, June 2019

Summary of Epidemiological Study: COVID-19 Health Facility Operational Readiness Assessment in the Urban Setting of Kampala and Wakiso Districts, Uganda, April 2020 Background:

Health facilities play a critical role in surveillance for and management of COVID-19 cases. On 21 March 2020, the Ministry of Health activated its coordination structures to respond to the pandemic. On 28 April 2020, we assessed health facility operational readiness for COVID-19 at 59 heath facilities [government, private not-forprofit (PNFP), and private for-profit (PFP) hospitals, and Health Centers (HC) II, III, and IV] in the capital district of Kampala and neighboring Wakiso.

Methods:

The World Health Organization COVID-19 readiness assessment tool was adapted for Uganda to assess health facilities. Health facilities were assigned readiness scores based on capacity to address COVID-19 needs in 1) surveillance and laboratory, 2) case management and Infection Prevention and Control (IPC), and 3) logistics. Readiness scores were derived using principal component analysis (PCA) and reported as quintiles.

Result:

Overall, 14 (24%) health facilities were in the top readiness guintile for case management and IPC, 13 (22%) for logistics and 12 (21%) for surveillance and laboratory. PFP had the most facilities (7/29; 25%) in the top readiness combined quintile; government (2/13; 17%) and PNFP (2/17; 13%) had the fewest. Five (25%) HCII facilities, three (20%) hospitals, three (17%) HCIII, and no HCIV were in the top combined readiness quintile. Kampala district had 14% of the facilities in the top combined readiness quintile compared to Wakiso (33%); Kampala also had more facilities in the bottom quintile (29%) compared with Wakiso (0%). Kampala consistently had the most facilities in the bottom quintile across surveillance and laboratory (26%), case management and IPC (26%), and logistics (27%).

Conclusion:

Few health facilities in Kampala and Wakiso districts were operationally ready for COVID-19 across any of the metrics evaluated; however, Kampala was consistently less prepared than Wakiso. As a result of our evaluation the Ministry of Health provided COVID-19 guidelines to health facilities, trained health workers in case identification, surveillance, laboratory, patient management, and IPC, and provided personal protective equipment and ambulances to transport confirmed cases to isolation units. Assessment of readiness elsewhere may allow other districts to also identify critical gaps in preparedness.

Key words:

COVID-19, Uganda, Health Facility, readiness, assessment, surveillance, laboratory, case management, infection prevention and control, Uganda COVID-19 heath facility operational readiness feedback meeting with the district health officer and surveillance focal person, Wakiso District, April 2020

Key lessons

- Scientific writing
- Data management and analysis skills
- Presentation skills
- Outbreak investigation skills
- Cost analysis studies
- Evaluating surveillance systems
- Implementing quality improvement projects
- Critical thinking and organizational skills
- Leadership skills
- Networking skills with colleagues and experts in similar field

Next Steps

Ground myself in field epidemiology through service in International organizations and universities among others. Additionally, to publish the work done during the training in peer reviewed journals.

Pictorial and narrative



Interviewing one of the households that had consumed contaminated food, Palabek refugee settlement, Lamwo district



Enhanced surveillance training, Luwero district 2020



Dr Yvette Wibabara

MBChB (Mak), MSc (Mak), Field Epidemiology Fellow (UPHFP)

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HOST SITE: STI/AIDS Control Program **Host Mentors:**

Dr Peter Mudiope Dr Joshua Musinguzi

Fellow's Profile

Yvette holds a Master of Science in Clinical Epidemiology and Biostatistics from Makerere University with а background in human medicine. I joined this program in 2019 and what captured my mind is the training through service in applied epidemiology and public health leadership. I have been equipped with knowledge and skills through a hands-on experience. The program has complemented my previous training by engaging me in large dataset analyses, scientific national writing, level scientific presentations, meetings, trainings to mention but a few, hence building my capacity. I have attained a spirit of excellence and problem-solving skills in my practice as an epidemiologist. During my time as a Fellow, I was attached to the STI/AIDS Control Program (ACP). While there, I led various national level trainings and supervisions, supporting mainly the strategic information and the prevention arms of the program.

Key achievements at ACP

- National trainer HIV Recency Surveillance project.
- Trained health workers on the implementation of Recency in the regions of Rwenzori, greater Masaka, Hoima, South western, Mubende, Kampala and Wakiso regions.
- Led site activation teams for Recency testing in the same regions.
- Member of the writing team for the PMTCT impact evaluation report (both base line and follow up reports)
- Participated in COAG baseline assessment in Busoga region in the districts of Bugiri, Bugweri, Namutumba, Kaliro, Mayuge and Jinja Districts.
- Participated in validating new DHIS data tools for ACP
- National trainer for Covid-19 surveillance: Conducted various trainings in KCCA facilities, prisons and Mulago Women's specialized Hospital. I also supported 5 districts of Mubende region as an epidemiologist
- Participated in various technical working groups at ACP
- Participated in the ACP M&E strategic plan writing
- Part of the writing team for the HIV epidemiologic status Report

 Participated in SWOT analysis and results framework development of the EMTCT plan

Program-specific deliverables Outbreak investigations and other projects

• I led an investigation of Leprosy in Lira District March 2019. This involved all cohort fellows.

I also led an investigation of TB diagnostic discrepancy in the prisons on Jinja, Mbale, Soroti and Moroto, Feb 2020

- I coordinated Ebola Virus Disease (EVD) Surveillance at the Symposium of Episcopal Conferences of Africa and Madagascar (SECAM) at Namugongo Catholic Shrine, Sep 2019
- I did preliminary investigation of an ٠ unknown, acute and fatal disease in one family in Kagadi District as well as investigation of neonatal deaths in Bukooba village Sekanyonyi subcounty Mityana district. These two investigations were resolved with the support of district surveillance focal ground without persons on necessitating travel to the field
- I Co- investigated the food poisoning outbreak caused by consumption of contaminated corn-soy blend meal in Napak and Amudat Districts March 2019, Evaluation of Isoniazid (INH) adverse events in Kampala, COVID-19 screening of travelers at Entebbe International Airport, as well as Malaria Data Quality Assessment conducted in selected health facilities in 15 districts, Uganda, March 2020

- I analyzed program data on HIV testing yield during pregnancy and postnatal periods, a descriptive analysis of surveillance data (2015-2018)
- designed and implemented two projects, one on Factors influencing Turnaround Time of GeneXpert Test Results at Lower-Level Health Facilities, City, Kampala Uganda, January-2018, the December second on Improving Recency Testing in Rwenzori Region Using Continuous Quality Improvement Approaches, Uganda 2020.

Conference presentations

- Oral presentation on HIV testing yield during pregnancy and postnatal periods, a descriptive analysis of surveillance data (2015-2018) at the National Field Epidemiology Conference, Kampala, 2019
- Oral presentation on Recency Testing Initiative: the Ugandan Case study at the National Field Epidemiology Conference, Kampala, 2019
- Oral presentation on investigation of TB diagnostic discrepancy in the prisons on Jinja, Mbale, Soroti and Moroto, Feb 2020 at the National Field Epidemiology Conference, Kampala, 2020
- Poster presentation on Factors influencing Turnaround Time of GeneXpert Test Results at Lower-Level Health Facilities, Kampala City at the PEPFAR summit 2020 Kampala
- Poster presentation on HIV testing yield during pregnancy and postnatal periods, a descriptive analysis of surveillance data (2015-2018) in Uganda, at the Joint

Annual Scientific Conference (JASH Conference), 2019, Kampala

Written communication

- Editor of Volume 4 issue 2 April-June Uganda National Institute of Public Health (UNIPH) epi bulletin
- Authored three articles in the UNIPH epi bulletin
- An investigation of Leprosy in Lira district, Uganda, Feb- March 2019
- The Uganda Public Health Fellowship Program Bids Farewell to Their Resident Advisor
- Uganda Holds the First African Hepatitis Summit
- Policy brief: The Hepatitis B vaccine birth dose should be part of Uganda's routine immunization Schedule
- Newspaper article: Why you need to check for Hepatitis B, just like HIV during pregnancy, published in the New Vision dated 11. July 2019

Manuscripts written

- Manuscript on HIV testing yield during pregnancy and postnatal periods, a descriptive analysis of surveillance data (2015-2018). Submitted to AIDS research Therapy BMC Journal for peer review and publishing. Responded to the comments from the journal reviewers.
- Manuscript on Factors influencing Turnaround Time of GeneXpert Test Results at Lower-Level Health Facilities, Kampala City. Undergoing review by the resident advisor.

Abstract for the Quality Improvement project

Title: Improving Recency Testing in Rwenzori Region Using Continuous Quality Improvement Approaches, Uganda 2020

Background

In a bid to achieve HIV epidemic control, Uganda has initiated point-of-care recency testing using the Asanté[™] HIV-1 Rapid Recency[™] Assay test kit, which distinguishes between recent (acquired within 12 months) and longstanding infections. Results are to be used for surveillance to identify hot spots for new infections through geo-mapping and guide targeted interventions in the affected regions.

The phased implementation of this project started with trainings in selected districts, on competency to conduct the quality assurance and test, data followed management, site by activation. The project implementation involved shipping samples to Uganda Virus Research Institute (UVRI) for verification of the recency test results. However, four months into the implementation which started in Rwenzori region, some facilities had not implemented recency, as evidenced by no samples received at UVRI in Jan 2020. This hindered the realization of the set targets in terms of numbers. We utilized quality improvement approaches in selected sites in Rwenzori region to improve recency testing.

Methods

implemented We the Quality Improvement Project in Nyabbani and Mahyoro HC III's in Kitagwenda district, Rwenzori region. We identified the root causes of the gap in Recency testing. We collected data from the HIV testing register, Recency Testing logbook, and consent forms to serve as our baseline. The data characterized a gap in enrollment to Recency. Using the fish bone analysis, we identified the problem. We conducted continuous medical education sessions on Recency testing for the testers, provided tools for proper documentation (consent forms) and trained the testers on how to fill the documents. There was monthly data collection, analysis and interpretation of results.

Results/Outputs

There was an increase in the proportion of HIV patients enrolled for Recency in facilities. both For Mahyoro the percentage of patients enrolled for recency increased from 0 % in the three months from site activation to 80% in May-June 2020 in while in Nyabbani HCIII the percentage enrollment rose from 0% to 90% during the same period. By September 2020 when the project ended, all facilities had reached 100% enrollment into Recency

Conclusions

The project achieved an improvement in Recency enrollment in Mahyoro and Nyabbani HC III's from 0% to 100%. This was attributed continuous mentoring and monitoring visits. The implementing teams need regular refresher trainings to improve on their confidence and knowledge in testina. We conducting recency recommend continued mentorship and support supervisions for healthcare workers involved in recency training.

Key words: Recency, testing, HIV

Skills/ Lessons learnt

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

- Conducting outbreak investigations
- Evaluating and strengthening surveillance systems
- Project desining, implementation monitoring and evaluation
- Scientific writing and presentation; Manuscripts, Abstracts and Policy Briefs
- Editorial skills for scientific articles
- Public speaking
- Data collection and analysis with different soft ware
- Networking skills
- Balancing work and family and multitasking
- Time management duri project implementation

Next steps

I hope to use all the knowledge and skills acquired to impact my community through expert service where need arises or an oportunity presents. I also hope to mentor those after me in this program if given a chance.

Pictorial and Narrative



Dr Yvette (standing) going through recency tools with the health workers at Mahyoro HC III Kitagwenda District, Rwenzori Region



Dr Yvette (1st from the right) during a high-level presentation to the US secretary for health, US ambassador for Uganda, Minister of health Uganda and other delegates.