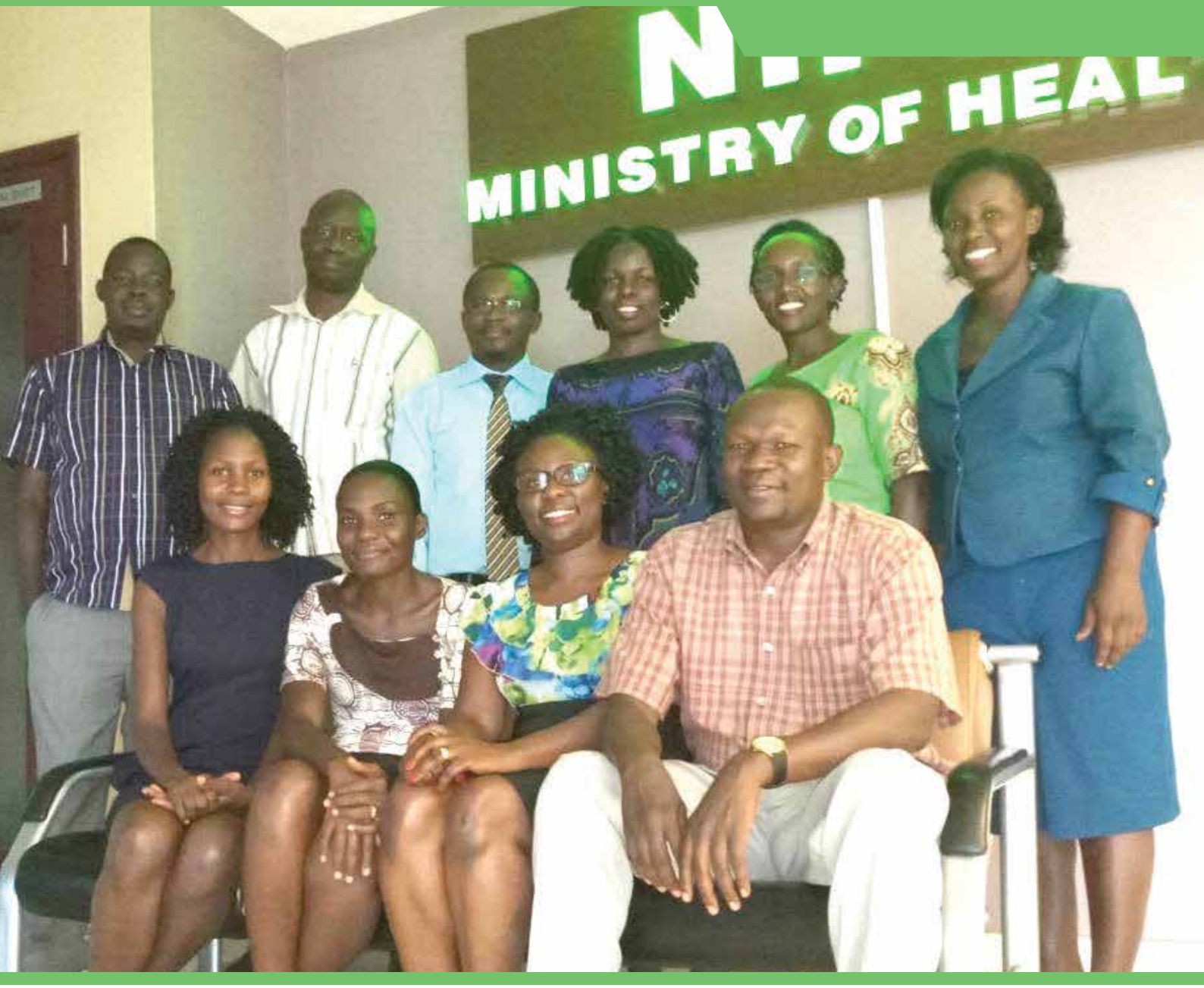


Cohort 2016

Fellow's Summary Report

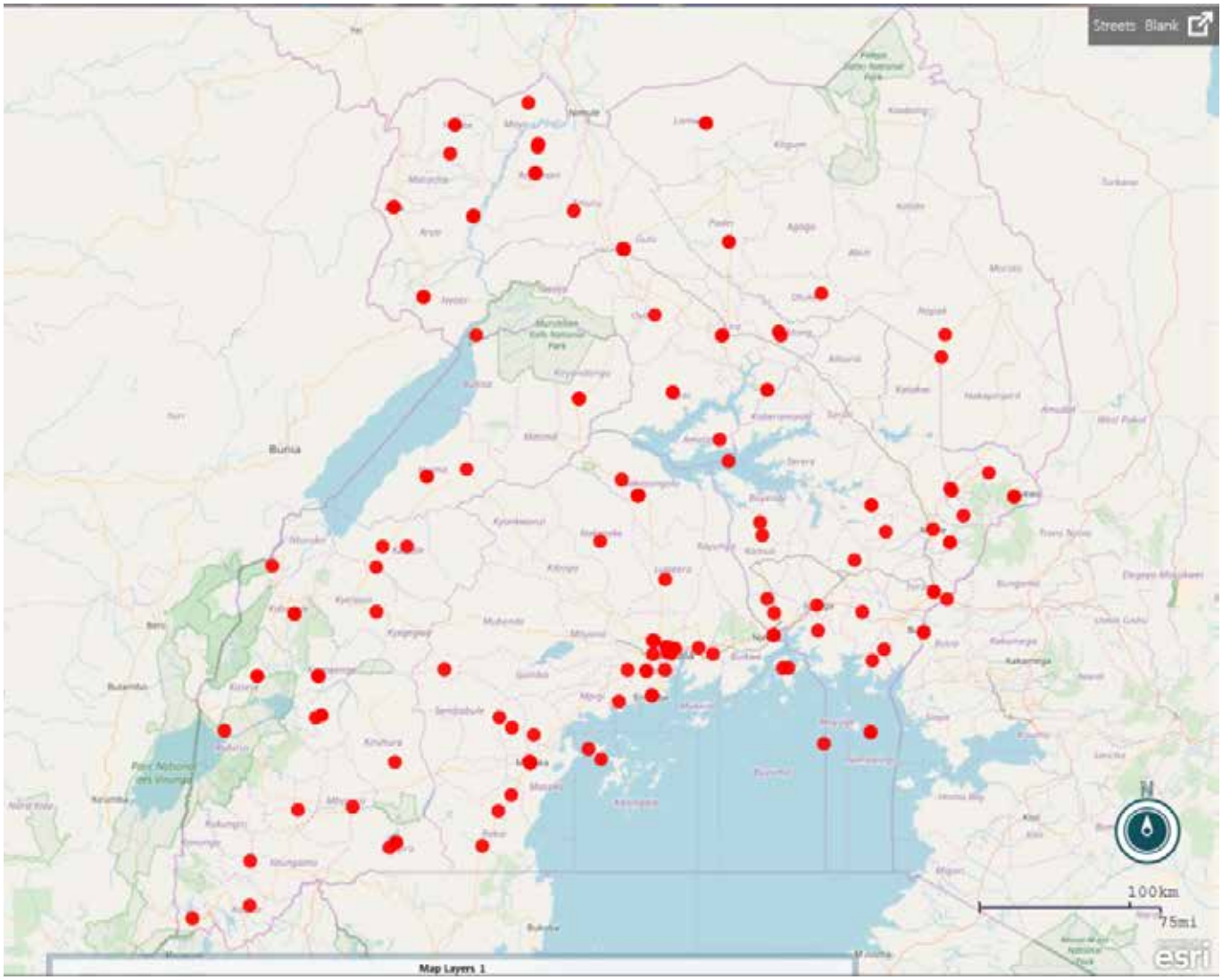
January 2018

Uganda Public Health Fellowship Program

MINISTRY OF HEALTH

CENTERS FOR DISEASE CONTROL AND PREVENTION

Makerere University



Map of Uganda showing districts in which field investigations have been carried out by Fellows of the Uganda Public Health Fellowship Program during 2015–2017

Disclaimer

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THE UGANDA PUBLIC HEALTH FELLOWSHIP PROGRAM (PHFP) BRIEF

The Public Health Fellowship Program is a capacity building program being implemented by the Ministry of Health (MoH) in conjunction with Makerere University School of Public Health (MakSPH) and the US Centers for Disease Control and Prevention (CDC). It is a two-year training-in-service program aimed at equipping public health professionals with skills to manage public health challenges and become the next generation of public health leaders. Currently, all Fellows are enrolled on the Field Epidemiology Track (FET). The PHFP – FET is a 2-year training-through-service program in applied epidemiology and public health leadership. The minimum requirements for enrolment on the program are the possession of Master's Degree in a health related field and at least 3 years of work experience in the public health sector.

Fellows develop competencies by providing valuable public health services to the Ministry of Health and District Health Teams. Fellows spend up to 80% of the time on field projects with supervision and mentorship provided by the Ministry of Health (MoH), US CDC and MakSPH. Through this placement, fellows provide technical assistance and fill key human resource gaps at priority departments of the Ministry of Health. Some of the departments that are currently hosting Fellows include the National Malaria Control Program, AIDS Control Program, the Emergency Operations Center, the Neglected Tropical Diseases Program, Reproductive Health Division, Mental Health and Substance Abuse, Uganda Cancer Institute, National Tuberculosis and Leprosy Program, Uganda National Laboratory Health Services, among others.In addition, Fellows develop competencies in emergency outbreak investigation and response.Fellows have investigated and contributed to the eventual containment of diseases such as Typhoid fever, measles, yellow fever, rift valley fever, cholera, to mention but a few. Worth noting is the recent involvement in the response to and control of the deadly Marburg Virus Disease.The evidence generated during outbreak investigations is used to inform public health actions where the outbreak occurs.

The remaining 20% of their time on the program is spent in interactive didactic training at MakSPH. Fellows attend a 6 weeks introductory course in introductory epidemiology at the beginning of the program and an additional 6-8 weeks in advanced epidemiology and biostatistics at the end of their first year on the program. The fellows are then placed at their host institutions for the rest of their time on the fellowship.

After graduating from the Program, some graduates have been retained to work on the program, while others have been placed at key public health institutions such as the World Health Organization (WHO), African Field Epidemiology Network (AFENET) and the Ministry of Health.This report details the work that has been done by Fellows in the second cohort (2016) since the start of the PHFP-FET.

PREFACE

The Uganda Public Health Fellowship Program (PHFP) has enrolled 41 Fellows in Field Epidemiology Track since 2015, 10 in 2015, another 10 in 2016, additional 11 in 2017 and the newest 10 in 2018. Over the past 3 years, the 30 Fellows have conducted more than 60 outbreak investigations on high priority diseases of public health importance; thereby contributing to their effective management and control. They have also analyzed public health surveillance data and conducted evaluation of public health surveillance systems with the aim of improving detection of disease epidemic alerts and prompting early response. All in all, Fellows have implemented a total of 252 projects, which is no mean achievement.

In addition, Fellows have made 132 presentations at national and international conferences, winning four awards including the prestigious CDC Director's Award for Excellence in Outbreak Investigation 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.

Another important achievement is the rejuvenation of the Ministry of Health Bulletin code named Uganda National Institute of Public Health Quarterly Epidemiological Bulletin where Fellows have participated very effectively as editors and article contributors. Nine volumes have so far been produced since commencement of the program three years ago. In addition, PHFP has initiated three new bulletins i.e. Neglected Tropical Diseases Bulletin, National TB and Leprosy Program Bulletin and Non Communicable Diseases Bulletin, where the fellows and other MoH epidemiologists and officers publish valuable public health information for consumption by the public and scientific world.

Fellows have submitted a total of 40 scientific manuscripts to reputable peer-reviewed journals. Seventeen manuscripts have so far been published and the other 23 have been either been accepted orstill undergoing peer reviews. This report presents the profiles of Cohort 2016 Fellows and their achievements over the two-year period of training in service from January 2015 – December 2017. Enjoy the reading!

Joselyn Annet Atuhairwe
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Host Mentors: Dr. Jimmy Opigo, Dr. Myers Lugemwa
Academic Mentor: Dr. Adoke Yeka, MakSPH

About the Fellow

Joselyn Annet Atuhairwe is a medical and veterinary entomologist/parasitologist with excellent skills and experience in epidemiology. She holds a Master of Science degree in Biology and Control of Parasites and Disease Vectors from University of Liverpool, United Kingdom and a Bachelor of Science degree in Zoology and Botany from Makerere University, Uganda. She is a fellow alumnus of: International Atomic Energy Agency (IAEA) in the field of Insect Pest Control and International Livestock Resources Research Institute (ILRI), Kenya where she evaluated the use of Insecticide Treated Netting (ITN) for control of flies in Butcheries in Nairobi, Kenya.

Prior to joining the Uganda Public Health Fellowship program, Joselyn worked as an entomologist with Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) on the African Union funded tsetse and trypanosomiasis eradication project: "Creation of Sustainable Tsetse and Trypanosomiasis Free Areas in East and West Africa" (STATFA), Uganda component. She spearheaded the Sterile Insect Technique (SIT) component of the project providing leadership to eight insectary, field and support staff. Together with eight other entomologists, she established a colony of Glossina fuscipes fuscipes using wild material from Buvuma Islands. She was part of the team that designed and implemented: entomological monitoring; operational research studies to inform and support tsetse control interventions and studies to evaluate the effectiveness of new vector control tools. Joselyn was also part of the team that designed the Uganda Tsetse and Trypanosomiasis Eradication Program (UTTEP) a document which doubles for resource mobilisation and guiding tsetse control and eradication efforts in the country. Joselyn is keen on using surveillance data for early warning and detection of epidemics to allow for prompt response to contain epidemics.

Achievements at the host site

Joselyn was based at the National Malaria Control program of Ministry of Health Uganda. Here she was a member of the national Insecticide Resistance Management (IRM) taskforce and two

Technical Working Groups (TWGs) namely: Malaria Surveillance, Monitoring and Evaluation-Operations Research (SME-OR) TWG and the Integrated Vector Management (IVM) TWG.

During the first quarter of her stay at NMCP, Joselyn was assigned a task to coordinate Indoor Residual Spraying activities in 11 districts in Northern Uganda on-behalf of the Program Manager. This was part of the intermediate response to the Northern Uganda malaria epidemic which started in 2015. She ably took on the responsibility and worked with a multidisciplinary, multi-stakeholder team to develop the IRS implementation strategy and refined the budgets. Joselyn later worked with her team through the Ministry of Health financial management system to effectively coordinate implementation of the activity in the epidemic districts. She coordinated the regional training meetings in IRS, drafted management letters to the implementing district administration, organised multi-stakeholder engagement meetings to review progress of implementation of the malaria epidemic response plan which was followed by bottleneck analysis to identify barriers to implementation. She closely followed up jointly agreed resolutions from these meetings and ensured their implementation.

Joselyn also undertook other assignments at NMCP ranging from analysis of surveillance data, co-authoring policy documents and implementation guidelines, establishment of surveillance systems and support supervision summarised below:

- She analysed Health Information Management (HMIS) data to determine the effectiveness of IRS in Northern and Eastern Uganda. From this she developed an abstract titled: "Changes in malaria morbidity following Indoor Residual Spraying: a comparative analysis of IRS and non-IRS districts in Eastern and Northern Uganda, 2013-2016". She presented this abstract at the 3rd National Field Epidemiology conference and has also submitted it for consideration for the 67th Annual EIS conference in Atlanta. She is drafting a manuscript from the same work.
- She analysed data from the Uganda Malaria Surveillance Program (UMSP) to determine the country's progress towards adhering to the test and treat policy for malaria case management. From this she developed a policy brief titled: "Adopt the Uganda Malaria Surveillance Program Model to improve adherence to Malaria Test and Treat Policy". The policy brief was published in the UNIPH quarterly epi-bulletin.
- She is a co- author of the Uganda IVM strategy, IVM implementation guidelines and IRM plan.
- She developed a roadmap for the development of the Uganda Malaria Dashboard, a document that was adopted to guide the process.
- Member of the team spearheading the establishment of the first ever national entomological surveillance and information management system for Uganda.
- Lead author of the "Guidelines for establishing the entomological surveillance system for malaria vectors in Uganda"
- She authored a newspaper article: "Embrace the on-going mass mosquito net campaign" as a way of sensitising the masses.
- She offered support supervision to health facilities in Kiryandongo, Buliisa and Kibaale districts.
- Supported 11 northern Uganda malaria epidemic districts to develop work plans for malaria activities. Emphasis was put of integrating surveillance in malaria control.

Program specific deliverables

Joselyn was involved in outbreak investigations and other epidemiological studies.

- Led the investigation of the March 2016 cholera outbreak investigation in Namayingo

district. From which she developed an abstract: "Spreading like a Wild Fire: A Tale of Three Cholera Outbreaks - Namayingo District, Uganda, March 2016". She made an oral presentation of the abstract at the: Joint Annual Scientific Health conference 2016; 1st Biosafety and Biosecurity and 2nd field Epidemiology conference in November 2016 and the 9th TEPHINET Global Scientific Conference in Chiang Mai Thailand, August 2017. She also published the article in the UNIPH bulletin. Joselyn has drafted a manuscript from this work entitled: "A Cholera outbreak associated with drinking untreated lake-water and geographically spread by movement of case-persons: Namayingo District, Eastern Uganda, March 2016"

- Co-investigator of the August 2017 Measles outbreak in Lyantonde district. She is co-author of the abstract: "Measles Outbreak Amplified by Hospitalization at a Pediatric Ward: Lyantonde District, Uganda, August 2017" which wassubmitted to the 67TH EIS conference in Atlanta for consideration.
- Lead investigator of the "Cost Analysis of Measles Outbreak and Response in Lyantonde District".
- Analysed the Uganda Prisons survey data to determine "Knowledge, Willingness and Uptake of Safe Male Circumcision for HIV prevention amongst Prisoners in Uganda".

Summary of an Epidemiologic Study: Changes in malaria morbidity following Indoor Residual Spraying: a comparative analysis of IRS and non-IRS districts in Eastern and Northern Uganda, 2013-2016

Introduction: Uganda contributes the fourth-highest number of cases to the global malaria burden, accounting for 8,480,000 cases in 2015. Indoor Residual Spraying (IRS) of insecticides is a proven effective intervention against malaria. Since December 2014, districts in Northern and Eastern Uganda have implemented IRS. We analysed malaria surveillance data for 2013-2016 to compare malaria morbidity before and after application of IRS in Eastern and Northern Uganda.

Methods: We analysed routine malaria surveillance data reported to the Uganda Health Management Information System during 2013-2016. We fit a negative binomial regression model to total confirmed malaria cases reported in five IRS districts and five non-IRS districts, using the natural log (Ln) of the population as the offset. We included rainfall level, Monthly Blood Examination Rate (MBER), district reporting rates, and 2013 (as baseline) total confirmed malaria cases as covariates. The IRS and non-IRS districts included in the study were from the same region with comparable malaria incidence at baseline.

Results: Malaria incidence in IRS districts decreased from 19/1000 population in 2013 to 14/1000 population in 2016 ($p<0.0001$), while non-IRS districts registered an increase from 13/1000 population in 2013 to 25/1000 population in 2016 ($p<0.0001$). The modelling results showed that, in reference to 2013 levels, IRS districts had 47% fewer confirmed malaria cases than non-IRS districts by 2016 (Incidence Rate Ratio [IRR]=0.53; 95% CI=0.43-0.66) after offsetting for Ln population and accounting for district reporting rates, rainfall, MBER and baseline malaria cases.

Conclusion and Recommendations: IRS application was associated with a significant reduction in malaria morbidity. We recommend that IRS be used as one of the key strategies for malaria control in all remaining endemic regions of the country.

Figure 1: Joselyn Annet Atuhairwe interacting with the VHT during a cholera outbreak investigation in Namayingo district, March 2016

Emily Atuheire Barigye
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Host Mentors: Dr. Nakiganda Blandina, Dr. Livingstone Makanga
Academic Mentor: Dr. Elizabeth Ekirapa, MakSPH

About the Fellow

Ms. Emily Atuheire is a graduate holder of Master of Public Health and Bachelor of Environmental Health Science from Makerere University, Kampala, Uganda. She's an upcoming public health epidemiologist with a passion for maternal and child health. Emily is a proactive and dynamic leader with a pragmatic approach to undertaking assigned projects. Prior to joining the Public Health Fellowship Program in 2016, she had over 10 years' experience in environmental health practice and 3years in reproductive maternal and child health epidemiology.As a fellow, Emily has been hosted at the Ministry of Health's Reproductive Health Division (RH), within the Community Health Department. The Division is responsible for policy development and gives oversight to reproductive, adolescent, maternal and child health policy and programing.

Achievements at Host Institution

While at the RH division, Emily used her leadership and writing skills to contribute to the division's mandate of developing policies and guidelines; she coordinated the writing of the national guidelines for maternal and perinatal death surveillance and response (MPDSR) including development of training materials for health workers. She has subsequently supported training of regional and district teams on implementation of the revised MPDSR guidelines which is ongoing. She used her excellent epidemiological skills, to successfully implement a quality improvement project for identifying and managing hypertensive disorders of pregnancy in Bududa hospital, contributing to

improved outcomes for pregnant mothers and newborns. As part of her contribution to quality improvement initiatives for maternal child health, Emily recently coordinated a national training of trainers for 'BABIES MATRIX', a powerful quality improvement tool that uses locally generated data to inform decisions and actions for improved quality of care for maternal and child health.

Program Specific Achievements

Emily has had several other achievements during her fellowship period in the following areas:

Emergency response

- Lead investigator, Yellow fever disease outbreak, April 2016
- Participated in investigation of suspected aflatoxicosis in Bukomansimbi District and mercury poisoning outbreak in Amudat District
- Lead investigator, rapid assessment of disease surveillance system in refugee settlements in Arua (Rhino Camp) and Adjumani (Mungula, Ayilo, Pagirinya and Boroli) Refugee Settlements.
- Lead investigator, rapid assessment of HIV services delivery in Adjumani hospital, Mungula HC IV, Ayilo HC II & III, Pagirinya HC III and Bira HC III.
- Member of the National Rapid Response Team

Public health surveillance

- Documented the trends of caesarean section births in Ugandan Health Facilities through report writing
- Participated in data analysis and writing of the national Annual Health Sector Performance Report of the Ministry of Health,2016

Leadership and management

- National trainer for Integrated Disease Surveillance and Response and Maternal Perinatal Death Surveillance and Response
- Mentored a team of Frontline Health Workers on disease and event surveillance in refugee settings for timely and effective response in Arua

Scientific communication

- 4 Presentations at national and international conferences including the Ghana Field Epidemiology and Laboratory training program conference Sept 2017:
    - Evaluation of water sanitation and hygiene infrastructure in health care facilities in Kamwenge district, March 2017
    - Rapid evaluation of disease surveillance in Rhino camp refugee settlement in Arua district, Sept 2016
    - Trends of cesarean section in Uganda, Nov 2016
- Published 2 articles in the Uganda National Institute of Public Health bulletin
    - Strengthening Disease Surveillance in Rhino Camp Refugee Settlement - Arua District, Sept 2016
    - Uganda adapts the WHO medical eligibility wheel for improved quality Family Planning care, June 2016
- 2 manuscripts currently under review
    - Spatial and Temporal Trends of Cesarean Section Deliveries in Uganda: 2012-2016
    - HIV transmission and related behavioral risk factors associated with early sexual debut among women in fishing communities in Lake Kyoga basin, Uganda, 2013-2014

Summary of the Quality Improvement Project:Improving Identification and Management of Hypertensive Disorders in Pregnancy, Labour and Puerperium in Bududa Hospital, Oct 2017

Introduction: Hypertensive disorders of pregnancy (HDPs) are important contributors to maternal and perinatal mortality accounting for 14% of maternal deaths worldwide and 18-20% in Africa [1]. In Uganda, HDPs are an important cause of maternal morbidity, second only to bleeding, with an estimated case fatality rate of 5.1% [2, 3]. Poor diagnosis of the condition due to gaps in assessment and management worsen the problem. A review of Maternal Deaths(MDs) in Mbale Regional Referral Hospital from July 2015 to June 2016 showed an institutional Maternal Mortality Ratio (MMR) of 674/100,000 live births, twice the national MMR of 310/100,000 live births. HDPs were the leading cause of death, accounting for 27% of deaths, followed by bleeding at 21%. Three quarters of MDs were referrals, and 96% of referred conditions should have been managed by the referring facilities. Of the 14 referring Districts, Bududa District contributed the most (15%) referrals leading to MD, despite the presence of a General Hospital. A follow-up survey, found that 78% of the maternity ward staff were unable to correctly administer magnesium sulphate for the management of HDPs per national policy. We set out to improve the identification and management of HDPs through a continuous quality improvement (CQI) approach.

Objectives:

1) To identify knowledge gaps that are causing delayed identification and mismanagement of HDP's in Bududa hospital.
2) To train selected hospital staff on CQI and identification /management of HDPs using ministry of health guidelines/protocols;
3) To monitor and evaluate changes in identification and management of hypertensive disorders during antenatal, labour, delivery and the pueperium.

Method: We reviewed, abstracted and summarized data to identify gaps in delayed identification and mismanagement of HDP's in Bududa hospital.

Found that 33% of women attending ANC had their BP measurements taken, 15% had their BP measurement recorded at first visit and no urine testing for protein during pregnancy. Health workers in ANC and maternity had knowledge gaps in administering treatment for HDPs. We conducted a problem outcome analysis using the fishbone method and prioritized the possible interventions to the identified problems basing on their impact value for the patient outcome - is the proposed change under control of the team?Is it easy to do? and what resources are required to implement it? We used the Plan Do Study and Act (PDSA) approach to set objectives, indicators, targets, activities, assign tasks and executed the plan. We observed the effect of implementation which is increased BP monitoring in pregnancy, labour and pueperium using data. We shared progress in weekly and monthly QI meetings.

Results: From May to September 2017, BP monitoring increased from 33% to 94% in pregnancy and BP measurement at first ANC visit increased from 15% to 84%. Monitoring in labour increased from 27% to 32% and 40% to 88% in the first 2hours post-delivery.

Conclusion and Recommendations: Capacity building for health providers improved BP monitoring in pregnancy, labour and post-delivery. Use of data through reviews, display and analysis helped to track progress.We recommend adoption of the QI methodology used to improve service delivery in other sectors in Bududa Hospital. The model and lessons learntcould be used to implement and spread the strategy to improve maternal health services in Bududa District and beyond.

Figure 2: Emily Atuheire (3rd right) checks on participants from the Antenatal clinic team drafting their improvement aims in Bududa Hospital

Joy Kusiima
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Host Mentors: Dr. Jackson Orem, Ms Nakaganda Annet
Academic Mentor: Assoc Prof Rhoda Wanyenze

About the Fellow

Dr. Kusiima Joy holds a bachelor's degree in medicine and surgery, a master's degree in health services research and a postgraduate diploma in project planning and management. Prior joining the fellowship programme, she worked as a project manager for a cooperative agreement titled: Enhanced surveillance in most at risk populations in the government of Uganda. This was a CDC funded project under Makerere School of Public health. While on the Public Health Fellowship Programme she was hosted at the Uganda Cancer Institute.

Achievements at Host Institution

These are the host specific institutional deliverables which she has been involved in during the two year period;

1) Strengthened the Mayuge Cancer Registry by drafting the protocol, overseeing data collection and offering support supervision on cancer surveillance and registration to health workers in this region.
2) Analyzed the electronic database of records at the Uganda Cancer Institute, drafted a report and disseminated the findings.
3) Analyzed records from the Comprehensive Cancer Control Programme (CCCP).
4) Supported a research protocol titled " Processes and barriers to accessing timely cancer treatment at the Uganda Cancer Institute" this included drafting standard operating procedures for this protocol and responding to reviewer's comments ,overseeing submission to the ethical review board , training research participants, ,chairing and coordinating research meetings.
5) Supported the establishment of the Uganda National Cancer Control Programme by organizing meetings, making presentations and writing minutes following subsequent meetings.

Program Specific Deliverables

The following are the programme specific deliverables Kusiima worked on during the two year period:

1. Led three outbreak investigations. These included; a typhoid verification exercise in Nakaseke District, a measles outbreak in Buvuma district, avian flu in districts surrounding shores of Lake Victoria, cluster of non-specific tumors in Isingiro District.
2. Presented at the 6th East African Health Scientific International Conference which was held in Burundi.
3. Presented in three local conferences: The Joint Annual Scientific Health Conference and the 2ndand 3rd National Field Epidemiology Conferences
4. Published three newspaper articles:The need to strengthen laboratory systems; 10th March 2017; Herbal remedies and supplements not recommended for cancer patients; the New Vision of 27th Feb 2017; why you should be skeptical about the typhoid test; the New Vision of 23 Dec 2016.
5. Published three articles in the MOH quarterly epidemiological bulletin: False typhoid report due to inadequacies in typhoid surveillance; falsely reported cluster of tumors in Isingiro District; Missed opportunities in cancer diagnosis.
6. Conducted a quality improvement project in Nakaseke District titled " Improving typhoid reporting in Nakaseke district using continuous quality improvement science"
7. Prepared a policy brief recommending the introduction of Typhoid Rapid Diagnostic tests to aid typhoid screening.
8. For the epidemiological study, she conducted secondary data analysis using data from the Non-Communicable Disease baseline survey. The study was titled "Uptake and correlates of cervical cancer screening services in Uganda"
9. Submitted a manuscript titled "High burden of HIV, Syphilis and schistosomiasis and low uptake of health services among fishing communities in the Lake Kyoga region".
10. Analyzed the electronic database to describe characteristics of patients seen at the Uganda Cancer Institute.

Summary of Epidemiological Study: Uptake and correlates of cervical cancer screening services in Uganda

Introduction: In Uganda, cervical cancer is the commonest cause of cancer deaths in women. Available screening services are avenues for early cancer detection and prevention. Uganda has no organized cancer screening program but some opportunistic cancer screening is provided by

various providers. Therefore, nationally representative data on uptake of screening services for cancer of the cervix in Uganda is scarce.Using secondary data, we estimated uptake of screening services for cancer of the cervix.

Methods: This secondary analysis was done using data collected from all women 18-69 years who participated in the 2014 Non Communicable Diseases (NCD) risk factor baseline survey. From the main NCD data set, we abstracted variables on: social demographic characteristics (age, residence, marital status, religion), cancer risk factors such alcohol and tobacco consumption, health seeking behaviours such as having as having blood pressure, blood sugar, blood cholesterol done prior the survey and whether a woman had screened for cancer of the cervix. We used proportions/ confidence intervals to estimate uptake of cervical cancer screening services and logistic regression models to estimate correlates of cervical cancer screening services in Uganda.

Results: Of the 1831 participants, 22.2% (n=406) were ≤ 24 years, 74% (n=1358) were from the rural region, 41.1% (751) had primary education as the highest level of education, 62.4 %(1,141) had a form of employment, and 66.9% (n=1225) were married. Uptake of cervical cancer screening services was similar among respondents in the urban (13%) and rural area (8.7%) AOR:0.9 (0.6 - 1.5).It was higher; in the 50-54yr age group (15%) compared to the 25-29 age group (9.3%); aOR; 2.3(95%; CI 1.2 - 5.1), among respondents with tertiary education status (18.6%) compared to those with no formal education (6.7%); aOR; 3.0 (95% CI: 1.5 - 6.5), and higher among those who had blood pressure measurements done (13%)compared to those who had never had a blood pressure measurement done(5.1%); aOR 2.1 (95% CI; 1.4- 3.1)

Conclusion/ recommendations: We report low uptake of cervical cancer screening in the general population calling for a need for organised screening programmes across all regions to improve coverage. Integrating cancer screening services when screening for other non-communicable diseases such as hypertension and diabetes will improve uptake of cancer of the cervix.

Lessons learned (over the duration of the Fellowship), key skills/competences acquired, and next

steps (career path)

Over the past two years, I have acquired the following competencies:

a) Conducting and leading outbreak investigations
b) Performing rapid health assessments in complex situations i.e. refuge situations
c) Analyzing both surveillance and secondary data
d) Conducting projects in continuous quality improvement
e) Communicating effective across different audiences. This includes presenting in both national and international conferences, writing scientific documents.
f) Improvement in writing skills; this includes writing for scientific and non-scientific audiences
g) Technical expertise in networking and stakeholder management.
h) Working with different team members and managing crises

Over the next phase of my life, I will build a career in research with bias to epidemiology, surveillance systems and outbreak investigations. I hope this will contribute to formation of evidence based policies and interventions as far as health care and disease control is concerned. In line with the global health security agenda, I would like to build competencies of field epidemiology among health service providers.

Figure 3: Joy Kusiima interviewing key informant during investigation of a cluster of tumors in Isingiro District

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Academic Mentor: Prof Henry Wabinga, MakCHS

About the Fellow

Leocadia Kwagonza holds a Master's Degree in Public Health (MPH) from Makerere University School of Public Health and a Bachelor's Degree in Biomedical Laboratory Technology (BBLT) of Makerere University. After her academic studies, Leocadia worked as Laboratory Administrator at Clinical Microbiology Laboratory in the department of Medical microbiology at Makerere University. Upon joining PHFP-FET in Jan 2016, Ms. Leocadia was attached to Uganda Cancer Institute (UCI) – the national cancer treatment centre that has the mandate to oversee cancer control activities in the country.

Achievements at Host Institution

While at UCI, Ms. Leocadia received comprehensive cancer training in cancer surveillance and planning. Since that training, Ms. Leocadia has participated in protocol development, training and support supervision of Health workers, baseline analysis of cancer situation in Mayuge for the establishment and strengthening of Mayuge Cancer Registry, a population based cancer registry. She also analysed surveillance data and evaluated data quality of the Kampala Cancer Registry. Besides cancer related activities. Other activities accomplished by Leocadia include:

- Conducting a study to assess client satisfaction with cancer care services at Uganda Cancer Institute.
- Coordinating a study on challenges faced by patients as they seek cancer treatment in Uganda.
- Participated in the National Cancer Control Program as a member on the steering committee.

Program Specific Achievements

- Descriptive analysis of public health surveillance data: The epidemiologic characteristics of top five cancers in males and females in Kampala.
- Led two outbreaks investigations:
    - Outbreak of Yellow Fever in Central and South-western Uganda, February–May 2016
    - A cluster of illness and deaths after eating the meat of a dead pig: Kagadi District, Western Uganda, November 2016
- Participated in four outbreak investigations
    - An Outbreak of Gastrointestinal Anthrax Following Consumption of Meat - Uganda, 2017
    - Measles outbreak in Kampala July-to Dec 2017
    - Cholera outbreak in Bulambuli March 2016

- Published 3 articles in UNIPH quarterly Epi-bulletin
- Published a policy brief on introduction of yellow fever vaccine into routine immunization
- Published a newspaper article in Uganda New Vision on road traffic injuries due to motorcycles "bodaboda" on 28th April 2016
- Made five presentations at national conferences and 3 at international conferences.
    - 2nd and 3rd National Field Epidemiology Conferences (NFEC), November, 2016, 2017 Kampala
    - Joint Annual Scientific Health Conference (JASH), September 2016, Kampala
    - African Field Epidemiology Network Conference (AFENET), August 2016, Abuja Nigeria
    - TEPHINET Conference, August 2017, Chiang Mai, Thailand
    - The 4th High-level ministerial meeting on Global Health Security Agenda (GHSA), Oct 2017, Kampala Uganda
- Four Manuscript undergoing peer review
    - Yellow fever outbreak in central and South-western Uganda: February-May 2016 (Submitted to BMC Infectious diseases journal)
    - Comprehensive Knowledge of HIV Transmission among Fishing Communities of Lake Kyoga, Uganda, 2013
    - Data Quality of Kampala cancer Registry
    - Utilization of Kampala Cancer registry data
- Conducted an epidemiological study: Client satisfaction with cancer care services at Uganda Cancer Institute.

Summary of Epidemiologic Study: Client satisfaction with cancer care services at Uganda Cancer Institute

Background: Patients' judgment of hospital service quality and their feedback are essential in quality of care monitoring and improvement. Uganda Cancer Institute is the only public health institution that provides comprehensive cancer care services in the country. There is limited data on client satisfaction with services offered. We determined the level and factors associated with client satisfaction with cancer care services at Uganda Cancer Institute.

Methods: We conducted a cross sectional study on 365 cancer patients receiving treatment at the institute. We defined a satisfied client as a patient whose perception of service exceeded their expectations. The SERVQUAL instrument with five dimensions (Reliability, Empathy, Assurance, Responsiveness, and Tangible) was used. In addition, demographic and clinical information were collected using a standard questionnaire. STATA v13 was used for analysis.

Results: Client satisfaction was found to be at 32% (117/365). This varied substantially among clients who received private (11%, 7/64) and general services (36%, 111/304). Reasons for dissatisfaction included drug shortages, poor attitude among Health workers and lack of food for patients. Clients who received private services were less likely to be satisfied compared to clients who received general services (AOR=0.3, 95% CI: 0.13-0.70). Clients with formal employment (13%, 11/87) were also less likely to be satisfied with cancer services compared to 36% (60/165) of unemployed clients (AOR= 95% CI:0.15-0.64).

Conclusion: The level of client satisfaction with cancer services was low. Poor health worker attitude, drug shortages and lack of food for patients were the reasons for dissatisfaction. We recommend managers to promote good medical ethics and attitude of medical staff and doctors

towards patients, and attract investors to build high-quality infrastructures to satisfy wealthier patients who choose to pay for the service.

Lessons learnt over the course of the fellowship

Key skills/competencies acquired

- Establishment and strengthening surveillance systems for both Communicable and Non Communicable Diseases.
- Evaluation, analysis and interpretation of surveillance data for routine and humanitarian settings.
- Practical skills in outbreak investigations and control.
- Scientific writing and presentation skills to different audiences– Bulletins, abstracts, power point presentations (at National and International Conferences) and manuscripts.
- Leadership and management and ability to train others in the field of field epidemiology.
- Participating in building partnerships between various stakeholders: Ministry of Health, Makerere University School of Public Health, CDC and other Development Partners.
- Grant writing skills

Next steps in career

Having acquired advanced skills in field epidemiology, my career plan is to become an established Field Epidemiologist in both non-communicable and communicable diseases.

I also have the desire to transfer the knowledge and skills acquired to young people who seek a career in field epidemiology.

Figure 4: Leocadia Kwagonza (in blue dress) during a poster presentation at the High Level Ministerial Meeting on Global Health Security Agenda, Oct 2017, Speke Resort Munyonyo

Robert Kaos Majwala
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Host site: National TB & Leprosy Program, Ministry of Health
Host Mentors: Dr. Frank Mugabe Rwabinumi, Dr. Stavia Turyahabwe
Academic Mentor: Dr. Bruce Kirenga, MakCHS

Fellow's Profile

Robert Majwala is a Ugandan health specialist with more than 7 years' health care experience; He has been hosted at the National TB and Leprosy Control Program where he was charged with strengthening surveillance for drug resistant TB. Prior to joining the fellowship, he was working as a Division Medical Officer at Kampala Capital City Authority. He has experience in health systems management in public and non-governmental organization sectors, rural and urban health.He has previously worked with Doctors with Africa CUAMM as a technical advisor MNCH.

He is a trained medical doctor with masters in health policy, and management from Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania. He has keen interest in use of epidemiological methods in solving global health challenges. He has skills in public health surveillance, outbreak investigations, maternal, neonatal and child health, monitoring and evaluation of health programs for quality improvement and epidemiology of infectious diseases including malaria, vaccine preventable diseases, tuberculosis (TB) and TB/HIV

Achievements during Fellowship:

National TB and Leprosy Program – Host Institution

- Led an epidemiological investigation of a Tuberculosis outbreak in a boarding secondary school in Mukono District, October – November 2017
- Coordinated District TB and Leprosy Supervisor's course 2017
- Led assessment of TB control among refugees in Uganda
- Participated in Global fund grant writing
- Participated in mentorships, support supervision, trainings in TB, TB/HIV
- Gave lecture at DTLS' annual training in Buluba on TB burden and epidemiology in Uganda
- Together with the NTLP Program Manager, led discussions of programmatic implications of

the 2016 TB prevalence survey
- Attended regional review meeting of the Integrated Tuberculosis-Diabetes Mellitus Care (ITDC) Project, Harare Zimbabwe (Nov. 2017)
- Participated in DHIS 2 roll out trainings as a trainer of trainers in Fortportal, Mbale and Kabale regions
- Participated in Programmatic Management of Drug Resistant TB support supervisions and mentorships
- Together with National TB Reference Laboratory, implemented a quality improvement project to improve weekly reports from Genexpert sites. Over a period of 2 years, reporting increased from about 40% in June 2016 to about 80% by November, 2017.
- Co-authored an abstract about programmatic implication of the 2016 TB prevalence survey that was presented the 46th conference on TB and Lung health in Guadalajara Mexico
- Presented a paper about TB outbreak in Secondary School in Mukono District at the Uganda Thoracic Society Scientific Meeting November 2017
- Reply to a misleading newspaper article in the Daily Monitor about use of Honey for TB Treatment, 'Honey not alternative to TB treatment, Tuesday June 28, 2016: (http://www.monitor.co.ug/OpEd/Letters/Honey-not-alternative-for-TB-treatment/806314-3270356-3w456w/index.html)
- Participated in technical working groups including programmatic management for drug resistant TB, pediatric TB
- Participated in reviewing and development of guidelines, standard operating procedures,

Fellowship Program Specific Achievements
- Led an outbreak investigation of a measles outbreak in Mayuge district, Eastern Uganda
- Participated in an epidemiological investigation of Rift Valley Fever Virus in Kabale district, March, 2016
- Led an epidemiological investigation into a reported outbreak of epilepsy in Ibanda District, South Western Uganda, July, 2016.
- Implemented a survey to determine prevalence of epilepsy in Ibanda District
- Participated in 1 cholera, 2 measles, 2 influenza virus disease epidemiological outbreak investigations
- Performed descriptive analysis of burden of epilepsy in Uganda using DHIS 2 data for period 2011 – 2015
- Submitted 1 manuscript to a peer review journal, 2 drafts available, writing is ongoing.
- Wrote a policy brief about 'Policy and Programmatic Implications to Tuberculosis control in Schools following a Tuberculosis outbreak in a Secondary School in Mukono District, Oct. 2017
- Published articles in MoH Epidemiology Bulletin; 2(1st author), 6(co-author)
- Newspaper article in the daily monitor published on World TB day about the need to find missing TB cases, 'we need to find missing Tuberculosis patients'. (http://www.monitor.co.ug/OpEd/Commentary/Need-find-missing-tuberculosis-patients/689364-3861918-12imw1z/index.html)
- Presented at 2 national and 2 international conferences. My abstract titled: A measles outbreak propagated by children congregating at water collection points: Mayuge District, Eastern Uganda, October 2016; that was accepted for presentation at the 66th Annual EIS conference April 24 – 27 2017, in Atlanta Georgia; was presented by a colleague as I was unable to travel due to competing priorities.

Other achievements

- January – October 2017: Participated in a 10 months' (6ECTS credits) fellowship in Biosafety and biosecurity academia for controlling health threats, organized by: Bernhard Nocht Institute of tropical Medicine, Robert Koch Institute, Swiss Institute of Tropical Medicine & African Field Epidemiology Training Network January 2017 – October 2017 (Hamburg, Berlin and Kampala). Areas covered included disease surveillance, outbreak investigations, development of case studies using country specific contexts, international health regulations and management of biological incidents.
- Acquired a competency of development of case studies for training of different cadres of public health professionals in outbreak investigations, disease surveillance and biosafety/ biosecurity

Summary of Epidemiologic Study: A measles outbreak propagated by children congregating at water collection points: Mayuge District, Eastern Uganda, October 2016

Background: On 12 October, 2016 a measles outbreak was reported in Mayuge district. We investigated the outbreak to identify risk factors, evaluate vaccination coverage and vaccine effectiveness, and recommend evidence-based control measures.

Methods: We defined a probable case as onset of fever (≥3 days) and generalized rash, plus ≥1 of the following: conjunctivitis, cough, runny nose in a resident of Mayuge (population: 480,079). A confirmed case was a probable case with measles-specific IgM (+) not explained by vaccination. We reviewed medical records and conducted active community case-finding. In a case-control investigation involving probable cases and age- and village-matched controls, we evaluated risk factors for transmission during the case-person's likely exposure period (7–21 days prior to rash onset). We estimated vaccine effectiveness (VE) using the formula: VE≈100 (1-ORprotective). We calculated vaccination coverage using the percent of controls vaccinated.

Results: We identified 62 probable cases (attack rate [AR] =4.0/10,000), including 3 confirmed. Males and females had similar ARs. Children <5 years (AR=14/10,000) were the most affected of all age groups. The epidemic curve indicated a propagated outbreak. 32% (13/41) of case-persons and 13% (21/161) of control-persons went to one of the four water-collection sites (by themselves or with parents) during the case-patients' likely exposure period (ORM-H=5.0; 95% CI=1.5–17). The effectiveness of the single-dose measles vaccine was 75% (95% CI=24-92); vaccination coverage was 68% (95% CI=61-76).

Conclusion and Recommendations: Exposures at water-collection sites might have contributed to propagation of this outbreak. Low vaccine effectiveness and vaccination coverage facilitated measles transmission. We recommended intensifying measles vaccination for young children, advising residents with fever and rash to avoid going public gatherings including water-collection sites, and introducing a two-dose measles vaccine in routine vaccination schedule.

Key skills/competences acquired

- Establishment and strengthening surveillance systems
- Evaluation, analysis and interpretation of surveillance data
- Epidemiological investigations: Protocol development, and submission to IRB. Implementation of epidemiological studies, data management, analysis report writing and making actionable recommendations
- Response to a public health emergency including outbreak investigations
- Leadership: Alignment for purpose, motivation, support supervision, mentorship, ethics, protection of individuals in research,

- Management: Mobilization of resources, planning and accountability, negotiation and ability to train others in the public health
- Capacity building: Training of others, mentorship
- Communication (Risk communication, written communication, presentation and use of technology for communication)

Next steps and career path

I intend further my career in the practice of public health using, epidemiological skills that I have acquired during these 2 years of the field epidemiology fellowship. I see myself as a practicing field epidemiologist furthering efforts towards control of communicable and non-communicable disease

Pictorial

Figure 5: Robert Majwala during a training on biosafety and biosecurity

Figure 6: Robert Majwala during Rift Valley Fever outbreak investigation in Kabale District, 2016

Lydia Nakiire
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Host site: Emergency Operations Center, Ministry of Health
Host Mentor: Dr Issa Makumbi
Secondary Mentor : Obua Thomas
Academic Mentor: Dr. Joan Kalyango MakCHS

About the Fellow

Lydia Nakiire holds a master's degree in Public Health and Bachelor of Biomedical Laboratory Technology from Makerere University, Uganda. Lydia started her career as a Laboratory Technologist at the Joint Clinical Research Centre and also worked in other capacities as a deputy head of immunology laboratory and a laboratory mentor. As a laboratory technologist she worked at Pfizer Malaria Research Project (Protocol A0661134) and other projects in collaboration with MRC-UK clinical trials unit. Lydia mentored Nsambya hospital laboratory personnel under the JCRC-THALAS project in collaboration with MOH-SUSTAIN project. She saw the laboratory performance improve steadily from star one to star three of WHO SLIPTA program in two years. Lydia joined the PHFP in 2016 and was attached to the Uganda Ministry of Health (MOH)-Public Health Emergency Operation Centre (PHEOC). The Public Health Emergency Operation Centre is among the Global Health Security Agenda (GSHA) pilot demo projects implemented in March-September 2013. The PHEOC was set up to enhance the countries capacity to detect, prevent and coordinate response to disease outbreaks, natural disasters, bioterrorism and other public health emergencies.

Achievements at the host site

- Member of the MOH National rapid response team in PH emergency and response
- Incident manager responsible for coordinating response to measles outbreaks in Kampala, Wakiso, Lyantonde, Kayunga, Lwengo and Kibuku Districts.

- Trained the Kampala District rapid response teams on surveillance
- Participated in weekly analysis of data for preparation of the Ministry of Health weekly epidemiological bulletin
- Spearheaded the AMR technical area during the Joint external evaluation June 2017
- Participated in AMR technical working group meetings and contributed to designing the National Action Plan for Antimicrobial resistance 2016-2017.
- Participated in the design and implementation of the Uganda Integrated Disease Surveillance and Response (IDSR) evaluation in 2016.
- Supervised ten research assistants in Eastern Uganda during data collection for IDSR evaluation in 2016.
- Participated in Event-Based Surveillance activities at the PHEOC for situation awareness.
- Spearheaded development of the national inventory of dangerous pathogens in Uganda National Council for Science and Technology in 2016.

Figure 7: Lydia Nakiire interviewing caretakers during a measles outbreak investigation in Kamuli, 2016

Figure 8: Lydia Nakiire and Innocent Nkonwa interviewing contact in Kween district, during Murburg outbreak, 2017

Program-specific achievements

Surveillance and Evaluation

- Lydia conducted analysis of the national cholera data from Health Management Information System: 2013-2016 and described epidemiology of cholera.
- Participated in evaluation of the IDSR evaluation in 2016.

Quality improvement project

- Lydia set up a data quality improvement project in Jinja Regional Referral Hospital, one of the AMR sentinel surveillance sites. This is in line with GHSA project of Infectious diseases Institute objectives of improvement of laboratory capacity to test for AMR and quality capacity.

Outbreak investigations

- Led two outbreak investigations
  - i) Measles outbreak investigation in Kamuli, 2016
  - ii) Acute haemorrhagic conjunctivitis in Gulu District, 2017
- Participated 3 outbreak investigations
  - i) Measles outbreak propagated by congregation of children at water collection sites: Mayuge District, Uganda, July-October 2016
  - ii) Marburg outbreak investigation in Kween and Kapchorwa Districts,2017
  - iii) Investigation of a suspected Hereditary Spastic Paraparesis in Ibanda District, 2016

HIV projects

- Lydia analysed Kyoga HIV data set for couple HIV counselling and associated factors
- Lydia analysed BASIIN data set for HIV/Hepatitis B co-infections and associated factors

Communication: Presentations and Publications

- Lydia wrote 3 bulletin articles: Measles outbreak in Kamuli District; Acute haemorrhagic conjunctivitis in Gulu, and Enhanced yellow fever surveillance
- Published an article in Uganda's New vision "Quality improvement training is crucial for improved laboratory standards"
- Lydia made the following presentations:
  - i) Measles outbreak propagated by congregation of children at water collection sites: Mayuge District, Uganda, July-October 2016." Presented at the 65th Epidemic intelligence Conference in Georgia Atlanta, USA.
  - ii) HIV couple counseling and associated factors among HIV infected patients in the Lake Kyoga fishing community." Presented at Joint Annual Scientific Health conference September 2017; submitted and accepted at ICASA conference and it was submitted to the International AIDS Conference 2018.
  - iii) Descriptive epidemiology of acute haemorrhagic conjunctivitis cases in Gulu district, 2017" Presented at the Joint Annual Scientific Health conference September 2017
  - iv) Descriptive analysis of Cholera cases: HMIS data 2013-2016" Presentedat the Joint Annual Scientific Health conference September 2017
- Manuscripts:
  - i) HIV couple counseling and associated factors among HIV infected patients in the Lake Kyoga fishing community." Manuscript submitted to BMC infectious Diseases
  - ii) Measles outbreak propagated by congregation of children at water collection sites:

Mayuge District, Uganda, July-October 2016." Manuscript submitted BMC Infectious Diseases Journal

Leadership and management

- Team lead for stakeholders in the AMR technical area
- Incident manager for measles outbreaks in 6 districts.
- Led 2 outbreak investigations

Summary of Epidemiologic Study: HIV couple counseling and associated factors among HIV infected patients in the Lake Kyoga fishing community

Introduction: Couple HIV Counseling and Testing (CHCT) is a key intervention in the prevention of heterosexual HIV transmission and achievement of the 90-90-90 UNAIDS targets for reducing HIV by 2020. This study assessed utilization of CHCT and associated factors among HIV-infected residents of Kyoga fishing community, a lakeside community of persons considered high-risk for HIV infection.

Methods: We conducted secondary data analysis of the Makerere University School of Public Health HIV behavioural survey data collected in 2013 among residents of the Lake Kyoga fishing community. We used logistic regression to identify factors independently associated with utilization of CHCT.

Results: The analysis included 118 records.The mean age of participants was 38 (SD: 8.7) years; 61 (53%) were women, 98 (78%) attained primary education, and 63 (53%) were in monogamous marriages. Among 118 persons surveyed, 57 (48%) had ever utilized CHCT. Previous discussion of individual HIV results with partner [adjusted odds ratio (aOR) =12; 95% CI: (3.1-46)] and living at a lake landing site (dock where fishing commerce often takes place) for >5 years [aOR=3.8; 95% CI (1.3-12)] increased the odds of ever utilizing CHCT. Traveling away from the landing site within one month before the survey [aOR=0.31; 95% CI: (0.1-0.93)] reduced the odds of ever utilizing CHCT.

Conclusion: Previous discussion of HIV results with a partner and living on the landing site for five or more years increased the odds of utilization of CHCT; recent travel away from the site reduced the odds of CHCT in this Ugandan fishing community. To increase CHCT uptake in this community, we recommended the rollout of interventions that encourage discussion of individual HIV results among couples, and interventions targeting mobile populations who have resided in the area for a shorter time.

Lessons learned

- Analysis and interpretation of surveillance data using Epi info and QGIS. This was particularly informative at the time when reporting during measles outbreak in Kampala and Wakiso was challenging. We used HMIS data to monitor trends of the outbreak
- Outbreak investigation and evidence based decision making.
- Scientific writing and communication skills.
- Networking with PHEOC/ MOH partners and scientists in other field epidemiology training programmes at the EIS conference and through the TEPHIConnect application. TEPHIConnect was particularly useful when I connected to TEPHINET conference 2017 in Thailand.
- Setting up a quality improvement project

Pictorial

Susan Nakubulwa
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Host site: Mildmay Uganda
Host Mentors: Ms Mary Odiit, Dr. Barbara Mukasa
Academic Mentor: Dr. Joan Mutyoba, MakSPH

About the Fellow

Susan Nakubulwa holds a Master of Science degree and a post graduate diploma in Epidemiology from the University London, United Kingdom. She also holds a Bachelor of Science degree in Economics and Statistics from Makerere University, Uganda. From January 2016 to December 2017, Susan was an Epidemiology Fellow with the Uganda Public Health Fellowship Program and she was hosted by Mildmay Uganda. Before joining the fellowship program, Susan was a Data Manager in the statistics section at Medical Research Council (MRC)/ Uganda Virus Research Institute (UVRI), Uganda Research Unit on AIDS where she contributed to the conduct of HIV research studies for over seven years. Currently, she is a member of the Mildmay Uganda Research Ethics Committee where she contributes to the protection of rights, safety and welfare of human research subjects. She also contributes to Quality Improvement in health service delivery. From July to December 2017, she was the team leader of a Quality Improvement project to improve the recording of data for the weekly Short Message System (SMS) Option B+ reporting at Entebbe hospital, Wakiso District. Susan has excellent communication skills and contributes to the dissemination of program and research findings through oral presentations at conferences and writing of manuscripts for publication in peer reviewed journals. She is a member of the Next Generation Global Health Security Network East Africa Working Group and the National Rapid Response Team, Ministry of Health, Uganda. She has contributed to public health in Uganda through investigation of outbreaks for illnesses associated with poisonings, guinea worm and cholera, in order to identify control and prevention measures. In 2016, she led the Rapid Health Assessment of South Sudan Refugees in Uganda. Susan would like to conduct research and contribute to Global Health Security in her future career. She also has interest in contributing to the application of Implementation Science in HIV/AIDS program settings.

Achievements at Host Institution

a) Appointed as a member of the Mildmay Uganda Research Ethics Committee (MUREC) to contribute to the protection of rights, safety and welfare of human research subjects. Contributed to the review of MUREC Standard Operating Procedures, reviewed twenty seven research protocols, led and participated in two site monitoring visits. With the support of Mildmay Uganda, obtained trainings in Research Ethics, Responsible conduct of Research, Good Clinical Practice and participated in two Annual National Research Ethics Conferences.
b) Took lead in writing the protocol to document the best practices of Mildmay Uganda in service for key populations. The protocol was entitled "Evaluation of the strategies for referral, linkage to- and retention in HIV care for key populations at Mildmay Uganda and supported districts of Central Uganda."
c) Analyzed data for a project on the Evaluation of the integration of Isoniazid Preventive Therapy (IPT) and Intensified Case Finding (ICF) into comprehensive routine HIV Care at Mildmay Uganda. Contributed as a co-author of a manuscript entitled "Outcomes of Isoniazid Preventive Therapy (IPT) and incidence of TB among persons attending care at Mildmay Uganda, 2010-2014."
d) Analyzed data and wrote a manuscript entitled "Factors associated with couple HIV counseling and testing among adults receiving HIV Voluntary Counseling and Testing Services at Mildmay Uganda, 2011 -2013."
e) Implemented a Quality Improvement project in order to improve the recording of Option B+ indicators for Short Message Service (SMS) reporting at Entebbe hospital, Wakiso District where Mildmay Uganda is the implementing partner for the elimination of Mother to Child Transmission of HIV program. Wrote the manuscript entitled "Quality Improvement in the recording of Option B+ indicators for SMS reporting, Wakiso District, July – December 2017."
f) Contributed to training and education at Mildmay Uganda Institute of Health Sciences by lecturing on the fundamentals of Epidemiology to students undertaking the Bachelor of Science in Health and Social Systems Management and Bachelor of Science in Human Nutrition and Clinical Dietetics degree studies.

Program Specific Achievements (key deliverables)

Leadership

- Sub-editor of the Quarterly Epidemiological Bulletin of the Uganda National Institute of Public Health, Ministry of Health, from January to September, 2016

Field outbreak investigations

- Led in the Rapid Health Assessment of South Sudan Refugees in Adjumani District
- Led in the investigation of suspected poisoning of workers at a flower farm in Wakiso District
- Led in the investigation of the cholera outbreak in Kasese District
- Participated in the investigation on suspected Guinea worm disease in Isingiro District

Surveillance

- Conducted descriptive data analysis on the topic entitled "Trends of weekly Short Message Service (SMS) reporting on Option B+ indicators for Mildmay Uganda supported districts of central Uganda, October 2016 to March 2017."
- Evaluated the surveillance system on Option B+ indicators.

Quality Improvement

- Conducted a Quality Improvement project at Entebbe hospital, Wakiso District to improve the recording of Option B+ indicators for SMS reporting, July – December 2017.

Communication

- **Manuscripts**
  - Submitted a manuscript entitled "Acute Metam Sodium (Sodium N-Methyldithiocarbamate) poisoning caused by occupational exposure at a Flower Farm – Uganda, October 2016" for publication in the Morbidity and Mortality Weekly Report (MMWR) series.

- **Conference presentations**

a) Presented at the 9th Training Programs in Epidemiology and Public Health Interventions (TEPHINET) Global conference at Chiang Mai, Thailand, August 2017 and the 3rd National Field Epidemiology conference, November, 2017 on the topic entitled "Acute Poisoning due to Occupational Exposure to Metam Sodium at a Flower farm: Uganda, October 2016"

b) Presented at the 2nd National Field Epidemiology conference in 2016 on the topics entitled "Health Assessment for South Sudan Refugees in Adjumani District and the need for Community workers, August 2016" and "Tracking Missed antenatal (ANC) appointments using Option B+ Weekly SMS reporting in central Uganda, January – June 2016"

c) Presented at the 12th Joint Annual Scientific Health Conference (JASH) in September 2016 on the topic entitled "Utilization of Comprehensive Health Promotion Packages Targeted for Refugees in Northern Uganda"

- **Policy briefs**

Wrote two policy briefs entitled "Strengthening the monitoring of Flower Farm activities in Uganda to protect the health of workers" and "Utilization of Comprehensive Health Promotion Packages Targeted for Refugees in Northern Uganda."

- **Newspaper articles**

a) Published an article entitled "Lessons from the recently launched Violence against Children study for Gender Based Violence (GBV) and HIV" in the New Vision newspaper on 22nd December, 2017.

b) Submitted a newspaper article entitled "Infant agony in the era of elimination of mother-to-child HIV transmission" to the New Vision.

Summary of Epidemiologic study: Report on "Factors associated with couple HIV counseling and testing among adults receiving HIV Voluntary Counseling and Testing Services at Mildmay Uganda, 2011 -2013"

Introduction: Couple HIV Counseling and Testing (CHCT) is an approach that contributes to reducing the spread of HIV. In 2012, the World Health Organization rolled out guidelines for CHCT which highlighted some of the potential benefits of the approach as increased strength of the relationship, emotional support, better quality of life and increased uptake and adherence to antiretroviral therapy.In a systematic review on the effect of HIV testing and counselling on HIV acquisition in Sub-Saharan Africa, one of the findings was that testing with a partner was significantly protective for HIV acquisition and the trend was stronger among females than males, Incidence Rate Ratio,

IRR 0.31 (95% CI: 0.19-0.48). Past studies have shown that the uptake of CHCT among health facilities in rural Uganda is at 34% and there is need to scale up the approach of CHCT in the country, given its potential benefits. Therefore, the objective of this study is to identify factors that are associated with CHCT in a routine Voluntary and Testing (VCT) semi-urban setting so that there is a contribution to the body of knowledge that can inform policy on the approaches to focus on in order enhance CHCT during VCT programming.

Methods: The study design was a cross-sectional survey. We conducted secondary data analysis based on data for an earlier study for VCT surveillance for HIV – acquisition. We conducted descriptive data analysis to obtain the socio-demographic characteristics of the study participants and univariable data analyses to investigate the crude associations between CHCT and selected variables of interest. We used the likelihood ratio test for hypotheses testing and adjusted for confounding using logistic regression.

Results: From 2011 to 2013, 12,233 individuals who accessed HIV VCT services at Mildmay Uganda were included in the VCT surveillance database. Of these, 98% (11,930/12,233) were aged 18 years and above and were included in this CHCT study, 43% (5,119/11,929) males and 57% (6,810/11,929) were females. Data on gender was missing for one participant. The CHCT data showed that, 90% (10,792/11,930) came alone and 9.5% (1,138/11,930) came as a couple. After adjusting for both age and education level which were considered as potential confounders, the factors which were associated with CHCT were living with sexual partner, adjusted Odds Ratio (aOR) 2.5, 95%CI 2.2-2.7,($p<0.001$), having ever tested for HIV in the past, aOR 1.5, 95% CI 1.3-1.7, ($p<0.001$). Participants who disclosed their HIV status to their sexual partners when they had their last HIV test were two times more likely to have come to the VCT site as a couple compared to those who had not disclosed the HIV status to their partners in the past, aOR 2.1(95%CI 1.8-2.5), $p<0.001$.

Conclusions and Recommendations: The study findings revealed that the main factors associated with CHCT were those which enhanced communication on VCT among couples. However, the uptake of CHCT was low thus there was the possibility of the lack of awareness of the benefits. There is need to scale up approaches that create awareness of the benefits of CHCT among clients attending routine VCT services in the country. Since there is evidence that communication on VCT among couples is a strong motivator for CHCT, the counselling approaches should be well utilized to emphasize the most appropriate approaches that can increase communication on HIV VCT among couples. There is need for further research in order to identify the barriers of CHCT.

Lessons learnt over the duration of the fellowship

I learnt that having a good working relationship with colleagues and seniors is a key component that contributes to career growth. Through proper planning, it is possible to achieve high levels of productivity from work activities amidst challenging circumstances. I also learnt the techniques for timeliness and multi –tasking mainly through the mentorship I received from my academic mentor. I will always treasure the collaboration with MakSPH.

Key skills/competencies acquired

Communication: Acquired through the PHFP mentorship during preparation for scientific conferences and the trainings in scientific writing and report writing.

Collaboration: Acquired during the implementation of the Quality Improvement project since the fellow needed to collaborate with Mildmay Uganda, the eMTCT implementing partner in

Wakiso District and the Entebbe hospital leadership to ensure success of the project.

Teamwork: Gained while working with colleagues (fellows), district teams and staff at the host institution.

Innovationand creativity: Acquired during writing of protocols, manuscripts and articles for newspapers.

Leadership: Acquired through leading teams during the implementation of the Quality Improvement project and outbreak investigations.

Problem solving:Learnt during the decision making processes during outbreak investigations.

Next steps (career path)

- Since I am part of the team of trained Field Epidemiologists I will provide insights for responding to public health threats within the country.
- I plan to write grants for the generation of research funds and conduct research in the area of HIV/AIDS and other communicable and non-communicable diseases.

Figure 9: Susan Nakubulwa (second from the left) mentors Entebbe Hospital staff during implementation of a Quality Improvement Project (July – December 2017)

Paul Edward Okello
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Host site: Uganda National Health Laboratories, Ministry of Health
Host Mentors: Mr. Ssewanyana Isaac, Mr. Kiyaga Charles
Academic Mentor: Dr. Henry Kajumbula MakCHS

About the Fellow

Paul Edward Okello holds a Bachelor of Science (Hons) in Applied Biology from De Montfort University, a post graduate diploma in Tropical Medicine and Hygiene and MSc Medical Microbiology both from London School of Hygiene and Tropical Medicine, United Kingdom. His BSc thesis was on "The development of a model bacterial biofilm system" while the MSc thesis was on "Serological responses to Bartonella henselae" the aetiological agent of Cat Scratch Disease. Paul has worked in many medical laboratories in Uganda, the most recent and notable of which was his role as Head of Microbiology Laboratory at Joint Clinical Research Centre between June 2007 and December 2015. Paul is currently hosted at Uganda National Health Laboratories Services (UNHLS). At UNHLS, Paul has developed his skills in Applied Epidemiology, effective Communication, and Laboratory support for disease surveillance and public health emergency response. Paul intends to build a career in Field Epidemiology with particular emphasis on the growth of Medical Microbiology to support Public health response.

Fellows' achievements

(a) Uganda National Health Laboratories Services (UNHLS) - Host Site

- Led the monthly and quarterly performance report writing for the Early Infant Diagnosis program. This lead to the creation of the current EID dashboard for real time data.
- Participated in the writing of monthly performance report for HIV Viral load Program. This lead to the creation of the current viral load dashboard for real time data.
- Contributed to the development of the 2016-2021 Strategic Plan and Operational plan for UNHLS.
- Contributed to the revision of the Biosafety, Biosecurity, and Biotechnology Bill of 2012 for presentation to Parliament.
- Contributed to the development of the National Antimicrobial Resistance Surveillance Plan for the Uganda Ministry of Health,
- Contributed to the writing, reviewing, and revising of standard operating procedures for Microbiology laboratory at CPHL

(b) Program-specific achievements

Descriptive analysis of public health surveillance data and submitted a report on "Secondary data analysis of various HIV prophylactic treatments by HIV positive mothers and risk of infants' HIV positivity". Based on 2015 EID data from the Central Public Health Laboratory.

Field investigations:

- (Led): Inter-Country Management of a Cluster of Influenza A/(H1N1)pdm09 Cases: Uganda and Kenya, February 2017
- (Led): A Rapid Health Assessment of Refugees and Internally Displaced Persons in
- Kiryandongo Refugee Settlement, Kiryandongo District, April 2017
- (Led): Evaluation of Disease surveillance system in Kiryandongo refugee settlement
- Kiryandongo District, April 2017
- (Led): Training on Integrated Disease Surveillance and Response in Kiryandongo District, June 2017
- Participated in 2 cholera outbreak investigations in Bulambuli district, the main one being the cholera outbreak caused by drinking contaminated river water in Bwikhonge sub county in March 2016
- Participated in the investigation of a measles outbreak in Bugiri district in Feb 2016
- Participated in the investigation of Avian influenza H5N8 in wakiso, Entebbe, Jan 2017
- Participated in measels out break investigation in kampala, Dec 2017.

Bulletin articles

(i) Lead author: A cholera outbreak caused by drinking contaminated river water, Bulambuli District, Eastern Uganda, March 2016. Issue 1, Volume 3, pages 6-7
(ii) Lead author: "HIV prophylactic treatments by HIV positive mothers and risk of infants' HIV positivity" (based on the Early Infant Diagnosis program of the Ministry of Health)
(iii) Lead author: Inter-Country Management of a Cluster of Influenza A/(H1N1)pdm09 Cases: Uganda and Kenya, February 2017
(iv) Co-authored article on measles outbreak in Kamuli district, in July 2016 UNIPH Epidemiological Bulletin, volume 4, Issue 1, September 2016, page 8-10
(v) Co-authored an NIPH bulletin article on Measles Outbreak in Bugiri District, Feb 2017
(vi) Co-authored article on HIV viral load turn-around times at CPHL/UNHLS. UNIPH Epidemiological Bulletin, volume 4, Issue 1, September 2016, page 11-12
(i) Co-authored an UNIPH bulletin article on Evaluation of Disease surveillance system in Kiryandongo refugee settlement in Kiryandongo District, April2017
(vii) Co-authored an NIPH bulletin article on CCHF outbreak in Nakaseke District in August 2017

Quality improvement project report submitted: Addressing HIV viral load timeliness, test uptake and utilization for achievement of higher viral load suppression rates using continuous quality improvement approach in two health facilities in Mbale District.

Abstracts presented

International: Presented an abstract at the 6th AFENET (African Field Epidemiology Network) international conference in Abuja (Nigeria), Hillton Transcorp Hotel, Late Breaker session of 12th August 2016.

National:

a) 2nd Field Epidemiology conference October 2016, Sheraton Hotel: "HIV prophylactic treatments by HIV positive mothers and risk of infants' HIV positivity" (based on the Early Infant Diagnosis program of the Ministry of Health).
b) 28th September 2017: JASH conference in Kampala, Hotel Africana. Title: Inter-Country Management of a Cluster of Influenza A/(H1N1)pdm09 Cases: Uganda and Kenya, February 2017
c) 3rd Field Epidemiology conference November 2017, Imperial Royale Hotel: Inter-Country Management of a Cluster of Influenza A/(H1N1)pdm09 Cases: Uganda and Kenya, February 2017

Newspaper article

(i) Published in Observer newspaper 13-14 Sept 2017: Learn to deal with deadly ticks. Highlighted the dangers of tick borne diseases including CCHF

Policy brief: Co-authored one on Control of Tick-Borne Crimean-Congo Hemorrhagic Fever Outbreaks in Uganda using the One-Health Approach,pending publication in UNIPH Epidemiology bulletin of April 2018

Manuscripts:

a) A cholera outbreak caused by drinking contaminated river water, Bulambuli District, Eastern Uganda, March 2016 - submitted to PloS Neglected Tropical Diseases
b) Inter-Country Management of a Cluster of Influenza A/(H1N1)pdm09 Cases: Uganda and Kenya, February 2017 - to be submitted to Emerging Infectious Diseases

HIV Project &Secondary data analysis: Risk factors for HIV infection in the youth (15-24 years): Voluntary Counselling and Testing-based surveillance at Mildmay Uganda clinic, 2011-2013

Epidemiology study& secondary data analysis: Risk factors for low CD4 count among persons testing HIV positive for the first time: Voluntary Counselling and Testing-based surveillance at Mildmay Uganda clinic, 2011-2013

EpidemiologicalStudy: Risk factors for low CD4 count among HIV positive persons: Voluntary Counselling and Testing-based surveillance at Mildmay Uganda Clinic, 2011-2013

Introduction: Studies show that in addition to HIV and Anti-Retroviral Therapy (ART) there are other non-biological factors such as demographics and socio-economic status that can affect CD4 cell counts. We analyzed data from the Voluntary Counseling and Testing (VCT) surveillance study at Mildmay Uganda to assess the risk factors for deteriorated or low CD4 counts in clients testing HIV positive between 2011 and 2013. Our objective is to determine the level of CD4 count and factors associated with its levels at the time of HIV diagnosis before ART initiation.

Methods: We analyzed data for 1910 persons aged 13–73 years who presented for HIV VCT at Mildmay Clinic between January 2011 and October 2013. These persons were counselled, interviewed, and tested for HIV. The clinic staff did the CD4 count test for persons who tested HIV positive. We computed proportions (univariate analysis), crude risk ratios by cross tabulations (bivariate analysis), and adjusted risk ratios (multivariate logistic regression) to determine risk factors for low CD4 count.

Results: We identified 1910 subjects who were HIV positive, with CD4 test results and ARV naive; 660 (34.6%) were males and 1250 (65.4%) females. All the subjects reported to be Ugandans aged between 13 and 73 years; 647 (33.9%) lived in Kampala district, 1093 (57.2%) lived in Wakiso district, while 170 (8.9%) lived in other districts. First time testers were 716 (37.5%) while those who had ever tested before were 1194 (62.5%). Persons who had never tested for HIV and for CD4 count were more likely to have higher CD4 count above 200 cells/mm^3 (AOR 0.65, 95% CI = 0.43-0.89). Older persons above 50 years were less likely to have deteriorated CD4 counts (AOR =0.29, 95% CI = 0.12-0.72).

Conclusion: Persons who tested for HIV and for CD4 count for the first time had higher CD4 counts compared to those who had ever tested before, probably because those who had tested earlier did not promptly start ARV use for various reasons. Between 2011 and 2013 when the Mildmay study was done, the Test and Treat policy was not yet adopted and so many people who tested HIV positive were not immediately initiated on ART. Youthful persons under 49 years were more likely to have low CD4 count compared to persons above 50 years. This is probably because the younger persons were not immediately started on ART or that they cared less about their health.

Figure 10: Paul Okello (Right) in a Quality Improvement support supervision at Wanale HCIII in Mbale district, November 2017

Figure 11: Paul Okello (squatting) at a water collection point at Cheptui River in Bwikonghe during cholera outbreak investigation in Bulambuli District, 2016

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Academic Mentor: Dr. Achilles Katamba, MakCHS

About the Fellow

Jimmy Ogwal holdsa Bachelor of Statistics and Master of Science in Clinical Epidemiology and Biostatistics from Makerere University. He additionally obtained a post graduate diploma in monitoring and evaluation from Uganda Management Institute. Prior to joining the Public Health Fellowship Program, Jimmy worked as Senior Biostatistician in the Uganda Ministry of Health. His roles were majorly data management, analysis and dissemination; disease surveillance, capacity building of health workers on data management, design and implement operational research. He was involved in planning, monitoring and evaluation of health services. Before that, Jimmy worked as abiostatistician in Apac District Local Government where he was in charge of data management, analysis and dissemination. He participated in aassessment of alternative family planning distribution methods by Ministry of Health in selected districts in Uganda and was a principal Investigator on the study Prevalence and Factors associated with sputum smear negative Tuberculosis among adults in Kawempe division-Kampala. He supervisedfood security and nutrition survey by World Food Programme in the Districts of Apac, Dokolo, Oyam and Amolatar in 2008. Jimmy coordinated Lots Quality Assurance Survey (LQAS) in conjunction with Liverpool School of Tropical Medicine in the Northern districts of Uganda. He also workedas a research assistant with Wilsken Agencies. Jimmy was hosted at Kampala Capital City Authority during the Fellowship.

Achievements at Host Site

1. Developed standard operating procedure for weekly epidemiological report and trained health workers from KCCA and implementing partners on weekly epidemiological reporting
2. Built capacity of data staff on District Health Information System. The reporting rate for HMIS 105 improved from xx to 80% and weekly epidemiological reporting to 50% from 25%
3. Coordinated the data use training for KCCA health workers
4. Participated in writing the concept for the cluster approach in improving health care service deliveries and management of disease outbreaks in KCCA

5. Coordinated several meetings in Mulago National Referral Hospital in a bid to improve the data reporting. This led to a coordinated data collection, reporting and completeness in Mulago Hospital.
6. Supervised and validated data on typhoid in health facilities, especially private in Kampala
7. Performed weekly analysis of epidemiological data for KCCA to detect possible outbreaks.

Specific Programme Achievements (Deliverables)

1. Descriptive analysis report on utilization Elimination of Mother To Chile Transmission of HIV in Kampala
2. Conducted several outbreak investigations; among others measles in Bugiri and Kampala, epilepsy in Ibanda and Cholera in Bulambuli
3. Published two articles in epidemiological bulletin (Evaluation of surveillance system in Bidibidi Refugee Settlement and Cluster approach in control of disease outbreak in Kampala)
4. Quality improvement on the newborn health in Lira Regional Referral Hospital using a tool called Birth Weight and Age-at-Death Boxes for an Intervention and Evaluation System (BABIES)
5. Published an article in Newspaper (Why you should promptly report any suspected disease outbreak)
6. Submitted one manuscript titled "Evaluation of Surveillance System in Bidibidi Refugee Settlement for publication Conducted evaluation of surveillance system in Bidibidi Refugee Settlement camp

Evaluation of the Surveillance System in Bidibidi Refugee Settlement: Yumbe District, Uganda, March 2017

Introduction: Between Aug 2016 and March 2017, 779,662 refugees who fled South Sudan due to political conflicts were settled in Bidibidi Refugee Settlement, Yumbe District, Uganda. This influx of refugees stressed the public health system leading to poor sanitation, insufficient safe drinking water, and an increased risk of disease outbreaks and malnutrition. We evaluated the disease surveillance system in Bidibidi Refugee Settlement to identify strengths and weaknesses, document gaps and recommend improvement measures.

Methods: We evaluated the surveillance system using the US Centers for Disease Control and Prevention (CDC) updated Guidelines for Evaluating Public Health Surveillance Systems. We interviewed key stakeholders, health-care providers and Village Health Teams using semi-structured questionnaires in Yumbe District. We reviewed surveillance tools for availability and quality. We collected data on attributes of the surveillance system.

Results: Between July 2016 and March 2017, 5 patients received treatment for suspected measles and there were 64 suspected cases of cholera and 2 deaths, but only 4 were notified as per Integrated Disease Surveillance and Response (IDRS) guidelines. 4% of health workers were trained on Ministry of Health standard data collection tools (Registers), 12% of health facilities had treatment guidelines. 19% of facilities analyzed their data and 22% health workers have ever collected data. The attributes for a high quality surveillance system were not exhibited at Bidibidi Settlement surveillance system. The health care providers are using parallel registers to capture data.

Conclusion and Recommendations: The surveillance system in Bidibidi settlement was found not to meet the required standards for health surveillance system's attributes and health care providers who use the surveillance system were not aware of the importance of a functional surveillance system and it's purposes. IDSR guidelines are not being implemented satisfactorily in the settlement.

We recommended harmonization of surveillance tools and building the capacity of health care providers on Integrated Disease Surveillance and Response.

Figure 12: Jimmy Ogwal (3rd right) at a local distillery for crude brew near fast running rivulet during investigation of epilepsy like illness in Ibanda District

FOR MORE INFORMATION ABOUT THE PROGRAM, PLEASE CONTACT:

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