MINISTRY OF HEALTH UGANDA

UNIPH Epidemiological Bulletin

Volume 2| Issue 2 | Mar 2017

Quarterly Epidemiological Bulletin of the Uganda National Institute of Public Health, Ministry of Health

January - March 2017

Dear Reader,

Welcome to the second volume of Issue 2 of the Uganda National Institute Public Health (UNIPH) Quarterly Epidemiological Bulletin.

This bulletin aims to inform the district, national, and global stakeholders on the public health interventions and investigations undertaken in disease prevention and control.

In this issue, we present updates on Cluster Outbreak of Acute Respiratory Illness, Acute Hemorrhagic Conjunctivitis Outbreak in Prisons**,** Suspected Cholera Outbreak associated with Drinking Unsafe River Water in Nebbi District amongst others. A policy brief on maternal depression has featured in this issue as well as improvement in reporting following introduction of electronic surveillance system. A rapid assessment of HIV serviced delivery which was done in emergency setting is documented. These investigations yielded very useful information that you ought not to miss.

In case you would like to access original references used in this issue, feel free to contact us at: *inabukenya_yahoo.com* **OR lkwagonza@musph.ac.ug**

We will appreciate any feedback regarding the content and general outlook of this issue and look forward to hearing from you. We hope this will be both an informative and enjoyable reading for you.

Thank you.

Inside this issue:

EXPERIENCE OF AN ENTRANT ON THE PHFP-FET

The journey of this fellowship program began on 16th January, 2017 and it is an honor to be part of this life changing experience. Even though it is just at the beginning, about four months down the road, it has been both an exciting and challenging journey so far.

The didactic training offered by world class lecturers were very informative providing new knowledge in field epidemiology. The lecturers were friendly and always willing to explain concepts that were not properly understood and they kept their doors open for any further consultations. However, The time allocated for some of the training sessions was limited, thus the lecturer either rushed through or left the remainder of the materials for personal reading. The fellowship management understood when one is not able to attend the sessions as long as communication was maintained.

The field trip to Nebbi for the suspected cholera outbreak with the whole 2017 Cohort Fellows enabled me to clearly appreciate the importance of following the steps of an outbreak investigation. The practical experience brought to life classroom knowledge. I learned so much on how to go about with investigating an outbreak practically and how to interact with stakeholders at community level. This exercise also enabled me gain teamwork skills since we had to deliver on reports jointly with the rest of the fellows.

The stipend that I receive enables me to handle some personal needs thus helping me concentrate on the fellowship. The fellows are friendly, considerate and always ready to help one another whenever there is need to do so. Even when there is still greater miles to be covered a head of us, I am confident that both the professional and personal relationships we have so far formed over the past few months will reach far into the future and the shared collective experience is one that will not be easily forgotten.

Like my Resident Advisor says; If you want to go fast go alone but if you want to go far then go together. My conviction is that the field Epidemiology Program will surely take us far.

Dr Freda Loy Aceng, PHFP-Fellow Cohort 2017

Cohort 2017 Fellows with Dr. Benon Kwesiga and Dr. Alex R. Ario during suspected cholera outbreak investigation in Nebbi District

International Accreditation of Central Public Health Laboratories

Two laboratories at the Central Public Health Laboratory, namely the Early Infant Diagnosis Laboratory and the Viral Load Laboratory, were on February 02nd 2017 accredited to international standards (ISO 15189 / 2012) by The South African National Accreditation System. The status is valid for five years as long as the laboratories maintain the standards that will be audited on an annual basis to monitor work practices and adherence to good quality standards.

The accreditation status means that the two laboratories perform laboratory tests to high standards that are comparable and acceptable to ISO15189 / 2012. Laboratories around the world that are accredited by the ISO standard are comparable by their work standards, and are effectively equal regardless of geographical location around the world. Standards include product quality, environmental friendliness, safety, reliability, and economy. These are all things that consumers look for, and often take for granted, when buying a product, but not all companies hold themselves up to such a standard.

The standard was developed by the International Organization for Standardization's Technical Committee 212 (ISO/TC 212). While the standard is based on ISO/IEC 17025 and ISO 9001, it is a unique document that takes into consideration the specific requirements of the medical environment and the importance of the medical laboratory to patient care.
To put it as simply as possible, ISO certified/accredited means that a company has proven that it follows the standards developed by the International Organization of Standardization. So why isn't it called IOS certified/ accredited since it is developed by an organization with that acronym? That is due to the fact that it is an international standard, therefore in different languages it would have a different acronym, so they decided to simply name it "ISO" no matter what language it is in, because after all the standards are supposed to be the same for each country so it only makes sense that the name remains unchanged as well. It is also very close to a Greek word, isos, which means "equal", another reason for the choice of acronym. That is why being an ISO certified/accredited company is such a big deal, it sends a clear message to consumers and other companies that the product being sold is worth buying.

Paul Edward Okello, PHFP-Fellow Cohort 2016

Suspected Cholera Outbreak associated with Drinking Unsafe River Water in Panyimur and Parombo Sub-counties, Nebbi District, March 2017

Eyu Patricia[1], Kizito Suzan[1], Nkonwa Innocent[1], Alitubeera Phoebe[1], Aceng Freda[1], Nakanwagi Miriam[1], Birungi Doreen[1], Nguna Joyce[1], Biribawa Claire[1], Okethwangu Denis[1], Opio Denis Nixon[1], Benon Kwesiga[1], Alex Riolexus Ario[1]

[1]Public Health Fellowship Program-Field Epidemiology Track

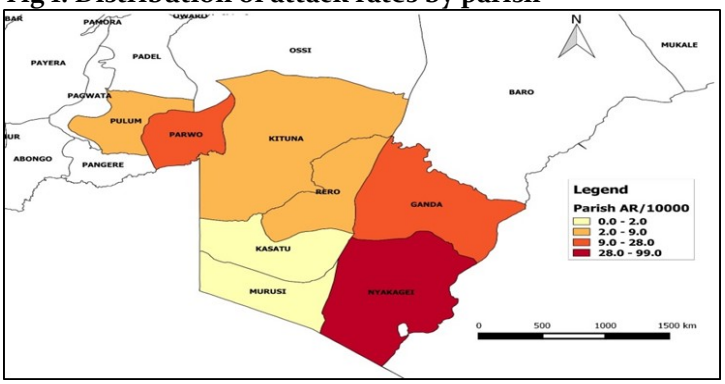
Summary: *On the 10th February 2017, Nebbi District Health Officer notified the Ministry of Health of a suspected cholera outbreak that had affected 117 people. We conducted an investigation to determine the scope of the outbreak, identify the mode of transmission and suggest control measures. We systematically identified cases using a standard case finding investigation form, conducted descriptive epidemiology and generated hypotheses. We conducted a case control study which included 67 cases and 134 controls. Drinking of unsafe river water from Nyaloi and Alala rivers was associated with the outbreak (OR: 2.2, 95% CI: 1.2-4.1). We recommended treatment of drinking water and health education on safe drinking water, proper waste disposal and hygiene.*

Introduction: On 10th February 2017, Ministry of Health received notification of a suspected cholera outbreak in Nebbi district, Uganda. The District Health Officer reported 117 suspected cases with 3 deaths. Nebbi district has suffered numerous outbreaks of cholera in the past few years and the most recent being in 2016. Nebbi district is bordered by Lake Albert to the South and Democratic Republic of Congo (DRC) to the West (UBOS, 2016); this porous border with DRC facilitates spread and transmission of communicable diseases. The most affected sub-counties in this outbreak are Parombo and Panyimur, both of which border the DRC; and these communities' main source of livelihood are fishing and farming. Cholera is a communicable disease with a short incubation period of a few hours to 5 days and has a high epidemic potential. It is a bacterial infection caused by *Vibrio Cholerae* and is mainly transmitted through consumption of food, or water contaminated with the bacteria. It commonly presents with profuse painless watery diarrhoea, and vomiting. When untreated, about 50% of the person cases die of severe dehydration (WHO, 2016) (Heymann, 2015). We conducted an investigation to determine the scope of the outbreak, identify the mode of transmission and recommend control measures.

Methods: We defined a suspect cholera case as sudden onset of profuse watery diarrhoea in a resident at least 2 years old from Parombo or Panyimur sub-county in Nebbi district, from 1st January 2017. A confirmed case was a suspect case with *Vibrio Cholerae* isolated from stool by culture. Using a standardized case finding investigation form, we systematically searched for cases in the community with the help of the village health teams and updated the line list. We carried out descriptive analysis and generated hypotheses. We tested these hypotheses using an unmatched case control study in which we randomly selected 2 asymptomatic village controls for each case identified giving a total of 67 cases and 134 controls. We collected stool samples for laboratory confirmation of the outbreak and also carried out an environmental assessment of the various water sources and the community.

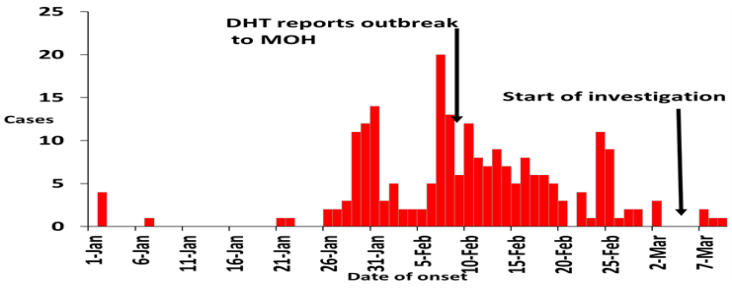
Results: We identified a total of 222 suspected cases (103 females and 119 males). The median age was 17.5 years IQR: 6-35years. The most affected parishes were Nyakagei (Attack rate of 143/10,000) and Ganda (Attack rate of 21/10,000) in Panyimur sub-county and Parwo parish (Attack rate of 42/10,000 persons) in Parombo sub-county. (Figure 1)

Fig 1: Distribution of attack rates by parish



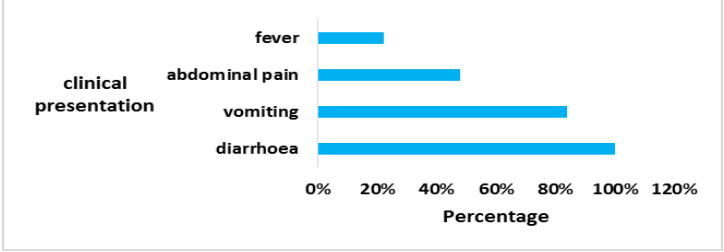
The index case had a date of onset of 21st January 2017. Majority of the cases were identified between the 27th January and 24th February 2017. (Figure 2)

Fig 2: Distribution of cases by date of onset of symptoms



The clinical presentations were consistent with cholera as 100% of the cases

Fig 3: Distribution of symptoms



Continued from page 3

Environmental assessment: The water in the rivers was visibly dirty. The rivers are not protected so community members step directly in the river to collect water for household use, and also wash their clothes from the same river. There was open defecation observed in No Man's land, Dei Parish in Panyimur sub-county. The dumping sites in some communities such as Market Square village in Parombo were poorly managed. There is a fairly good distribution of taps in Panyimur sub-county but some are not operational.

Case control findings: **Case control findings**: Stratified epidemic curves showed that the outbreak started in Nyakagei parish, Panyimur sub-county and spread to Parombo sub-county. 40/67 (60%) of cases compared to 56/134 (45%) of controls drank water from Alala and Nyaloi rivers (OR: 2.2, 95% CI: 1.2-4.1).

Discussion: Nebbi district has suffered numerous outbreaks of cholera in the past few years, and most have occurred in the dry season as reported by the district leadership. The epidemiological findings and environmental assessment of this outbreak investigation were in line as most of the community members were drinking the river water which was visibly dirty. The findings of this investigation therefore suggested that consumption of river water was the risk factor for transmission of cholera in Nebbi district.

During the investigation it was noted that one of the community boreholes in Parombo sub-county was locked with a padlock by the wife of a traditional chief and out of respect for her, no one had questioned her actions. Because of this, the community resorted to using water from the nearby Alala River which was stagnant and visibly dirty.

The most affected sub-counties (Parombo and Panyimur) border the Democratic Republic of Congo. This could pose a risk of cross border transmission of the disease as cholera cases could cross over from the DRC to Uganda for treatment, trade or visiting family members and relatives thus propagating the disease. This cross border transmission is in line with a cholera outbreak investigation done by Bwire et al in 2016 which showed rampant cross-border movements as one of the contributing factors of the cholera outbreak at the Uganda-DRC border (Bwire, et al., 2016). Furthermore, the No Man's land on Uganda-DRC border has very poor sanitation as latrines were observed to have no pits therefore aiding open defecation by the communities in the No Man's land.

Despite the fact that two months had already elapsed since cholera was suspected in Nebbi, new cases were still coming in from the community and the confirmation of the diagnosis has not been possible due to lack of transport medium. The 3 stool samples that were eventually collected were negative for *Vibrio Cholerae.* This could be because the cholera cases had taken antibiotics prior to going to the health facilities, and also RDT was not available to test for cholera.

Nebbi district is not yet able to contain the current infection and later on prevent new infections from happening. This was observed at the health facilities of the affected sub-counties which had a cholera treatment centre (CTC). These CTCs lacked infection prevention and control measures like having a barrier, the use of antiseptics, disinfectant for stepping in at the entrance, and protective gears. The district health team raised a concern of always being insufficiently equipped and supplied with resources to enable them deal with such health emergencies. It was suggested that the MoH rethinks about providing buffer supplies to districts to help them manage outbreaks such as these. Also a case fatality rate of greater than 1/10,000 is an indicator of poor case management which is likely to lead to more cholera cases.

Conclusions and recommendations: This was a cholera outbreak that affected two sub-counties in Nebbi district. Drinking contaminated water from Alala and Nyaloi rivers was linked to the outbreak. The communities had poor sanitation and hygiene practices and case management was sub-optimal. The designated cholera treatment centers at the health facilities did not observe standard infection prevention and control measures. There was lack of timely laboratory testing of the samples.

We recommended treatment of drinking water by the community members; health education on safe drinking water, proper waste disposal and hygiene; the treatment centers should adhere to standard infection prevention and control practices; and continuous active surveillance especially in the most affected sub-counties.

References

Bwire, G. et al., 2016. Cross-Border Cholera Outbreaks in Sub-Saharan Africa, the Mystery behind the silent Illness: What Needs to be Done?. 3 June.

Heymann, D. L., 2015. *Control of Communicable Diseases Manual, 20th Edition.* 64th Edition ed. Washington: American Public Health Association.

UBOS, 2016. *The National Population and Housing Census 2014,* Kampala: Uganda Bureau of Statistics.

WHO, 2016. *Prevention and control of cholera outbreaks: WHO policy and recommendations,* Geneva: World Health Organisation.

Improvement in reporting and monitoring of Public Health Events following introduction of electronic-based surveillance systems

D.N Opio[1], B. Kwesiga[1], A. R. Ario[1] J. Kissa[2], E. Mukoyo[2]
[1]Public Health Fellowship Program-Field Epidemiology
[2]MoH-Division of Health Information

Summary: *Electronic-based surveillance systems offer a novel and developing means of detecting and monitoring conditions of public health concern, including emerging infectious diseases. We have discussed and demonstrated the improvement in reporting rates of notifiable diseases in Uganda after adopting and scaling up electronic systems (mTrac and DHIS2) to most health facilities in Uganda. We have also documented practical challenges experienced during the implementation of these surveillance systems and recommended appropriate solutions at all levels of health service delivery.*

Introduction: Emerging and re-emerging epidemics continue to pose tremendous threats, based on reported cases of severe acute respiratory syndrome (SARS), human influenza caused by a new subtype, Wild Polio Virus, Ebola, Cholera, anthrax or small pox, avian flu, among others. This increase in emerging infectious diseases has led to calls for new

Continued from page 4

technologies and approaches for detection, tracking, reporting, and response. Electronic-based surveillance systems offer a novel and developing means of monitoring conditions of public health concern, including emerging infectious diseases. Electronic-based surveillance systems have good similarity with traditional surveillance approaches. Additionally, Electronic-based approaches are logistically and economically appealing. However, they do not have the capacity to replace traditional surveillance systems; they should not be viewed as an alternative, but rather an extension.

Traditional Versus Electronic Surveillance Systems

Traditional passive surveillance systems typically rely on data submitted to the relevant public health authority by various healthcare providers. This process is often expensive and inefficient, as substantial delays between an event and notifications are common, resulting in an incomplete account of disease emergence. Such limitations of traditional surveillance systems are a shared concern worldwide. The electronic system has revolutionized efficient health-related communication and epidemic intelligence. The increased frequency of electronic system use for acquiring health information has contributed to the rise of web-based early detection systems for infectious diseases through various methodologies.

The performance of Surveillance Systems in Uganda

Uganda has continued to strengthen and improve her capability to perform early detection and rapid reporting, analysis, and interpretation of infectious disease/health events using electronic information systems. These systems enable health workers to collect, report, and analyze in real time public health threats.

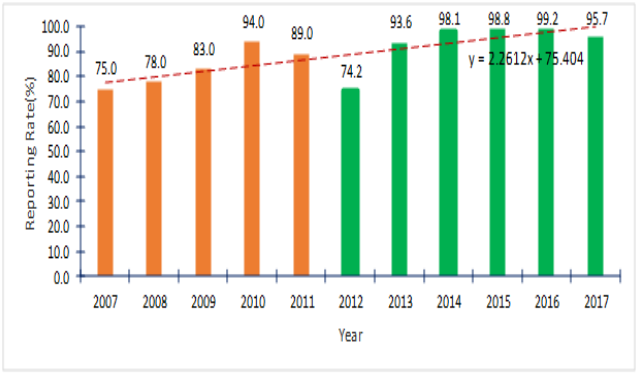
Between 2000 and 2010, the Surveillance System in Uganda continued to rely on paper-based forms that were used to collect data at community and health facility levels. These forms were summarized by the health workers and dispatched to the District Health Office and then submitted to MoH using various means including: e-mail, phone text messaging (SMS), faxing, and physical delivery. From 2010 up to date Uganda has adopted several electronic health surveillance systems such as mTrac (Mobile tracking of Health Services), DHIS2 (District Health Information Software2, OpenMRS (Open electronic Medical Records System) among others. In DHIS2, aggregate data is collected from the Health Facility (HF) and the report is submitted manually to the District Biostatistician for further entry, submission and analysis to MoH.

In mTrac system, surveillance data on priority Diseases, Conditions and events such cholera, Maternal Death, Medicine Stock balances are collected at the HF using registers, summarized onto the reporting forms and entered as SMS using a mobile phone. Data is then sent to the District Biostatistician on 6767, the district is supposed to validate, clean and approve the data for submission to the MoH. Health services within the community are reported through toll free SMS anonymous hotline coded as 8200. OpenMRS system is based at the HF, it captures data on individual HIV patients on care.

Improvement in reporting rates after adoption of Electronic Surveillance Systems

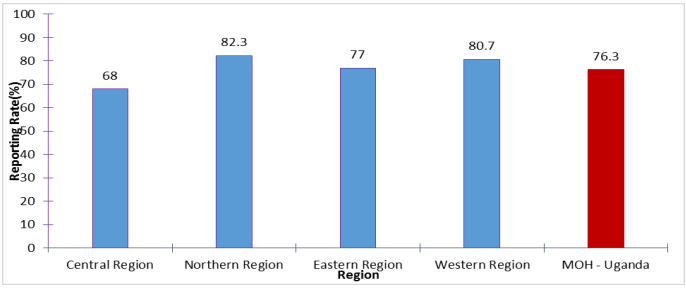
The scale up of these systems have improved monthly reporting rates (RR) from less 75% in FY 2007/8 to about 99.2% in 2016 (Figure1).

Fig 1: Monthly Outpatient Reporting Rate (number reported/expected) before and after DHIS2



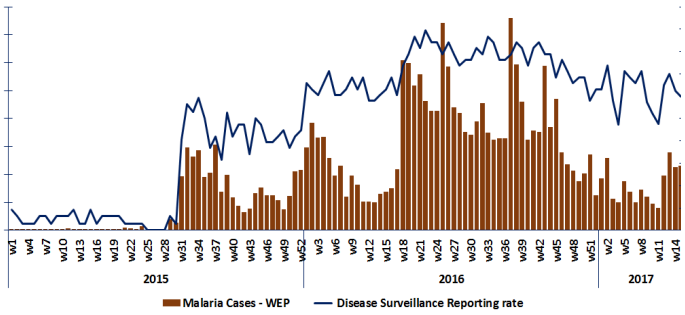
The Northern Region had the highest reporting rates (RR=82.3%), followed by Western (RR=80.7%) and least is Central Region (RR<70%) by Week 7 of March 2017

Fig2: Reporting rates by Region Early Notification of Malaria Outbreaks using mTrac System in Pader District



During the year 2015, Pader district reported low Malaria cases because only about 10% of the HFs had reported, this implies that a lot of malaria cases were missed out during that period. However, after massive scale up of mTrac and IDSR training by the Ministry of Health, the district improved its reporting rates to about 70% between from weeks 31 of 2015 to week 21 of the year 2016 hence detecting most of malaria outbreaks (Figure3).

Fig 3:Weekly Malaria cases in Pader district Vs Reporting Rates; 2015-2017



Electronic Surveillance Systems Challenges

These systems especially mTrac and DHIS2 are so beneficial in the provision of health services. However, lessons learnt during the implementation showed a lot of challenges at various levels of health services delivery. Some of these include:

Continues to page 6

Continued from page 5

training and support supervision, Remote areas – Limited Access to power to charge phones, staff attrition and transfers, absenteeism, inconsistent and inaccurate data recorded and transmitted. Mobile Phone is too mobile, some health workers report cooked data out of the HF, inadequate reporting tools (Registers, Reporting forms, case investigation forms, Cards/tally sheets and Box files/ cartridges/shelves), some community members do not know anonymous hotline.

a. **Computer System related** - Network traffic jam, especially on Mondays, inconsistent feedback report after submission, system still manual (requires 8 messages), other parallel reports and network coverage.

National Level and district level - inadequate utilization of data for decisions, inadequate district capacity to use the dashboard to monitor health facility reports, district surveillance teams don't have transport means to follow up on inconsistent data at the HF.

Conclusions and Recommendations: Timely detection and reporting of disease outbreaks and other health events can be improved by strengthening the electronic information systems. Reporting of health events from the HF to district and MoH have improved after the country adopted electronic surveillance systems. Most of the challenges hindering the sustainability of these systems are at the user level (Health facility and community).

MoH should continue strengthening the capacity of the end users in terms of disseminating new changes and guidelines on the systems, providing reporting tools and transport means, as well as providing fixed phones at the HF for reporting

The district leadership should integrate the sustainability of these systems in their plan, lobby for services from key stakeholders such as Telecom and power companies to be provided in areas where they don't exist

Health workers and community leaders should continue using the existing systems to report health events in their areas as well as any

Cluster Outbreak of Acute Respiratory Illness in Kampala, February 2017

Authors: *Paul Edward Okello[1], Robert Kaos Majwala[1], Susan Kizito[1], Benon Kwesiga[1], Daniel Kadobera[1], Alex Riolexus Ario[1]*

[1]Uganda Public Health Fellowship Program

Summary: *An outbreak of acute flu like illness was reported on 22nd Feb to Ministry of Health. The index case was an expatriate working for a multinational company in Kampala. He developed symptoms of acute fever and headache after a return from a trip to the Middle East. He was managed in two private hospitals in Kampala and subsequently airlifted to Nairobi Hospital when his condition deteriorated despite treatment. His nine year old son, and the only other case in the family, who attended an International School in Kampala also developed similar symptoms and was admitted in a private hospital in Kampala. He was also airlifted to Nairobi Hospital. Laboratory tests confirmed Influenza A (pH1N1) for both the index case and his son. The only other suspected case and a co-worker of the index case who developed fever and cough tested negative for H1N1 but had a neutrophilia and was managed as a bacterial infection. Contact tracing of individuals and health workers who interacted with case-persons yielded nothing significant. In conclusion, this was a cluster outbreak of pH1N1 which was self-limiting.*

Introduction: On 22nd Feb 2017, Ministry of Health through PHEOC an expatriate who developed acute flu like illness a few days earlier, managed at the hospital but later airlifted to Nairobi Hospital. The son of the expatriate similarly developed acute flu-like symptoms; was managed at private hospital in Kampala for a few hours and later airlifted to Nairobi Hospital. A co-worker of the index case at the Country Office developed acute fever and headache and was admitted at the same private hospital in Kampala. Based on the above information; a team from Ministry of Health set out to conduct an epidemiologic investigation to identify the cause, mode of transmission and recommend control measures for this outbreak.

Methods: We contacted the management of the private hospitals where the cases were admitted and managed to obtain firsthand information. We also met the administration of the organization at their Country Office and obtained updates on the chronology of events.

We defined a **Suspected Case** as a resident or visitor of Kampala with acute onset of fever, sore throat and cough with one of the following symptoms: headache, body weakness and difficulty in breathing, and a **Confirmed Case** was a suspected case with laboratory confirmation of the causative pathogen.

We conducted active case search by reviewing records in hospitals where the suspected case-persons were admitted, investigated and treated. Interactions with doctors in hospitals which have Intensive Care Units in Kampala was done. More information on the travel and exposure history of the index case-person and family were got. Laboratory tests were conducted on all the case-persons.

Findings: In Nairobi, samples obtained from the deceased index case-person (Mr. A) all tested positive for pH1N1 Influenza. The son to the index case also tested positive for Influenza A. Both the index case and son were negative for MERS-CoV, haemorhagic fevers and other subtypes of Influenza A. Lab tests done at KEMRI (27th Feb) confirmed that the index case was positive for Influenza A (pandemic flu H1N1) as was the son. Specimens were lung aspirate for the index case and a nasopharyngeal swab for the son.

In Kampala, lab results on the index case were as follows: Initial CBC was normal and no malaria parasites were detected. Subsequent investigations revealed a low WBC count (Severe Leucopenia) and Chest X-ray showed consolidation in the lungs. The D-dimer was high at 3568.8 which was an indication of a possible pulmonary embolism. Laboratory findings of co-worker (Mr. B), tested 24th Feb 2017 at UVRI: CBC, LFT, serum electrolytes, urea, creatinine, CRP were all normal and the test for MERS-CoV and Influenza A were negative.

Sequence of Events: The index patient, Mr. A, was a 46-year old male expatriate and an employee of a non-governmental organization in Uganda. He travelled to the Middle East on Sat 11th Feb 2017 for holiday with his family of 5, (his wife, a son and 2 daughters).

He travelled from Uganda (Entebbe) UAE (Dubai) via Kenya (Nairobi). The family stayed in Dubai for a week (11th -18th Feb 2017). Information on activities conducted

Continued to page 7

Continued from page 6

during the vacation is scanty, however, it was reported that Mr. A and his son came into contact with a camel at some point. Detailed information on interaction with the camel was not clear. The family returned to Uganda on 18th Feb 2017 and he stayed home on Sunday 19th Feb 2017. On the 20th Feb 2017, Mr. A reported to office in Kampala and held a series of meetings. During the third meeting, colleagues noted that he was shivering. Later he disclosed to a friend that he had developed fever, headache, cough and difficulty in breathing. He was taken to a private hospital by a company driver who by the time of investigations was in good health; a series of laboratory tests were done. His symptoms were: general body weakness, headache, shivering, fever 38.8°C, sore throat, running nose, mild dry cough; he was diagnosed with acute pharyngitis. While at home on Tuesday 21st Feb. 2017, his temperature shot up and he was taken back to the hospital where he was found to have leucopenia and temperature of 37.3°C which rose to 41°C within a short time. He developed general body weakness and severe respiratory distress and needed respiratory support. He had abnormal chest X-ray and was airlifted to Nairobi Hospital from where he died the following day, 22nd Feb 2017. Post mortem revealed fulminant pneumonia and multi-organ failure.

The 9year old son of the index case was admitted at a private hospital on 22nd Feb 2017 at 10pm with a high fever, sore throat, mild cough, general body weaknesses and difficulty in breathing. He only spent about 4 hours at the hospital and with a deteriorating condition a decision was taken to airlift him to Nairobi Hospital. Earlier on Monday 20th Feb. 17, the boy attended school at an International School in Kampala without any complaints.

Contact Tracing: The domestic worker to Mr. A, a 30yr old female Uganda national was interviewed. She said she only came to Mr. A's residence on Tuesday 21st Feb. 2017 and had no direct contact with Mr. A. She was by 2nd March 2017 in good health with no flu-like symptoms. Her other family members were reportedly fine as well. Follow up in the International School revealed nothing remarkable. A list of co-workers at the Country Office and health workers at the private hospitals who had contact with Mr. A was generated and monitored for possible symptoms. None of them had by 02nd March 2017 developed any sudden onset of fever, cough, or sore threat suggestive of pandemic flu. No cases were reported in all Intensive Care Units in Kampala.

Time, Place and Person Characteristics: A cluster of 3 case-persons in close contact with one death were line-listed, Case Fatality Rate = 33% (1/3). The index case traveled with the son and shook the hand of the Co-worker on Monday. All case-persons were males. Both the survivors are currently stable and symptom free. All the case persons had fever (100%). The other symptoms were distributed as follows: headache (67%), sore throat (67%) and difficulty in breathing (67%).

Autopsy Results: The autopsy performed on the deceased index case revealed fulminant pneumonia and multiple organ failure.

Conclusion

The most probable pathogen responsible for this outbreak was pH1N1 Influenza. The infection was limited to the cluster and did not spread to other members who came in contact with the case persons.

Public Health Actions and Recommendations

The following public health actions were instituted:

- Follow up the contacts who were listed in Kampala
- Notification of WHO
- Education of the public and health personnel on hand hygiene and cough etiquettes
- Weekly reporting from the Emergency Operations Centre
- Notification of clinicians in health facilities within Kampala and surrounding areas to have a high index of suspicion when patients report with acute flu-like illness
- The National Task Force declared the outbreak confined to a cluster without spread to other members of the community

We recommended:

- Strengthening surveillance system for influenza in the country
- Preparing pamphlets for education of the health personnel and general public on Influenza

Rapid Assessment of HIV Service Delivery in Bidibidi Refugee Settlement, Yumbe District, March 2017

Miriam Nakanwagi[1], Denis Okethwangu[1], Benon Kwesiga[1], Alex R. Ario[1]
[1]Uganda Public Health Fellowship Program – Field Epidemiology Track

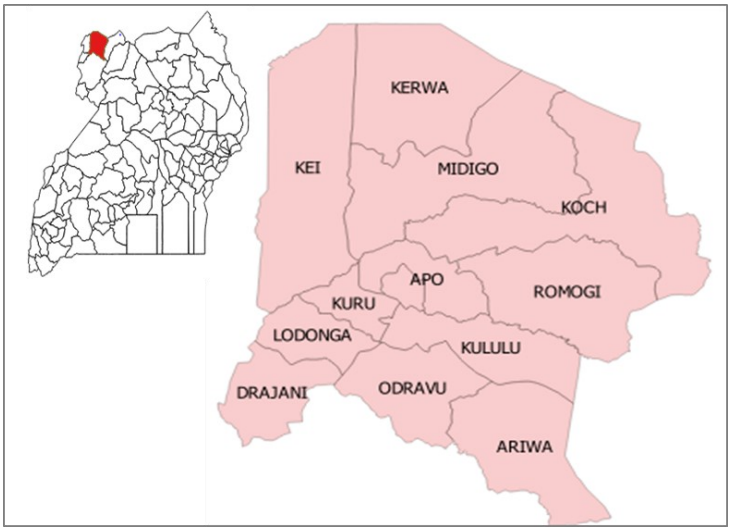
Summary: *Bidibidi Refugee Settlement in Yumbe District North Western Uganda was opened in August 2016, to resettle refugees fleeing the conflict in South Sudan. It currently shelters 272,000 refugees. We assessed HIV prevention and care services in the settlement, as part of the rapid health assessment, so as to identify gaps and make necessary recommendations. We collected data through household and health facility surveys, key informant interviews with health care providers, focus group discussions with the village health team members and local leaders, and review of secondary data from the UNHCR Health Information System (HIS) database for the camp. Of the 210 household heads surveyed, 103 (49%) reported having had an HIV test and of these, 25 (12%) reported an HIV positive result. Almost all the facilities assessed conducted HIV counseling and testing but only 10% provided comprehensive HIV prevention and care services. The main challenges in HIV care provision cited were; lack of facility accreditation to offer HIV care, drug and test kits stock out and poor adherence to ART by the refugees. We recommended HIV care outreaches to facilities in the settlement and later on accreditation of these facilities to offer HIV care services, training and mentoring of staff in health facilities in the settlement on HIV care, reporting and stock management and finally good ANC attendance should be an avenue for scale up of comprehensive PMTCT services .*

Continued to page 8

Continued from Page 7

Introduction: The political unrest in South Sudan and the resulting violence, food scarcity, and financial instability led to an influx of many South Sudanese refugees into Uganda from July 2016 to date. Bidibidi Refugee Settlement in Yumbe district was opened in early August 2016 to resettle them. It has a current refugee population of about 272,000 and no more refugees were being received in this settlement by March 2017 (1). In refugee settlements, information on HIV is limited because food, shelter, water and emergency health care take precedence (2). However, HIV spreads fastest in conditions of poverty, socio-economic powerlessness and social instability which are highly prevalent among refugees (3). Thus an understanding of the HIV prevention and care services in refugee settlements is crucial to limit further spread in this vulnerable population. In March 2017, we conducted an assessment of HIV care provision in the Settlement. Our aim was to establish the number of health facilities and scope of HIV services in the settlement, challenges encountered in the provision of HIV services and assess the refugee population's knowledge of HIV prevention and transmission methods.

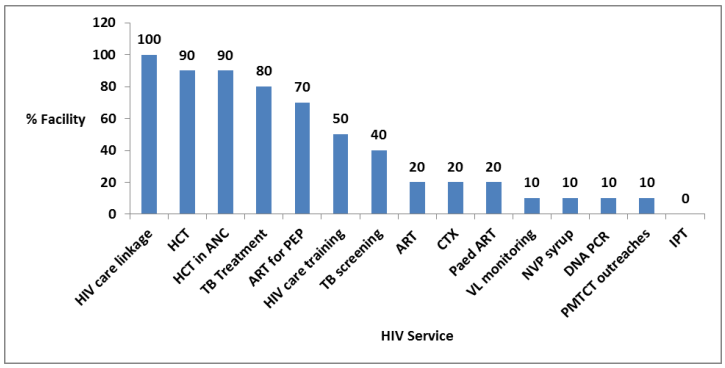
Figure 1: Map of Uganda showing Yumbe district, home to Bidibidi refugee settlement.



Methods: We used the modified cluster-sampling technique and sampled 30 villages across the five zones. We then randomly selected 7 households within the sampled villages. We thus administered questionnaires in a sample of 210 householeads. Of the sixteen facilities in the settlement, we randomly selected 10 health facilities and purposively selected three health facilities where refugees were commonly referred. We conducted key informant interviews with health care providers and held focus group discussions with the village health team members and local leaders. We also had a key informant interview with a representative of Infectious Disease Institute (IDI) in Yumbe District. Focus group discussions were limited to local leaders of the settlement and village health team members (VHTs). We also reviewed refugee reports from Yumbe District Health Office, and HIS data from Real Medicine Foundation (RMF), the lead UNHCR implementing and coordinating partner for health.

Results: Of the 210 house-heads sampled, 99% were South Sudanese. The median age of the house-head was 31 years (IQR: 26-41), 117(56%) were female and 7(3.5%) were child headed. From the household survey, 103(49%) of the respondents had tested for HIV and of these, 12 (12%) reported positive test. More than two thirds of the household heads had knowledge of the correct means of HIV transmission. About 70% of the household heads reported having knowledge of availability of HIV services provided at the facilities. The health facilities in the camp are at a level of a HC III. However, none of these is accredited to offer ART and apart from one facility, Bidibidi reception area HC III, the rest of the facilities sampled refer HIV positive patients to government facilities near the settlement. Bidibidi HCIII was the only facility that offered comprehensive HIV care services of those assessed. They run a daily clinic and see close to 20 patients per day but only 20% of these are refugees. They offer adult and paediatric ART, cotrimoxazole prophylaxis and anti- TB medicines and limited PMTCT services. However, dried blood spot for HIV DNA PCR for infants and viral load (VL) monitoring are not done and patients are referred for this service to public facilities. In other settlement facilities, the commonly provided services are HIV counseling and testing (HCT), Post Exposure Prophylaxis (PEP) and linkage to HIV care services. Others such as ART, Cotrimoxazole (CTX) prophylaxis, Paediatric ART (Paed ART) and EID testing (DNA PCR) are offered in only 2 (20%) of the facilities that were sampled. Isoniazid preventive therapy (IPT) is not provided at any facility in the settlement. (See figure 2)

Figure 2: Availability of HIV services in Bidibidi refugee settlement, October to March 2017



Condom distribution is mainly by some facilities. Voluntary Medical Male Circumcision is not provided in all the facilities. There are no known hot spots of female sex workers in the settlement however there are truckers. There is no implementing partner supporting HIV care in the settlement although Infectious Diseases Institute (IDI) sometimes offers a supervisory role. The challenges reported were: Stock out of test kits, NVP syrup and some ARVs in January and February, 2017, lack of training on HIV care, poor ART adherence due to an unstable population, under reporting of HIV indicators by facilities supported by agencies in the settlement, inadequate personnel, and parallel sample transportation making result follow- up complex.

Conclusions: The self-reported HIV prevalence in this assessment was much higher than the known HIV prevalence Yumbe and South Sudan (0.9% and 2.5% respectively). However, HIV service provision in the camp is suboptimal with very few facilities offering comprehensive HIV care services. On a positive note, most of the refugee population was knowledgeable about the correct modes of HIV transmission as well as the HIV services

Continued from page 8

Recommendations: Prior to accreditation of facilities in the settlement, there is need to carry out HIV care outreaches to support the facilities in the settlement provide HIV care and treatment. The Yumbe district health team (DHT) and RMF, the lead agency for health in the settlement should ensure that staffs in health facilities in the settlement are trained and routinely mentored in HIV care provision, stock monitoring, forecasting and ordering to improve quality and access to these services. Similarly, since all the facilities are Health Centre IIIs and thus conduct deliveries, RMF and the DHT can help them scale up comprehensive PMTCT services through provision of Nevirapine syrup and training on DBS sample collection to minimize attrition of infants through the PMTCT cascade. Finally, UNHCR, Uganda's Ministry of Health and Implementing Partners should work with Yumbe's DHT and support the facilities in the settlement towards accreditation to offer comprehensive HIV service provision in order to increase treatment access in the settlement.

Acknowledgements:

Yumbe district Health team , IDI, RMF CDC and the PHFP.

References

1- United Nations High Commission for Refugees Conflict and HIV: A framework for risk assessment to prevent HIV in conflict-affected settings in Africa: MockEmail, Nancy B; Duale, Sambe; Lisanne F Brown; Mathys, Ellen; O'Maonaigh, Heather C; Abul-Husn,Nina KL and Sterling Elliott, accessed on 3rd April 2017 at https://ete-online.biomedcentral.com/articles/10.1186/1742-7622-1-6.

2-Vulnerability to HIV/AIDS Report of the Seminar on NGO Action, 28 -29 October 1996, London , accessed on 3rd April 2017 at http://reliefweb.int/sites/reliefweb.int/files/resources/31CCA21E053DD731C1256DC200372DAD-ukcon-ref-96.pdf

Acute Hemorrhagic Conjunctivitis Outbreaks caused by Coxsackievirus A24 in Three Prisons, Gulu District, Uganda, 2017

Lydia Nakiire[1], J.A. Atuhairwe[1], B. Masiira[1], D. Kadobera[1], I Makumbi[2], A.R. Ario[1]

Background: Acute hemorrhagic conjunctivitis (AHC) is a derivative of the highly contagious conjunctivitis virus, known as pink eye. On December 16, 2016, the Uganda Ministry of Health received an alert from Gulu District Health Office of a suspected conjunctivitis outbreak among inmates in three prisons. We investigated to determine scope, identify etiological agent, epidemiologically characterize cases, recommend evidence based interventions and prevent future outbreaks.

***Methods:** We defined a suspected case as onset in any resident of Gulu District from November 1st 2016 onwards of red eyes and any of the following: eye itching, eye swelling, eye discharge or tearing. A confirmed case was a suspected case with positive enterovirus PCR test and sequenced as Coxsackievirus A24. We conducted medical record reviews and active case-finding in three Gulu Prisons. We conducted descriptive epidemiology and laboratory tests on conjunctivae swabs were done at CDC Atlanta.*

***Results:** We identified 493 case-persons. The overall attack rate (AR) was 16/10000 and only male inmates were affected. Age group of 20-29 was the most affected, AR=4.3/1000. Gulu Main Prison was the most affected, AR= 86/10000. The Epicurve was suggestive of a propagated transmission. 43% (9/21) of swabs tested positive for enteroviruses of Coxsackievirus A24 variant and no Ev 70 was isolated.*

***Conclusion**: The outbreaks in Gulu Prisons were caused by Coxsackievirus A24 variant and only occurred in males. We recommended provision of hand washing facilities, suspension of hand shaking and visitations during the outbreak. AHC transmission was interrupted within the prisons and community transmission stopped.*

Introduction

Acute hemorrhagic conjunctivitis (AHC) commonly known as "pink eye disease" is highly contagious and rapidly progresses in the population. It's a disease of ocular adnexa due to inflammation of the mucous membrane of the conjunctiva. Acute form is characterized by conjunctival congestion, vascular dilatation, pain and onset of eye edema. In AHC, a prominent hemorrhagic component soon appears that is characteristic of this infection and can lead to impaired vision. The etiological agent for AHC is enterovirus in the family piconaviridae consisting of 100 serotypes delineated into four species (A-D). Serotypes enterovirus D (Species D) and Coxsackie virus A24 (species C) are responsible for most AHC outbreaks. Typically the CVA24 has an incubation period of 18-48 hours and persists for 3-7 days before resolving spontaneously. The first reported CVA24 outbreak in Uganda and Sudan occurred in June 2010 and July 2010 respectively. On December 16, 2016, the Ministry of Health (MoH) received an alert from Gulu District Health Office regarding *Red Eyes* outbreak among inmates in Gulu Main Prison. Gulu District is located in Northern Uganda. Based on the above information the MOH (PHFP, ESD, CPHL) and WHO responded to the outbreak to epidemiologically describe cases, confirm etiology of the outbreak, recommend evidence based interventions and prevent future outbreaks.

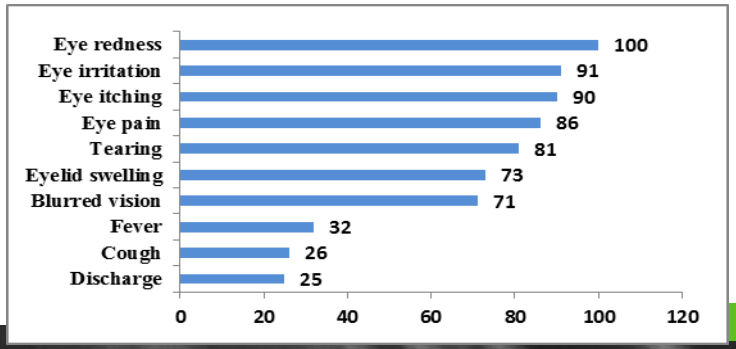
Methods

We defined a suspected case as onset of red eyes and any of the following: eye itching, eye swelling, eye discharge or tearing in any Gulu resident since November 1st, 2016. A confirmed case was a suspected case-person with a positive enterovirus PCR test and sequenced as Coxsackievirus A24. We reviewed clinical records, interviewed 100 case-persons using a case investigation form to generate hypotheses. The possible risk factors were stratified by the prisons and possible risk factors for transmission were identified. Eye swabs were collected and transported in viral transport media (VTM) to Uganda Virus Research Institute and later to CDC Atlanta for laboratory investigations.

Results

A total of 493 cases were identified. Majority of the case-persons had eye irritation (91%), eye itching (90%) and eye pain (86%).

Figure 1: Distribution of symptoms



Continued from page 9

Gulu Main Prison was the most affected (AR = 86/10000) compared to Pece Prison (AR = 11/10000) and Gulu Remand Home (AR = 5.4/10000). Men accounted for all the cases reported (AR = 16/100000) and the age group most affected was 20-29 years (AR = 43/10000).

The index case was apprehended on the 14th November, 2016 and detained at Gulu Central Police Station. On 25th November he was transferred to Gulu Main Prison. There outbreak peaked on 15th December 2016. This was followed by a decline in number soon afterwards with multiple peaks in between. Another outbreak was reported in Pece Prison where the index case had an epidemiological link with a case from Gulu Main Prison on 28th November 2016. Two days later cases increased reaching the highest peak on 8th December. Another outbreak was reported among the juveniles in the Remand Home on 2nd December after an inmate attended a court session the day before. He reported having contact with a case at the court.

Figure 2: Map of Gulu showing the two affected sub-counties

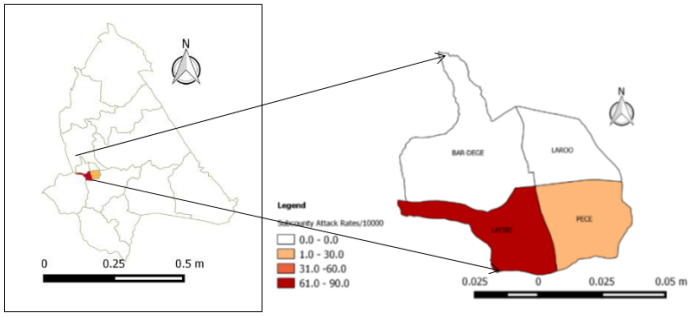
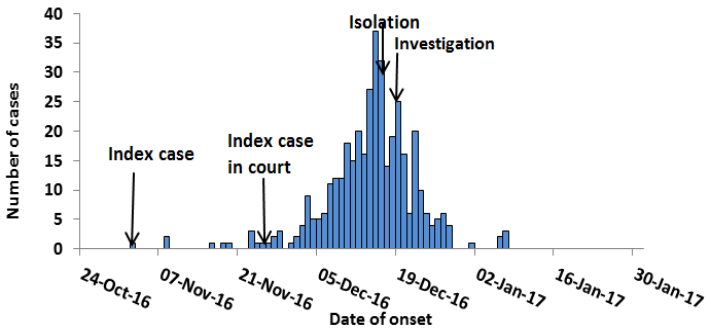


Figure 3: Epidemic curve for the A24 Coxsackie virus outbreak



Potential Risk Factors

Following descriptive epidemiology, the following hypotheses were generated: sharing items, shaking hands, contact with a case, using water from an open container, bathing less than two times and visiting a facility before onset of symptoms.

Figure 4: Possible risk factors

Name of Prison	Sharing of items %	Hand shaking %	Contact with case %	Open water source %	Bathing < 2 times %	Visiting the health facility before %
		96	100	88	83	18
Gulu Remand Home	88					
Pece Prison	100	63	73	43	87	49
Gulu Main Prison	24	96	86	0.43	22	18

Unfortunately, we could not conduct an analytical study to test these hypotheses.

Laboratory findings

Conjuctival swabs were tested using reverse transcriptase Polymerase Chain Reaction (RT PCR) and sequenced using EV VP1 RT snPCR. Nine of the twenty one (43%) swabs tested positive for enteroviruses and where characterized as Coxsackie virus A24 variant.

Discussion

Enteroviruses are responsible for many large outbreaks although adenoviruses have been implicated in smaller outbreaks (Herlinda Mejía-López 2011). In this outbreak in Gulu Prisons CVA24 was identified as the causative agent and there were no isolates of adenovirus identified. This was the second CVA24 outbreak after the one reported in June 2010 involving Uganda and Sudan one month later (Wamala 2010). CVA24 might be circulating in the Ugandan population with sporadic cases transmitting when the enabling factors like dry season, overcrowding and poor hygiene set in. The other studies where CVA24 was identified as the etiology for the outbreak of acute hemorrhagic conjunctivitis was in Brazil, (Tavares FN 2011, Medina NH 2016) and China (Wu, Qi et al. 2014). Men accounting for all the cases could be explained by the higher number of inmates on the male wing. Hand to hand contact is very frequent in this setting and could have facilitated this outbreak. The highest attack rates could be explained by poor unhygienic practices among the young adults. This has been documented elsewhere as well, in Pakistan, the mean age for the patients was 24 (Khan A 2008) and Wu et al. had highest proportion affected among students at 23.9% , factory workers at 22.9% and children in kindergarten at 16.9% (Wu, Qi et al. 2014). In this outbreak cases were confined in the three prisons and there were no community cases. The 2010 outbreaks involved 6818 cases and 26 districts in Uganda while 428 cases were reported from Juba in Southern Sudan (Wamala 2010). Given that the index case came from the community and caused larger outbreak in the prisons it is conceivable that congestion coupled with unhygienic conditions in the prison was favorable for rapid transmission.

Conclusions and Recommendations

This was an outbreak of acute hemorrhagic conjunctivitis caused by Coxsackievirus A24, confined to Gulu Prisons. At our recommendation all convicts were screened at the police and isolated if they were suspected AHC. The prison authorities provided hand hygiene facilities with support from Ministry of Health and Uganda WHO Country Office. Water taps in the prison wards in Gulu Main Prison were repaired.

References

Herlinda Mejía-López, C. A. P.-M., Alejandro Climent-Flores and Victor M. Bautista-de Lucio (2011). Epidemiological Aspects of Infectious Conjunctivitis- A Complex and Multifaceted Disorder, Prof. Zdenek Pelikan (Ed.), ISBN: 978-953-307-750-5.

Khan A, S. S., Shaukat S, Khan S, Zaidi S. (2008). "An outbreak of acute hemorrhagic conjunctivitis (AHC) caused by coxsackievirus A24 variant in Pakistan" Virus research 137(1): 150-152.

Medina NH, H.-M. E., Pellini AC, Machado BC, Russo DH, Timenetsky MC. (2016). ". Acute hemorrhagic conjunctivitis epidemic in São Paulo State,

Brazil,Rev Panam Salud Publica." Pan American Journal 39(2): 137-141.
Wamala, J. (2010). Notes from the field: Acute Heamorrhagic conjuctivitis caused by Coxsackievirus A24v-Uganda and Southern Sudan. MMWR. 59.
Wu, B., (2014). "Genetic Characteristics of the Coxsackievirus A24 Variant Causing Outbreaks of Acute Hemorrhagic Conjunctivitis in Jiangsu, China

1st Cohort of Field Epidemiology Fellows Graduates

The first cohort of Fellows who enrolled in January 2015 graduated on 2nd Feb 2017. The guest of honor was the Hon. Minister of Health, Dr. Jane Ruth Aceng. In attendance were dignitaries that included HE The US Ambassador, Director General Health Services ,The Principal Makerere College of Health Sciences, Dean MakSPH, CDC Director and WHO Country Rep amongst others.

Hon. Minister of Health, Dr. Jane Ruth Aceng, middle front flanked by other dignitaries and graduating Fellows

In her speech, the Hon. Minister thanked everybody who spared their precious time to attend the auspicious occasion of the 1st graduation of Advanced FETP Fellows. She noted that this is an important milestone for Uganda as the country implements the Global Health Security Agenda and moves towards compliance to the International Health regulations. She said her Ministry came up with an initiative to improve disease detection, prevention and response as well as addressing eminent threats which amongst others entails training Field Epidemiologists and other cadres to ensure efficient and effective response to outbreaks.

The Public Health Fellowship Program is a partnership between Ministry of Health and Makerere University School of Public Health (MakSPH) in collaboration with USG through Centres for Control and Prevention (CDC) which aims at cultivating technically competent human resources that can serve as the next generation of public health leaders, she reechoed. She gave a brief history of disease outbreaks in the country and the responses, outlining successes and challenges faced along the control process.

On the training of field epidemiologists and other cadres of Fellows, she noted that this will enable the country address the shortfalls in execution of essential public health functions and in particular re-energise efforts to achieve the following: following (1) reinforce surveillance, laboratory, and health information systems; (2) enhance the communication of health information; (3) strengthen the quality and use of public health data to guide program implementation; (4) improve the quality of investigation and response to acute public health events, and (5) enhance the effectiveness of disease prevention efforts. She pledged the government's full support for the program.

She congratulated the graduands for dedicating their time and effort to improve health service delivery in the country. I urge you to use the skills you have acquired to make a change in the culture of work in this country, to empower those below you and also influence those above you so that we can start to see a revolution in the health sector. We will want to see our response to public health needs different. You should be the ambassadors of change wherever you will be absorbed. We pledge to support you to continue the good work you have been trained to do. She concluded amidst applause. She wound up her speech by appreciating the contribution of all the players that have made it possible to address critical areas of improving disease surveillance and controlling epidemics in the recent past. She particularly paid tribute to the USG through Centers for Disease Control and Prevention (CDC), PMI, Global Health Security and the US President's Plan for AIDS Relief (PEPFAR) for their continued contribution to the success of the Program.

Meanwhile the US Ambassador said the Advanced FETP aims at training Uganda's next-generation public health leaders on disease investigation, prevention and control, much like how CDC's Epidemic Intelligence Service (EIS) program trains U.S. disease detectives. In only two years of existence, the program has investigated almost 50 disease outbreaks, assessed health situations in emergency settings and provided evidence based solutions for public health action, which is a remarkable achievement. She concluded by reiterating that the USG support for public health workforce development has been consistent to ensure that we have capacity to respond to epidemics. One such program that is fully supported by USG through its agency CDC is the Field Epidemiology Training Program.

Continued on page 12

Integration of Maternal Depression Screening and Treatment into Maternal Health Programs in Uganda – Policy Brief

By Alitubeera Phoebe Hilda,

Epidemiology Fellow, Uganda Public Health Fellowship Program

Summary: *Maternal depression is a debilitating disorder that impairs women's ability to care for themselves during pregnancy and their newborns after delivery often resulting in adverse birth outcomes including low birth weight, preterm birth and maybe a precursor to chronic depression. In Uganda, up to 16% of women have maternal depression. Acknowledging the burden of maternal depression and incorporating its screening and treatment into maternal programs is key to maintaining the momentum gained in improving maternal and child health indicators in Uganda.*

Introduction

Pregnancy is a life altering event that results in marked hormonal, psychological and physiological changes(Bennett, Einarson et al. 2004). The changes during pregnancy coupled with other risk factors such as intimate partner violence experience, unintentional pregnancy, lack of social support can trigger depression with adverse effects on the mother and child (Stewart, Robertson et al. **2003,** Nakku, Nakasi et al. 2006, Gelaye, Rondon et al. 2016). Maternal depression commonly complicates pregnancy and may occur in the antepartum or postpartum period(O'hara and McCabe 2013). Antepartum depression (APD) refers to a major depressive episode during pregnancy. (Gelaye, Rondon et al. 2016). Postpartum depression (PPD) refers to psychiatric disturbances that occur among women of reproductive age following childbirth and typically arise within four weeks up to a year after delivery. Depression during pregnancy may result in risky health affecting behavior including substance abuse, poor clinic attendance all of which are detrimental to the mother and unborn baby (Gelaye, Rondon et al. 2016). Maternal depression disproportionately affects women in low-income countries and low-income settings with about one in every five women affected (Gelaye, Rondon et al. 2016).

In Uganda, studies among women in rural areas revealed prevalence of maternal depression ranging from 10-16% (Assael, Namboze et al. 1972, Cox 1983) while the prevalence among women in urban areas is lower at 6%(Nakku, Nakasi et al. 2006). Furthermore, risk factors of maternal depression identified in our setting include current physical illness, young age, unwanted sex of the baby, unplanned pregnancy, baby physical problems and negative life events (Nakku, Nakasi et al. 2006). Currently Uganda's total fertility rate (TFR) stands at 6.2 children per woman (UBOS 2012.), which means pregnancy episodes per woman is quite high. The fertility rate among 15-19year old Ugandans is 134 per 1000. It is worth emphasizing that young age is a significant risk factor for PPD given our teenage fertility rates. In addition, for every Ugandan woman who is lost due to pregnancy or birth complications; up to 30 more retain disabilities chief among which is depression (Nakigudde, Ehnvall et al. 2013). To compound this dire situation, culturally in Uganda, it is believed that ancestral spirits cause mental illness which can only be treated by traditional healers (Nakigudde, Ehnvall et al. 2013).

Context and Importance of the Problem: The Ministry of health through concerted efforts has made great strides in improving maternal and child health indicators by concentrating on obstetric complications. However, the enormous burden posed by maternal depression is largely unrecognized and under-treated. Effective treatment for depression exists; it includes psychosocial support, counselling and medication. Uganda has a well-established mental health program, but there has been little integration of mental health into maternal programs. Because of the big burden of maternal depression in the country, there is need to incorporate mental screening and treatment into maternal programs.

Critique of Policy Options: Currently the national health policy prioritizes maternal health through its mandate of safe motherhood as one of the key elements of the minimum health care package with the aim of reducing maternal morbidity and mortality (Ssengooba, Neema et al. 2003). In addition, the Ministry of Health has initiated maternal health audits among all public health facilities country wide providing maternal health services in order to highlight avoidable factors pertaining to maternal mortality (Ssengooba, Neema et al. 2003). Nevertheless, health care providers do not routinely screen for maternal depression. Managing maternal depression in mental health facilities would be stigmatizing and discourage women from seeking skilled maternal health care services. However, if integrated into existing maternal health programs would not be more appealing to mothers but significantly contribute to improvement of maternal and child health.

Recommendations: There is need to acknowledge maternal depression as a priority in order to maintain the momentum gained in improving maternal and child health indicators in Uganda. Policy makers can mandate improvement in detection and treatment of maternal depression by:

- Integration of mental health services into existing antenatal and post-natal care programs
- Developing standardized protocols that are cross-culturally acceptable for detection of maternal mental health disorders during antenatal and post-natal health facility visits.
- Providing guidelines for provision of appropriate treatment for maternal mental health disorders to health workers
- Producing education materials for health workers and the general public on maternal mental health