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Uganda Declares End of Yellow Fever Outbreak

On 6th September, 2016 the Ag. Director General Health Services Prof. Anthony K. Mbonye, released a press statement declaring the end of the yellow fever outbreak which had begun in March 2016.

On 24th March 2016, an alert of a suspected Viral Haemorrhagic Fever (VHF) outbreak in Masaka district (Kaloddo village) was received by the Ministry of Health through the Public Health Emergency Operations Centre (PHEOC). Three cases from a single family had presented to Masaka Regional Referral Hospital with high-grade fever that was non-responsive to anti-malarial treatment with haemorrhagic and acute neurological signs and symptoms (convulsions and unconsciousness).

Prof Mbonye giving the end of yellow fever outbreak press release

A rapid response team (RRT) from MoH headquarters was deployed immediately to work with Masaka District Health Office to further investigate and respond to the suspected outbreak. The Masaka district task force was activated, a treatment centre set up at Masaka Regional Referral Hospital, active community case finding conducted and more samples collected and referred to the Uganda Virus Research Institute (UVRI) for laboratory testing. On 7th April 2016, Yellow Fever was confirmed. Intensified surveillance also confirmed Yellow Fever in Rukungiri and Kalangala districts on 13th April 2016 and 4th May 2016 respectively. Subsequently, from 24th March to 4th May 2016, 65 suspected Yellow Fever cases were reported from districts in the greater Masaka region, out of which 7 cases were confirmed. These were from Masaka (5), Rukungiri (1) and Kalangala (1). Three of the confirmed cases died giving a case fatality rate of 4.6%.

With support from World Health Organization (WHO), CDC, Yellow Fever Vaccination in the three affected districts. Between May-June 2016. A total of 627,706 people (≥6months) were vaccinated; 273,447 in Masaka, 304,605 in Rukungiri district and 49,654 in Kalangala. Overall, a vaccination coverage of 94% (above the WHO recommended 90% coverage) was achieved in the 3 districts; Masaka-91%, Rukungiri-97% and Kalangala-95% . There has been no evidence of subsequent active Yellow Fever since then.

Uganda Excels at the 2016 AFENET Conference

Every two years, Field Epidemiology and Laboratory Training Programs (FELTPs) are presented with a strategic platform to showcase their contribution to the public health community via the AFENET scientific conference.

The conference also provides an opportunity for Residents and graduates of FELTPS to network with other stakeholders as they develop a common agenda to address critical public health challenges in Africa and beyond. The 6th AFENET scientific conference under the theme " Enhancing Global Health Security through Field Epidemiology Training Programs" was held between 8th and 12th August 2016 at the Transcorp Hilton Hotel Abuja, Nigeria and Uganda scooped two (2) awards.

The Uganda Delegation at the 2016, AFENET Conference.

Residents and FELTP graduates made outstanding presentations

Continues on page 2

EDITORIAL

Dear Reader,

Welcome to the fourth issue of the quarterly epidemiological bulletin of the Uganda National Institute of Public Health (UNIPH). This bulletin aims to inform district, national and global stakeholders on the public health interventions undertaken in disease prevention and control. In this issue, we share highlights from the AFENET Conference, Abuja where Fellows made outstanding presentations and declaration by Ministry of Health of an end to a Yellow Fever outbreak in Masaka region. The highpoints on a number of outbreaks responded to and investigated such as the Measles outbreak in Kamuli, Typhoid Intestinal Perforations following an outbreak of Typhoid Fever and a Rapid Assessment of the health of refugees in Adjumani district are covered. In this issue, interesting articles on non-communicable diseases notably Trends of Cancers and Attitudes, Awareness and Practices related to the Tobacco Control Act have been cited. In case you would like to access references used in this issue, feel free to contact us at: inabukenya@yahoo.com OR ckihembo@musph.ac.ug. We will appreciate any feedback regarding the content and general outlook of this issue and we will be delighted to hear from you. Have a nice read.

Continued from Page 1

The TEPHINET Director, Dr Dionisio Herrera, awards Dr Fred Nsubuga as 2nd runner up best Oral presenter at the 2016 AFENET Conference, Abuja

on outbreak investigations and research on issues of public health priority. Over 360 scientific presentations on current public health issues such as IHR, Global Health Security Agenda, antimicrobial resistance, one health concept, building resilient public health systems among others were made at this conference. Uganda was ably represented by a delegation from the Ministry of Health led by the Minister, Hon. Jane Ruth Aceng, Fellows from the Public Health Fellowship Program, graduates from the Makerere University School of Public Health, epidemiology subject matter experts among others.

Conference highlights

Several Ministers of Health attended the conference and held a ministerial dialogue on how to improve IDSR in their respective countries through FELTPs.

Special emphasis was put on the recent Ebola pandemic in West Africa specifically the nature in which the outbreak was swatted in Nigeria.

Several networking activities were held including an international and cultural night where participants showcased their unique cultures and a sports gala

A group of Ugandan participants during the 2016 AFENET conference international night

EDITORIAL TEAM

Risk factors associated with typhoid intestinal perforations during a large outbreak of typhoid, Kampala Uganda, 2015

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Between January-June, 2015, a large typhoid outbreak occurred in Kampala, causing 10,230 suspected infections. An increase in the number of intestinal perforations (TIP) was observed by surgeons during the 2015 outbreak period. In this study, we ascertained if there was an increase in the number of TIP and identified risk factors associated with TIPs during a large outbreak of typhoid fever that occurred in Kampala in 2015. A sharp increase in the number of both TIPs and other IPs was observed between January to March 2015. Delay in seeking treatment, self medication, not having heard of typhoid before and not being aware of the typhoid outbreak increased the risk of TIPs. We recommended active community case finding for early and appropriate treatment, health education about typhoid fever and TIPs, and raising awareness among physicians about the risk of perforations during future typhoid outbreaks.

INTRODUCTION: Typhoid Intestinal Perforation (TIP) is one of the life-threatening complications of typhoid fever. Typhoid intestinal perforation refers to non-traumatic intestinal perforation in the terminal ileum diagnosed as due to typhoid fever. Although typhoid fever remains a serious public health problem in developing countries, it is poorly understood compared to other regions (1). There is limited information about modifiable risk factors for TIPs in Uganda and Africa at large.

METHODS: We defined TIP case as a physician-diagnosed typhoid patient with non-traumatic terminal ileum perforation. We reviewed medical records from Jan 2013-Dec 2015 at 5 major hospitals in Kampala which performed surgeries. In a case-control study, we compared potential risk factors for TIP among cases and controls; controls were those with typhoid diagnosis by TUBEX, culture, or physician but with no TIP, matched to cases by age, sex and residence. We used conditional logistic regression to assess risk factors and control for confounding.

RESULTS: Of the 88 TIP cases identified, 77% (68/88) occurred during the outbreak period. Both TIPs and other IPs sharply increased in January and peaked in March, coinciding with the outbreak period (Figure 1). The prevalence of TIPs and other IPs during the outbreak period was each estimated to be 5 TIPs/100,000 population (68 TIPs, 70 other IPs/1,516,210).

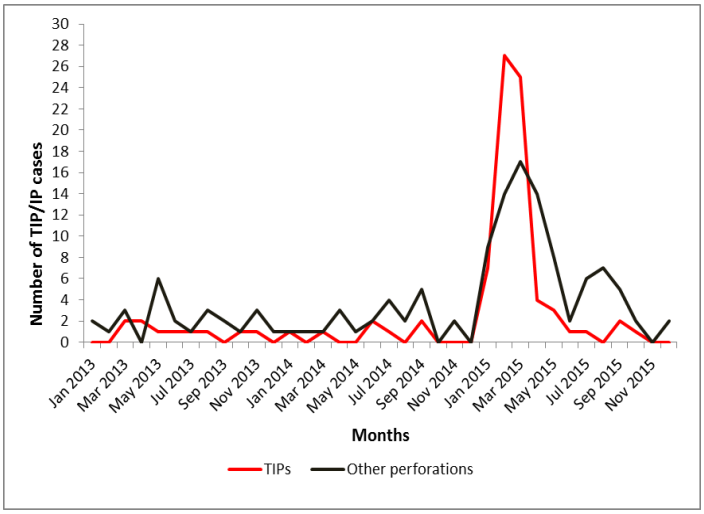

Figure 1: Trends of TIPs and other intestinal perforations, January 2013-December 2015

The case fatality rate for TIPs was 10% (7/68). Compared with 29% (13/45) of cases and 63% (86/137) of controls who sought treatment within 3 days of onset, 42% (19/45) of TIP cases and 32% (44/137) of controls sought treatment after 4-9 days (OR_{adj}=3.0, 95% CI=1.3-6.3); 29% (13/45) of cases and 5.1% (7/137) of controls sought treatment after ≥10 days ($OR_{adj=}$12, 95%CI=4.1-37). Additionally, 57% (26/46) of cases and 31% (43/137) of controls had self-medication (OR_{adj}=2.9, 95%CI=1.4-6.2); 36% (25/39) of cases and 18% (116/142) of controls had not heard about typhoid (OR_{adj}=2.5, 95%CI=1.1-5.5); and 59% (23/39) of cases and 25% (35/142) of controls had not heard about the typhoid outbreak in Kampala (OR_{adj}=4.9, 95%CI=2.0-12).

DISCUSSION: In this study conducted to ascertain if there was an increase in the number of TIPs and identify risk factors associated with TIPs during the 2015 typhoid outbreak in Kampala, we found that an outbreak of perforations (both TIPs and other perforations) occurred and an association was observed between TIP and duration of before seeking treatment. The risk of developing TIPs increased with increasing duration before formal treatment. Self medication, not having heard about typhoid infection before, and not having heard about the typhoid outbreak in Kampala City were also strongly associated with developing TIPs.

The sharp increase in the number of cases observed in this study coincides with the 2015 typhoid outbreak period in Kampala. The observed increase in the number of IPs in other areas of the gut (and around the same period of time as the TIP) implies that these perforations might have been as a result of typhoid fever. Intestinal perforations in other sites of the gut such as upper ileum, caecum and jejunum have been reported in other studies (2, 3).

One of the major findings in our study was a highly significant association of TIPs and longer duration before seeking medical care. Up to 60% of patients with TIP were hospitalized after seven days since onset of symptoms. This is in agreement with findings of studies mainly conducted outside Africa (4, 5).

Self medication, which involves the use of medicinal products to treat self recognized disorders or symptoms without a medical prescription (6) is a common practice in developing countries and it was significantly associated with TIP in our study. Self medication may lead to potential risks such as incorrect self-diagnosis, , inappropriate choice of therapy and inadequate dosing of antibiotics (6).

Continues on page 4

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It is possible that being on inappropriate therapy may have contributed to delay in seeking medical care from qualified medical professionals which in turn increased the risk developing TIP.

In conclusion, a sharp increase in the number of both TIPs and other IPs was observed between January 2015 and March 2015. Delay in seeking treatment, self medication, not having heard of typhoid before, not being aware of the typhoid outbreak increased the risk of TIPs. We recommended active community case finding for early and appropriate treatment, health education about typhoid fever and TIPs, and raising awareness among physicians about the risk of perforations during future typhoid outbreaks.

The study presents two public health implications. As noted above, limited information about typhoid fever and the typhoid outbreak, and delay in seeking health care were strongly associated with TIPs. This suggests that we have an opportunity to reduce the burden of TIPs if only we improve access to care and management by ensuring appropriate and prompt antibiotic use and putting in place better surgical facilities.

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A Rapid Health Assessment of Refugees in Adjumani district, August 2016

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Fresh political clashes in South Sudan in June 2016 led to a large influx of refugees to Uganda through the Elegu border post in Adjumani district. 41,154 refugees entered Uganda in July 2016, leading to an overstretch on supplies like water and shelter, posing a risk for communicable diseases outbreaks. The Ministry of Health (MoH) conducted a Rapid Health Assessment in Adjumani district on refugees who arrived in Uganda from June to August 2016 in order to; access their general health status, identify potential public health threats and service delivery gaps and recommend public health actions for rapid response. Findings revealed a shortage of community workers, health workers, shelters and human waste disposal facilities. Refugees had poor hygiene practices and a negative attitude towards health services. In conclusion, there was a shortage of health workers, shelter and waste disposal facilities for the refugees and they had poor hygiene practices. The recommendations were to increase health facility staffing levels, decongest the refugee reception centers, construct more pit latrines and provide health promotion packages ad-

BACKGROUND: From January 2014 to date, refugees from South Sudan have been entering Uganda and have been resettled in Adjumani, Koboko, Kiryandongo, Yumbe and Arua districts as a result of a political conflict which started in December 2013. In June 2016, fresh political clashes broke out in South Sudan leading to a huge influx of refugees to Uganda. According to records in Adjumani district, 41,154 refugees were received in July 2016. Resources such as shelter, water and health services were over stretched at the refugee reception centers in Adjumani district. The large number of refugees entering Uganda also posed a risk for possible communicable diseases outbreaks. From 8th to 12th August, 2016, the Ministry of Health in Uganda (MoH) conducted a Rapid Health Assessment among the newly displaced refugees in Adjumani district with the following objectives; To assess the general health status of arriving refugees, to identify potential public health threats for the arriving refugees and health service delivery gaps and to recommend public health actions for rapid response.

METHODS: The assessment focused on refugees from South Sudan who had entered Uganda from June to August 2016. It was conducted at Pagirinya 1, Pagirinya 2, Nyumanzi refugee reception centers and Elegu border post. The health centers and health posts serving the refugee population which were assessed were; Pagirinya Health Center III, Pagirinya Health Post and Nyumanzi Health Post. A World Health Organization (WHO) standardized Health Assessment tool containing checklists guided the assessment process. It included components for health systems, essential services delivery, Water, Sanitation and Hygiene (WASH), shelter, Food and Nutrition. The tool was administered by interviewing health facility in-charges and Village Health Teams (VHTs) and observation. An individual level questionnaire was administered to 197 refugees to assess their general health status. The District Health team and Implementing Partners shared experiences about the large influx of refugees with the Assessment team through dialogue meetings

FINDINGS Coordination; There was a high level of coordination and communication between the Adjumani District Health team and Implementing Partners regarding refugee related affairs. There were daily inter-organization meetings at health facilities and

Continued on page 5

Continued from page 4

Patient management: There was a shortage of human resources for health; the Nurse: Population ratio was 1:2000 , Clinical Officer: Population ratio was 1:6725. These were overstretched given the frequent demand for medical attention. There was a negative attitude towards HIV prevention services like condom use and care services like ART. At Elegu border, there was triage and deworming for all, immunization of polio (0-5 years) and measles (6 months to 15 years), TT for expectant mothers, Nutritional assessment and Vitamin A supplementation (children 6 – 59 months).

Treatment protocols: There were no job aides and treatment e.g., Uganda Clinical Guidelines and IMCI charts.

Maternal and child health services: Pagirinya HC III offered maternal delivery services and Expanded Program on Immunization (EPI) services. Expectant mothers were provided with mosquito bed nets. Ambulances services on call for emergency referrals was available. It was noted that mothers delayed or failed to consent for caesarean sections as they relied on and waited for husbands' consent, some of whom were soldiers way on duty back home in Sudan. Uptake of PMTCT services was poor.

Disease surveillance: Weekly Health Information System (HIS) reports were submitted by health facilities to Medical Teams International (MTI) . MTI was officially contracted by UNHCR to handle health related issues among refugees. MTI disseminated HIS reports to the Adjumani District Health office and other Implementing Partners (IPs). There had been cholera outbreak in the sites and by assessment time 16 suspects cases had been documented. Consumption of contaminated water was suspected to be the driver of the outbreak.

Infection control and medical supplies: Hand washing facilities with soap were available at health facilities. There was evidence of segregation of medical wastes in separate boxes although the waste cans were inadequate in number. There were no incinerators for disposal of medical waste. However, there was sufficient supply of medicines with a broad range of antibiotics, basic medical equipment and supplies such as gloves at health facilities.

Nutrition services: Nutrition assessment conducted on 7,275 children revealed Severe Acute Malnutrition in 2%, Moderate Acute Malnutrition in 4.9% . Global Acute Malnutrition among children was 6.8%. Nutrition surveillance was in place and food for lunch and supper was served only once a day. This meant cold food was consumed aiding transmission of food borne illnesses.

Shelter: There was overcrowding within the shelters at the reception centers.

Water, Sanitation and Hygiene (WASH): There was open defecation at reception centers. The water supply was over stretched . Each at Pagirinya received 7.8 litres of water per day (15 litres/day recommended). Some refugees resorted to use of river water for household use. Open pits and incomplete latrine pits with stagnant water were observed at reception centers. Pit latrines and hand washing facilities were available but insufficient in number.

Individual refugee interviews: The median age of interviewed refugees was 24 years. 42% (82/197) were males, 67% (131/197) of the refugees reported having health problems with cough as the prominent symptom in 20% (40/197). 37% (49/131) of those with health problems had not accessed health services. They of basic commodities like jerry cans 68% (134/197), soap 79% (156/197) and blankets 84% (166/197).

Dissemination of findings for policy engagement : The findings were disseminated at feedback meeting in Adjumani on 12th August 2016, MOH National Task Force meeting on 16th August, 2016, the inter-agency meeting on South Sudan, Office of the Prime Minister, Department of Refugees on 17th August, 2016 among others

Nyumanzi Refugee Centre, Adjumani district

CONCLUSIONS: There was a shortage of health and community workers at the refugee reception centers. Shelter and waste disposal facilities were insufficient. There were poor hygiene practices and a negative attitude towards HIV/AIDS and Maternal Child Health services. The limitation of the assessment was that it did not cover training levels of health workers to respond to disease outbreaks, for example, cholera.

RECOMMENDATIONS: We recommended recruitment of more health and community workers, provision of treatment guidelines and protocols at health facilities, construction of incinerators for disposal of medical waste, decongestion of refugee reception centers, educating the food service providers to serve hot meals twice a day, sealing of incomplete drainage and latrine pits to get rid of stagnant water, increasing the number pit latrines and hand washing facilities, provision of appropriate and the training component to be included in future rapid assessments.

Burden of Cancer in Kampala, Uganda: Common Types, Incidence and Trends

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Comprehensive data on the burden and trends of cancer to inform public health action is limited in most Eastern African countries. The Kampala Cancer Registry (KCR) was established to fill this gap in Uganda. We described the trends, incidences, and morphological verification of top five cancers in males and females using data from Kampala Cancer Registry. We extracted data from the KCR CANREG5 system into EPI Info V7.2 for analysis. From January 2009 to December 2013, 8,168 new cancer cases were registered. 55% (4522/8168) were female. Cancer of the Cervix in females and Prostate in males were leading cancers while Kaposi Sarcoma affected mostly young age groups equally. The Morphological Verification was 54.3%. This study demonstrated that cancer is an important Public Health problem with high incidences. Cervical, KS and Prostate cancer are the leading cancers. We recommend integration of cancer screening services in HIV programs.

Introduction: Cancer is one of the leading causes of death in the world. The World Health Organization's GloboCan project, estimated 14.5 million new cancer cases of all types globally in 2012, with 55% (8 million cases) occurring in less developed countries [1]. According to the GloboCan report, 32.6 million people were living with cancers worldwide causing 5.3 million deaths [1]. The projected, cancer incidence and mortality will increase by 69% and 72% respectively by 2030.[2, 3].

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Globally, cancers of the lung, breast, colorectum, stomach and prostate are the most common cancers [3], however in sub-Saharan Africa (SSA), infection related cancers such as Kaposi Sarcoma and cervical cancer are the most prevalent. Prevalence of risk factors for cancers in SSA are high; HIV 10% or more, human papillomavirus 34%, tobacco smoking 25% and harmful use of alcohol 19% particularly in men, obesity in women 28% or more among others [4]. Comprehensive data on the burden and trends of cancer to inform policies, strategies and interventions are lacking in most countries in eastern and southern African region. We described the trends, incidence and Morphological Verification (MV) of top five cancers in Kampala District using the Kampala Cancer Registry (KCR) a population-base Cancer registry.

Methods: KCR covers Kyadondo County is comprised of Kampala district and surrounding Wakiso district. The population is mainly Baganda (50%); 30% are other ethnic groups from Uganda and 20% of immigrants from other countries. We used the UBoS 2010 census data and assumed that the population was stable over the study period. Total population was 2,100,305 (995,601 males and 1,104,704 females with the younger age groups being the majority.

We extracted KCR records from 2009 to 2013. Data at KCR is extracted from health facilities, histopathology laboratories, and palliative centers such as Hospice Uganda.

Results: Between 1st January 2009 and 31st December 2013, 8168 new cases were registered. Of these, 55.4% (4522/8168) were females. 58% (4554/8168) of the new cases contributed to the top five cancers among males and females.

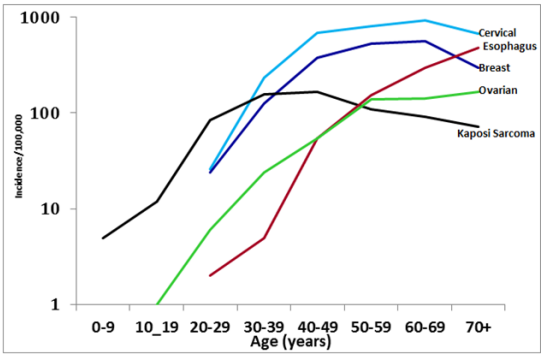
Top five cancers: Among females, Cervical cancer was most incident cancer at 20/100,000.followed by Breast, Kaposi Sarcoma, Esophagus and Ovarian cancer. Among males, Kaposi Sarcoma had the highest annual incidence of 18 per 100,000 Populations followed by Prostate, Esophagus, Leukemia and liver cancers.

Cumulative incidences of top five cancers: Among females, cervical cancer had the highest cumulative incidence of up to 6.4% followed by breast, Kaposi Sarcoma, Esophagus and Ovarian as shown in figure 2a. Among males, Prostate cancer had the highest cumulative incidence followed Esophagus, Kaposi sarcoma, Leukemia and Liver cancer.

Trends in incidence of top five cancers: There were more incident cases of Cancer of the cervix registered in 2012 and 2013, compared to the incidence registered during the previous years. Kaposi Sarcoma (KS) was highest among cancers in Males as shown in Figure 1.0.

There was a gradual increase in the incidence of cancers with increase in age. Whereas majority of cancers affected the older age-groups, KS was more frequent among the younger age-groups and then declined among adults as shown in the figures below.

Figure2: Incidence of top five cancers by age



Majority of the cases were diagnosed by histology of the primary area affected. The MV for the 8168 cases was 54.3%

Discussion: This study demonstrated that cancers are an important public health problem with high incidences in both men and women. Cancer of the cervix, prostate, breast and KS were the most incident cancers. Incidence of KS and cervical cancer is partly fueled by high HIV prevalence in Kampala and Wakiso Districts [5]. Several studies now clearly demonstrate an increased risk of pre-invasive cervical lesions among HIV-infected women [6] and the incidence of Kaposi Sarcoma among HIV patients. KS remains the most common AIDS-associated neoplasm [7]. AIDS-associated KS occurs with increased frequency in all HIV transmission groups compared with the general population[7].

The increased incidence in the trends of cancer in 2012 was due to the enhanced screening programs for both breast cancers and cervical cancer within Kyadondo county and neighboring communities and the launching of Uganda Breast Cancer early detection project at Fred Hutch cancer institute in Mulago [8].

The fairly good MV of cancers in the registry shows that a good number of cases are being captured through clinical assessment. Kaposi Sarcoma had the highest percentage Morphological Verification of 70%.

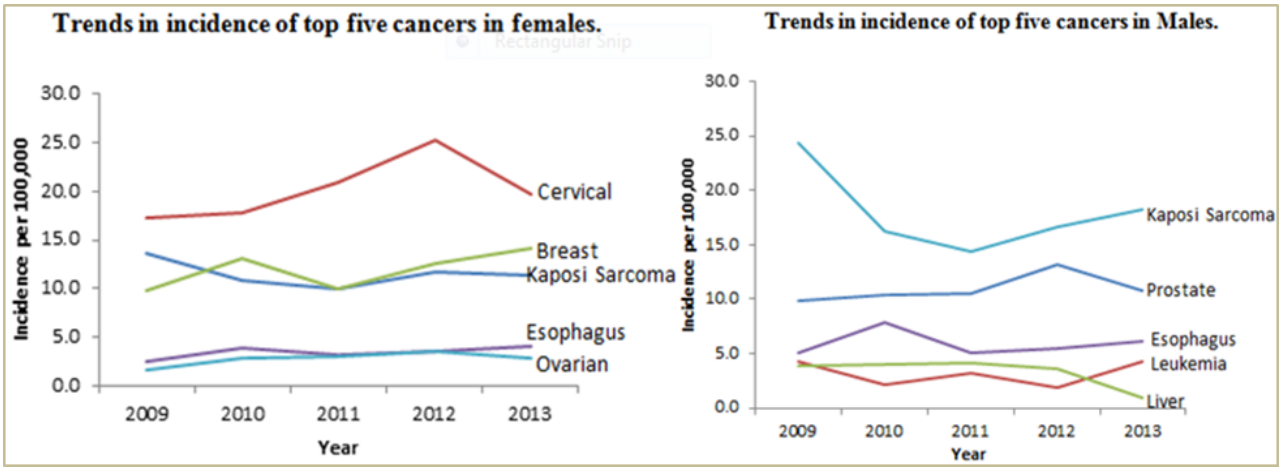


Figure 1.0: Trends of Cancer incidence in Kampala (2009-2013)

Kaposi sarcoma, one of the commonest cancers is much easier to diagnose clinically compared to other cancers. Leukemia had the lowest % MV of 29% yet it is expected to be diagnosed cytologically. Ideally we would have expected the leukemia %MV to be over 70%. This means that nonspecific methods such as clinical assessments, death certificates, or blood cell count are the basis of diagnosis for leukemia. This has implications of either under reporting or over reporting of leukemia.

Conclusions and recommendation: Cervical cancer in females and Prostate cancer in males remain the leading cancers. Prostate cancer was most common among the elderly men while Kaposi Sarcoma affected the younger age groups in both males and females equally. The MV of cancer cases in the cancer registry was fair. We recommended integration of cancer screening into HIV programs to enhance early detection and treatment and enhanced advocacy for cancer screening programs .

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Awareness, Attitudes and Current Practices Related to Uganda's Tobacco Control Act 2015 Prior to its Enforcement in Restaurants and Bars in Kampala City

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Summary: *On 19 September 2015 the President of Uganda signed the Tobacco Control Bill 2014 into the Tobacco Control Act 2015. We assessed attitudes and awareness about the Act and current practices related to tobacco use and tobacco smoke exposure prior to implementation. The study involved 216 interviews and observations from 218 randomly selected establishments around Kampala City. 61.5% of respondents were either unaware about the law or had a misconstrued message. Among respondents that self-acknowledged having sufficient information, 70.2% got it from media such as Radio, TV and print media. 39.4% agreed that the law would lead to financial losses. 63% of establishments that allowed for tobacco use on premises had designated smoking zones. 26.6% had in-door smoking and 11% had visible tobacco promotion and sponsorship signs. Although the new law has come into effect, the public is still not aware about it. We recommend dissemination and advocacy of the law to business owners and the public.*

Introduction:

On 19 September 2015 the President of Uganda signed the Tobacco Control Bill 2014 into the Tobacco Control Act 2015. Prior to enforcement, we carried out a study to describe awareness, attitudes and practices related to the Act.

Methods:

We interviewed personnel in 216 establishments and observations from 218 randomly selected establishments around Kampala City. A structured questionnaire was used to guide observations and interviews.

Results:

61.5% of respondents were either unaware or had a misconstrued message. Among respondents that self-acknowledged to have sufficient information, 70.2% got it from media such as Radio, TV and print media. 28.3% agreed that the law would lead to financial losses at their own establishment. In 50% of the establishments, tobacco products were allowed to be smoked on the premises and 63% of these had a designated smoking area. In the 50% that did not allow for tobacco products to be smoked on their premises, only 17% had noticeable no-smoking signs. In 26.6% of establishments, there was observation of in-door smoking and 11% had visible tobacco advertising signs and products.

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Discussion and Conclusions: The study found that 61.5% of respondents were either unaware about law or had a misconstrued message about the law. There is a need for the government to disseminate the law. Although the public has responsibility of being aware about new legislation, an effective information program will ensure that owners of public places and clients are appropriately informed and not left vulnerable to the penal ramifications of violating the law [2]. Among those who felt adequately informed, most (70.2%) got it from media such as radio, television and newspapers. According the Uganda Demographic Health Survey [3], in Kampala, 41.1% of women and 57.7% of men read a newspaper at least once a week, 77.4% of women and 88.7% of men watch television at least once a week and 73.5% of women and 86.1% of men listen to radio at least once a week. This high level of media access presents an opportunity for how the new legislation can be disseminated.

Figure 1: No smoking sign

The study also found that although 50% of establishments did not allow for products to be smoked on premises, only 17% had noticeable no-smoking signs. No-smoking signs deter initiation of smoking where it is prohibited [2]. Although some studies have found No-smoking signs deter initiation of smoking where it is prohibited [2]. Although some studies have found minimal changes in smoke exposure after placement of no-smoking signs [8, 9], others have found evidence of less smoking [10].

As the new legislation is being disseminated, owners of public places need to be informed of their responsibility to place no-smoking signs.

11% said they conducted tobacco product promotion. Tobacco product marketing promotes the initiation, continuation and re-uptake of smoking [14]. It has been shown that regulation of tobacco product marketing significantly decreases smokers' awareness of pro-smoking cues [15].

Figure 2: Tobacco advertising

Recommendations: The National Tobacco Control Program should utilize media to disseminate and publicize the Tobacco Control Act.

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Measles outbreak and associated risk factors for measles transmission in Kamuli district, July 2016

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Summary: *The Ministry of Health was notified of a measles outbreak in Kamuli district on 11th July, 2016. We conducted an investigation to establish the scope of and risk factors for the outbreak, estimate district measles vaccine effectiveness and vaccine coverage. We estimated the vaccine efficiency and measles coverage and in a case control study we compared exposures of 25 cases individually matched by age and village of residence with 100 asymptomatic controls. Children under 5years had the highest attack rates (5.3/ 10,000) compared to those 5 years and above (1.1/10,000). Butansi Sub County was the most affected (15cases/10,000 population). Lack of prior measles vaccination was associated with measles cases (ORMH= 6.8, CI: 1.8-25). The estimated vaccine effectiveness was 82% and district immunization coverage was 58%. Lack of prior measles vaccination caused the measles outbreak. Measles vaccination coverage was lower than the recommended 90% national coverage. We recommend intensification of measles vaccination in the district.*

Continues on page 9

Continued from page 8

Introduction: Measles has been targeted for elimination due its high public health impact on families. Measles can lead to hospitalization and loss of work hours. In Uganda, Measles control has been implemented through routine vaccination which begun in early 1980's, three year measles supplemental immunization since 2003 and case based surveillance (MOH 2015). Despite all these efforts there have been outbreaks reported in western and central districts in the country. In the recent past, the outbreak has spread to other parts of the country including Eastern Uganda. Analysis of Kamuli district measles data showed that there were reported 1-2 cases per month since January 2016 but in May 2016 there was an increasing trend of 3-4 cases per month. The alert to Ministry of Health on 5th July 2015 indicated that the suspected cases mainly presented with fever, generalized skin rash, red eyes and cough. On 11th July, 2016, the PHEOC was notified of a measles outbreak in Kamuli District located in Eastern Uganda. The outbreak was confirmed when 5 out of 8 samples taken to the Uganda Virus Research Institute tested positive for measles IgM antibodies. We investigated the outbreak in order to establish the scope of the measles outbreak, determine risk factors for transmission, control

Methods:

We defined a suspected case as any resident of Kamuli with fever and generalized skin rash lasting for 3 or more days with at least one of the following: cough, coryza and conjunctivitis since 1st June, 2016; and a confirmed case as any suspected case with positive measles IgM antibodies laboratory test. A control was any person who did not have signs and symptoms of measles and not living in the same household with a case patient. We conducted active case finding by records review at health and schools. With the help of Village Health Teams, we conducted community case finding. We line listed 72 case patients with no deaths. We interviewed 31 suspected cases for hypothesis generation.

We conducted a case control study among 25 cases and 100 controls individually matched by age and village of residence. We conducted a case control study among 25 cases and 100 controls individually matched by age and village of residence. We estimated the vaccine effectiveness

Results: Children under 5 were most affected. No adults were affected in the outbreak. Males and females were equally affected with the attack rate of males slightly higher than that of females. (table 1). Butansi sub-county was the most affected rate of 15/10000, followed by Kamuli Municipal Council with attack rate of 2.8/10000 as shown in figure 1.

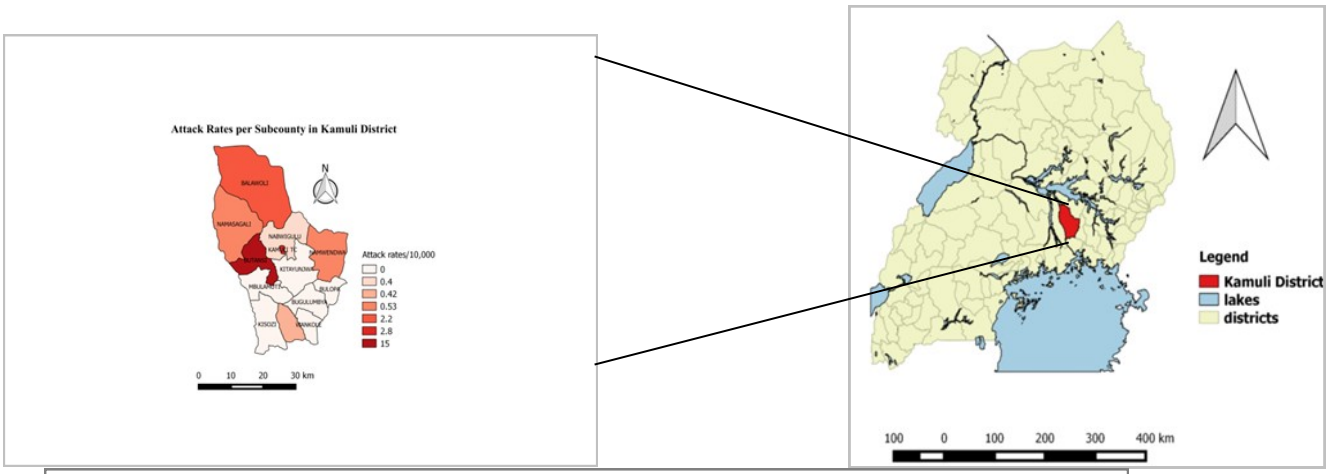

Figure 1: Attack rate by sub-county

	Frequency	Population at risk	AR /10,000
Age group			
0-4	52	99,032	5.3
5-17	19	175,512	1.1
18+	0	215,711	0.0
Sex			
Male	39	235,322	1.7
Female	32	254,933	1.3

Table 1: Measles Attack rate by age group and sex

Continues on page 10

Continued from page 9

The epidemic curve shows a propagated outbreak with the index case occurring on 5th June 2016. (figure 2). The probable index case was a 3 year old male from Buleta village, Bugeywa parish in Butansi sub-county. Successive peaks are observed on 27/06/16 and 17/07/16 with higher prevalence in each successive cluster.

Case control study findings: A case control study among 25 cases and 100 controls , ratio 1:4, revealed that not being vaccinated was associated with the measles. 21/25 (84 %) of case-patients and 51/100 (51%) of controls having measles, OR_{MH} = 6.8, 95% 1.8-25) as shown in table 2: Visiting a school or church during the effective exposure period was associated with the diseases though this was not statistically significant.

Vaccination coverage: The proportion of cases line listed who were vaccinated was 12/71 (17 %). We computed the proportion of population vaccinated (PPV) using population of cases vaccinated (PCV) and assumed vaccine efficacy (VE) 85%.

PPV = PCV/(1-PCV) * VE

Assumptions made: the vaccination rate in case patients with unknown vaccination history was the same as in case patients with known vaccination history, ii) the case patients with unknown vaccination status were not vaccinated. The Proportion of population vaccinated (PPV) was 58%.

This low vaccination coverage compared to the recommended target of 90%.

Vaccine effectiveness (VE) = (1-RR)* 100

OR_{MH} (odds of vaccinated/ odds of unvaccinated in rare disease) ≈ RR

VE = (1-0.18)* 100 = 82%

Variable	Cases (%)	Controls (%)	OR_{MH}	95% CI*
No measles vaccination				
Yes	21 (84)	51 (51)	6.8	1.8-25
No	4 (19)	49 (49)	1.0	

*Fishers exact 95% Confidence Intervals, MH-Mantel Henzel

Table 2:Factors associated with the measles outbreak

Discussion: Children under-five years were the most affected in this outbreak. This is consistent with results from studies done in India (Bhuniya 2013, Sudipta 2015) . The reasons for the highest attack rate in this age group could be because of the diminishing maternal antibodies in children between 6 - 9 months.

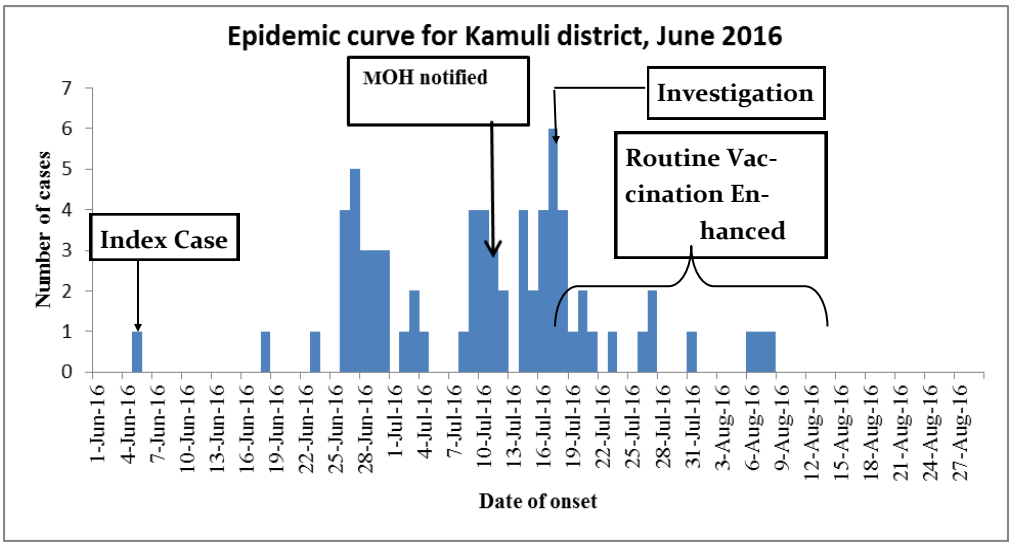

Figure 2: The distribution of cases of measles by date of onset in Kamuli district

Children above 9 months could have missed getting vaccinated during the routine EPI scheduled vaccination at 9 months. These contribute to a pool of susceptible children who reduce the heard immunity of the population and thus out breaks. (Bhuniya 2013, Sudipta 2015).

There was low vaccination coverage in this study compared to the target for Kamuli District at 90%. This is consistent with several studies done in developing countries which often show vaccine coverage computed during outbreaks being lower and probably more accurate than the administrative coverage. The very low vaccination coverage means there is no herd immunity in this population thus the outbreak .

Conclusion and recommendations: Lack of prior measles vaccination, low vaccination coverage and low vaccine effectiveness propagated this outbreak. The vaccination coverage is too low to confer any protection to the population. Intensify routine immunization services at the health facility and community outreaches. All health facilities should offer vaccination daily. Pay more attention to the quality of data used in calculating administrative coverage in the district

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HIV Viral Load Sample Delivery Times, Rejection Rates and Results Dispatch Turnaround Time, August 2014-July 2015, Uganda

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Summary: Nationally, anti-retroviral therapy (ART) monitoring using viral load (VL) as a gold standard commenced in August 2014 in Uganda. We described VL samples delivery times , results dispatch turnaround time (TAT), rejection rates, and major reasons for sample rejection at CPHL between August 2014 and July 2015 as part of continuous performance improvement for the centralized VL testing program. Samples from Karamoja region had the highest TAT followed by samples from the Western region. As the sample volumes increased over the time, even the sample delivery time increased. The laboratory results dispatch time was highest at the start of the program. However, as time went by, the laboratory gradually reduced the TAT despite the increasing sample volumes . 2% (2344/107609) of the submitted samples were rejected. Of the 2344 rejected samples, 93%(2179/2344) were rejected because of not meeting the sample quality criteria, 3%(63/2344) because of failure to complete the VL test lab request form with vital information and 4% (102/2344) because of patients not meeting the VL testing eligibility criteria. Expansion of the HUB and the VL programs should be critically thought about in line with all aspects likely to affect the desired outcomes. Additionally, standard operating procedures (SOPs) addressing good quality sample collection should be provided to sites. CPHL should routinely analyze and review sample quality trends and geographic hot spots for poor quality specimens. Results should routinely be disseminated to key stakeholders as part of routine supportive supervision and quarterly review meetings to facilitate improvement in specimen quality.

INTRODUCTION: In Uganda, monitoring response to Antiretroviral therapy (ART) using viral load (VL) as a gold standard nationally started in August 2014. Blood samples are collected from HIV-positive patients who have been on ART for at-least 6 months [1, 2].

Dried blood spots (DBS) and or plasma samples are referred from both government and private health facilities all over the country and transported to Central Public Health Laboratories (CPHL) through the national laboratory sample transport system, commonly known as the Hub system as illustrated in figure 1 [3].

Before samples are accepted for testing, they must meet the quality criteria otherwise they are rejected. The quality criteria include; sample must come from a patient who is eligible for VL testing; the request form accompanying the sample must have all data fields filled in appropriately; the sample itself must meet the packaging criteria, timeliness in transportation to CPHL, volume and appearance. According to the CPHL standard operating procedures. The DBS are put into a sealable plastic bag and desiccant packets and humidity cards added before sealing the bag Sealing the bag. Dried blood spots can be transported without cold-chain and remain stable for one month after collection [11, 12]. The whole pack is then put in a pre-labeled envelope ready for .

transportation.

DBS samples should not go beyond 14 days during transportation.

Plasma storage and transport requires that plasma is transported within 24 hours at 25°C in EDTA tubes, or within 5 days at 4°C for EDTA tubes or PPT, after centrifugation. If there is no access to centrifugation, whole blood in EDTA tubes or PPT cannot be stored for more than 6 hours at 25°C. At least 0.75mls of plasma is required for the sample to be processed.

Laboratory testing: Two Polymerase chain reaction (PCR) based methods are used (Roche Molecular System and Abbott) for viral load testing at CPHL. The time to results is approximately 8 hours for both systems[4].Laboratory testing: Two Polymerase chain reaction (PCR) based methods are used (Roche Molecular System and Abbott) for viral load testing at CPHL.

The time to results is approximately 8 hours for both systems [4].Laboratory testing: Two Polymerase chain reaction (PCR) based methods are used (Roche Molecular System and Abbott) for viral load testing at CPHL. The time to results is approximately 8 hours for both systems[4]. Given the infancy of the centralized VL testing program in Uganda, and the need to facilitate continued performance improvement of the program we carried out this operational assessment.

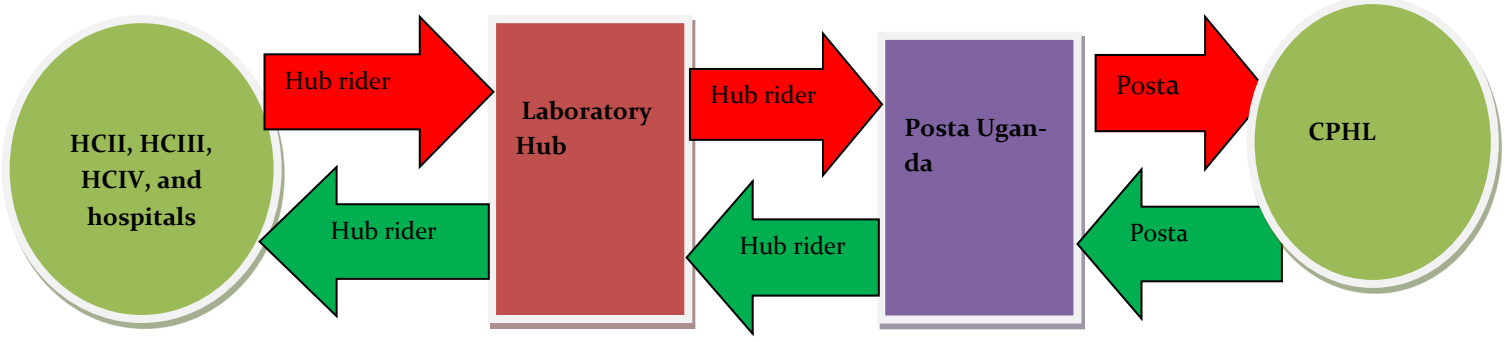

Figure 1: Flow of samples and results within the hub sample transport system:

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Category	Frequency (%)
0-2	15463(15)
3-7	53426(51)
8-14	28029(27)
15-21	4523(4)
22+	3189(3)

Table 3: Overall laboratory results dispatch TAT categorized (N=104630)

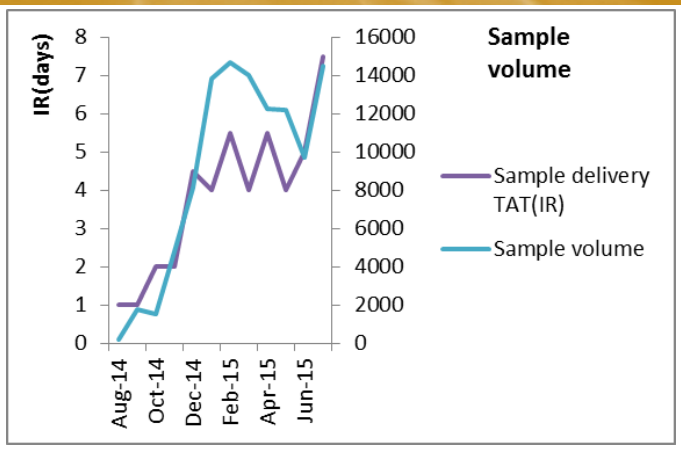

Figure 2: Sample volume verses sample delivery TAT, August 2014-July 2015

In this study, we estimated the delivery time for VL samples, laboratory results dispatch turnaround time (TAT), proportion of VL samples rejected, described major reasons for rejection of samples and described the relationship between sample volume and sample delivery time, sample volume and results TAT between August 2014 and July 2015.

METHODS: We extracted data generated between August 2014 and July 2015 from the central viral load testing data base at CPHL. We defined Sample delivery time as number of days from when a sample is collected at the health facility to the day when the sample is received at CPHL. Laboratory results dispatch turnaround time (TAT) as number of days from when the sample is received at CPHL to the day when the results are dispatched to their respective health facilities.

RESULTS: Majority of DBS samples arrived at CPHL between 0-14 days while most plasma samples arrived within 2-5 days. Samples from Karamoja region had the highest TAT followed by samples from the Western region. As the sample volumes increased over the months, even the sample delivery time increased. 51% percent of the results were dispatched within a week's time. The laboratory results dispatch time was highest at the start of the program. However, as time went by, the laboratory gradually reduced the TAT despite the increasing sample volumes as shown in figure 3.

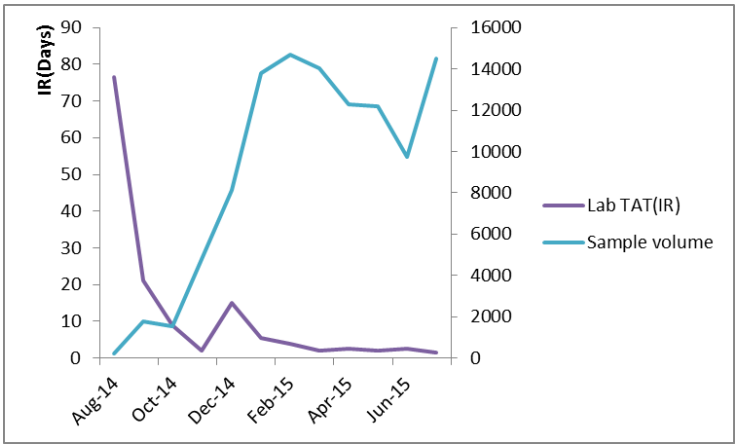

Figure 3: Sample volume verses laboratory results dispatch TAT, August 2014-July 2015

2% (2344/107609) of the submitted samples were rejected. Of the 2344 rejected samples, 93% (2179/2344) were rejected because of failure to complete the VL test lab request form with vital information and 4% (102/2344) because of patients not meeting the VL testing eligibility criteria. Under the sample quality criteria, main reasons for rejection included DBS being less than the required size (49.7%), haemolysed samples (13.6%), blood samples being older than 3 weeks (12.1%) among others. Dispatch days were highest at the start of the program. However, as time went by, the laboratory gradually reduced the TAT despite the increasing sample volumes.

Discussion: In this study, 89% of the DBS samples were delivered within the recommended 2 weeks time while as 30% of plasma samples were delivered within the recommend 24hrs.

The laboratory results dispatch TAT was highest at the start of the program. As time went by, the laboratory gradually reduced the TAT despite the increasing sample volumes. Our findings also reveal that, as the sample volume increased over time due to expansion of the program, the sample delivery time increased as well. This could be explained by the possibility of the program expanding in terms of number of health facilities/health workers trained and oriented to start sending samples while as its other aspects like staff to manage transportation remain constant. The quality of training and lack of follow up mentorships could be the other contributing factors. As expansion of the program is planned, all aspects including sample transportation should be critically thought about and planned for. Otherwise, we risk reaching a time whereby the sample volumes are too high and hence compromising the sample quality.

On the contrary, as the sample volume increases over time, we observe the laboratory results TAT remaining under check. This could be explained by the laboratory putting in place extra measures to counteract the impact of the increasing sample volumes. Night and weekend shifts have played a big role in controlling of the TAT. Sometimes there is shift of staff from sections with less work to overloaded sections in order to reduce the overall results dispatch time. 93% of rejections were due to samples failing to meet the sample quality criteria. This may be attributed to the limited information about VL sample quality amongst health workers who do the actual sample collection and packaging. This may as well depend on to the selection of the people to be trained, sometimes the people trained, are not the ones who do actual sample collection and packaging. The quality of training and lack of follow-up mentorship may be contributory.

We recommend some operational changes like immediate feedback to health facilities sending poorly collected samples, through phone calls indicating reasons for rejection. Understand challenges providers face in ensuring that a good quality sample is obtained and transported accordingly and provision of SOPs is crucial. Results should be disseminated at to key stakeholders routinely to facilitate improvement in specimen quality.