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Dear Reader,

We take great pleasure in welcoming you to Issue 2 Volume 10 of the Uganda Public Health Bulletin.

We aim to inform the district, national, and global stakeholders on disease outbreak investigations, public health surveillance, and interventions undertaken in detecting, preventing, and responding to public health events in Uganda.

In this issue, we present a variety of articles including: Assessment of mpox severity, Uganda, November 2024–February 2025; Mpox knowledge, vaccine attitudes, and vaccine concerns among healthcare workers, Kampala Metropolitan Area, Uganda, February 2025; Mpox outbreak investigation in Mbarara City, Uganda, October 2024 –March 2025; Investigation of yellow fever outbreak associated with swamp-based rice cultivation, Kibuku District, Uganda, December 2024; Knowledge, attitude, and practices of secondary school student leaders towards alcohol and other drug use, Uganda, July 2024; Uganda Public Health Fellowship-Laboratory Leadership Program support, achievements, and challenges experienced in response to an anthrax outbreak, Amudat District, June 2024; Uganda Public Health Fellowship-Laboratory Leadership Program support and achievements during a cholera outbreak response, Kasensero Landing Site, Kyotera District, Masaka Region, May 2024.

Should you have any questions or require additional information related to articles in this bulletin please contact us on: pkwizera@uniph.go.ug, abbog@uniph.go.ug, enabatta@uniph.go.ug, wopeli@uniph.go.ug, lbulage@uniph.go.ug.

Thank you

Inside this issue:

Continued from page 1

Assessment of mpox severity, Uganda, November 2024–February 2025

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Summary

Background: On July 24, 2024, Uganda's Ministry of Health confirmed an mpox outbreak, which spread nationwide, with 377 confirmed cases by November 1, 2024. Assessment for severity was suboptimal, yet it is useful for identifying risk factors for severe illness, evaluating efficacy of treatment modalities, and prioritizing care. We assessed for severity and its associated factors among confirmed mpox case-patients, November 2024–February 2025.
Methods: We conducted a cross-sectional study among all confirmed mpox case-patients who were admitted in isolation and treatment units of Entebbe, Nakasongola, and Mbarara, as well as in health facilities in Masindi and Mayuge districts that were most affected at the time. We used the mpox severity scoring system (MPSSS) tool to assess severity. The MPSSS tool is a 7-parameter numerical scoring tool. Each parameter is scored on a scale of 0-4;the total score ranges from 0-23.We used a cut off of ≥7 for severe disease. We used Wilcoxon rank-sum tests to compare the severity scores and background characteristics.
Findings: We investigated 244 case-patients. Of these, 128 (52%) were males; the median age was 29 years, interquartile range (IQR)=24-38,range=1day-54 Of the total participants, 75% (185/244) presented with severe disease, and 30% (74/244) had underlying conditions, with living with HIV (LHIV) being the most common underlying condition (88%, 65/74). Among the participants, 5.7% (14/244) died, with 71% (10/14) of these having underlying conditions. The median severity score was 12.5, interquartile range of 7-16. Mpox case-patients with any underlying illness were more likely to have higher severity scores when compared to those without ($p<0.001$).
Conclusion: We found a high prevalence of mpox severity, with having an underlying illness increasing the likelihood of severe disease. We recommend prioritizing case-patients with underlying conditions for inpatient care and vaccination to protect them from severe mpox.

Background

Mpox is a multisystemic disease affecting several organs of the body and in some cases leading to death. The clinical presentation of the disease differs by the route of exposure, immune status of the host, the strain of the virus and the dose of the virus. Additionally, the disease has variable clinical severity. People living with HIV(PLHIV) especially those with advanced disease, children <5 years of age, and pregnant women are more likely to develop severe disease and have higher case fatality rates. Clade Ib is more likely to cause severe disease compared to clade Ia and II (1). A study in New York City piloted an mpox Severity Scoring System (MPSSS) tool to guide health workers on severity assessment and also assessed validity of the tool. It was found to match with other surrogate measures of severity of the disease and to agree with other monitoring parameters (2).

On July 24, 2024, the Uganda Ministry of Health (MoH) through the National Emergency Operations Centre confirmed an mpox outbreak in Kasese District, Uganda. Mpox cases have since then continued to rise with spread to over 100 districts in the country. Some of the cases have presented in a very sick state.

Severity assessment has been suboptimal in the response, yet assessment for severity can be useful in identifying risk factors for severe illness, monitoring disease progression, and in evaluating efficacy of different treatment modalities. We estimated the prevalence of mpox severity and recommend evidence-based measures to prevent or reduce severity related to mpox, Uganda, November 2024–February 2025.

Methods

Uganda neighbors the Democratic Republic of Congo (DRC) to the West, which had been experiencing an outbreak of mpox for more than a year before Uganda confirmed a case. Uganda is divided into 146 administrative units known as districts. It has a population of 45.9M people with a high HIV prevalence of about 1.2M PLHIV (3, 4).

We conducted a cross-sectional study of all mpox confirmed cases admitted in the isolation and treatment units during the study

Continues to page 2

Continued from page 2

period.

The study was conducted in Entebbe, Nakasongola, and Mbarara isolation and treatment units. We also collected data in health facilities in Mayuge and Masindi Districts. By the time of the study, the country was implementing isolation of all confirmed cases.

We included all cases confirmed to have had mpox using polymerase chain reaction(PCR) test for mpox.
To ascertain the degree of severity, we assessed all mpox cases identified using the adapted MPSSS tool. The MPSSS tool is a 7-parameter numerical scoring tool comprising number of lesions, number of body parts affected, confluence of the lesions, secondary bacterial infection, mucosal involvement, degree of pain and the optimal level of care for case-patients. Each parameter is scored on a scale of 0-4; the total score ranges from 0-23. We used a cutoff of ≥7 for severe disease.
We also obtained information from the cases on their socio-demographics, comorbidities, and other clinical information such as pregnancy status for women from the case investigation forms (CIF).
We applied the MPSSS to obtain mpox severity scores. We described the cases and estimated the prevalence of mpox severity. Wilcoxon rank sum test was used to compare the severity scores among different groups of patients according to their background characteristics.

The Ministry of Health of Uganda gave the directive and gave approval to conduct this study. The Office of the Associate Director for Science at the US Centers for Disease Control and Prevention (CDC) Uganda determined that this research did not involve human subject research and that its primary intent was public health practice or disease control. Verbal informed consent was obtained from participants or, if the interviewee was a minor, guardians before the start of each interview.

Results

We applied the adapted MPSSS tool to 224 confirmed mpox cases for severity.

The majority of the mpox cases presented with rash 100% (243/244), followed by fever 83% (203/244), local lymphadenopathy 67% (167/244), and sore throat 52% (126/244). Of the 244 cases, 30% (74/244) had comorbidities. Of the 74 cases who had underlying conditions, 88% (65/74) had HIV. The other underlying conditions included pregnancy, multidrug resistant tuberculosis (MDR TB), sickle cell disease, peptic ulcer disease, and hypertension. Of the 244 cases, 52%(128/244) were males, the median age was 29 years, interquartile range (IQR) =24-38,range=1day-54 years (Table 1).

Table 1: Baseline characteristics of mpox patients during the mpox outbreak, Uganda, 2024–2025 (n=244)

Characteristic	Frequency (n)	Percentage (%)
Gender		
Female	116	48
Male	128	52
Occupation		
Waitress	27	12
Vendor	24	11
Business person	23	10
Sex Worker	22	9.8
Shop Keeper	18	8.0
Agriculture	17	7.6
Student	15	6.7
Builder	10	4.5
Driver	10	4.5
Salon attendant	10	4.5
Others	48	20
Age-group		
0-5 years	8	3.3
5-17 years	14	5.7
18-29 years	104	43
30-41 years	88	36
42-53 years	29	12
54-65 years	1	0.41
Median (IQR	29(24-38)	
Underlying condition		
No	170	64
Yes	74	36
HIV status		
Negative	155	70
Positive	65	30
Pregnancy status		
No	95	95
Yes	5	5
Outcome		
Alive	192	93
Deceased	14	6.8
Severity		
Mild	60	25
Severe	184	75

Continues to page 3

Continued from page 3

Severity of mpox

The majority of the cases were severe, 75% (184/224). The median severity score was 12.5 with a range of 1-23 with right-sided skewness (Figure 1). Out of the 224 cases, 6.8% of the cases died (14/224) (Table 1). Among these deaths, 71% (10/14) of them had comorbidities and 50% (7/14) scored 23/23 using the MPSSS tool. Of the 10 who had comorbidities, 9 had HIV infection and the other had sickle cell anemia. Among the deaths, most 43% (6/14) were aged 30-45years, followed by <5years of age who contributed 21% (3/14), 15-30 years of age contributed 14% (2/14), 45-60years of age contributed 14% (2/14), and 5-15 years of age contributed 1% (1/14).

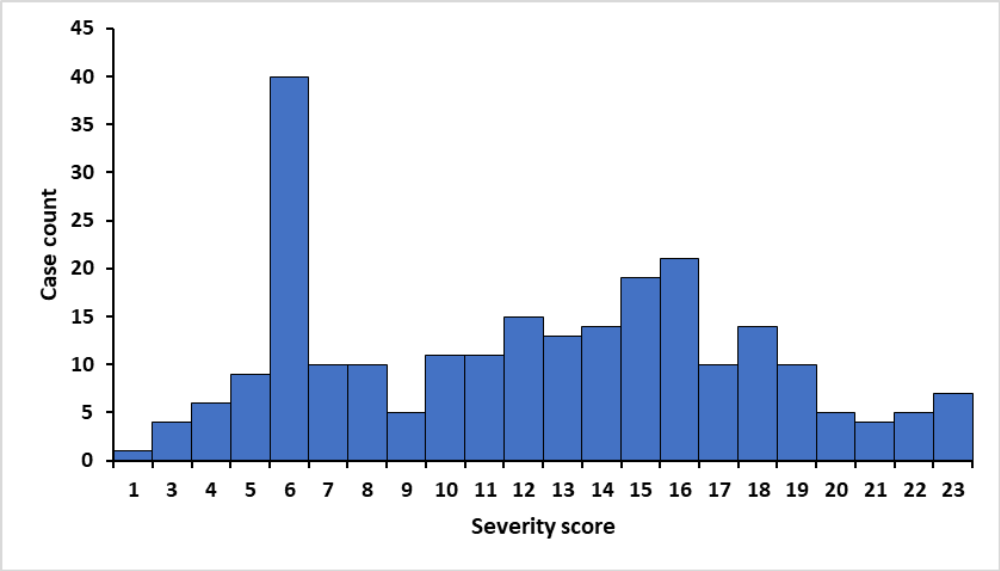

Figure 1: Distribution of the mpox cases by their severity score during the mpox outbreak, Uganda, 2024–2025

Mpox severity score and background characteristics

We analyzed the relationship between the background characteristics of the mpox patients and their severity scores using the Wilcoxon rank-sum test. We found no significant statistical difference when females where compared to males (p=0.72). We categorized age into children (0-17 years) and adults (≥ 18 years), and we found no statistical difference between the two groups but children were more likely to have higher severity scores (p=0.25). Mpox patients with any underlying illness and PLHIV were more likely to have higher severity scores when compared to those without (p<0.005). Pregnant women were more likely to have a higher severity score compared to non-pregnant women but with no statistical significance (p=0.58) (Table 2).

Continues to page 4

Continued from page 4

Table 2: Comparison of severity scores and the background characteristics of mpox cases, November 2024–February 2025,Uganda

Characteristic	Frequency (n)	Rank-sum	Expected	p value
Age				
< 17 years	22	2,332	2,695	0.25
18–55 years	222	27,588	27,195	
Gender				
Female	116	15,481	15,680	0.72
Male	128	14,410	14,210	
Pregnancy				0.59
Pregnant	7	279	245	
Non-pregnant	93	4,475	4,508	
Underlying illness				
Yes	74	12,352	90,655	<0.001
No	170	17,359	20,825	
HIV status				
Positive	65	10,159	7,183	<0.001
Negative	155	14,151	17,128	

Discussion

Our findings contribute to further characterization of the current mpox pandemic, focusing on the severity of the disease. We found a high prevalence of severe mpox and a high proportion of deaths among the cases.

We defined a severe disease using a severity score cut off ≥7 which demonstrated good predictive ability in settings with high HIV prevalence in a study that piloted the MPSSS tool(2). We recommend adopting the ≥7 cutoff in our setting and other similar settings given the high HIV prevalence. The high prevalence of severe mpox in this study was likely due to the high HIV prevalence in our setting. HIV has been found to be both a risk factor for mpox infection and also for severe mpox. Other studies have found similar findings, with PLHIV more likely to have severe presentations of mpox compared to those without HIV. Case-patients with HIV were also more likely to be hospitalized compared to those without HIV (5, 6).

In our study, the proportion of deaths among the cases was high, and living with HIV was a big contributor. These deaths also had high severity scores. Other studies have found a similar pattern of increased risk of death among PLHIV with mpox (5, 7). Prioritizing people with comorbidities for vaccination, especially PLHIV and other comorbidities, can protect them against severe disease. Cases with low severity scores and with no known comorbidities can be considered for home-based care and monitoring, whereas cases with higher scores would be prioritized for more inpatient care and close monitoring.

Strengths

To our knowledge, this was the first study to assess for severity of mpox in the country using the MPSSS tool. It has demonstrated consistency in the clinical presentation and outcome of mpox patients with their respective severity scores.

Continues to page 5

Continued from page 5

Study limitations
We applied the MPSSS tool at one point in time and only updated for the outcome. Some changes could have occurred as the mpox disease progressed. There could also have been an overestimation of the scores due to subjective assessment of secondary bacterial infection on clinical basis for most of the cases without carrying out a culture and sensitivity.

Conclusion
We found a high prevalence of mpox severity, with PHIV having an increased likelihood of severe disease. We recommend prioritizing case-patients with underlying conditions, especially PLHIV, for inpatient care and vaccination to protect them from severe mpox disease.

Conflict of interest
The authors declared no conflict of interest.

Authors' contribution
All authors contributed to the write-up and review of the bulletin. EM drafted the initial version of the bulletin. RM, PE, BK, LB, and ARA revised the manuscript for substantial intellectual content. EM, JOK, EOO, DW, JLK, PK, JN, CM, HK, LON, AMN, BA, and GA participated in the data collection and case investigations. RM, LB, BK, IL, PE, and ARA supervised the field data collection and reviewed the draft bulletin for substantial intellectual content. All authors read and approved the final bulletin.

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Continues to page 7

Continued from page 7

Mpox knowledge, vaccines attitude and vaccines concerns among healthcare workers ,Kampala Metropolitan Area, Uganda, February, 2025

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Summary

Background: Vaccination is one of the key outbreak countermeasures against mpox. However, it is challenged by vaccine hesitancy. Not only are healthcare workers one of the most at risk populations prioritized for vaccination, they also play a crucial role in health education, health promotion and vaccine advocacy.
We assessed mpox knowledge, and vaccine attitudes and concerns among the healthcare workers in the Kampala Metropolitan area (KMA), Uganda, to guide the Mpox vaccination program.
Methods: We conducted a cross-sectional study using a semi-structured self-administered questionnaire among 423 healthcare workers. Kampala Metropolitan area was purposively selected as it had 74.6% of the Mpox cases in the country at the time. In each of the districts, the highest level of healthcare facility and a randomly selected primary-level-care facility were selected. A knowledge score of ≥60% was considered adequate knowledge, and an attitude score ≥60% was considered a good attitude.
Results: All the 423 study participants had heard about Mpox, but only 44% (186) had adequate knowledge about Mpox. Only 44% (186) were aware that Mpox vaccines exist. Most 68.3% (289) of the participants had a positive attitude towards the Mpox vaccines; 71% (300) believed the vaccines are effective, and 52% (219) believed they are safe. Complacency was low, and 79% (334) agreed that getting vaccinated would protect their loved ones. Forty-two percent (178) of the participants expressed concerns about the Mpox vaccine, especially; vaccine safety 80(45%), effectiveness 30(17%), the fact that they aren't well informed about the vaccines 34(19%), and possible interaction with Ebola infection 12(7%).
Conclusion: Less than half of the health care workers had adequate knowledge about mpox and key knowledge gaps which should be addressed were identified .Most of the health care workers had a positive attitude towards mpox vaccine, which set a good platform for advocacy. Health care concerns regarding the mpox vaccine were identified. Vaccines campaigns addressing the health care concerns could improve their attitude towards the vaccines and ultimately increase vaccines advocacy and intent to get vaccinated.

Background

As of August 14, 2024, the World Health Organization (WHO) recommended and approved vaccines for Mpox. The vaccines can be administered as a pre-exposure prophylaxis for people at higher risk of getting Mpox, and can also be administered as post- exposure prophylaxis for people who have been in contact with someone with Mpox, within 4 days of exposure, or up to 14 days if the person has not developed symptoms yet(1). On January 21, 2025, the 10,000 doses of Mpox vaccine were delivered to Uganda(2).

According to the national situation report on mpox, as of January 22, 2025, 74.6% (1,646) of the 2,209 Mpox cases in the country were from the Kampala Metropolitan Area (KMA). In view of the limited vaccines, the Ministry of Health planned to conduct the vaccination in phases, prioritizing the most affected areas, and high-risk groups such as sex workers and healthcare workers among others. Noteworthy, Uganda has experienced vaccine hesitancy in the past, hindering the efforts to combat outbreaks (3-5)

Health care workers are not only one of the most at risk populations prioritized for mpox vaccination, they also play a key role in health education, health promotion and vaccines advocacy. Establishing the mpox knowledge, and vaccine attitudes and concerns among healthcare workers is crucial in guiding key talking points to address knowledge gaps and vaccine concerns to improve vaccine advocacy and intent to get vaccinated. We determined the mpox knowledge and vaccine attitudes and concerns among healthcare workers in the Kampala Metropolitan Area, Uganda, to guide the Mpox vaccination program

Continues to page 8

Continued from page 8

Methods

We conducted a cross-sectional study among Healthcare workers (clinical and non-clinical) working at public hospitals in the KMA. In the context of limited vaccine supply and targeted vaccination, the study area, KMA, was purposively selected as it bared the biggest burden of mpox with 74.6% (1,646/2,209) of the cases in the country as of January, 22, 2025.

Using the Keish Leslie formula for cross-sectional studies we enrolled a total of 423 study participants.

We collected data on social demographic characteristics, knowledge on Mpox, as well as attitudes and concerns towards the mpox vaccine. Knowledge on mpox was assessed using seven questions; the signs and symptoms, mode of transmission, incubation period, possibility of re-infection, who is as at higher risk of mpox, if mpox has specific treatment, and if it has a vaccine. Attitude towards the mpox vaccine was assessed using seven vaccine statements, and the participants asked if they had any concerns about the vaccine, those with concerns were requested to state them.

Knowledge on mpox: for the seven knowledge questions, “yes” was indicated as a correct answer and scored 1, and “no or don’t know” answers were scored 0. Three of the seven knowledge questions had multiple answers; leading to a maximum score of 22. A cut off point of 60% was set; one was considered to be knowledgeable about Mpox if they scored ≥60% and not knowledgeable if they scored ≤59%. Regarding attitude, the seven questions were scored on a 3-point Likert scale (disagree, agree and don’t know). The responses were scored 1 for those who agreed to positive statements and disagreed to negative statements, and a score of 0 for don’t know and no responses. A score of ≥60% was considered good attitude towards the Mpox vaccine, and a score of ≤59% was considered a negative attitude. Results on concerns about the mpox vaccine were presented using frequencies and proportions.

The Ministry of Health (MOH), Uganda, provided administrative clearance and authorized this study. The US Centers for Disease Control and Prevention provided a non-research determination (NRD) for non-human subjects. We sought verbal consent from respondents during data collection. Participants were told that their participation was voluntary and that there would be no negative consequences if they refused to participate (none declined). During data collection, respondents were assigned unique identifiers instead of names to protect their confidentiality. Information was stored in password-protected computers and was not shared with anyone outside the investigation team.

Results

Socio-demographic characteristics of healthcare workers, Kampala Metropolitan Area, Uganda, February 2025

A total of 423 participants were enrolled. The mean (SD) age of the study participants was 31.6 ±7.6, and slightly over half 59%(250) were female. Most 62.4% (264) of them had been health workers for < 5 years, and the majority 84% (354) had received the Covid-19 vaccine (Table 1).

Continues to page 9

Continued from page 9

Table 1: Socio-demographic characteristics of healthcare workers, Kampala Metropolitan Area, Uganda, February 2025

Social demographic characteristic	Frequency (N=423)	Percentage (%)
Sex		
Female	250	59
Male	173	41
Age		
20-30	233	55
31-40	141	33
>40	49	12
Marital status		
Single	185	43.7
Married	227	53.7
Divorced/separated/widowed	11	2.6
Level of education		
Certificate	170	40
Diploma	123	29
Degree	111	26
Masters or PHD	19	5
Healthcare role		
Non-clinical (administrators, janitors, security, etc.)	72	17
Allied health (Pharmacy, laboratory, physiotherapy)	78	19
Nurses and Midwives	209	49
Doctors	64	15
Health facility level		
District and Primary-care facilities	142	34
Regional Referral Hospital	123	29
National Referral Hospital	158	37
Years in healthcare service		
<5	264	62.4
5-10	103	24.4
>10	56	13.2
Comorbidities		
Yes	39	9
No	384	91
Did you get the COVID-19 vaccine?		
Yes	354	84
No	39	16

Continues to page 10

Continued from page 10

Mpox knowledge

All of the participants had heard about mpox , but only 44% had adequate knowledge about mpox. Over 115(27%) knew all the signs and symptoms, 49 (12%) correctly stated all the modes of transmission, 93(22%) correctly stated the different categories of people at a higher risk of getting mpox,110 (26%) correctly stated the different categories of people at a higher risk of getting worse outcomes, 186 (44%) were aware that mpox vaccines exist, 187 (44.2%) correctly stated the incubation period, 225(53%) were aware that one can get re-infected with mpox, and 212(50%) correctly stated that there is no specific medication for mpox.

Attitude towards the mpox vaccine

Most 289 (68.3%) of the study participants had a positive attitude towards the mpox vaccine. Most expressed confidence in the mpox vaccine; 300 (71%) believed that the vaccine is effective, and 219 (52%) believe that it is safe. Complacency was low; only 91 (22%) agreed that mpox is not severe enough to warrant vaccination, and 19% (81) believed that their immune system is strong enough to obviate the need for vaccination. A strong sense of collective responsibility was also observed, with 79% (334) of the participants agreeing that vaccination contributes to the protection of others in the community (Table 2).

Table 2: Attitudes towards the mpox vaccine among health care workers, Kampala Metropolitan Area, Uganda, February 2025

(Attitude statement: n=423)	Agree n (%)	Disagree n (%)	Don't know n (%)
The Mpox vaccine is safe	219 (52)	64 (15)	140 (33)
The Mpox vaccine is effective in protecting me against Mpox	300 (71)	123 (29)	-
Getting the Mpox vaccine will protect me and my loved ones against Mpox	334 (79)	89 (21)	-
There are better ways of preventing Mpox than vaccination	264 (62)	159 (38)	-
Mpox is not so severe that I should get vaccinated	91 (22)	332 (78)	-
My immune system is strong, I don't need to get the Mpox vaccine	39 (9)	239 (57)	-
Getting more information about the Mpox vaccine will make me more willing to get vaccinated	239 (57)	39 (9)	145 (34)

Concerns about the mpox vaccine

When asked if they had any concerns about the mpox vaccine, 178 (42%) of the study participants expressed concerns about the mpox vaccine. The participants were concerned about possible side effects from the vaccine 80(45%), the fact that they had not receive enough information about the mpox vaccine 34(19%), vaccine effectiveness 30(17%), and possible interaction between the vaccine, mpox infection, and Ebola infection 12(7%) as there was an Ebola outbreak at the time, the speed at which the vaccine was cleared for use 8(4%), and the fact that the government might have had ulterior motives for vaccinating the population 4(2%) (Figure 1).

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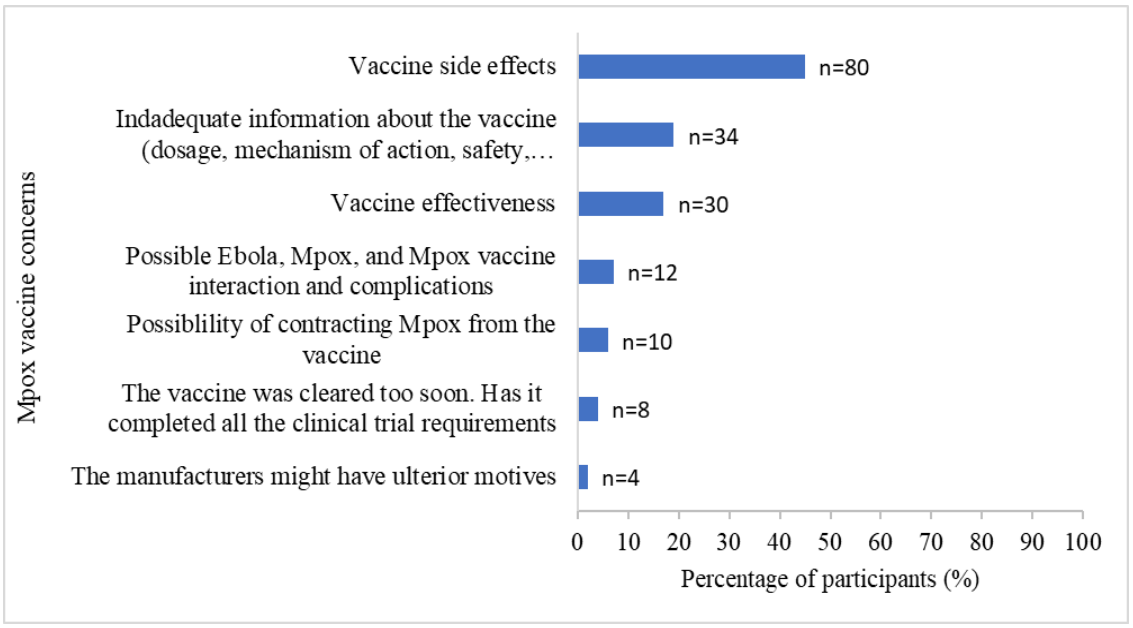

Figure 1: Concerns about the mpox vaccine among healthcare workers, Kampala Metropolitan Area, Uganda, February 2025

Discussion

Less than half of the participants had adequate knowledge about mpox, and only 44% were aware that mpox vaccines exist. When informed that mpox vaccines do exist, most of the participants had a positive attitude towards the vaccines; majority expressed confidence in the vaccine, there was low compliancy, and a strong sense of collective responsibility was observed. Forty-two percent of the participants expressed concerns about the mpox vaccine, specifically regarding vaccine side effects, vaccine effectiveness, the possible interaction between mpox, the mpox vaccine, and ebola disease, and the fact that they didn't have enough information about the mpox vaccines.

The finding that only 44% were knowledgeable about the Mpox is consistent with what has been found elsewhere(6, 7). The fact that there were some knowledge gaps identified is concerning, especially since this study was conducted six months into the outbreak in Uganda, and years since it was declared a Public Health Event of International Concern. More than half of the healthcare workers weren't aware that mpox vaccine exist. This is particularly concerning as healthcare workers are responsible for health education, and ultimately vaccine advocacy. Furthermore, healthcare workers are one of the most at-risk populations and hence they are prioritized for vaccination.

The healthcare workers expressed a good attitude towards the mpox vaccine. A positive attitude towards a vaccine has been known to positively influence vaccine advocacy and willingness to recommend the vaccine, as well as one's intention to get vaccinated.(8) This study highlights the concerns the healthcare workers have about the mpox vaccine, which provide information on key talking points for vaccination campaigns. Addressing these concerns in the vaccine campaign program could increase vaccine advocacy, and willingness and intent to get vaccinated. This can also increase the knowledge base among the healthcare workers and facilitate sharing of facts to their patients and the population at large.

Continues to page 12

Continued from page 12

Study limitations

Including only the participants on duty on the day of the interview could have introduced a selection bias. However, we checked and established that for most of the health facilities, the healthcare workers work day and night duties in turns, giving almost every healthcare worker an equal probability of being on a day duty shift on the day of the interview.

Conclusion

Less than half of the healthcare-workers had adequate knowledge about mpox, and key knowledge gaps to be addressed were identified. Most of the healthcare-workers had a positive attitude towards the mpox vaccine, which set a good platform for advocacy. The study also highlighted the healthcare-workers' concerns regarding the Mpox vaccine. Mpox vaccine campaigns addressing the healthcare-workers' concerns could improve their attitude towards the vaccine, and ultimately increase vaccine advocacy and intention to get vaccinated.

Competing interests

The authors declare no competing interests, be it financial or personal.

Author contribution

LON: Participated in the conception, design, analysis, and interpretation of the study results, drafted the bulletin; RM, BK, ARA reviewed the report and bulletin for intellectual content and scientific integrity.

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Mpox outbreak investigation in Mbarara City, Uganda, October 2024–March 2025

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Summary

Background: Uganda has reported multiple mpox outbreaks, including in Mbarara City, a densely populated urban center in western Uganda. The first mpox case in Mbarara was confirmed in October 2024. By February 2025, the city had recorded 188 cases. We estimated the scope of the outbreak, identified transmission risk factors, and recommended control and prevention measures.
Methods: We conducted a descriptive epidemiological investigation in Mbarara City from October 2024 to March 2025. Mpox cases were classified as suspected, probable, or confirmed based on Uganda Ministry of Health and World Health Organization case definitions. Data were collected through active case finding, interviews and medical record reviews. Analyses included person, place, and time distribution.
Results: A total of 304 mpox cases were reported, yielding an overall attack rate of 127 per 100,000 population. Males were more affected (137/100,000) than females (118/100,000). Nyamitanga Division had the highest attack rate (223/100,000), while Nyakayojo had the lowest (39/100,000). Common symptoms included skin lesions (99%), swollen lymph nodes (91%), and sore throat (73%). The index case, a 35-year-old male, reported unprotected sexual contact prior to illness onset and tested positive on October 14, 2024. The outbreak peaked with 12 new cases on March 5, 2025. Two deaths occurred, both in HIV-positive females.
Conclusion: We confirmed the first documented mpox outbreak in Mbarara City, with widespread transmission and elevated attack rates in more densely populated divisions. These findings underscore the urgent need for strengthened surveillance, early case detection, and targeted risk communication. Integrating mpox screening and education into existing HIV and sexual health services could enhance future outbreak prevention and control in urban areas.

Background

In Uganda, the first identified known human case were declared on July 24, 2024, in Kasese District (1). The Ministry of Health (MoH) reported that the two cases were imported and originated from the Democratic Republic of Congo (DRC). Following this, mpox spread to other districts and cities in Uganda. On October 11, 2024, the first two cases in Mbarara were reported: a 28-year-old female and a 35-year-old male. Both cases were confirmed on October 14, 2024. The cases increased to 188 mpox cases by February 2025 prompting national response team to intervene and support Mbarara City. We estimated the scope of the mpox outbreak, assessed risk factors for transmission, and recommended evidence-based control and prevention measures

Methods

Mbarara City is situated around 270 kilometers (roughly 168 miles) to the southwest of Kampala, the capital of Uganda. The city has a population of approximately 238,500 people, according to local statistics. Mbarara City is widely recognized as a major hub of trade, industry, and administration in Western Uganda.
We defined mpox cases as suspected, probable or confirmed cases using the standard case definition by the Ministry of health, Uganda and the World Health Organization(2,3).

We line listed cases using the snowball method where individuals in the community with already existing symptoms led us to others.

We performed descriptive epidemiology on the line-listed case-patients. Case-patients were described by time, place, person characteristics.

A total of 304 samples from the skin lesions were collected and transferred to the testing laboratory using the hub system. Mpox confirmation was based on identification of mpox by PCR.

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This outbreak investigation was in response to a public health emergency and was therefore determined to be non-research. The Ministry of Health (MoH) gave permission to investigate this outbreak. The Office of the Associate Director of Science, US CDC/Uganda determined that this activity was not human subject research and that its primary intent was public health practice or disease control activity (specifically, epidemic or endemic disease control activity). Prior to the data collection, informed consent was obtained from all the participants who were aged 18 years or older(legal age in Uganda). For those below 18 years, consent was sought from their parents/guardians and assent was also obtained from them to participate in the study.

Results

Descriptive epidemiology

Between October 2024 and March 2025, a total of 304 cases were documented in Mbarara City. The majority of cases 152 (50%) occurred in individuals aged 15–30 years, followed by 123 (41%) in the 30–45-year age group. Cases who were below 15 years accounted for 4 (1%), while those over 45 years comprised 25 (8%).

Males accounted for 161 cases (53%), and females for 143 (47%).

Among 304 mpox cases, the most commonly reported symptoms were lesions 301(99%), swollen lymph nodes 278(91%), and sore throat 221(73%) (Figure 1).

The overall attack rate (AR) in Mbarara City was 127 per 100,000. Males more affected (AR=137 per 100,000) compared to females (AR=118 per 100,000). The highest division-specific attack rates were observed in Nyamitanga (223/100,000) and Kakiika (219/100,000). These were followed by Kakoba (AR=170/100,000), Biharwe, Kamukuzi, and Nyakayojo (AR=75, 70, and 39/100,000, respectively).

Exposure sources were largely unknown, with 213 cases (70%) reporting no identifiable exposure. Among known exposures, sexual contact was the most common, with 89 (29%) cases. Other exposures included contact with cases in public transport and hospital exposure, each accounting for one case (0.3%).

Regarding comorbidities, 52(17%) cases were HIV-positive, 92 (30%) were HIV-negative, and the HIV status was unknown for 160 (53%) cases.

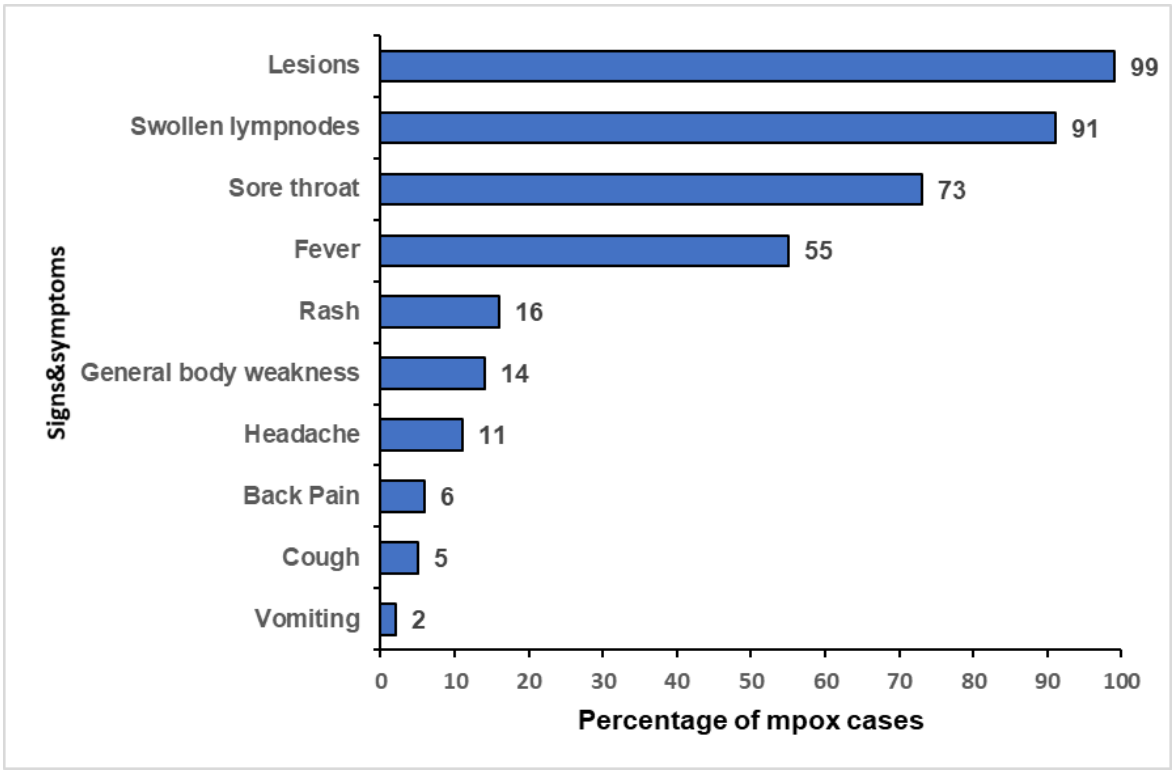

Figure 1: Distribution of clinical symptoms of mpox cases during mpox outbreak, Mbarara City, October 2024–March 2025 (n=304)

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On October 6, 2024, a 35-year-old man from Nyarubanga parish, Mbarara City, sought medical attention after developing a fever for two days, followed by a generalized rash and swollen lymph nodes. The index reported to have had hard random sex with an unknown girl he picked from the club. Despite initial treatment with antibiotics from the clinics, his condition worsened, and he was referred to Mbarara Regional Referral Hospital (MRRH) on October 11, 2024, where lesion swab samples were collected and confirmed positive for mpox on October 14, 2024. This case marked the start of the outbreak in Mbarara. The outbreak continued to escalate, with cases increasing to 41 in December 2024. By January 2025, the number of cases significantly increased to 99 and reached the notable peak of 188 in February 2025. In response to the rising cases, the Ministry of Health responded on March 4, 2025, acknowledging the ongoing rise in cases and calling for enhanced surveillance and more public awareness. The outbreak peaked in early March 2025, with 12 cases reported on March 5. Two death occurred first one on March 15, 2025, a 24-year-old HIV positive female. The second one occurred on March 30, 2025, a 25-year-old HIV positive female. Cases decreased towards end of March 2025 (Figure 2).

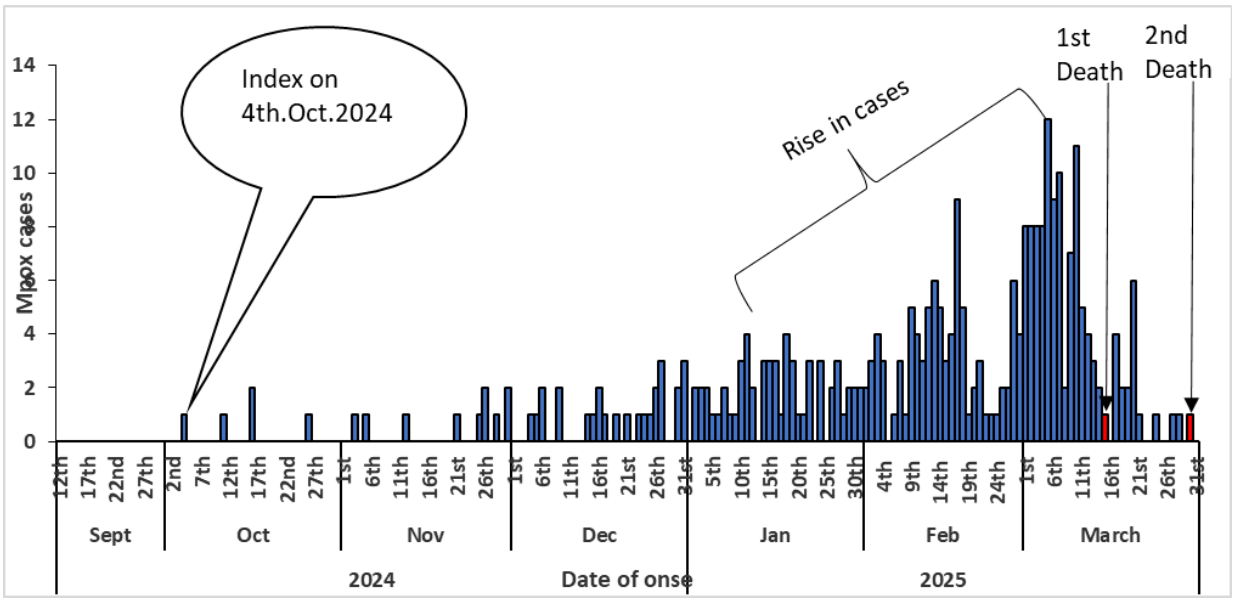

Figure 3: Distribution of mpox cases by time in Mbarara City, October 2024–March 2025

Discussion

This outbreak marked the first confirmed mpox occurrence in Mbarara City, with cases across all six divisions, indicating urban community transmission. The index case had classical mpox symptoms and a history of sexual contact, aligning with prior findings on sexual exposure as a transmission route (4,5). Higher case concentrations in densely populated, socially active divisions support existing evidence that crowding and social interaction facilitate mpox spread in urban settings (6,7).
Males were more affected than females. This sex distribution is consistent with findings from previous studies, which have noted similar patterns of disproportionate impact (8).

Clinically, most cases presented with characteristic features of mpox, including skin lesions, lymphadenopathy, and sore throat. These findings are consistent with previously described symptom profiles in both endemic and non-endemic settings(9–11).
The majority of cases were mild and moderate cases. However, the death of a female with underlying immunosuppression highlights the heightened vulnerability of certain populations. This observation reinforces earlier findings that individuals with compromised immune systems such as those living with HIV, are at increased of severe outcomes(12).

Study limitations

The study relied on self-reported exposure histories, which may be biased. Over half of the cases had unknown HIV status, limiting analysis of disease severity in immunocompromised individuals. As a descriptive study, it could not establish causal relationships.

Continues to page 17

Conclusion

This outbreak showed the potential for rapid mpox spread in densely populated urban settings, especially among young adults and immunocompromised people. Early detection and tailored interventions are critical for managing urban mpox outbreaks. Mpox screening should be integrated into sexual and reproductive health services, especially for people living with HIV. Strengthening community-based surveillance and targeted awareness in high-density areas is essential for outbreak control.

Conflict of Interest

The authors declared no conflict of Interest

Author contribution

PK, CM, JLK, BK, RM, ARA conceived and designed the study. PK, CM, JLK contributed to data collection, cleaning and analysis. PK, CM, JLK, BK, RM, ARA took lead in developing the bulletin. All authors contributed to the final draft of the bulletin. All the authors read and approved the final bulletin.

Acknowledgments

We extend our appreciation to Mbarara Regional Referral Hospital, City surveillance focal person for the technical and administrative support during the investigation.

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Continues to page 18

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Investigation of yellow fever outbreak associated with swamp-based rice cultivation, Kibuku District, Uganda, December 2024

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Summary

Background: In August 2024, the Uganda Ministry of Health was notified of three laboratory-confirmed yellow fever cases in Kibuku District. We estimated the outbreak scope, characterized cases, assessed transmission risk factors, and recommended evidence-based control measures.
Methods: We defined a suspected case as acute onset of fever plus ≥2 of the following symptoms: altered mental state, abdominal pain, diarrhea, vomiting, headache, unexplained bleeding and jaundice, in a resident of Kibuku District from June 1-December 31,2024. We defined a probable case as a suspected case with positive IgM for YF specific antibodies and is unvaccinated against yellow fever. A confirmed case was defined as a probable case with a positive Plaque Reduction Neutralization Test (PRNT). We conducted case-patient reviews, reviewed medical records, conducted risk assessment, obtained samples from suspected case-patients and shipped them to the Uganda Virus Research Institute (UVRI) for testing.
Results: We identified 3 confirmed, 4 probable, and 35 suspected cases, with no deaths. The mean age among probable and confirmed cases was 12 years. Common symptoms included fever (100%), headache (100%), jaundice (60%), and abdominal pain (60%). All confirmed cases were from Kasasira Subcounty and were unvaccinated. All reported rice farming near swampy areas, indicating likely exposure to infected mosquitoes. One probable case was identified in December, suggesting ongoing transmission.
Conclusion: Sylvatic yellow fever outbreak occurred in Kibuku District. The outbreak was linked to exposure to mosquito bites during rice cultivation and no vaccination. We recommend strengthening routine yellow fever vaccination and implementing targeted vector control in high-risk swampy areas.

Background

Yellow fever is an acute viral hemorrhagic disease caused by a flavivirus in the *Flaviviridae* family (1). It is transmitted to humans through the bite of infected *Aedes* or *Haemagogus* mosquitoes, and occurs in three main transmission cycles: sylvatic (jungle), intermediate (savannah), and urban (2, 3). The disease has 2 phases; the acute phase characterized by fever, muscle pain, backache, rigors, loss of appetite, nausea, vomiting and abdominal pain; the toxic phase is characterized by jaundice, abdominal pain with vomiting, unexplained bleeding from the mouth, nose, eyes and stomach, appearing in vomit, urine and feaces. Yellow fever has no cure but prevention is mainly by vaccination (4).

Uganda is located within the yellow fever endemic zone (5). Since 2016, multiple districts in Uganda, including Masaka, Wakiso, Buikwe, and Bundibugyo, have reported outbreaks (6). In October 2022, Uganda introduced mandatory yellow fever vaccine into the routine immunization schedule, given at nine months of age (7). Despite the vaccination campaigns conducted, gaps in coverage and surveillance leave some population at risk.

On August 13, 2024, the Uganda Ministry of Health (MoH) was notified of three positive yellow cases from Kasasira Primary School, Kibuku District. We estimated the scope of the outbreak, characterized the cases, assessed associated risk factors for transmission, and evaluated the presence of active viral transmission.

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Methods

The outbreak occurred in in Kibuku District, Eastern Uganda. Kibuku District is characterized by an extensive network of wetlands associated with Mpologoma River(8). These wetlands facilitate extensive rice farming, fishing, and subsistence agriculture.

We defined a suspected case as acute onset of fever plus ≥2 of the following symptoms: altered mental state, abdominal pain, diarrhea, vomiting, headache, unexplained bleeding and jaundice, in a resident of Kibuku District from June 1-December 31, 2024. A probable case was defined as a suspected case with positive IgM for YF specific antibodies and is unvaccinated against yellow fever. A confirmed case was defined as a probable case with positive Plaque Reduction Neutralization Test (PRNT).

We visited the health facility that had confirmed yellow fever cases and other health facilities within Kibuku District. We further conducted case search in the affected community. We reviewed medical records of identified cases and conducted interviews using a case investigation form we designed. We line-listed suspected cases and took off blood samples for a yellow fever test from Uganda Virus Research Institute.

We conducted an environmental assessment to identify possible risk factors of yellow fever transmission. We observed the farm lands where confirmed cases cultivated from and determined the distance of their homes from the farm lands.

We conducted six case interviews using a yellow fever case investigation form. Case-patients were interviewed on potential risk factors that occurred prior to symptom onset.

We trapped mosquitoes from around the homesteads and farmlands of the three confirmed cases to identify their species and morphology. We collected water samples from swamps close to the confirmed cases' homes to facilitate our findings about the presence of Aedes mosquito species in the homesteads

We performed descriptive epidemiology and described data by person, place and time. We analyzed data on only 7 cases.

Approval to conduct this project under the Non-Research Determination criteria was obtained from the U.S Centers of Disease Control and Prevention (CDC). We sought authorization from the District Health Office and health facility In-charges, to access case-patients' medical records. Informed consent and verbal assent were sought from the case-patients prior to conducting interviews.

Results

Descriptive epidemiology

Between June and December 2024, we identified a total of 42 yellow fever case-patients in Kibuku District: 3 confirmed, 4 probable, and 35 suspected. Their mean age was 12years (10-14). Most were female, 6 (86%), muslim by religion 5 (71%), and were from Kasasira town council 5 (71%). All the case-patients presented with fever and headache 7 (100%) and the majority presented with yellow eyes 4 (60%), abdominal pain 4 (60%) and chills 3 (50%) (Figure 1). The 3 confirmed case-patients were sparsely distributed in Kasasira subcounty.

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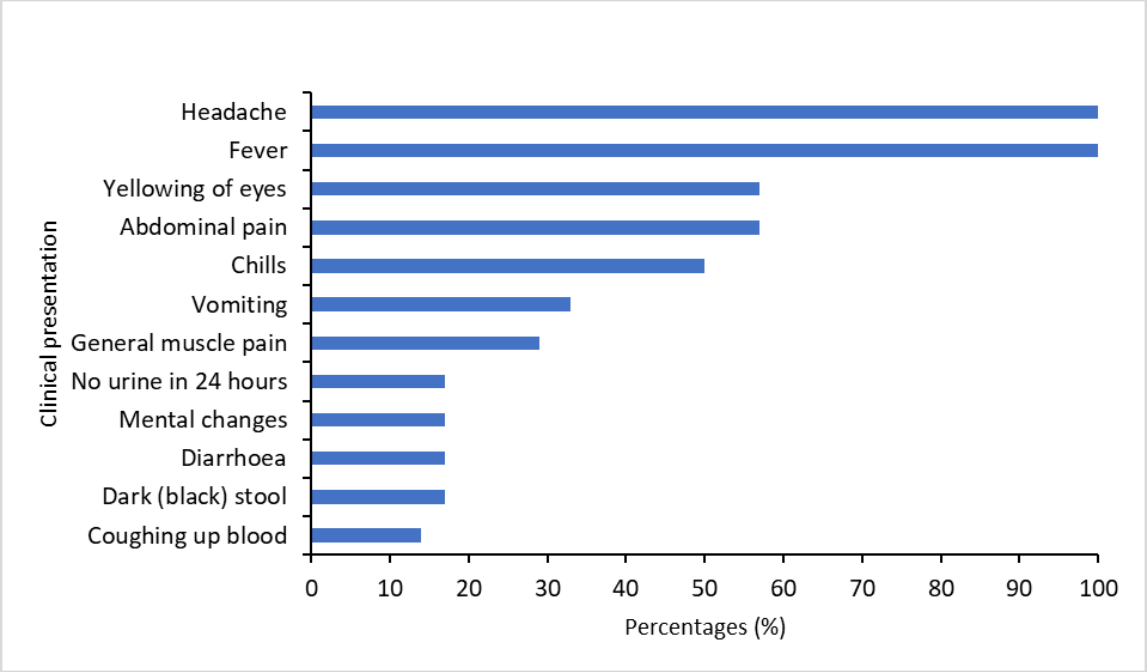

Figure 1: Clinical presentation of case-patients during a yellow fever outbreak in Kibuku District, June – December, 2024
Over 6 yellow fever cases (both probable and confirmed) were registered in the district during the month of June, where as one case was registered in December 2024.

Confirmed yellow fever case summaries

Confirmed case one was a 12-year-old female from Bugiri 2 village, Kasasira Parish, Kibuku District, developed high-grade fever with chills, rigors, headache, and abdominal pain on June 14, 2024. She lost consciousness and was taken to Kasasira Health Centre III, where a malaria rapid diagnostic test was positive. She was hospitalized, and samples for viral hemorrhagic fevers, including yellow fever, were collected. She later exhibited jaundice and hematuria but no vomiting. Serological testing on August 13, 2024, revealed positive IgM and PRNT titers for yellow fever. Her family engages in rice farming near her home, and she sleeps under a mosquito net, with no history of yellow fever vaccination. By December 2024, she was asymptomatic (Figure 2).

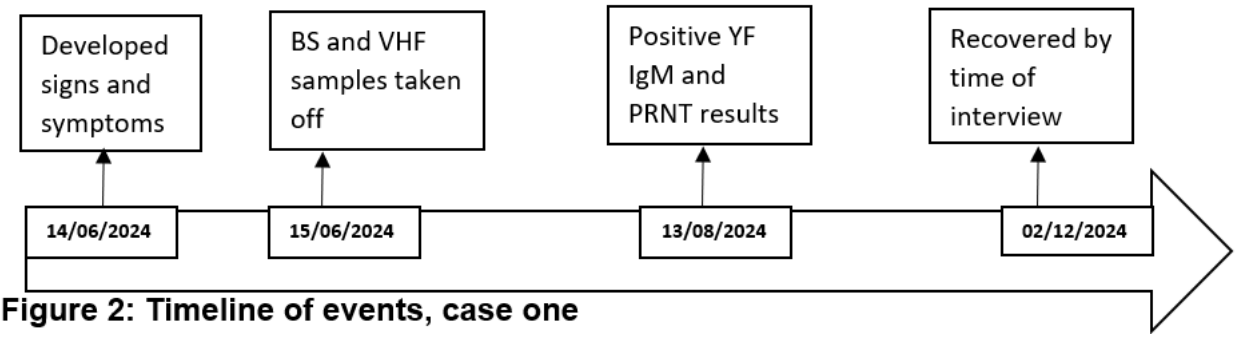

Figure 2: Timeline of events, case one

Confirmed case two was a 10-year-old female in Primary 3 from Kasasira 2 village, Kibuku District, presented with fever, headache, dizziness, altered mentation, and passing deep yellow urine on June 13, 2024. She was taken to Kasasira HCIII on June 14, 2024, where an mRDT was positive for malaria, and samples for viral hemorrhagic fever (VHF) were collected and shipped to Uganda Virus Research Institute (UVRI) on June 15. She was promptly started on antimalarials. Laboratory results later indicated positive yellow fever IgM antibodies and a PRNT titer of 20, suggesting recent yellow fever infection (Figure 3).

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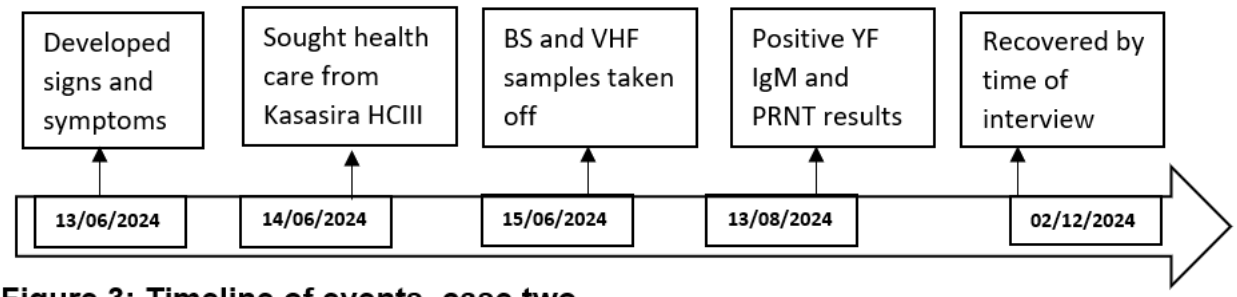

Figure 3: Timeline of events, case two

Confirmed case three was a 13-year-old female resident of Lemwa village, Kasasira Town Council and was a Primary five pupil at Kasasira day and boarding primary school. On Jun 14,2024, developed fever associated with chills and rigors, abdominal pain, bloody urine, yellow eyes and was referred to Kasasira HCIII. Samples taken off were positive for malaria, both YF specific IgM antibodies and PRNT. She practiced farming for economic purposes, slept under a mosquito net daily, no history of travel to nearby districts during the exposure period and was never vaccinated against yellow fever (Figure 3).

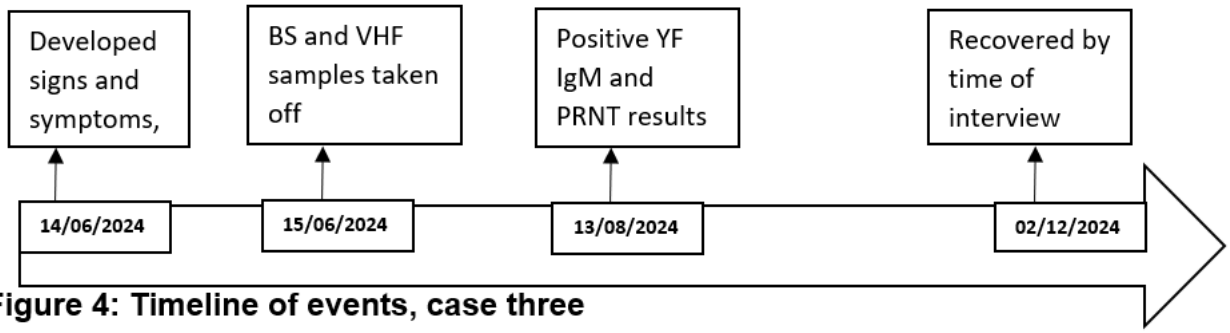

Figure 4: Timeline of events, case three

Probable cases that tested negative on confirmatory with PRNT tests for yellow fever disease

There were 4 individuals, three of whom were pupils of primary level of education at Kasasira primary school, and the fourth was a pupil at another school in the nearby subcounty to Kasasira in Kibuku District, who developed signs and symptoms suggestive of yellow fever. They had VHF samples taken off which tested positive for IgM specific YF antibodies but negative PRNT. All carried-out rice farming from nearby swamps, had no travel history to other districts and had never been vaccinated against yellow fever.

From observations made near farmlands and homes of confirmed case-patients, there were no forests, but rice farming was done in swamps that were about 5km from their homes. These had stagnant water which was a fertile source for mosquito breeding. In addition, there were fish ponds near the homes of one of the confirmed cases, where fish rearing was done.

rearing was done.

Findings for probable exposure risk factors to yellow fever disease

Among 6 case-patients, not being vaccinated against yellow fever 6 (100%), working from the agricultural field 5 (83%), visiting a swamp before exposure period, 5 (83%) and cultivation in a swamp 5 (83%) were the likely exposures to yellow fever disease in the district.

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Discussion

The outbreak affected several sub-counties with Kasasira the most affected. The outbreak was most likely sylvatic in nature, propagated by agricultural activities in swampy environments and lack of vaccination in the community. Our findings are consistent with a study in Central and Southwestern Uganda, where yellow fever was transmitted by mosquito bites during farming in swampy areas (6). There was clustering of confirmed cases within Kasasira town council suggesting localized transmission, likely driven by environmental and behavioral factors. There was one probable case-patient registered in December, with a time lag of five months after confirmation of three case-patients in June. This finding suggests recurrent yellow fever outbreaks and likely endemicity of the disease in the district, which is likely due to decline in population immunity to infection, increased human activities such as swamp reclamation, and climate change (6, 9). There is need to re-enforce prevention and control strategies against yellow fever, such as vaccination. The primary economic activity of rice farming in swamps emerged as a likely risk factor, as stagnant water in swamps provides breeding grounds for *Aedes* mosquito species, the primary vector for yellow fever (2). These findings are consistent with global patterns where proximity to water bodies and wetlands contributes to higher YF transmission risk (10). Probable cases with positive IgM but negative PRNT results indicated possible cross-reactivity with other flaviviruses, such as Dengue, Zika or West Nile viruses, highlighting the need for comprehensive differential diagnosis to avoid misdiagnosis and missed opportunities for outbreak control (11). Surveillance on other flavi viruses is required in these communities to avoid future outbreaks.

Notably, all case-patients were unvaccinated against yellow fever, underscoring gaps in immunization coverage despite the country's introduction of routine yellow fever vaccination in October 2022. Vaccination is a critical preventive measure and has been shown to reduce risk of disease and outbreaks (12). There is need for frequent mass-vaccinations in the district to build herd immunity especially among the older population who existed before the introduction of routine yellow fever vaccination in the immunization schedule

Our findings should be interpreted with the following limitation. First, Kibuku District has a high malaria burden. Malaria clinical manifestation is similar to yellow fever. This likely led to missing out yellow fever cases during active case search. This could have led to an under estimation of the magnitude of the outbreak.

Conclusion

The outbreak occurred among children of school going age and Kasasira subcounty was the most affected. All the confirmed cases were not vaccinated against yellow fever, and engaged in rice cultivation from swamps, which could be the possible risk factor to acquiring yellow fever disease.

Recommendations

We recommended mass vaccination against Yellow Fever among residents of Kibuku District to build community-level immunity. Ongoing Yellow Fever surveillance should be implemented at the community level to enable timely detection of cases.

Conflict of interests

The authors declare that they have no conflict of interests.

Authors' contributions

AMN, DW, PO, designed the study and contributed to the data collection and analysis. AMN led the writing of the manuscript. AMN, DW, PO, RM, FN, BK, ARA, participated in bulletin writing and review to ensure scientific integrity and intellectual content. All the authors contributed to the final draft of the bulletin.

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Knowledge, attitudes and practices of secondary school student leaders towards alcohol and other drug use in Uganda, July 2024

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Summary

Background: Alcohol and Other Drug (AOD) use contributes to a total health burden of 14% among adolescents, potentially impacting their cognitive development, academic performance, and mental health. We assessed the knowledge, attitudes, and described practices (KAP) of students toward the use of AODs to inform prevention and control strategies.
Methods: We conducted a cross-sectional study among secondary school student leaders attending the annual prefects conference in Kampala in July 2024. We obtained students' registration lists and systematically selected participants at an interval of three. We collected data using self-administered questionnaires. Bloom's cut-off of ≥60% and <60% was used to determine adequate knowledge and positive attitudes towards AOD use, while practices towards AOD use were descriptively defined.
Results: A total of 569 student leaders were surveyed, 400 (70%) were male, 423 (74%) were 18 years or older, and 329 (58%) were in an advanced class level. Their mean age was 18 years (SD: 1.9) with a median age of 19 years (IQR: 17–20) years. Nearly one-third of students, 27% (155), had ever used AODs, while 18% (103) reported current use. Among participants who had ever used AODs, alcohol was the most commonly used substance, 99 (64%). Most current AOD users, 62 (60%), consumed AODs at home and primarily with friends 70 (68%). Overall, most participants demonstrated adequate knowledge about AOD use 518 (91%). Attitudes toward AOD use were mixed, with 467 (82%) viewing addicts as victims, 381 (67%) disliking students who used AODs, while 159 (28%) supported punitive measures. Among current users (n=103), most reported using AODs with friends 70 (68%) and at home 62 (60%) while citing peer pressure 54 (52%) and curiosity 35 (34%) as key reasons for initiating use. Overall, the majority of the participants 529 (93%) demonstrated positive attitudes towards AOD use.
Conclusion: Our findings demonstrate that while students had good knowledge about AOD use, their practices remained risky, often influenced by peer pressure and home environments, suggesting that knowledge alone is not sufficient to prevent AOD use. Schools could build on this knowledge by addressing students' attitudes and practices to promote safe, supportive environments that discourage AOD use.

Background

According to the Global Status Report on Alcohol and Health 2018, approximately 5.6% of adolescents aged 15-19 years globally reported engaging in heavy episodic drinking (defined as consuming 60 or more grams of pure alcohol on at least one occasion within 30 days) (1). Additionally, the United Nations Office on Drugs and Crime World Drug Report 2022 noted that about 30 million adolescents globally used drugs in the previous year(2). Globally, the prevalence of alcohol and drug (AOD) use among adolescents has been linked to various adverse outcomes, including impaired cognitive development, poor academic performance, and increased risk of mental health disorders such as depression, anxiety, and conduct disorders (3). In Uganda, secondary school students face unique challenges related to AOD use, influenced by cultural, social, and economic factors. Addressing these challenges requires an understanding of students' knowledge, attitudes, and practices towards AOD use.

Research has shown that students' awareness of the risks of AOD use and their attitudes toward it significantly influence their behavior(4,5). On June 27, 2024, the Uganda Mental Health Division of the Ministry of Health raised an alert about increasing numbers of students using AODs in secondary schools. We assessed students' knowledge, attitudes, and practices towards AOD use, Uganda, July 2024.

Continues to page 25

Continued from page 25

Methods

Study design and setting

We conducted a cross-sectional study among secondary school student leaders who attended the 3rd Uganda annual national prefects conference held at Hotel Africana in Kampala, Uganda, in July 2024. The 3rd edition of the National Prefects Conference was held in Kampala, focusing on the theme "Drug Abuse and Its Effect on Mental Health". The conference attracted over 1,600 student leaders who resided in 22 districts of Uganda.

Sample size and sampling

Sample size estimation was based on a conservative 50% prevalence rate, using the Kish Leslie formula with a 95% confidence level (Z=1.96) and a margin of error of 5%. To account for non-response, the sample size was increased by 10% (6), resulting in a final sample size of 423 participants. However, our study considered a total sample size of 569 participants, given the students' availability and willingness to participate in the study. We utilized a systematic sampling technique to identify respondents to participate in the study. We used registration lists of all students who attended the prefects' conference, and this provided a sampling frame. We calculated the K^{th} interval of selecting students as 3.

$$\text{Kth interval} = \frac{\text{Total learners that attended the conference (1707)}}{\text{Number of learners needed (569)}} = 3$$

The first learner was randomly selected by choosing a random number between 1 and 3. The following participants were selected after every 3^{rd} learner on the registration list until the required sample size of 569 was attained.

Data collection and study Variables

Using a structured self-administered questionnaire loaded in the Kobo collect toolbox, we collected data regarding the variables of participants such as age, sex, religion, their knowledge, attitudes, and practices.

Data analysis

We generated descriptive statistics to compute the frequencies and percentages of different variables, including sociodemographic variables. Knowledge, attitudes, and practices (KAP) of participants were assessed. Positive responses were scored with 1, while negative responses were scored with a 0 value. All scores were added to generate total scores. Bloom's cut-off points were used to measure the knowledge, practices, and perception levels. Scores that were <60% we considered to be poor while those that were ≥60% were considered to be good (7).

Ethical consideration

The Ministry of Health Uganda provided administrative clearance to conduct this investigation. In addition, we received a non-research determination clearance from the US Centers for Disease Prevention and Control (US CDC). This activity was reviewed by the CDC and was conducted consistent with applicable federal law and CDC policy. § §See e.g., 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq. We sought informed consent from participants who were ≥18 years and assent from those who were <18 years.

Results

Socio-demographic characteristics of study participants

We enrolled 569 students, with a mean age of 18 years (SD:1.9) and a median age of 19 years (IQR: 17–20) years. Most of the students were male 400 (70%), 423 (74%) were 18 years or older, and most were in an advanced class level, 329 (58%). Most participants attended private schools, 285 (50%). Among the study participants, 155 (27%) reported having ever used AODs, while 103 (18%) reported current use.

Knowledge about Alcohol and Other drug use among secondary school learners

Our study found out an overall high level of knowledge on AOD use among study participants, 518 (91%). Most participants, 558 (98%) were aware of the legal age for purchasing alcohol in Uganda and could identify an example of an illegal drug. Additionally, the majority 552 (97%) recognized the potential dangers of mixing alcohol. However, 119 (21%) were knowledgeable about the short-term effects of marijuana use while 336 (59%) were aware of the risks involved in inhalant abuse (Figure 1).

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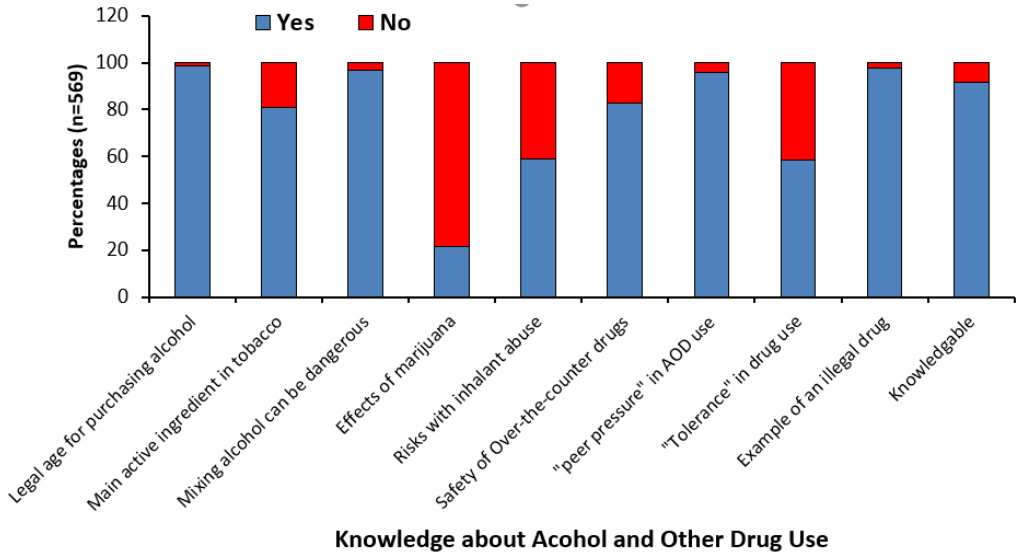

Figure 1: Knowledge of students on the use Alcohol and Other Drugs, Uganda, July 2024

Attitudes towards Alcohol and Other Drug Use

Our study indicated an overall positive attitude of students towards the use of AODs 529 (93%). Less than half of the participants, 262 (46%) strongly believed that alcohol was as dangerous to health as cigarettes. There was strong support for making drug treatment accessible to all addicts, with 296 (52%) strongly agreeing with this stance. Nearly half, 273 (48%) believed that spending on drug prevention was worthwhile. The majority, 467 (82%) viewed drug addicts more as victims than criminals. However, 381 (67%) admitted they would dislike a student who uses substances like alcohol, and 216 (38%) would dislike one who uses illegal drugs. There was less consensus on punitive measures, with 159 (28%) agreeing that severe punishments for drug misuse might solve the problem.

A small minority 34 (6%) viewed it as normal for students to try drugs at least once (Table 1).

Continues to page 27

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Table 1: **Attitudes of students towards the use of Alcohol and ther Drugs, Uganda, July 2024**

Attitudes	Agree n (%)	Disagree n (%)
Alcohol is just as dangerous to one's health as the use of cigarettes	253 (46)	294 (54)
Almost all drug addicts are dangerous to society	182 (33)	365 (67)
Drug addicts should be given a fair chance to get treatment	282 (52)	265 (48)
Drug and substance abuse cause more problems in schools	258 (47)	289 (53)
Drugs are not really a problem to us here in Ugandan Schools	96 (18)	451 (82)
Drugs education in schools should start at the primary level	277 (51)	270 (49)
I see drug addicts more as criminals than victims	101 (18)	446 (82)
I would hate a student who takes substances like alcohol	366 (67)	181 (33)
I would hate a student who uses illegal drugs like Kuber or shisha	209 (38)	338 (62)
I would not like to live near a person who is a drug addict	206 (38)	341 (62)
It is bad for a student to try drugs even once	259 (47)	288 (53)
Most people are concerned about the drug problem in Uganda	158 (29)	389 (71)
Occasional use of alcohol by students is not really dangerous	16 (3)	531 (97)
Occasional use of drugs by adults is not really dangerous	49 (9)	498 (91)
Occasional use of tobacco by students is not dangerous	37 (7)	510 (93)
Our society is too tolerant towards drug users	221 (40)	326 (60)
People who end up with a drug problem have only themselves to blame	167 (31)	380 (69)
The availability of illegal drugs poses a great threat to student	337 (62)	210 (38)
The use of drugs like Kuber is against the laws of Uganda	298 (54)	249 (46)
Very severe punishments for drug misusers may be answers to the problem of substance misuse	152 (28)	395 (72)
Money spent on the prevention of drug use is money well spent	260 (48)	287 (52)
More students today try out substances like Walagi, Cigarettes et	254 (46)	293 (54)
Most illegal drugs like Kuber, Marijuana, Shisha etc are harmful to o	289 (53)	258 (47)
Most used substances like Beer, Walagi, Tobacco etc are harmful to one's health	374 (68)	173 (32)
It is normal for students to try drugs at least once	35 (6)	512 (94)
Treatment should be available to all drug addicts	283 (52)	264 (48)

Overall positive attitudes: 93%

Continues to page 28

Continued from page 28

Practices of students who had ever used Alcohol and Other Drugs

Type of substance used

Among students who had reported ever using AODs (155), alcohol was the most ever used substance, 99 (64%) followed by marijuana 25 (16%) while the least used substance was tobacco 9 (6%) (Figure 2).

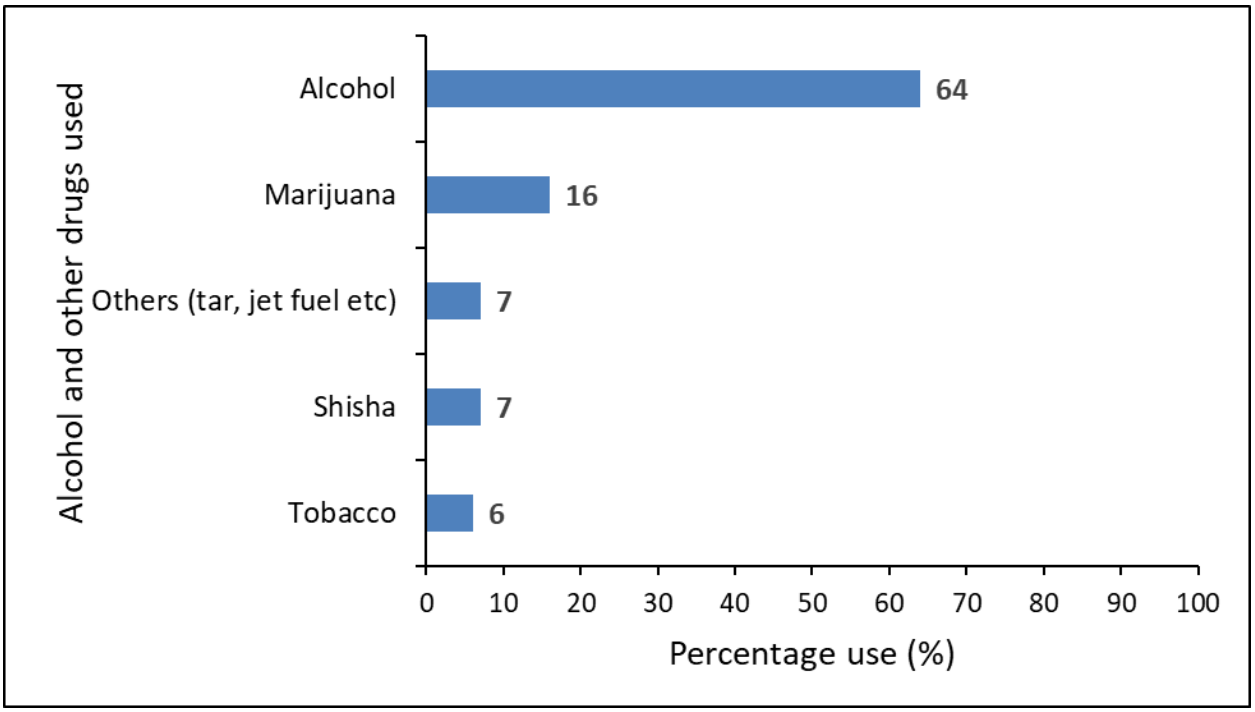

Figure 2: Alcohol and Other Drugs used by participants, Uganda, July 2024

Description of Current Alcohol and Other Drug users

Among the current AOD users (n=103), most, 50 (49%) reported using AODs for 1 or 2 days while 15 (15%) used AODs every day of the month. Most users, 69 (67%) consumed AODs once per day. Most students, 70 (68%) used AODs with friends, and AOD use most occurred at home, 62 (60%). The primary reason for initiating AOD use was peer pressure, 54 (52%) followed by curiosity, 35 (34%) with media influence being minimal 4 (4%) (Table 2).

Continues to page 29

Continued from page 29

Table 2: Practices of current Alcohol and Other Drug users among students in Uganda, July 2024

Variable	n=103 (%)	p-Value
Number of days AOD were used		
1–2	50 (49)	<0.0001
3–5	10 (10)	
6–9	10 (10)	
10–19	9 (8)	
20–29	9 (8)	
All 30	15 (15)	
Frequency of use in a day		<0.0001
1	69 (67)	
2	21 (20)	
3	12 (13)	
Whom they use the AOD		
With friends	70 (68)	<0.0001
With family	17 (17)	
Alone	16 (15)	
Where AOD are used		
Home	62 (60)	0.45
School	24 (23)	
Other places e.g. bars, outings	17 (17)	
Circumstances for introduction to AOD		
Peer pressure	54 (52)	0.0052
Curiosity	35 (34)	
Family environment	10 (10	
Media	4 (4)	

Discussion

This study revealed that most student leaders had a high level of knowledge about alcohol and other drugs (AODs), particularly concerning legal regulations and health risks. Similarly, participants depicted overall positive attitudes towards AOD use, with strong support for treatment access and prevention. Alcohol was the most commonly used substance among those who reported ever using AODs, followed by marijuana and tobacco being the list used. Students reported using AODs mostly with friends and in the home environment.

Our study highlights a high level of knowledge among secondary school student leaders regarding various aspects of AOD use. This finding is consistent with previous studies which indicated that adolescent awareness of AOD-related risk was high, likely attributable to expanded access to information (8,9). Leveraging this foundation through involving student leaders as peer educators could enhance health education efforts while reinforcing positive norms within the student community.

Our study revealed a nuanced view of secondary school students' attitudes towards AOD use. Their attitudes were marked by a mix of concern, support for treatment, and stigma. The split opinion on societal tolerance towards AOD users underscores a complex social attitude toward AOD use. This view is consistent with the concept of social stigma and the idea that AOD addiction is often perceived through a lens of victimhood rather than criminality (10). The lack of consensus on punitive measures is supported by evidence suggesting that punitive approaches alone are insufficient for effective drug policy and that a combination of prevention, treatment, and harm reduction strategies is more effective (11,12).

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Our findings suggest a preference for alternative approaches to addressing AOD use among students that emphasize prevention, access to youth-friendly treatment services, and harm reduction.
Our study indicates that most students had ever used AODs, with alcohol emerging as the most commonly used substance. This aligns with existing research showing that alcohol is often the first substance adolescents experiment with and the most used substance (13–16). Prevention programs should emphasize the risks associated with alcohol use and promote healthy behaviors from an early age.
Our study further highlights a strong social component of AOD use, with most of the users consuming AODs with friends and primarily at home. This underscores the role of social contexts in AOD use behaviors. Additionally, research consistently shows that peer pressure significantly impacts the initiation and continued use of AODs among adolescents, which is congruent with our findings (17–20). Peer-led prevention programs could be effective in reducing AOD use by leveraging peer influence in a positive direction (25). Additionally, addressing the social contexts where AOD use occurs, such as home environments and social settings with friends, could be key in developing effective prevention strategies.

Study limitations

The self-reported approach of responses is prone to recall bias and social desirability bias both of which could either have overestimated or underestimated the outcome. Our study population was composed of student leaders who may not be representative of the general student population.

Conclusion

Our study highlights a high level of knowledge and mixed attitudes among secondary school student leaders towards AOD use. Despite this awareness, AOD use, particularly use of alcohol, remains prevalent, often influenced by peer dynamics and in social settings such as the home. Our findings underscore the need for school-based interventions that harness students' knowledge and peer influence while addressing social environments that facilitate AOD use.

Conflict of interest

The authors declare no conflict of interest.

Author contribution

CM, BBM, KK, EM, EO, JN, DK, and HLS conceived and designed the study. CM, JN, HK, EM, EO, and PK contributed to data collection, cleaning, analysis, and implementation of the study. CM analyzed the data and took the lead in developing the original manuscript. CM, BBM, KK, HLS, BK, RM, and ARA are all responsible for the final content in the bulletin. All authors contributed to the final draft of the bulletin. All authors read and approved the final bulletin.

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Continues to page 31

Continued from page 31

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Continues to page 32

Continued from page 32

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Continues to page 33

Continued from page 33

Uganda Public Health Fellowship - Laboratory Leadership Program support, achievements and challenges experienced in response to an anthrax outbreak in Amudat District, June 2024

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Summary

Background: On 15th March 2024, Amudat District registered its first anthrax outbreak. We describe the Uganda Public Health Fellowship (UPHFP)-Laboratory Leadership Program (LLP) support, achievements, and challenges experienced in response to the anthrax outbreak, Amudat District, June 2024.
Methods: We conducted a laboratory capacity assessment using the World Health Organization (WHO) laboratory assessment tool, 2012 for two laboratories to assess human resource, sample collection, handling, and transportation, biorisk management, presence of a response plan, and sample referral register.
Results: The average laboratory capacity to respond to anthrax outbreaks was 51%. Amudat Hospital laboratory and Karita HCIV laboratory performance was 54% and 47% respectively. The district had adequate sample referral supplies and had only 13% competent staff. Biorisk management score was 0% for both laboratories indicating that these were high risk facilities. The district lacked a laboratory response plan and sample referral register. We supported the DLFP to develop a response plan and Karita HCIV was supported to open a sample referral register. The sample referral register facilitated calculation of turnaround time (TAT).
Conclusion: Significant gaps in anthrax outbreak preparedness and response, with a suboptimal overall capacity score and critical deficiencies in biorisk management, human resource competence, and response planning were identified. The UPHFP-LLP strengthened local laboratory systems by supporting the development of a district laboratory response plan and establishing a sample referral register. These interventions were essential for improving turnaround time and enhancing the district's readiness for disease outbreaks.

Background

Anthrax is an acute infectious disease caused by the spore-forming gram-positive rod-shaped bacterium *Bacillus anthracis (1)*. Anthrax primarily affects herbivorous animals, but humans can become infected through direct or indirect contact with infected animals or their products (1). The disease manifests in three main forms: cutaneous, inhalational, and gastrointestinal anthrax (3).

Laboratory response is a critical component of anthrax outbreak management, providing definitive diagnosis and guiding public health interventions. Accurate laboratory diagnosis relies on the timely collection of appropriate clinical specimens, which varies depending on the form of anthrax suspected. Additional specimens such as serum, pleural fluid, or environmental samples may also be required to confirm infection and trace sources during outbreaks. Diagnostic methods include culture and microscopy to identify *B. anthracis*, complemented by advanced techniques such as polymerase chain reaction (PCR), immunofluorescence assays, and toxin detection tests that enhance sensitivity and specificity (4). Laboratory work with anthrax requires stringent biosafety measures, typically involving Biosafety Level 2 for clinical specimens and Biosafety Level 3 for environmental and aerosolized samples, to protect personnel from exposure to infectious spores (5). Proper sample collection, handling, and transport protocols are essential to maintain specimen integrity and ensure accurate results.

On 15th March 2024, Amudat District registered its first anthrax outbreak. We describe the Uganda Public Health Fellowship (UPHFP)-Laboratory Leadership Program (LLP) support, achievements, and challenges experienced in response to the anthrax outbreak, Amudat District, June 2024.

Continues to page 34

Continued from page 34

Methods

Capacity assessment to respond to anthrax outbreaks

Jointly with the district laboratory focal person (DLFP), we conducted a laboratory capacity assessment using the World Health Organization (WHO) tool at two laboratories (Amudat Hospital and Karita HC IV Laboratory). We focused on the two laboratories because of the patients sought care from there. Additionally, Amudat hospital was in charge of packaging and referring the samples. The tool evaluates parameters such as human resource, sample collection handling and transportation and biorisk management, presence of a response plan, and sample referral register.

Assessment findings

Both laboratories had adequate supplies to support sample collection, packaging and transportation. Both had two competent staff in sample collection and referral. However, the district lacked a laboratory response plan because they lacked the knowledge and skills to for its development. There was also no sample referral register to ease tracking of samples. The district also lacked knowledge on biorisk management requirements for handling anthrax (Table 1).

Table 1: Key performance scores for Amudat Hospital laboratory and Karita Health Center Four

Key indicator	Karita HCIV (%)	Amudat General Hospital (%)
Indicator score	47	54
Organization and management	31	58
Documents	47	64
Specimen collection, handling and transport	54	69
Data and information management	75	77
Consumables and reagents	93	79
Equipment	NA	100
Facilities	51	24
Human resources	12	14
Biorisk management	0	0
Public health functions	63	54

*NA- Not assessed

Interventions and public health actions to address identified

Following the capacity assessment, we mentored the DLFP and laboratory staff on the proper sample collection and referral documentation using a register. We also mentored the team regarding the development and use of a laboratory response plan. Jointly, we designed a sample tracking and referral register and a laboratory response plan. We also mentored staff on Biorisk management one of the lowest scoring indicators putting emphasis on chain of custody to ensure that there is no accidental or intentional release of anthrax. We additionally reminded the team about proactively calling the hub riders to ensure prompt sample transportation. We also supported the DLFP to contact the Result Dispatch System (RDS) developers to ensure activation of the accounts for the district staff

Continues to page 35

Continued from page 35

Ethical considerations

The Ministry of Health Uganda provided administrative clearance to conduct this investigation. In addition, we received a non-research determination clearance from the US Centers for Disease Prevention and Control (US CDC). This activity was reviewed by the CDC and was conducted consistent with applicable federal law and CDC policy. § §See e.g., 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq. We sought verbal consent from the district team that we interviewed to obtain the laboratory capacity.

Achievements following the assessment and interventions

We drafted a costed laboratory preparedness and response plan which was presented in the District Task Force meeting by the DLFP. Capacity was built for three additional staff (two staff from the human health sector and one from animal health sector) on anthrax sample collection, packaging, and referral. We mobilized sample collection and packaging materials from Karita HCIV to support sample collection from suspected dead animals. Together with the mentored staff, six animal samples were collected, packaged and sent to NADDEC for testing. We developed a sample referral register which facilitated tracking the number of samples collected, transported, received, and results returned. The register also facilitated calculation of TAT for the collected samples. The RDS account for the DLP was successfully activated and access to results made possible.

Challenges during the response

We encountered network issues as we tried to communicate with the hub coordinators to facilitate quick sample transportation. Additionally, due to the insecurities in Karamoja region, adjustments to enable sample pick up in the later hours of the day was not possible, therefore in most instances' samples were picked the next day.

Discussion

We revealed major challenges in district-level preparedness and response, especially in laboratory coordination, biorisk management, and sample referral systems. The absence of a laboratory response plan and a sample referral register was one of the critical gaps identified. These tools are essential for coordinating outbreak response and ensuring timely feedback of results.

We reveal a biorisk management score of 0% indicative of high risk for the laboratories. Poor biosafety and biosecurity practices increase the risk of accidental exposure for responders and facilitates the spread of the pathogen, laboratory-acquired infections and environmental exposure, particularly when handling dangerous pathogens such as *Bacillus anthracis*. Strengthening local laboratory capacity through training and implementation of International Organization for Standardization (ISO)-based standards like ISO 35001:2019 can reduce these risks and improve outbreak handling.

Challenges such as poor network connectivity and insecurity slowed down the response activities. Improving coordination, communication systems, and security support especially in hard-to-reach areas will be critical in managing similar outbreaks in the future.

Study limitations

This study faced some limitations that may have influenced the findings and their interpretation. The relatively short period of engagement with the district team limited our ability to observe and document the full extent of improvements attributable to the PHFP-LLP support. We present immediate effects of our efforts. Observing and documenting the long-term effects of the interventions is important but was not done. Future studies would benefit from establishing prospective documentation systems and conducting follow-up assessments over an extended period to better evaluate the durability of capacity gains and process improvements.

Conclusion

Significant gaps in anthrax outbreak preparedness and response, with a suboptimal overall capacity score and critical deficiencies in biorisk management, human resource competence, and response planning were identified. The UPHFP-LLP strengthened local laboratory systems by supporting the development of a district laboratory response plan and establishing a sample referral register. These interventions were essential for improving turnaround time and enhancing the district's readiness for future zoonotic disease outbreaks.

Continues to page 36

Continued from page 36

Conflict of interest

The authors declare that they had no conflict of interest.

Authors contribution

NE, designed the study and data analysis. SG, HK, PK, AMN, TR, LB, JK, RN, GB, TN, DK and ARA participated in bulletin review to ensure scientific integrity and intellectual content. All authors read and approved the final bulletin.

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Continues to page 37

Continued from page 37

Uganda Public Health Fellowship program – Laboratory Leadership Program support, achievements during a cholera outbreak response, Kasensero Landing Site, Kyotera District, Masaka Region, May 2024

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Summary

Background: On May 8, 2024, the Ministry of Health confirmed a cholera outbreak at Kasensero landing site in Kyotera District, Masaka Region, Uganda. We describe the Uganda Public Health Fellowship (UPHFP)-Laboratory Leadership Program (LLP) support and achievements during the outbreak response.
Methods: We modified the World Health Organization (WHO) capacity assessment checklist to assess four key laboratory outbreak response capacities at Masaka regional referral hospital (RRH) and Kasensero HCII laboratories: human capacity; infrastructure; equipment functionality; and cholera specific logistics management and records, such as rapid test kits, culture media and sample tracking registers. Following the assessment, we initiated targeted resource mobilization through stakeholder engagement meetings. Key partners were mapped and engaged to provide the necessary support.
Results: Masaka RRH laboratory met infrastructural standards with functional equipment and staffed with a qualified microbiologist. However, critical gaps were identified including shortages of cholera rapid diagnostic test (RDT) kits, limited staff training on their use and insufficient supplies of culture and transport media. Kasensero HCII had two untrained laboratory personnel and poor record keeping. Following the assessment, 160 RDT kits were acquired, laboratory staff were mentored on RDT cholera testing, two expert microbiologists were deployed, and a sample tracking register was developed.
Conclusion: We identified strong diagnostic capacity to support cholera outbreak response, critical logistical gaps—particularly shortages of rapid diagnostic test kits and culture media which undermined effective response efforts in the region. The UPHFP-LLP support facilitated filling of the gaps and strengthening of the overall laboratory capacity for cholera outbreak response.

Background

In Uganda, periodic cholera outbreaks continue to pose challenges, especially in districts bordering large water bodies such as Lake Victoria, where risk factors are heightened due to dense populations and inadequate sanitation infrastructure (2). Rapid and accurate laboratory diagnosis is essential for early outbreak detection, timely clinical management, and implementation of control measures.
The World Health Organization (WHO) recommends a tiered diagnostic approach using rapid diagnostic tests (RDTs) for initial screening and culture confirmation for definitive diagnosis and antimicrobial sensitivity testing (3). However, laboratory systems in resource-limited settings often face constraints in supplies, trained personnel, and sample transport logistics, all of which can delay outbreak response and increase mortality risk (4).
Strengthening regional laboratory capacity including infrastructure, human resources, and logistical preparedness is critical to improving cholera surveillance and outbreak containment. On May 8, 2024, the Ministry of Health confirmed a cholera outbreak at Kasensero landing site, Kyotera District, Masaka Region. We describe the Uganda Public Health Fellowship (UPHFP)-Laboratory Leadership Program (LLP) support and achievements during the response

Methods

To assess the readiness for cholera response at Masaka Regional Referral Hospital and Kasensero HCII laboratories, we conducted a capacity evaluation using a modified WHO capacity assessment tool. We interviewed the district health officer and the laboratory managers about the human resource capacity, laboratory infrastructure standards, equipment functionality and cholera specific logistics management, and records such as cholera rapid diagnostic test kits (RDT), culture media, transport media for cholera samples, personal protective gears, sample tracking registers among others.

Continues to page 38

Continued from page 38

Following the assessment, we initiated targeted resource mobilization through stakeholder engagement meetings. Key partners were mapped and engaged to provide the necessary support. Laboratory managers were assisted in placing emergency orders for critical cholera testing supplies, including cholera RDT kits, Cary-Blair transport medium, and selective culture media. In collaboration with the district laboratory focal person, we also supported the submission of a formal request to the Ministry of Health for mentorship on cholera sample management. Additionally, the laboratory leadership team worked closely with both Kasensero HCII and Masaka RRH laboratories to design a sample tracking register to enhance accountability and ensure timely documentation of sample collection and test results.

We analyzed data in excel and presented findings in form of percentages.
The Ministry of Health Uganda provided administrative clearance to conduct this investigation. In addition, we received a non-research determination clearance from the US Centers for Disease Prevention and Control (US CDC). This activity was reviewed by the CDC and was conducted consistent with applicable federal law and CDC policy. § §See e.g., 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq. We sought informed consent from participants who were ≥18 years and assent from those who were <18 years.

Results

Regional laboratory capacity assessment to respond to the cholera outbreak

At Masaka Regional Referral Hospital (RRH), the laboratory met WHO standards for both human resources and infrastructure requirements. It was staffed with a qualified microbiologist and was equipped with essential functional equipment, such as incubators. Despite this, RDT kits and culture media were unavailable. Additionally, there was a notable training gap, as staff had not received adequate guidance on the use of cholera RDTs. The team had challenges with access to the result dispatch system which hindered timely access of the results.

Kasensero laboratory capacity assessment to respond to the cholera outbreak

At Kasensero HCII, two laboratory personnel were available to support the outbreak response; however, neither had been trained in cholera sample management or RDT techniques. The facility lacked RDT kits during the early stages of the outbreak, necessitating the referral of all samples to Masaka RRH for testing. Furthermore, Kasensero had poor sample documentation and did not have access to test results.

Achievements following the assessment

As a result of these engagements, several response gaps were effectively addressed (Table 1). Additionally, emergency orders for critical cholera testing supplies, including cholera RDT kits, Cary-Blair transport medium, and selective culture media was made. A formal request to the Ministry of Health for mentorship on cholera sample management was made. A sample tracking register to enhance accountability and ensure timely documentation of sample collection and test results was developed. The RDS was activated for result access (Table 1).

Continues to page 39

Continued from page 39

Table 1: Resources provided by stakeholders following mapping and engagement

Identified Gap	Responsible stakeholder	Intervention
Limited diagnostic capacity at onset of outbreak	Ministry of Health	Mentored six laboratory personnel on RDT techniques; supplied 160 cholera RDT kits
Delayed sample transportation	Ministry of Health	Strengthened transport network and re-routed couriers for prompt sample delivery
Inadequate human resource capacity for culture testing	Implementing Partners	Deployed two senior microbiologists to Masaka RRH laboratory
Lack of dedicated transport for field sample movement	Implementing Partners	Provided a standby, fueled vehicle for timely sample transportation
Need for confirmatory laboratory testing	Masaka RRH Laboratory	Conducted RDT and culture testing; referred samples to National Reference Laboratory
Poor coordination of result flow from regional to peripheral levels	Kyotera District	Coordinated dissemination of laboratory results from Masaka RRH to Kasensero HCII

Discussion

The assessment revealed both considerable capacity and notable gaps in diagnostic readiness. Masaka RRH laboratory met WHO standards regarding infrastructure and human resources, including the presence of a qualified microbiologist and essential equipment. The laboratory at Kasensero HCII had two laboratory personnel available to support the outbreak although they were both not trained on cholera sample management. The WHO guidelines emphasize the need for functional laboratories with skilled personnel as critical components of cholera outbreak response strategies (7). Significant logistical barriers were encountered, particularly shortage of RDT kits at both sites and culture media at the RRH laboratory which impacted timely screening and confirmation. Prompt diagnosis is vital in managing cholera outbreaks (4).

Following the assessments, resources were mobilized including RDT kits and deployment of additional laboratory personnel at the RRH laboratory to fill the identified gaps. These actions align with the Global Health Security agenda's call for strengthened laboratory systems and emergency responsiveness (5).
These findings highlight the critical need for continuous investment in laboratory systems, including logistics, staffing, and diagnostics. They also highlight the value of cross sectoral collaboration and rapid resource mobilization in outbreak settings (8).

Study limitations

We did not assess the effect and sustainability of the interventions over time.

Continues to page 40

Continued from page 40

Conclusion

We identified strong diagnostic capacity to support cholera outbreak response, critical logistical gaps—particularly shortages of rapid diagnostic test kits and culture media which undermined effective response efforts in the region. Following the assessment, we mobilized resources through engagement of stakeholders that led to acquisition of RDT kits, mentorship on RDT techniques, deployment of expert microbiologists, and development of a sample tracking register. We additionally, mentored laboratory staff in different aspects cholera testing. These interventions led to faster diagnosis and strengthened overall laboratory capacity for cholera outbreak response

Conflict of interest

The authors declare that they had no conflict of interest.

Authors contribution

TMR, designed the study and data analysis. SG, AA, JW, WS, SM, RN, JBN, DI, HN, GO, FO participated in bulletin review to ensure scientific integrity and intellectual content. All authors read and approved the final bulletin.

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Continues to page 41

Continued from page 31

Updates of Outbreak Investigations conducted during by the Uganda Public Health Fellowship Program, April–June 2025

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Leprosy investigation, Eastern Uganda, May, 2025

In May 2025, a team of epidemiologists supported the Ministry of Health's investigation into sporadic leprosy cases in Mbale, Tororo, and Kibuku Districts (Bugisu and Bukedi sub-regions). The team identified 15 case-patients and listed 55 contacts, who received single-dose rifampicin prophylaxis.

Cases were identified through health facility reviews and community active case search. Key findings included delayed diagnosis, disability due to late treatment, and community stigma. Improving early detection by training health workers and Village Health teams (VHTs), reducing stigma through community education, and strengthening district-level coordination were emphasized (Figure 1)

Figure 1: Gertrude Abbo and Charity Mutesi (Fellows in jackets) visiting a leprosy case-patient in Kibuku District

Mpox outbreak, Masaka City and Masaka District, April, 2025

In April 2025, Masaka City was declared a mpox hotspot following a surge in confirmed cases from 105 in February to 125 in March. A field investigation was launched to determine outbreak magnitude, risk factors, and guide response.

The team reviewed treatment unit records and conducted community case searches with VHT support. Over half of confirmed cases were among people living with HIV, highlighting increased vulnerability. High-risk groups included fisherfolk and commercial sex workers. Misinformation and weak rural risk communication were also identified.

The Ministry of Health used findings to target risk communication to key populations and strengthen surveillance in high-burden areas(Figure 2)

Figure 2: Gertrude Abbo and Bridget Ainembabazi (Fellows in jackets) investigating of mpox in one of the primary schools in Masaka city. The team of epidemiologists were verifying an alert from one of the primary schools in Masaka

Continues to page 42

Continued from page 42

Mpox situation overview: Kiryandongo District and Hoima City, April 2025

Following re-emergent mpox outbreaks in Uganda during 2024–2025, a rapid assessment was conducted in Kiryandongo District and Hoima City in April 2025. The team reviewed medical records at high-burden facilities including Kiryandongo Hospital, Panyadoli HC IV, Kigumba HC III, and Hoima Regional Referral Hospital—and held interviews with health workers, district surveillance teams, and Village Health Teams (VHTs).

As of April 18, 2025, Kiryandongo District reported 28 confirmed mpox cases, with 55% from host communities and 45% from refugee populations. Affected individuals included both Ugandans and refugees, highlighting the district's cross-border vulnerability. Active home-based care was ongoing for three adolescent cases; all students were likely exposed at school.

Preliminary findings indicate ongoing transmission, with the first case traced to a refugee camp in January 2025, followed by spread within host communities. The situation underscores the importance of cross-sectoral coordination in refugee-hosting districts, timely case detection, and targeted school-based health messaging.

Continues to page 43

Continued from page 43

Upcoming Key Health Events, July–September 2025

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28th July, 2025, World Hepatitis day

World Hepatitis Day, observed every year on 28 July, raises global awareness of viral hepatitis and promotes prevention, testing, treatment, and vaccination. The date commemorates the birth of Dr. Baruch Blumberg, who discovered the hepatitis B virus and developed the first vaccine against it. As of 2022, approximately 304 million people worldwide are living with chronic hepatitis B or C infection. An estimated 2.2 million new infections and 1.3 million deaths occurred in the same year, with Hepatitis B Virus (HBV) accounting for the majority of the deaths. In 2016, WHO established the goal of eliminating viral hepatitis as a public health threat by 2030, aiming for a 90% reduction in new infections and a 65% reduction in mortality from 2015 levels. There has been slow progress to achieving this target and some of the barriers include low healthcare access, particularly in low- and middle-income countries, insufficient vaccination coverage especially the hepatitis B birth dose in regions such as Africa and limited public awareness. The 2025 theme, “Take Action. Test, Treat, and Vaccinate,” calls for urgent action to scale up testing, ensure access to affordable antiviral and curative therapies, and improve vaccine coverage to meet global elimination targets.

1st August, 2025: World Lung cancer day

World Lung Cancer Day, held annually on August 1, is a global initiative dedicated to raising awareness about lung cancer, its impact, and the importance of prevention, early detection, and advanced treatments. Established in 2012 by the Forum of International Respiratory Societies (FIRS) in collaboration with other health organizations, the day focuses on educating the public about risk factors such as smoking, air pollution, and occupational exposures, while advocating for research and improved access to care. World Lung Cancer Day serves as a platform to support those affected by the disease and to emphasize the critical need for collective action in the fight against lung cancer

Continues to page 44

Continued from page 44

1-7th August, 2025: World breast feeding week

Supported by the World Health Organization, United Nations Children's Fund (UNICEF), and numerous Ministries of Health along with civil society partners, World Breastfeeding Week takes place during the first week of August each year. Breastfeeding is recognized as one of the most effective methods for ensuring the health and survival of children; however, currently, less than half of infants under six months are exclusively breastfed. In 2018, a resolution from the World Health Assembly endorsed World Breastfeeding Week as a significant health promotion initiative. Each year features a different theme, aiming to foster supportive environments that assist women in breastfeeding. This includes community and workplace support, adequate protections in government policies and laws, and the dissemination of information regarding the benefits and strategies of breastfeeding.

1-30th September, 2025: World Polycystic Ovary Syndrome Awareness month

During the month of September, Polycystic Ovary Syndrome (PCOS) Awareness Month seeks to enhance the lives of women impacted by PCOS by fostering public comprehension of the condition and advocating for early diagnosis and effective management. PCOS is recognized as one of the most prevalent hormonal disorders affecting women of reproductive age and is linked to various complications, such as infertility, type 2 diabetes, cardiovascular diseases, and mental health issues. In 2019, the global point prevalence of PCOS was estimated to be 1,678 per 100,000 women, with an incidence rate of 59.8 per 100,000. Since 1990, the prevalence of this condition has increased by 30%. Despite its significant effects, PCOS frequently remains undiagnosed due to insufficient awareness and limited training among healthcare professionals. Enhancing public and clinical awareness, investing in research, and ensuring access to diagnosis and treatment are essential steps in tackling this escalating health issue.

Continues to page 45

Continued from page 45

13th September, 2025: World Sepsis day

World Sepsis Day is commemorated every year on 13 September to enhance awareness regarding sepsis, a critical condition resulting from the body's severe reaction to infection. Annually, sepsis accounts for approximately 11 million fatalities worldwide, representing nearly one in five deaths globally. This condition predominantly impacts at-risk groups, such as newborns, elderly individuals, and those with compromised immune systems. Strategies for prevention encompass the enhancement of hygiene practices, increasing access to vaccinations, and encouraging the prompt identification and treatment of infections. Educational and awareness initiatives aimed at both healthcare providers and the general populace are essential for decreasing the number of deaths associated with sepsis.

17th September, 2025: World patient safety day

On 17 September, World Patient Safety Day unites various stakeholders from the health sector—including patients, caregivers, health professionals, and policymakers—to promote safer healthcare systems. Instituted by WHO Member States via Resolution WHA 72.6, this day highlights the global significance of patient safety in providing quality healthcare. It encourages initiatives aimed at minimizing medical errors, enhancing communication between patients and providers, and reinforcing infection control

28th September, World Rabies Day

World Rabies Day, commemorated each year on 28 September, aims to raise awareness about rabies prevention and control. Rabies causes an estimated 59,000 human deaths annually, with the majority occurring in Asia and Africa. The disease is almost always fatal once symptoms appear, yet it is entirely preventable through vaccination of dogs and proper post-exposure treatment to victims of dog bites. The WHO and global partners have set the goal of eliminating human deaths from dog-mediated rabies by 2030. Mass dog vaccination, community awareness, and improved access to post-exposure prophylaxis are key strategies in achieving this target

Continues to page 46

Continued from page 46

Continues to page 47