Evaluation of the Surveillance System in Kiryandongo Refugee Settlement, Kiryandongo District, Uganda, April 2017

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ABSTRACT

Introduction: Integrated Disease Surveillance and Response (IDSR) involves surveillance of priority diseases and conditions, and is implemented in many African countries, including Uganda. During humanitarian emergencies, public health surveillance systems such as IDSR may face challenges. We assessed the capacity of health facilities (HF) in Kiryandongo District, a district with a large and recent refugee influx, to perform IDSR core functions. **Methods:** We visited five HF serving refugee settlements and one serving the host community. We interviewed HF in-charges, surveillance Focal Persons, and District Health Team (DHT) members about their capacity to perform IDSR. We reviewed paper-based forms in IDSR to evaluate system attributes during April 2016-March 2017. We determined the average weekly health Management Information System (HMIS) reporting rate for weeks 1-13 of 2017. **Results:** All HFs were well-staffed. However, half of the 12 suspected disease outbreaks reported in the past year were not investigated. The average weekly reporting rate was 79% (target: 80%). Barriers to IDSR included absence of standard case definition booklets (50%) and updated paper forms (67%), incomplete filling of registers, and inadequate data analysis (33%). The District Epidemic Preparedness and Response Committee (DEPRC) was non-functional. **Conclusion:** There was low capacity of the district to conduct IDSR, which could have slowed detection of and response to outbreaks. We recommended IDSR refresher trainings in two-year cycles and supplying guidelines to all HFs. The DEPRC and DHT should be strengthened through funding, regular meetings, and supplies of essential commodities.

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Introduction

Integrated Disease Surveillance and Response (IDSR) Surveillance is a framework for collecting public health surveillance and laboratory data in African countries, developed in the late 1990s [1]. The main aim of IDSR is to improve the use of data for detecting, reporting, investigating, and responding to public health threats. Uganda adopted IDSR in 2000 for use in its national surveillance system, and developed national IDSR Technical Guidelines in 2001 with an emphasis on epidemic-prone diseases, diseases targeted for elimination and eradication, and other diseases of public health importance. In 2012, the national IDSR guidelines were revised to take into account the One World-One Health perspective, which is a strategy that addresses events at the intersection of human, domestic animal, wildlife, and ecosystem health [2]. The district level is the focus for integrating and implementation of IDSR, in addition to health workforce management, support supervision plus health system performance monitoring. The district health department receives reports from HSDs and submits an aggregated report to the national level electronically. The HSD oversees health services within health facilities within the catchment area, receives surveillance reports from these units and submits aggregate data to the district. The District Surveillance Focal Person (DSFP) oversees surveillance activities in the district supervised by the District Health Officer (DHO) [3]. Laboratory or surveillance focal persons at each level ensure safe specimen processing or referral to regional or centralised reference laboratories via the laboratory hub system. Laboratory results are delivered via the reverse mechanism.

Similar to all districts in Uganda, Kiryandongo District uses IDSR to detect and respond to epidemic-prone diseases. The District Health Team (DHT) is responsible for responding to an outbreak by convening the District Epidemic Preparedness and Response Committee (DEPRC), selecting and carrying out appropriate public health responses, conducting mass vaccination campaigns, strengthening case management and infection control measures during a response. The DHT is also responsible for updating health workers´ skills during a public health event/outbreak, and enhancing surveillance during a public health event/outbreak. The DEPRC is responsible for planning and coordination of response activities, including developing a district emergency preparedness and response plan, establishing a community communications plan, mobilizing resources for emergency prevention and control, supporting the procurement of emergency material stockpiles, and coordinating training of community, health facility, and district personnel in emergency preparedness and response [4].

During humanitarian emergencies, broad public health surveillance systems may be underperforming, disrupted, or non-existent, as they become overwhelmed trying to adequately meet surveillance information needs. [5] The civil war in South Sudan has resulted in massive displacement of over 1.5 million people to neighbouring countries. The majority (~1 million people) are settled in various refugee settlements in Uganda, including Kiryandongo. In April 2017, this number sharply increased due to renewed conflict and hostilities that have plagued South Sudan since July 2016 [6]. Kiryandongo Refugee Settlement is vulnerable to disease outbreaks and seasonal peaks in malnutrition: for instance, there was a measles outbreak in January 2014, cholera outbreaks in August 2015, cases of Hepatitis B in August 2016, and upsurges of malaria and diarrheal diseases during rainy seasons (April-October, 2016) [7].

Periodic evaluation of surveillance systems can assess whether or not surveillance and response objectives have been achieved.The evaluation helps establish whether surveillance data is being utilised for public health action and also provides evidence that surveillance, laboratory, and response activities have an impact on the outcome of health events [8]. We assessed the capacity of health workers, DHT, and the DEPRC in performing IDSR functions during April 2017 following an influx of refugees in Kiryandongo district. We also evaluated simplicity, stability, sensitivity, acceptability, timeliness, and data quality attributes of the surveillance system, and recommended improvement measures.

Methods

Study Setting

Kiryandongo District is located in the Western Region of Uganda with an estimated population of 287,200 people [9]. It was among the first districts to receive and resettle refugees since the onset of the

civil conflict in South Sudan. A total of 52,545 individuals were resettled in this refugee and Internally Displaced Persons camp during December 2013-March 2017. Of the total camp population, approximately 99% are from South Sudan, with <0.5% each from Democratic Republic of Congo, Kenya, Sudan, and Uganda [10]. According to UNHCR statistics, 42% of the refugees and internally displaced persons (IDPs) are <18 years of age [11]. The Refugee settlement is served by 3 Health Centre IIs, 2 Health Centre IIIs and 1 General Hospital, out of the 24 health facilities (HF) in Kiryandongo District.

Description of the IDSR system

Between 2000 and 2010, the Surveillance System in Kiryandongo District relied on paper-based forms to collect data. These forms were summarised by the health workers, dispatched to the District Health Office, and submitted to MoH using various means including e-mail, phone text messaging (SMS), faxing, and physical delivery. From July 2012 up to date, Kiryandongo District adopted several electronic health surveillance systems such as mTrac and DHIS-2 [12]. Aggregate monthly data are collected from the health facility and filled into the monthly HMIS tool. The data are then submitted manually to the District Biostatistician who enters it into DHIS-2. In the mTrac system, aggregate weekly data on priority diseases and conditions from HFs are entered on the weekly HMIS tool. The data are then sent to the mTrac platform on DHIS-2 by using SMS. When the data are transmitted to DHIS-2, the district Biostatistician receives notification. The Biostatistician reviews, validates, approves and incorporates the data into DHIS-2 (Figure1).

Study design

We conducted a cross sectional survey to determine the readiness of Kiryandongo DHTs to implement IDSR. We adopted the US Centers for Disease Control and Prevention (US CDC) updated guidelines for Evaluating Public Health Surveillance Systems in order to evaluate the surveillance system in Kiryandongo District [13]. Of the 24 health facilities in the district, we visited five serving the refugee settlement and one serving the host community. We interviewed the health facility in-charges, surveillance focal persons, and DHT to determine the capacity for IDSR functions. We also reviewed outpatient HMIS registers to evaluate system attributes during April 2016-March 2017. We calculated the average weekly HMIS reporting rate as total number of health facilities that submitted weekly reports from week 1-13 divided by the total expected reports from week 1-13 of 2017.

Study population

Our study population comprised of health workers selected from 24 health facilities in Kiryandongo district. We purposively selected a total of 6 HFs (i.e., 3 Health Centre IIs, 2 Health Centre IIIs and 1 General Hospital) out of the 24 health facilities in the district. Five of the six facilities were primarily serving the Refugee Settlement while one was serving the host community. The selected HFs handled the biggest number of patients in the settlement and district. We then interviewed the HF Team (In-charges, Surveillance Focal Persons and Village Health Teams).

The HF team is responsible for identifying cases using standard case definition booklets, recording information in the patient registers using the recommended case definitions, summarizing and reporting case-based information to the next level if an immediately reportable disease, condition or other public health is suspected, reporting summary information for priority diseases, conditions and events, weekly, monthly and quarterly summary totals and providing comments on the forms about results seen during data analysis, taking and transporting specimen to the testing laboratory, case management of an epidemic, and analyzing and using data for action. In addition, we interviewed the DHT) for their capacity to perform IDSR core functions.

Data collection

We collected data on IDSR system functions and attributes from the facility HMIS and in-charges using semi-structured questionnaires and data abstraction forms. We conducted Focus Group Discussions (FGD) with DHT and 80 VHTs using an interview guide to obtain information on key surveillance attributes. We also visited key stakeholders (i.e. Office of the Prime Minister, United Nations High Commission for Refugees, and Action Contre la Faim) working in the refugee settlement and obtained information on settlement

population, and other health services offered to refugees. We observed the use of IDSR tools, standard case definitions, and outpatient registers, weekly and monthly HMIS reports to assess the level of usefulness, simplicity, stability, acceptability, timeliness and data quality of the surveillance system in the Refugee settlement.

Level of usefulness

The system is considered useful if it satisfactorily addresses at least one of the surveillance objectives; i.e. detect cases of a disease (or other health-related event), provides the magnitude of morbidity and mortality related to the health-related event under surveillance. We reviewed HMIS 105 and DHIS-2 to determine the cases of notifiable diseases reported by the district.

Simplicity

Simplicity refers to both its structure and ease of operation of the surveillance system. We interviewed clinicians about their ability to use standard case definitions booklet and filling HMIS forms. We also interviewed health workers and DHTs about the flow of surveillance data in the system at all levels.

Stability

Stability refers to the reliability and availability of the public health surveillance system. We assessed the key resources required to implement IDSR functions.

Data quality

We compared total malaria case on weekly surveillance forms for weeks 1-13 (January-March 2017) with what was captured on monthly forms. We chose malaria because it´s the leading cause of morbidity and mortality in this region[14]. Data quality was considered acceptable (good) if the discrepancy between these forms was below 10%.

Acceptability

Acceptability reflects the willingness of persons and organisations to participate in the surveillance system. We interviewed the health facility In-Charges and DHTs about their interaction with HMIS tools including case notification forms, DHIS-2 and mobile Tracking of health services (mTrac) systems.

Timeliness

We generated the reporting timeliness from weekly and monthly reporting forms in DHIS-2 for week 1-13. We compared the date of submission with the recommended MoH timeline of mid-day of the following week.

Data Analysis

We exported, cleaned and analysed data using Epi Info version 7.2 (CDC) and generated frequencies and percentages. We used content analysis to classify and summarize qualitative data.

Ethical considerations

Due to the refugee influx in the study area, the Ministry of Health of Uganda (MoH) gave the directive and approval to conduct the evaluation. The Office of the Associate Director for Science, CDC/Uganda, also determined that this activity was not human subject research, and its primary intent was public health practice or a disease control activity (specifically, epidemic or endemic disease control activity). In addition, we sought administrative clearance from the Kiryandongo District Health Officer to conduct the study. We sought verbal informed consent from the participants before the qualitative interviews. To ensure confidentiality, we assigned unique identifiers to each of the participant questionnaires. Data held on computers was protected by encryption with a password.

Results

Capacity of health facilities to perform key IDSR functions

Human resources capacity

A total of 66 health workers were trained in IDSR in 2015, of which 7 were DHT members and 59 were HF-level health workers. Only 32/48 (67%) health workers were knowledgeable on IDSR in terms of immediately reporting priority diseases to the district level, of which 12 (38%) were from the Refugee

settlement HFs. Most of the IDSR-trained health workers in the settlement had left to other districts, leaving a skills gap in IDSR services. Only 70/372 (19%) VHTs in the district were trained on Integrated Community Case Management (ICCM). Out of the 70 trained, 60 (86%) were from the Refugee Settlement and only 10 (14%) were from the host community near the settlement. All six HFs selected had key staff trained in surveillance activities. Some HFs had more than the recommended government staffing level, while others had inadequate staff **Table 1**.

Capacity of health facilities to use correct IDSR tools

Eighty three percent of the health workers made a diagnosis of priority diseases according to Standard Case Definitions. Sixty seven percent of the HFs were using updated HMIS tools for recording data. Sixty seven percent of the health facilities visited had at least one staff trained on IDSR. Fifty percent of the HFs had appropriate supplies for specimen collection during urgent situations. No health workers knew how to estimate supplies in emergency situations **Table 2**.

Functionality of District Epidemic Preparedness and Response Committee

We found that Kiryandongo District has a non-functional Epidemic Preparedness and Response Committee. However, there was an indication that some DHT members were ready to respond to outbreaks. During past disease outbreaks, the key DHT members that were active were District Health Officer (DHO), District Surveillance Focal Person (DSFP), Laboratory, Medical Officer, and Supplies Officer among others. The DSFP acknowledged they do not have an Epidemic Preparedness and Response Plan. The DSFP also emphasized the challenge of limited capacity to develop the plan, work overload from clinic related assignments/activities especially in ART Clinic of the Hospital which he heads hence leaving him with very limited time to concentrate on IDSR activities. The DHT reported having adequate stock of drugs and vaccines including essential antimicrobial agents, rehydration solutions and measles vaccine among others. However, very limited supplies of the following were available at the time of the visit: disinfectants, insecticides, rodenticides, water purification chlorine tablets, syringes and needles, intravenous giving sets, mosquito nets, and safety wear.

The attributes of the surveillance system

Simplicity

The system was rated as simple because of the clarity of its case definitions. The demographic and exposure information were easy to understand and record. Sequential flow of information from the community/HF to the district and national level was effective **Figure 1**. We found that VHTs within the settlement detected suspected disease cases using community case definitions and reported immediately to the HF. The HF detected suspected disease cases using standard case definitions (SCDs) and reported immediately to the district. The DHT reviewed and approved the data received from reporting facilities using mTrac System, verified whether the HMIS forms are filled out accurately and completely, entered the data into DHIS2, sent feedback to reporting sites using mTrac system, and analysed data as well as sharing information during review meetings.

Stability

The IDSR was seen to be fairly stable because it is fully integrated with the other health activities. Most of the facilities had some HMIS forms 033b and outpatient registers. The major challenges for IDSR system included use of older versions of weekly reporting forms, network fluctuations (since weekly reporting is done using mTrac which affected weekly reporting). At the district level, the electronic systems (DHIS2 and mTrac) were fully functioning. The district has a trained Biostatistician and a Surveillance Focal Person who oversee the operation of these systems. Logistics, transport, and communication challenges were also apparent during the evaluation.

Sensitivity

The IDSR system was found to be sensitive. It was able to detect 12 notifiable diseases and other health-related events. However, the DSFP noted that the DHT was incapacitated to investigate and respond to some of the outbreaks. Many suspected outbreaks were reported by the HFs between April 2016 and

March 2017, but were not investigated by the DHT Table 3.

Acceptability

Fifty percent of health workers felt it was their duty to fill the case notification forms. About 83% of respondents had used SCDs to make diagnoses of priority diseases and could validate their weekly reports before submission to the district. All respondents (100%) were willing to continue participating in the system.

Timeliness of surveillance reports

The average weekly HMIS reporting timeliness in Kiryandongo Refugee Settlement was at 89% by the end of March 2017 (Week 13). The best-performing health facilities in terms of timeliness in reporting were Panyadoli Hills HCII, Panyadoli HCIII, and Diika HCII each with 100%, followed by Kiryandongo General Hospital with 92%, Katulikire HCIII with 77%, and lastly Nyakadot HCII with 62%. The DSFP attributed poor performance in reporting to inadequate skills to record, summarize, and send reports using mTrac reporting system by the various section heads in the health centres. He pointed that very few health workers are registered on mTrac system, hindering them from sending a weekly report. Laxity among some registered health workers was also pointed out by one of the DHTs to be a leading cause of under-reporting of HMIS statistics.

Data Quality

We found that HMIS data was of poor quality with >10% discrepancy between the total outpatient malaria cases reported on a monthly and those reported on weekly basis in all HFs. The weekly report had grossly underreported malaria cases by 50% as compared to monthly reporting system Table 4.

Discussion

This study provides information on the capacity of health workers, DHT, and DEPRC in performing IDSR functions in the Kiryandongo Refugee Settlement and the host community as well as the attributes that measure the functionality of IDSR.

We found that suspected disease outbreaks were reported by the HFs between March 2016 and March 2017, but many were not investigated and responded to within 48 hours. This is comparable with findings of a study conducted in Ghana in 2015 [15]. This low capacity to confirm and respond to suspected disease cases could be attributed to many factors such as skills gap, inadequate stockpiles of emergency medicines and laboratory supplies, delays in collecting and transporting samples to reference laboratories, and non-use of standard case definitions. Outbreaks and public health emergencies require adequate mobilisation of resources such as vaccines, medicines, and laboratory supplies. It is therefore recommended to have stockpiles of these materials before an outbreak occurs. Evidence shows that delayed recognition and response to emerging diseases may result in adverse consequences regarding illness and death, spread to other countries, and disruption of trade and travel [16].

Our study found higher staffing levels in HFs within the refugee settlement as compared to those in the host community. Most of these staff were recruited by Non-Governmental Organizations supporting the settlement to attend to additional cases from the refugee influx. High staffing, if comprised of adequately-trained persons, can be leveraged to strengthen disease surveillance and response in the settlement. Massive training of health workers was limited by lack of resources to conduct the training. A systematic Review conducted in 2013 showed that the number of trained personnel was directly proportional to improvements in reporting quality, timeliness, consistency, completeness as well as supervision and feedback at all levels in Cape Verde, Eritrea, Ethiopia, Guinea Bissau, The Gambia, Uganda, and Malawi [17].

The average HF weekly reporting rate was below the national target of 80%. Most health workers attributed the poor reporting rate to inadequate skills in using registers and tallying, stock out of registers and tally sheets, inability to send a weekly report on SMS, and network failure. A report published by Common Approach for Refugees and other migrants Health (CARE) showed that 80% of health workers found the syndromic surveillance system flexible and useful [18]. However, this study was focused only on the electronic system in the settlement. In other

descriptive studies, poor reporting has been related to staff having too high a workload to find time to report surveillance data [19], staff having tasks that compete with reporting surveillance activities, or understaffing at the HF [20]. Having a designated surveillance focal person or HMIS Focal person makes surveillance reporting the core responsibility of the officers´ work in the facility. In Uganda, this kind of structure does not exist in lower level facilities. In a health centre II, the In-charge of the facility handles both clinical work and reporting activities, while from HCIII-General Hospital, there is HMIS Focal person who manages HMIS data. These people are not specialized and may not understand the relevance of surveillance data. This finding is in line with a study conducted in Tanzania in 2007 [21], and Kenya in 2013 [22].

Data quality was poor; this was evidenced by a discrepancy >10% between HMIS033b and HMIS105. The poor data quality could have been attributed to non-reporting of weekly reports by some facilities in DHIS2. Some facilities find it overwhelming to report every week and therefore may prefer reporting on a monthly basis. Some of the non-reporting facilities do not use supporting HMIS tools such as tally sheets, summary forms to speed up the process of data transmission. This wide discrepancy could also have been attributed to counting errors. We recommend double counting of data from the registers by the surveillance team before submitting to the next level. There is also need for the HF in charges to validate the data before sending to the district to minimize this discrepancy. Introduction of patient-level data linked to DHIS2 would be the optimal solution.

We found a high use of SCD in making diagnoses. The use of an SCD increases the specificity of reporting and improves the comparability of the health-related events reported from different sources of data, including geographic areas [23]. Another study in Tanzania found that standardised case definitions were used for only 3 of 21 infectious diseases [24].

We found that Kiryandongo District had a non-functional DEPPRC. Several factors such as attrition of key members and lack of dedicated funding for committee sittings limited their functionality. There was an indication that the DRRT was functional. The DSFP acknowledged they don´t have an Epidemic Preparedness and Response Plan. He emphasised the challenge of limited capacity to develop the plan, work overload from clinic related assignments/activities especially in ART Clinic of the hospital which he heads hence leaving him with very limited time to concentrate on IDSR activities. A similar study to evaluate preparedness for an influenza pandemic in the Africa region found that only 35 of the 53 (67%) countries selected had epidemic preparedness plans [25]. The same study notes that the available preparedness plans lacked strategic focus and had limited clarity on the existing surveillance capacities.

Limitations

Our study findings were subject to a few limitations. Timeliness of reports was calculated using the date stated on the reporting form. It is possible that the date may not entirely reflect the true day a report was submitted. A report could be submitted late but the date stated could be timely. However, we also compared the time of submission from mobile phone to mTrac to validate the timeliness of weekly report submission.

Conclusion

There was a low capacity of the Kiryandongo District to perform IDSR functions which slowed down the system's ability to detect and respond to outbreaks. The DHT and health workers should be trained on IDSR in cycles of two years to refresh the members on guidelines for disease surveillance. Copies of SCD booklets should be distributed and used on a regular basis to ensure accurate diagnosis and reporting of diseases and conditions. The DEPRC should be strengthened through funding, regular meetings and supplies of essential commodities. Support supervision of HFs should be stepped up to improve on upward reporting of HMIS data. The district laboratory should be supported to procure and stock transport media for proper collection and transport of clinical specimens during particular disease outbreaks.

What is known about this topic

- IDSR Surveillance is a framework for collecting surveillance and laboratory data in

African countries, developed in the late 1990s
- Uganda adopted IDSR in 2000 for use in its national surveillance system

What this study adds

- Only 32/48 (67%) health workers were knowledgeable on IDSR, of which 12 (38%) were from the Refugee settlement HFs
- Kiryandongo District had a non-functional DEPRC
- The DHT and health workers should be trained on IDSR in cycles of two years to refresh the members on guidelines for disease surveillance

Competing interests

The authors declare no competing interest.

Authors' contributions

DNO took lead in conceptualizing the study idea, execution of the study, and manuscript writing. Other Authors also participated in conceptualizing the study idea, execution of the study, and manuscript writing.

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Tables and figures

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Table 3: The Common Diseases, Conditions and Events reported between April 2016 to March 2017, Kiryandongo District

Table 4: Discrepancy in Outpatient Total-Malaria cases reported using Weekly and Monthly Reports, Kiryandongo District, Jan-March 2017

Figure 1: Data flow of Surveillance System in Kiryandongo Refugee Settlement Jan-March 2017

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Table 1: Availability of key staff serving Panyadoli Health Centre III in Kiryandongo Refugee Settlement, Jan-March 2017

Key Cadres	**Norm**	**Filled**	**Ratio**
Nurses	4	22	6
Midwives	2	13	7
Clinical Officers	2	9	5
Doctors	0	2	2
Laboratory Staff	2	8	4
Environmental Health	1	3	3
Others*	8	23	3
Total	19	80	4

* Includes Medical Records Assistants, Nursing Assistants, and support staff

Table 2: Capacity of Kiryandongo District in performing IDSR core functions, Jan-March 2017		
Surveillance Functions	**Indicator**	**N=6 %**
Detection	Presence of Standard Case Definition (SCD) booklets or charts	50
	Diagnoses of priority diseases made according to SCDs	83
	HF has drawn its list of priority diseases, events and conditions	0.0
Recording	Availability of updated HMIS forms	67
Reporting	Submitted at least one weekly report in last 8 weeks	100
	Missed submission of at least one weekly report in last 8 weeks	67
	Availability of updated data collection tools	83
	Health facility In-Charge reviews weekly forms	83
Data analysis and interpretation	Drawing of graphs on priority diseases	33
	Use of maps to display information on priority diseases	33
Investigation and confirmation of reported cases	Reported a suspected epidemic prone disease in the last 8 weeks	50
	Immediate reporting of the epidemic prone diseases to the district	67
	Laboratory results received from Reference Laboratories	50
	Availability of appropriate supplies for specimen collection during urgent situations	50
Response	Availability of appropriate supplies for responding to confirmed outbreak	50
	Health facility has Surveillance Focal Person	67
	At least one staff at health facility trained in IDSR	67
Feedback	Health facility provides feedback to the community	100
	Health facility receives feedback from district	83
	Receives latest bulletin from central or sub-national level	67
Evaluate and improve system	Health facility sent the last 3 monthly reports to the district	83
	Monthly reports sent on time	83
Epidemic preparedness	Knows how to estimate supplies in emergency situations	0.0
	District leaders conducted supervisory visits	83

Table 3: The Common Diseases, Conditions and Events reported between April 2016 to March 2017, Kiryandongo District	
Health Events Reported	**Number of Cases**
Malaria Cases	88,746
Typhoid Fever Cases	575
Dysentery Cases	349
Animal Bites (Suspected Rabies) Cases	142
Adverse Events Following Immunization Cases	4
Presumptive MDR TB Cases	4
Acute Flaccid Paralysis Cases	2
Measles Cases	32
Malaria Deaths	30
Perinatal Deaths	9
Maternal Deaths	3
Presumptive MDR TB Deaths	1

Table 4: Discrepancy in Outpatient Total-Malaria cases reported using Weekly and Monthly Reports, Kiryandongo District, Jan-March 2017			
Health facility	**Monthly Report (HMIS 105)**	**Weekly Report (HMIS 033b)**	**% Difference**
Diika HC II	1150	829	28
Katulikire HC III	207	165	20
Kiryandongo GH	2323	1766	24
Nyakadoti HC II	1512	607	60
Panyadoli HC III	4088	1744	57
Panyadoli Hill HC II	1068	48	96
Total	10348	5159	50
GH-General Hospital			

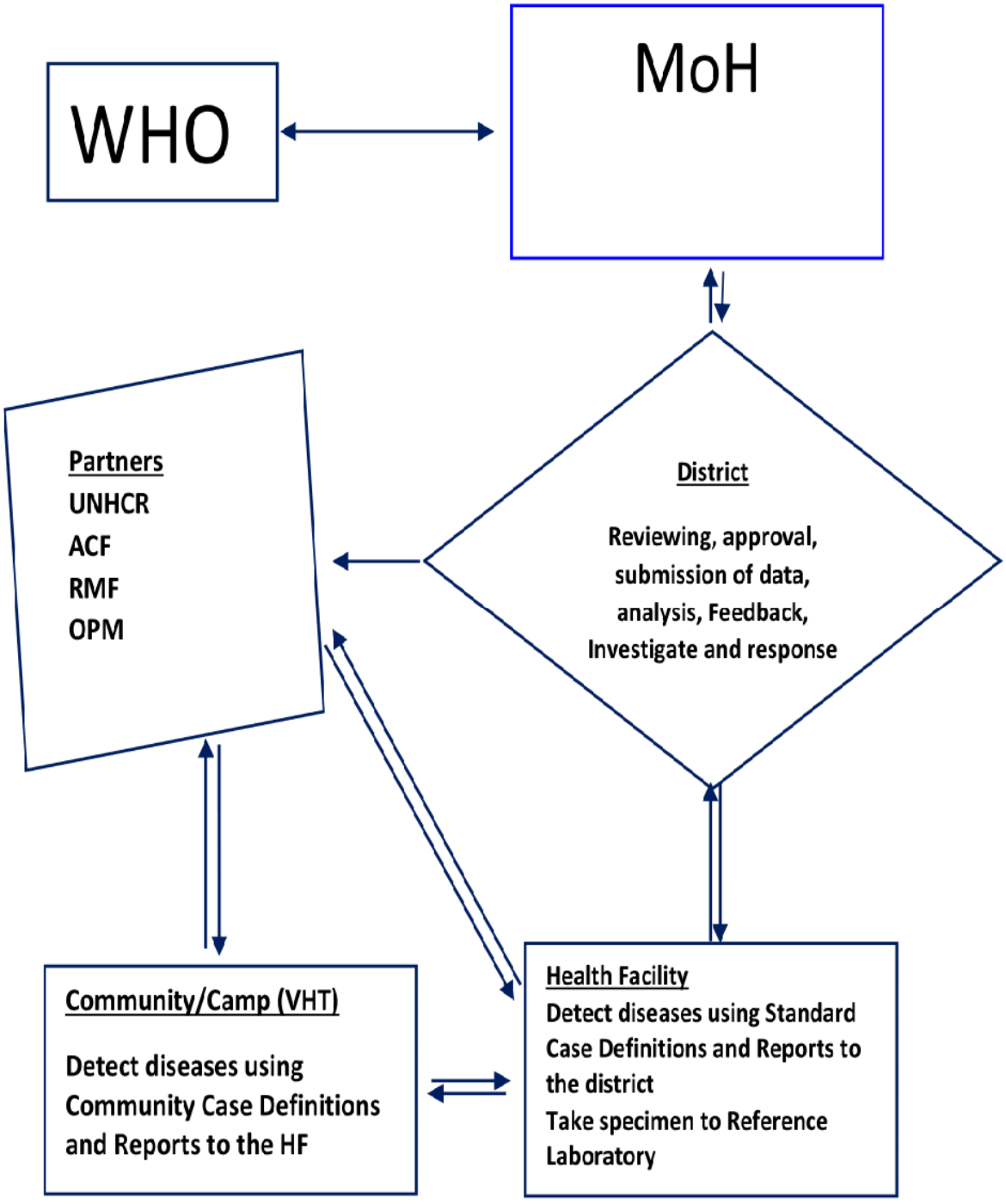

Figure 1: Data flow of Surveillance System in Kiryandongo Refugee Settlement Jan-March 2017