



Assessment of acute flaccid paralysis surveillance system in Kwahu South District

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Abstract

Millions of children and adults in Africa suffered from disability as a result of the impact of polio, which is one of the diseases targeted for eradication worldwide. Effective Acute Flaccid Paralysis surveillance had therefore been a key strategy to ensuring the absence of the circulation of polio virus amongst populations in all countries, which is a prerequisite for global eradication. However, this surveillance system in Kwahu South district has not detected any AFP case since 2013 thus the need to evaluate the system.

The evaluation of the AFP surveillance system intended to ascertain whether the system was meeting its objectives, and to assess the attributes of the system as well as its usefulness.

The CDC updated guidelines for evaluation of surveillance systems was adopted as the tool for the study. Data was collected through interview of key informants, observation and review of records. A purposive sampling method was used to recruit health facilities and staff as participants of the study and the data analyzed by descriptive statistics using Microsoft excel 2016 version and SPSS version 20. Findings and recommendations were disseminated to the stakeholders in the district through district review meetings.

The study revealed that, the AFP surveillance system in Kwahu South district, is simple, flexible, and acceptable but does not meet its objectives. The Non-polio AFP rate was seen to be 0/100,000 children >15 years. However, for a system to be seen as sensitive enough, it should have non-polio AFP rate of at least 2/100,000 children >15 years, which was not achieved in Kwahu South within the study period, an indication that the system is not sensitive. Strengthening Community participation through sensitization and involvement of clinicians and community-based surveillance volunteers in surveillance activities would be a key strategy towards heightening surveillance on AFP in the district.

Key Words

Acute Flaccid Paralysis, Surveillance, Surveillance System

Introduction

Acute flaccid paralysis (AFP) defined by World Health Organization (WHO), is sudden onset of weakness and floppiness in any part of the body in a child less than 15 years of age or if a clinician suspects polio in any person of any age (excluding adults, spastic paralysis, old cases or cases with obvious causes like trauma).(1) It is a clinical syndrome that can be caused by a wide range of etiologies. It presents with a rapid onset of weakness, including weakness in the muscles involved in respiration and swallowing, and progresses to maximum severity within several days to weeks.(2)

Worldwide, incidence rate of AFP is reported to vary from 0.8 per 100,000 children less than 15 years old in Australia, to 4.0 per 100,000 children less than 15 years old in Afghanistan.(3) Further studies shifted from the look of varying global incidence, and reported a drop in the incidence of the syndrome.

According to an epidemiological analysis of acute flaccid paralysis and its surveillance system that was carried out in Iraq, between 1997-2011, it was revealed that, a total of 4,974 cases of AFP were reported from Iraq during the study period, with an annual incidence of 2.5/100,000 population.(4)

Ghana recorded the last case of indigenous wild poliovirus in 1999 but suffered two more outbreaks in 2003 and 2008. In a study that was conducted by Odoom et al,(5) to evaluate AFP indicators in the country, it was realized that, 1,345 cases of AFP from children aged less than 15 years were reported to the Disease Surveillance Department from January 2009 to December

2013. However, none of the cases were classified as polio, after the specimen were taken to the laboratory for investigation. (5)

Again, in the Eastern region of Ghana, the last reported case of polio was in 2003. From a study by Opare et al,(6) in which records were reviewed and secondary data analysis conducted of all AFP suspected cases reported to the region between 1997 and 2010, 306 suspected cases were reported, with one wild polio virus confirmed. The non-polio AFP rate ranged from 0.12 to 4.3/100,000 population and stool adequacy from 60 to 100 %. (6)

AFP that turns out as polio, is highly fatal. It could result in irreversible paralysis in 1:200 infections and has a case fatality rate of 5-10% especially when the respiratory muscles become immobilized. (7)

Provision of clean water, improved hygienic practices and sanitation are important for reducing the risk of transmission in endemic countries. Immunization is the cornerstone of polio eradication. Two types of vaccine are available: an inactivated poliovirus vaccine (IPV) and a live attenuated OPV. Oral polio vaccine has been the vaccine used predominantly in the past in global campaigns and is still used in endemic areas. It has the advantages of inducing both humoral and intestinal immunity and of being cheap and easy to administer. The disadvantage is the small risk of vaccine associated paralytic poliomyelitis, which occurs in about 4 out of every 1,000,000 vaccinated children and unvaccinated contacts. (8)

Inactivated poliovirus vaccine is injected intramuscularly and does not carry any risk of vaccine associated paralytic poliomyelitis. The disadvantage is that it does not confer intestinal immunity and is not effective for outbreak control. It is more expensive and requires better trained staff for deliverance.

Sensitive surveillance for acute flaccid paralysis (AFP) cases or, alternatively, testing for virus in sewage water (which is routinely done in several EU countries) along with rapid case investigations and containment of outbreaks are equally essential for maintaining polio-free status. (8)

In 1996 African heads of state resolved to stamp polio out of Africa. But by 2000, wild poliovirus was still circulating in Egypt, Niger, and Nigeria. (9) Ghana however, was declared a polio free nation in 2013, and was commended by The Africa Regional Certification Commission (ARCC) for maintaining her Polio-free Status for three more years, and was advised to intensify surveillance and develop strategies to sustain the gains. (10)

Surveillance; is defined as “the ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of [this information] to those who need to know” and act upon that information. (11) A surveillance system, in turn, is a collection of processes and components that enable public health practitioners to conduct surveillance. Surveillance processes include data collection, data quality monitoring, data management, data analysis, interpretation of analytical results, information dissemination, and application of the information to public health programs. (11)

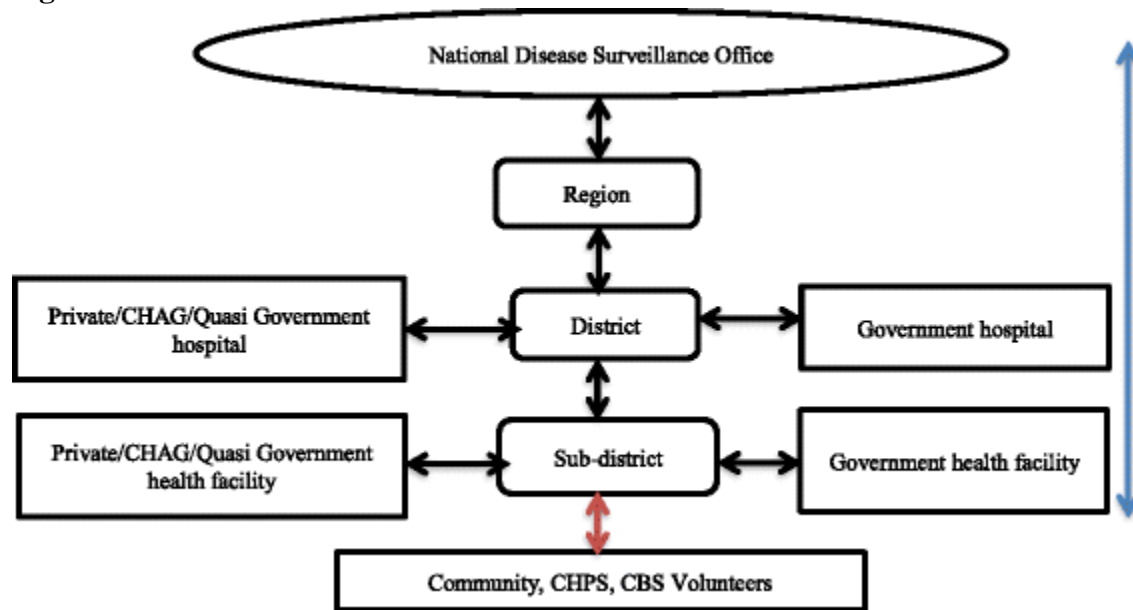
To ensure that paralytic polio cases will be detected if they occur, countries conduct surveillance for all AFP by using a standard case definition. All cases identified are tested to determine whether paralysis is caused by poliovirus infection. Data collected from this surveillance system helps to monitor progress towards the worldwide eradication of polio. In addition, as the Global Polio Eradication Initiative (GPEI) moves towards achieving the goal of polio eradication, environmental surveillance which investigates polio virus in sewage or wastewater and soil, plays a major role in providing evidence of absence of polio virus in circulation, Ghana as a

country, has a system of environmental surveillance in place which has conducted some tests of sewage in 2016 in Greater Accra and Eastern regions. Out of 36 samples that were taken, 7 of them turned out positive. This was an indication of a working surveillance system (12)

The quality of AFP surveillance is measured by using a standard definition for sensitivity and completeness, as follows: A rate of one or more non-polio AFP cases per 100,000 population aged <15 years with timely collection of specimens indicates that surveillance is sensitive enough to detect polio and allows comparison of AFP reporting completeness among and within countries.

Poliomyelitis is targeted for eradication. Highly sensitive surveillance for acute flaccid paralysis (AFP), including immediate case investigation, and specimen collection are critical for the detection of wild poliovirus circulation with the ultimate objective of polio eradication. AFP surveillance is also critical for documenting the absence of poliovirus circulation for polio-free certification. The last time a case of acute flaccid paralysis was suspected in Kwahu South district, was in the year 2013. No case has been suspected afterwards. The study therefore aims to evaluate the AFP surveillance system in the district, to assess its attributes and determine if it is meeting its objectives. **Figure 1** below presents a flow chart of Ghana surveillance system.

Figure 1: A Flow chart for Surveillance in Ghana



Statement of problem.

WHO has established standards to check the efficacy of surveillance systems in each country, polio-endemic or not; which means countries should be able to detect at least **two cases** of AFP not caused by polio per every 100,000 children under age 15. The Eastern Regional Health Directorate has however set a target of at least one suspected case of AFP per every district, in bid to meet the WHO standards. Unfortunately, the last case that was suspected in the Kwahu South district dates back to the year 2013. Polio as a condition, has maimed and killed hundreds of thousands of people worldwide and has caused physical suffering, life-long dependency, and loss of productivity and placed a heavy burden on poor families.(9) In effect, if the AFP surveillance system of Kwahu South district miss some possible cases of AFP, people may contract the infection, and get paralyzed, and that would go a long way to affect lives of people and productivity in the district. A comprehensive system of Integrated Disease Surveillance and Response (IDSR) is in place, and some health staff working in the 20 structured health care

facilities within the district, have had capacity building on IDSR once in the 2017, to update their knowledge and sharpen their skills in surveillance core functions which constitute part of efforts to improve surveillance activities in the district.

As a core function of the system, all health care facilities collect surveillance data and use the weekly and monthly IDSR reporting forms to transmit data to the district level. Health staff at the periphery, especially the community health officers, carry out home visits during which they render health care services to the people in their homes and equally search for cases including AFP within their respective communities. All the afore mentioned systems in place as well as capacity building efforts, should positively influence the effectiveness of AFP surveillance system. However, no case of non-polio AFP has since been detected in the district. The research, based on this deem it necessary to evaluate the surveillance system of Acute Flaccid Paralysis to determine its sensitivity, whether it meets the systems objectives and the level of usefulness of the system.

Materials and Methods

Study population

Health staff in the some health facilities in the district, who directly or indirectly are involved in AFP surveillance, constituted the population under study. This included Clinicians, Community Health Nurses, and Field Technicians. In addition, weekly records of AFP for the period between 2013 and 2017 were reviewed.

Exclusion and inclusion criteria

Health staff who diagnose or serve as prescribers at the selected facilities, and those who are involved in case finding were included in the study. These included Disease Control Officers,

Physicians Assistants, Community Health Officers, facility in charges and/or Surveillance officers or focal persons of the selected health facilities or communities within the district, who were properly consented to be part of the study.

However, staff who work in Kwahu South district, but were on study leave, maternity leave, or unwell were excluded from the study.

Study design

It was a cross sectional study, which involved the use of Center for Disease Control updated guidelines for evaluating surveillance systems as the tool for the study, where primary data and secondary data were collected. Primary data were collected from key informants using a checklist derived from the CDC guidelines, whilst the secondary data was obtained from AFP records review between 2013 and 2017 and the Ghana Health Service DHIMS2. Data collected, has been stored on the principal investigator's computer and protected with password. Hard copies have been filed under lock and key in the principal investigator's office.

Sampling method

A purposive sampling method was adopted to select 14 out of 20 fully operational health facilities in the district, including the District Disease Control department, that handle and manage AFP cases and data. Key informants or focal persons at the selected facilities were interviewed and assisted the researcher in the review of the data on AFP. This method of sampling is appropriate for the study because specific facilities and staff at the selected facilities, carry out the surveillance activities hence, should be the participants of the study. Any other method, may select different facilities and staff who are not into surveillance activities. Apart from it being appropriate for this evaluation, it is also simple to use since it does not involve technical procedures.

Data collection procedure

Data was collected from participants and records reviewed at the facility level. Key staff at facility level who are involved in surveillance, or focal persons at the facility level, were identified and interviewed using a checklist. With the help of these informants or focal persons, records were reviewed for completeness of reporting and cross checking if a suspected case was missed from the IDSR weekly reports. The researcher asked questions, and recorded the responses in a simplified checklist derived from the CDC guidelines, which is the standard tool for evaluating public health surveillance systems. Available Records of patients less than 15 years who were admitted at the hospital, or attended the OPD, were reviewed as well to check the number of possible AFP cases that were seen, captured by the surveillance system and reported as well as number that were missed. These records were gotten from the consulting room registers at the hospital.

Data analysis

Data collected was cleaned, and organized using SPSS version 20 and Microsoft Excel 2016. Analysis was done using simple frequencies and proportions. The interpretation was derived from these analyses.

Ethical issues

Ethical clearance was acquired from the University of Health and Allied sciences ethical committee before data collection. The purpose of the study was clearly communicated to participants and confidentiality assured and adhered to, by the researcher. A consent form was completed by the participants before participating in the study. Participants were also assured of confidentiality and anonymity and that, their names and other details shall not be linked to the

data analysis and dissemination of findings of the study. Unique codes were assigned to participants, which were used in the analysis. Data management, storage, analysis and reporting was done using codes which did not expose the details of participants

Risk: there were no anticipated risks associated with the study

Benefits: there were no direct benefits for participating in this study

Compensation: participants were not compensated for taking part in the study.

Consent process: Participants were provided with necessary information about the study in order to be informed about the implications of participation. After understanding what the study involved, participants had the right to make decision about participating in the research or not. Clarification on any questions that were posed by participants were given by the researcher. They were therefore made to sign the consent form before participating in the study. A copy of the signed form was given to each of them for their record after which the structured questionnaires were then administered.

Limitations

Limitations of the study was staff attrition. Most of the trained staff had study leave and newly qualified ones posted to the district, who had barely no knowledge about disease surveillance issues. Some facilities could not produce the reports they prepared at the facility level for review

Results

The study took into consideration, the CDC guidelines in evaluating surveillance systems, which formed the bases for evaluating the features of the system such as its sensitivity, simplicity, flexibility as well as its reliability. Hence data on the amount of time involved in reporting, completeness in reporting, evidence of case search activities at the health facility level, availability of standard data collection and reporting tools, availability of standard case definition on AFP, among others were collected. These variables are the basic elements that are required in

each surveillance system, which will apprise how good or poor a system is with regards to its sensitivity, simplicity and usefulness.

Table 1: Distribution of results by Attributes of the system

| Variable | | Frequency | Percent |
|--|----------------|------------------|----------------|
| Ever completed Notification form | Yes | 5 | 35.7 |
| | No | 9 | 64.3 |
| | Total | 14 | 100 |
| Time spent in completing notification form | <15mins | 4 | 28.6 |
| | 15-20mins | 1 | 7.1 |
| | Total | 5 | 35.7 |
| | missing | 9 | 64.3 |
| | Total | 14 | 100 |
| Time spent in completing IDSR1 Levels involved in case reporting | <15mins | 14 | 100 |
| | One | 3 | 21.4 |
| | Two | 2 | 14.3 |
| | Three | 8 | 57.1 |
| | No idea | 1 | 7.1 |
| | Total | 14 | 100 |
| Completeness of reports | Yes | 13 | 92.9 |
| | Missing | 1 | 7.1 |
| | Total | 14 | 100 |
| Availability of itinerary for case search | Itinerary Seen | 3 | 21.4 |
| | Not seen | 11 | 78.6 |
| | Total | 14 | 100 |
| Deadline for reporting cases | Yes | 14 | 100 |
| Availability of standard data capturing tool | Yes | 14 | 100 |

From “**Table 1**” above, 35.7% of the respondents have ever completed the AFP notification form before, whilst 64.3% of had never completed it before. 28.6% of participants who ever completed the report form before, indicated that, time spent in completing the form takes less than fifteen (15) minutes, whilst 7.1% said time spent is between fifteen to twenty minutes. All participants agreed that, preparing the weekly report, takes less than fifteen minutes. Levels that are notified when a case is suspected are three as indicated by 57% of the participants 92.9% of reports that were seen and reviewed were properly completed whereas, 7.1% were not well completed. For case search activities, only 21.4% of the health facilities visited, had

itinerary guiding them whilst 78.6% had no itinerary available at the time of visit. 100% of the facilities indicated that, they were aware of the deadlines for reporting. All facilities indicated that, there is a standard report for reporting, however, there is also a system in place for immediate reporting via phone call and SMS.

Meeting System's Objectives

Table 2: Distribution of results by system's objectives

| Variable | | Frequency | Percent |
|---|---------------|-----------|-------------|
| Availability of Epidemic Preparedness Plan | Available | 1 | 7.1 |
| | Not Available | 13 | 92.9 |
| | Total | 14 | 100 |
| Number of trained staff (all categories) | One | 5 | 35.7 |
| | Two | 1 | 7.1 |
| | Four | 1 | 7.1 |
| | None | 7 | 50 |
| | Total | 14 | 100 |
| Availability of action plan on disease surveillance | Available | 3 | 21.4 |
| | Not available | 11 | 78.6 |
| | Total | 14 | 100 |
| Availability of weekly disease monitoring chart | Seen | 2 | 14.3 |
| | Not Seen | 12 | 85.7 |
| | Total | 14 | 100 |
| Monthly Feedback on disease surveillance | Yes | 10 | 71.4 |
| | No | 4 | 28.6 |
| | Total | 14 | 100 |
| Number of prescribers trained | One | 3 | 21.4 |
| | Two | 2 | 14.3 |
| | 4 and above | 3 | 21.4 |
| | None | 6 | 42.9 |
| | Total | 14 | 100 |
| Number of CBSVs available | One | 4 | 28.6 |
| | Two | 3 | 21.4 |
| | Three | 5 | 35.7 |
| | None | 2 | 14.3 |
| | Total | 14 | 100 |
| Number of trained CBSVs | One | 4 | 28.6 |
| | Two | 3 | 21.4 |
| | Three | 2 | 14.3 |
| | None | 3 | 21.4 |
| | Total | 12 | 85.7 |

| | | | |
|----------------------------|--------------|-----------|------------|
| | Missing | 2 | 14.3 |
| | Total | 14 | 100 |
| Number of CBSVs who report | Two | 3 | 21.4 |
| | Three | 1 | 7.1 |
| | None | 10 | 71.4 |
| | Total | 14 | 100 |

One health facility out of the fourteen facilities visited, had an epidemic preparedness plan available, which was not up to date. From “**Table 2**”, 92.9% of the facilities had no preparedness plan available. The number of participants (staff) who received some form of training on IDSR is shown on “**Table 2**” above. Thirty- five (35.7%) percent of the facilities visited had one staff trained on IDSR, 7.1% had four staff trained. However, 50% of these facilities had no trained staff at all at the facility.

Action plan for surveillance activities was available for 21.4% of the facilities whilst 78.6% of the facilities had no action plans for surveillance. Weekly disease monitoring chart was seen at 14.3% of the facilities whilst 85.7% of the facilities had no monitoring chart available. 71.4% of health facilities indicated that, they receive monthly feedback on surveillance from the next level whilst 28.6% said they do not receive feedback from the next level. 42.9% of the facilities had spot maps whilst 57.1% did not have spot maps at their facilities. 42.9% of the facilities had no prescriber who received training on surveillance, 21.4% had just one trained prescriber, and 14.3% percent had two trained staff. Number of community surveillance volunteers within each facility’s catchment area, 35.7% of facilities reported to have three CBSV, whilst 14.3% reported to have none. 28.6% of the facilities said they had one person trained, whereas 21.4% reported to have none trained. 21.4% of the facilities had at least two CBSVs reporting, whilst 71.4% had none of them reporting to the health facility.

Table 3: Number of AFP cases suspected 2013-2017

| Year | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------|-------------|-------------|-------------|
| Children less than 15 | 34,111.80 | 34,828.7 | 35,502.3 | 36,339.8 |
| Number suspected AFP | 0 | 0 | 0 | 0 |
| Number Confirmed | 0 | 0 | 0 | 0 |

Source: GHS DHIS2.

Sensitivity is measured by the number of cases the surveillance system is able to suspect within the target population which is the Non-polio AFP rate. From “**Table 3**” above indicates that, from 2014 to 2017, Non-polio AFP rate for the district was 0 cases per 100,000 children less than 15years of age.

Table 4: Distribution of results by usefulness of the system

| Variable | | Frequency | Percent |
|--|---------------------------|------------------|----------------|
| Availability of OPV3 monitoring chart | Available and up to date | 2 | 14.3 |
| | Available but not updated | 12 | 85.7 |
| | Total | 14 | 100 |
| Availability of weekly reports | 0%-49% | 8 | 57.1 |
| | 50%-79% | 3 | 21.4 |
| | 80% -100 % | 3 | 21.4 |
| | Total | 14 | 100 |

From “**Table 4**” above, 14.3% of the facilities had an updated monitoring chat for OPV 3 as at the time of the visit, whilst 85.7% had no monitoring chat available. Reporting of via weekly IDSR report, the table above shows that, 57.1% of the facilities fell within 0-49% reporting rate whilst 21.4% performed between 80 and 100%.

Table 5 : OPV3 coverage from 2015-2017

| | 2015 | 2016 | 2017 |
|---------------------------|-------------|-------------|-------------|
| Number under 1year | 3,096 | 3,156 | 3,230 |

| | | | |
|-------------------------|-------------|-------------|-------------|
| Number immunized | 2,575 | 2,919 | 3,072 |
| Coverage | 83.2 | 92.5 | 95.1 |

The coverage for OPV3 is good. From “**Table 5**” above, there has been an increasing trend from 2015 to 2017 with 83.2%, from 95.1%.

Discussion

AFP is noted for worldwide eradication. Available literature depicts studies that were carried out to evaluate the surveillance, taking into consideration the attributes of the system and its usefulness. For instance, an evaluation of the AFP surveillance system was carried out in Gokwe north district in Zimbabwe, when it was realized that the district was always failing to meet its target of at least 5 cases per year (13). This is a similar reason for which this study was conducted in Kwahu South district, to find out why the system has not been able to detect any case within the four year period (2014-2017) and as a result, have not been able to meet set targets of at least 1 case per year. The study therefore sought to assess if the system was meeting its objectives, assess its attributes and its usefulness.

Attributes of the system

The findings revealed that, more than half of the respondents have never completed a notification form at their respective facilities and for the few who have ever completed it, they all responded to have spent less time in completing it. In the same way, all of them indicated to have spent less time in completing the integrated surveillance report (IDSR1). It was also imperative that, the system consist of three levels in surveillance reporting hence, not complicated. Almost all the

reports that were available during the visit were all completed properly with no suspected case seen in any of them. More than half of the respondents had no itinerary for case finding activities on AFP, and all respondents knew the deadline for reporting on disease surveillance and meets this deadline during reporting. All the respondents agreed to have standard data collection tool which AFP is a part of it. However, it allows for reporting via other channels like WhatsApp, which portrays flexibility of the system.

In view of this, the system was seen as simple, flexible, acceptable, but not sensitive. This findings however, partially confirms the results of a similar study that was conducted by Anyanwu, (14) in Oyo state of Nigeria, where after the evaluation, the system was found to be flexible, simple and sensitive. As mentioned earlier on, a system is seen as sensitive if the Non-polio AFP rate is at least, 2/100,000 in children <15 years, and in the case of Kwahu South, within the period of the study, the polio AFP rate has consistently been 0/100,000 children <15. Sowa, (15) also evaluated the AFP surveillance system in Sierra Leone and his finding were also not different from the findings from this study except that these two had their system to be sensitive which this research could not establish.

Meeting System's Objectives

More than half of the health facilities that were visited had no plans of action towards surveillance activities at the facility and community level including AFP, since it uses an integrated approach with other diseases with topmost priority. No sub district had an epidemic preparedness plan in place in case of any outbreak, except for the district health directorate where the plan was seen but not updated.

About half of the health facilities that were visited for the study, had no trained staff at all at the facility on surveillance to help in case findings. A greater number of the facilities had no disease monitoring charts available to monitor trends of diseases including suspected AFP cases in case

of any, and more than half of them had no spot maps to show the spatial distribution of disease conditions under surveillance. It was also clear that, a greater number of the prescribers who work at the health facilities had no training on surveillance in general, which makes it difficult to capture and report suspected cases to the next level for further investigation using the standard protocol and procedures. Most of the trained staff also proceeded on study leave and were replaced with new staff who were not trained, and in some cases no replacement was done, which created shortage of staff hence, affected performance in surveillance activities.

A few of these facilities reported to have no Community-based Surveillance Volunteers within their catchment areas, to assist in active case search activities. For those facilities that reported to have these CBSVs within their catchment areas, a few of these volunteers received some kind of training within the past five years. However, more than half of these CBSVs, do not report to the Health facilities.

These findings however, give the researcher enough evidence to suggest that, the system is not in the best shape to meet its objectives in respect to disease surveillance and specifically, AFP detection. The findings however, are contrary to that of the study by Sowa, (15) which found the system to be meeting its objectives and needed improvement. However, the study conducted by Anyanwu, (14) in Oyo state of Nigeria revealed that the system was meeting its objectives within the period under study. This could be related to the fact that, the study area had a very strong system and structures in place, trained personnel sub district and facility surveillance teams and committed community surveillance volunteers in place to assist the health staff with their activities, which is not the same in Kwahu South district.

Usefulness of the system

The study revealed that, more than half of the facilities visited had monitoring charts for OPV3, which were not updated and over half of the facilities had reporting rates of between 0-49 percent. It was also found out that, the OPV3 coverage for the period was good. About 83.2% of the targeted children were immunized for OPV which was the lowest recorded coverage within the period and about 102% of children were immunized which happened to be the highest. National immunization days campaigns are usually organized to dose children with the oral polio vaccine which also depicts one key strategy in overcoming polio in the sub region. However, between the periods taken for this study, there wasn't any National Immunization Days campaign organized.

Coverage data collected from the system gives clear picture on the number of children covered and those left unimmunized and this demonstrates clearly the usefulness of the system in helping to prevent children from polio. The system however, has been found to be useful, and serves its purpose.

The findings of this study however, are similar to that of the research by Makoni et al, (13) which was carried out in Gokwe north district of Zimbabwe. It was found out that, the system in Gokwe north was useful. However, the picture was not the same as that of the study conducted by Pomerai et al, (16) in Bikita District where the findings revealed that, the system was not useful since the data collected was not used locally by the stakeholders in any form. This is however not the case in Kwahu South district. Data collected is used locally to give a clear picture of target population and as basis for educating the inhabitants, to foster behavioral change.

Conclusion

The study was conducted to evaluate the AFP surveillance system in Kwahu South district, following the inability to suspect a single case for four consecutive years, and not meeting its annual AFP non-polio target as a result, within the Eastern Region.

The evaluation demonstrated that the AFP surveillance system in Kwahu South, does not meet its objectives, with most prescribers or clinicians untrained, very few trained community volunteers who do not report making community participation poor. The attributes of the system were seen to be simple, flexible, acceptable but not sensitive enough to pick up suspected cases of AFP, since it is however challenged with, inadequate staff at the community level, inadequate funds and logistics for surveillance activities at the district and community levels, inadequate transport for officers to move for field work. More research is however needed, to explore the factors affecting the sensitivity of the surveillance system and in the district

Recommendation

Recommendations were derived from the findings of the study and are presented as follows;

1. There is the need to focus on regular capacity building of staff on surveillance and reactivate the roles of community-based surveillance volunteers, and improving upon their skills, to boost active case search in communities with integrated disease surveillance approach
2. The district surveillance team and senior management should consider and explore avenues to secure and sustain funding and other logistics in surveillance activities including the district assembly, and how other program funds can be ridden on to carry out surveillance activities

3. The sub district surveillance system should be fueled with resources and tasked to conduct more case search activities at the various health facility and community level as part of strengthening surveillance activities.
4. The district should lobby for more motorcycles for surveillance officers at the district and sub district levels to enable them move down to the lower level for monitoring and supervision.

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References

1. Chaudhary S, Singh RR, Bhatta NK, Shah GS, Agrawal J. Acute Flaccid Paralysis with Acute Encephalitis Syndrome at a tertiary care centre of eastern Nepal . J Coll Med Sci. 2017;13(1):216–9.
2. Membo HK, Mweene A, Sadeuh-Mba SA, Masumu J, Yogolelo R, Ngendabanyikwa N, et al. Acute flaccid paralysis surveillance indicators in the Democratic Republic Of Congo during 2008-2014. Pan Afr Med J. 2016;24(July).
3. Momen AA, Shakurnia A. An epidemiological analysis of acute flaccid paralysis in

- Khuzestan Province, southwest Iran, from 2006 to 2010. *Epidemiol Health*. 2016;38(July):e2016030.
4. Jaseem JA, Marof K, Nawar A, Khalaf Y, Al-Hamdani F, Ali S, et al. An epidemiological analysis of acute flaccid paralysis and its surveillance system in Iraq, 1997-2011. *BMC Infect Dis*. 2014;14(1).
 5. Odoom JK, Ntim NAA, Sarkodie B, Addo J, Minta-Asare K, Obodai E, et al. Evaluation of AFP surveillance indicators in polio-free Ghana, 2009-2013. *BMC Public Health*. 2014;14(1):1–8.
 6. Opare J, Oluabunwo C, Afari E, Bonsu G, Sackey S, Wurapa F. P2-535 Progress towards eradication of poliomyelitis in Ghana: a review of eastern region- Ghana, 1997-2009. *J Epidemiol Community Heal*. 2011;65(Suppl 1):A369–A369.
 7. Abubakar Saleh J-E. A Critical Look at 2015 Acute Flaccid Paralysis (AFP) Surveillance Core Indicators of Bauchi State, Nigeria. *Sci J Public Heal*. 2016;4(4):326.
 8. Centre E, Prevention D. Immunisation and vaccines. 2020;4–7.
 9. Wiysonge CS. Africa is within reach of being declared a polio free region. 2020;5–7.
 10. Gana R, Leke F, Commission RC. Ghana commended for maintaining polio-free status. 2020;11–4.
 11. Groseclose SL, Buckeridge DL. Public Health Surveillance Systems: Recent Advances in Their Use and Evaluation. *Annu Rev Public Health*. 2017;38(1):57–79.
 12. Jk O, Obodai E, Diamenu S, Ahofo V, Addo J, Banahene B, et al. Environmental Surveillance for Poliovirus in Greater Accra and Eastern Regions of Ghana-2016 *Virology : Current research*. 2017;1(1):1–6.

13. Makoni A, Chemhuru M, Gombe N, Shambira G, Juru T, Bangure D, et al. Evaluation of the acute flaccid paralysis (AFP) surveillance system, Gokwe North district, Zimbabwe, 2015: A descriptive cross sectional study. *Pan Afr Med J.* 2017;27:3–5.
14. Anyanwu M. Acute Flaccid Paralysis Surveillance system Evaluation, Oyo state, Nigeria; 2008-2014. *Online J Public Health Inform.* 2017;9(1):4–7.
15. Sowa D. Evaluation of the Acute Flaccid Paralysis surveillance (AFP) system in Sierra Leone, 2012. *Int J Infect Dis.* 2014;21(14):144.
16. Pomerai KW, Mudyiradima RF, Tshimanga M, Muchekeza M. Evaluation of the acute flacid paralysis (AFP) surveillance System in Bikita district Masvingo Province 2010. *BMC Res Notes.* 2014;7(1):1–18.

