Evaluation of the Surveillance System for Under-5 Malnutrition in the Sagnarigu District of Northern Ghana – 2015

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Abstract

Background: The Northern, Upper East and Upper West Regions have some of the highest rates of malnutrition in Ghana. An effective surveillance system is needed to prevent under-five malnutrition. We evaluated the under-five malnutrition surveillance system in the Sagnarigu District of the Northern Region to determine whether it meets its objectives and also to assess its attributes.

Methods: We engaged stakeholders and described the under-five malnutrition surveillance system. We interviewed stakeholders using an interview guide. The updated guidelines for evaluating surveillance systems from Centers for Disease Control and Prevention (CDC) was used. Data was abstracted and reviewed from case based forms and data sets and facility records. Data was analyzed using Microsoft excel and Epi Info version 7.

Results: The system was well integrated into the Integrated Disease Surveillance and Response system with clear flow of information. It has a clear and simple case definition. Reporting was timely and feedback was good. However, data quality and completeness was low.

Conclusion and Recommendations: The under-five malnutrition surveillance is well integrated, it is useful and meeting its objectives. It is however recommended that data quality which is crucial for the effectiveness of a surveillance system be improved.

Keywords: Malnutrition; Under-5; Surveillance System

Introduction

Malnutrition causes nearly half of all deaths in children under-five. This translates into the unnecessary loss of about 3 million young lives a year [1]. Globally there are 40 countries with a child stunting prevalence of 40% or more, out of this number 23 are in Africa [2]. Ghana is ranked 138 out of 187 countries in the 2014 Human Development Report and is classified as a low-income, food-deficit country [3]. The Northern, Upper East and Upper West Regions have some of the highest rates of malnutrition in the country; four out of ten children under the age of five are stunted or chronically malnourished, meaning they will not be able to meet their full growth potential [4].

Poor socio- economic conditions, poor Water, Sanitation and Hygiene (WASH) activities, mothers' nutritional education on how to feed babies and young children, and repeated infections are the main causes of malnutrition [5]. Programs elaborated to eradicate malnutrition are on food security, water and sanitation, promotion of infant and young children feeding practices, micronutrient supplementation programs, management of severe cases of malnutrition in the communities and in the health facilities, management of infections mainly diarrhoeal disease [6]. Ghana has improved tremendously in under-five malnutrition over the last the last decade. An effective surveillance system is crucial for proper implementation of interventions [7].

Community Based Surveillance Volunteers detect and reports suspected cases of under-five malnutrition to the community health nurse or public health nurse either in person or by telephone call. In the other instances a case of under-five malnutrition reports to the health facility. The clinician who attends to the case uses the case definitions to identify the case and then records it in the hospital's register. For every suspected case of under-five malnutrition, the Mean Upper Arm Circumference (MUAC) measurement is taken and compared to the range in the case definition, a case based form is then filled before the clinicians then continue with an intervention to treat the case.

The stakeholders involved in surveillance for under-five malnutrition include the Community-Based Surveillance Volunteers (CBSV) who report cases suspected cases to Community Health Nurse. The nutrition unit directly collect and analyze data from the various levels such as health centers and clinics [8]. The World Food Program (WFP) and UNICEF are the donor agencies which support the district with funds, logistics and supplies to help fight under-five malnutrition. The stakeholders involved in the evaluation process are, Healthcare workers, Disease Control Officers, Nutrition Officers, Metropolitan and Regional Directorates of Health, Ministry of Health, World Health Organization, Non-Governmental Organizations [9].

Data on malnutrition is collected as it forms one of the disease surveillance systems in Ghana which are to be evaluated periodically. Though a number of nutrition surveys are organized in Ghana, the nutrition surveillance data is not adequately evaluated. Therefore, interventions related to prevention and under-five malnutrition surveillance system in the Sagnarigu District are to detect new cases of under-five malnutrition, determine the burden and pattern of disease and identify areas and population at risk [15]. We evaluated the under-five malnutrition surveillance in the Sagnarigu District, to determine whether the system is meeting its objectives and assess the performance of the surveillance system using attributes.

Methods
Study site

This evaluation was carried out in the Sagnarigu district in the Northern Region of Ghana. The district one of twenty-six districts in the region and covers a total land size of 200.4km². Sagnarigu shares boundaries with the Savelugu - Nanton Municipality to the north, Tamale Metropolis to the south and east, Tolon District to the west and Kumbungu District to the north-west. The total population of the District is 148,099 with 20,940 being the population of children under-five years [11]. The District has five health centres and 14 CHPS compounds and no district hospital. The nutrition units of the health facilities are responsible for coordinating the activities of the under-five malnutrition surveillance system.

Data collection

We carried out a descriptive study from 14th December, 2015 to 14th January 2016. We interviewed key stakeholders; Regional Director of health Services, Regional Nutrition Officer, Disease Control Officers, District Nutrition Officers, Community Health Nurses and Community Based Surveillance Volunteers using a semi-structured interview guide. The evaluation design followed the updated guidelines for Evaluating Public Health Surveillance Systems published by the United States Centers for Disease Control and Prevention [12]. Using the stated objectives of the under-five malnutrition surveillance system, appropriate attributes were selected based on the relevance to the system and the ability to access corroborating information from other systems. The selected attributes for the evaluation were simplicity, acceptability, data completeness, quality and validity, timeliness, sensitivity, specificity and representativeness. We interviewed stakeholders on their knowledge, understanding and views on the current case definitions and objectives of the under-five malnutrition surveillance system. We also collected data on their views on the relevance, acceptability and ease of use of the system. The questionnaire was administered via face-to-face interviews with internal stakeholders considered key to the operation of the surveillance system. Interviewees were randomly selected from each facility based on their role in the under-five malnutrition surveillance system.

Case definitions

The case definition employed in the Sagnarigu Municipality was that from the Integrated Disease Surveillance and Response. Under five Malnutrion was defined as Children under five who are underweight (indicator: weight for age< - 2 Z-Score) or Children 6 to 59 months with Mean Upper Arm Circumference (MUAC) <11.5 cm (high risk of mortality). Severe acute malnutrition was defined by a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional oedema. Moderate malnutrition (MM) is defined as a weight-for-age between -3 and -2 z-scores below the median of the WHO child growth standards.

Data analysis

We abstracted and reviewed data from case based forms and facility records between 2012 and 2015. Data entry and cleaning was done using Microsoft Excel 2013. We described the epidemiology of cases, that is the person, place and time of disease occurrence within the reporting period. Categorical variables were summa-

rized as counts and proportions and continuous variables presented using appropriate measures of central tendency and variation. All statistical analyses were performed using Epi Info Version 7.

Results

Reporting activity

During 2012–2015, 625,240 cases of malnutrition were recorded in the District. Out of this number, 586,823 (93.87%) had Moderate Acute Malnutrition (MAM) with the rest having Severe Acute Malnutrition (SAM). The crude incidence rates for SAM increased steadily from 6.13 per 1,000 children in 2012 to 12.01 per 1,000 in 2015. The highest incidence rate of MAM (195.8/1,000) was recorded in 2013 (Figure 1).
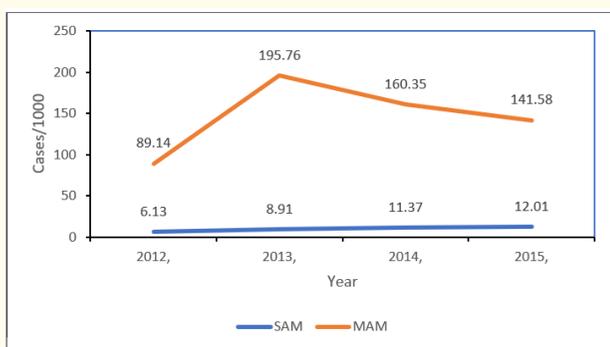
Figure 1: Incidence rates for Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM), Sagnarigu District, 2012 – 2015.

During the evaluation period, 54.74% (321, 224 /586,823) reported Moderate Acute Malnutrition were within the age group 0-11 months. Age group 24-59 months recorded the least percentage of cases (16.19%). Among cases reported for Severe Acute Malnutrition, the age group 0-11 months again recorded the highest percentage (48.16%) with the age group 24-59 months recording the least (20.69%). The 0-11 months was the most affected age group (Figure 2).
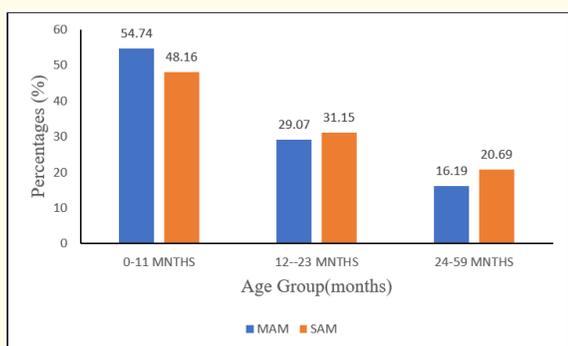

Figure 2: Age distribution of Moderate Acute Malnutrition and Severe Acute Malnutrition.

Flow of Data and feedback through the system

The surveillance system for under-five malnutrition uses both active and passive reporting in collecting data. At the community level, all suspected cases are recorded in the community vital health registers. Cases are also reported by clinicians and other health professionals in the health facility and hospital registers. Again the CBSV and community health nurses actively search for cases of under-five malnutrition in the community. Feedback is given at all levels. However, this is most often not frequent and sometimes delayed. The national nutrition unit gives feedback to the regions through emails, phone calls, supervisory visits and quarterly bulletins. Written reports are also sent to the regions. The region also gives feedback to the districts through phone calls. Quarterly, written reports are also sent to the various districts. Bulletins received from the national level are also made available to the districts. The district also gives feedback to the health facilities through a number of ways. Verbal and written reports are sent to the sub districts and health facilities. Staff meetings, durbars and review meetings are also used to share information on under-five malnutrition. The district also hold spot discussions with health facility and sub-district in-charges when they come to submit their monthly reports. The international partners such as WHO, UNICEF, USAID and WFP, gets feedback from the district, regional and national levels. Most of the data generated at the district level is shared directly with the donor agencies. The feedback from the health facility to the community is very poor and rarely happens. When it takes place, it is through phone calls.

Flow chart
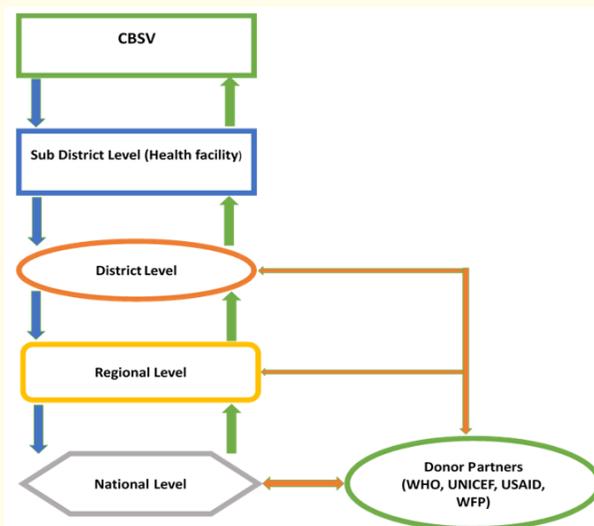
Figure 3: Flow chart for data and resource in the under-five malnutrition surveillance system, Sagnarigu District, 2016.

Performance of the system

Usefulness

A public health surveillance system is useful if it contributes to the prevention and control of adverse health -related events, including an improved understanding of the public health implications of such events [12]. Data generated from under-five malnutrition surveillance system was found to be useful since it monitored the incidence of malnutrition in children under-five years. Within the evaluation period, data generated by the surveillance system helped determined the worst affected communities and helped the implementation of intervention programmes such as the Infant and Young Child Feeding (IYCF) and the Community Based Management of Acute Malnutrition (CMAM) projects. Data from the system was also used in monitoring the impact of these intervention programs being implemented.

System attributes

Flexibility

Flexibility of a system describes how the system can easily adapt to and incorporate new demands or operating conditions with little or no additional resources [10]. The under-five malnutrition surveillance system is flexible and is very much integrated into the Integrated Disease Surveillance and Response (IDSR). The system adopts easily to changes in the reporting format and also incorporates other diseases using same staff and same resources.

Stability

Stability describes the ability of a system to be available, reliable and functional overtime [10]. The system was quite stable. No form of disruption in its performance has been experience since its establishment. At the district and regional levels where data is stored in computers, Uninterrupted Power Supply (UPS) and backups are available when the power goes off. But there are no generators to power their computers if the power outage is for longer periods. Stakeholders at all levels work closely together to ensure the sustainability of the system

Acceptability

Acceptability reflects the willingness of persons and organizations to participate in the surveillance system [10]. Acceptability is for most part a subjective attribute and depends on how willing the people involved in the public health surveillance system to provide accurate, consistent, complete, and timely data. The system is acceptable as most stakeholders were willing to participate in the system. Except for some clinicians who proceed to manage cases of under-five malnutrition without allowing the system capture those cases, all other stakeholders willingly participate and support the system.

Simplicity

Simplicity of a public health surveillance system refers to the structure and ease of operation of the system [10]. Simplicity relates closely to acceptance, timeliness and the amount of resources required to operate the system. The surveillance system for under-five malnutrition is quite simple. The data required to meet the case definition are MUAC measurement, presence or absence of pedal edema and some demographic information. The absence of laboratory confirmation also makes the system very simple.

Timeliness

Timeliness reflects the time spent between steps in a public health surveillance system [10]. Cases detected at the community level are reported and managed in a timely fashion at the health facility level. Data flow between the various reporting units are within the stipulated reporting time.

Data quality

Data quality reflects the completeness and validity of the data recorded in the public health surveillance system [10]. Completeness of data collected was determined by estimating the unknown or missing values on the under-five malnutrition forms. The data in the register was incomplete for most of the variables for majority of the patients. For example 11% and 17% of case based forms had their sex and ages respectively missing. Generally, the data generated at the health facilities was of poor quality. About 40% of the case based forms examined were not completely filled.

Sensitivity

A surveillance system is said to be sensitive if it can detect cases of a disease of health event [10]. The system was found to be highly sensitive as it easily picked up cases which were reported at the health facility. The system was found to be very sensitive at the level of case detection picking up several cases of both Moderate Acute Malnutrition and Severe Acute Malnutrition within the period under evaluation. The system was also able to detect seemingly focal outbreaks in some sub-districts leading to the implementation of control programmes.

Representativeness

A public health surveillance system that is representative, accurately describes the occurrence of the health -related event over time and its distribution in the population by place, person and time [10]. During the period under evaluation, cases were reported in all age categories and in all geographical locations within the district.

Discussion

The under-five malnutrition surveillance system is part of the Integrated Disease Surveillance and Response (IDSR). We assessed this surveillance system to determine whether it was meeting its set objectives. The objectives of the system are clear and simple and its performance over the years has been very good. The data collected by the system though very useful, however lacks the desired quality. This is manifested in the level of completeness of the case-based forms at the facility level. More than 40% of the case-based forms were incompletely filled. This finding is contrary to findings by Kaburi and that of Kasu in their evaluations of tuberculosis and meningitis surveillance systems respectively in Ghana [13,14]. These evaluations recorded very high levels of data quality compared to the present study showing the lack of much needed effort surveillance staff place on under-five malnutrition surveillance compared to communicable diseases such as tuberculosis and meningitis.

Our evaluation of the under-five malnutrition in the Sagnarigu District, Ghana, found the system be simple, acceptable to all users and useful as it achieves its objectives. The stakeholder participation in the surveillance system is phenomenally high as the system is widely accepted by all stakeholders. Reporting units submit their reports in a timely manner and also do so regularly. This is degree of acceptability is in agreement with reports by UNICEF in their evaluation of acute malnutrition surveillance and management in Kenya [15]. Feedback was generally good at all levels, with all reporting units attesting to the fact that they regularly receive updates and reports from higher levels concerning cases that has been referred.

Adequate data entry was done at the district and regional levels. No data analysis was done at the sub-district and facility levels. Data analysis was done at the district, regional and national levels. Epidemic curves and spot maps were clearly displayed at both the district and regional level. This made it quite easy to be able to pick up the cases according to person, place and time at a glance. Strengths of the under-five malnutrition surveillance system includes its stability and well integration into the Integrated Disease Surveillance and Response (IDSR), high stakeholder participation, a well-defined line of reporting and communication, a sensitive and simply case definition. The system however had weakness with regards to data quality, as there is incomplete filling of case based forms.

Limitation of the Study

The surveillance data described is solely based on reported cases, this may not be precisely representative of numbers and distribution of under-five malnutrition cases in the Sagnarigu District.

Conclusion

The under-five malnutrition surveillance system is meeting its objectives. It has a clear and simple case definition which makes it useful and sensitive in detecting cases. However, the data quality needs to be improved. We recommend that the District health directorate sensitize nutrition officers, disease surveillance officers, public health nurses and community health nurses on the need to improve data quality. In addition, its recommended clinicians be encouraged to get involved in under-five malnutrition surveillance activities. We educated mothers on Infant and Young Child Feeding (IYCF) practices within the period.

What this study adds

- There has been an increase in the number of reported Moderate Acute Malnutrition cases in the Sagnarigu District of the Northern Region of Ghana from 2012 to 2015
- Lapses have been found in the data quality for under-five malnutrition surveillance and this need to be worked on in order to improve the surveillance system in the district.

Declaration of Interest

Authors have declared that no competing interests exist.

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