Journal Homepage: -www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI:10.21474/IJAR01/8914
DOI URL: http://dx.doi.org/10.21474/IJAR01/8914

RESEARCH ARTICLE

ASSESSMENT OF THE INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IMPLEMENTATION IN SELECTED HEALTH FACILITIES OF SOUTHERN PROVINCE OF ZAMBIA.

Emmanuel Hakwia Kooma.
texila american university.

Manuscript Info

Manuscript History
Received: 20 February 2019
Final Accepted: 22 March 2019
Published: April 2019

Key words:-
Assessment, Public Health, Disease Surveillance Systems, Southern Province, Zambia.

Abstract

Background: Disease Surveillance has been the cornerstone of public health decision making and practice world over. Monitoring of the progress of IDSR Strategy has been an important component to ensure its sustainability in Zambia. The aim of this paper was to reflect upon the experiences in the province in order to learn lessons and improve systems.

Methods: A descriptive cross-sectional study design was used to assess the structures, core and support surveillance functions using a modified checklist from the WHO questionnaire. The purpose of the study was designed to gain more information through observations, descriptions and review of document aspects of the IDSR situation. All 13 districts, national and provincial offices, 77 facilities and 13 laboratories were assessed. Literature review studies were from PubMed and database of WHO and CDC from 31BC-2017 was under taken assessing communicable diseases surveillance systems.

Results: The Public Health Act Cap 295 of the Laws of Zambia has inadequacies for effective implementation of modern required environment of IDSR. The findings revealed that despite significant progress made in overcoming the challenges identified, gaps still exist. The mixed challenges with core and support functions were observed.
The issues identified included non-financing of IDSR activities, inadequate training and high turnover of peripheral staff, nonexistent of feedback from higher levels, inadequate supervision, weak laboratory capacities to diagnose dysentery, lack of Job Aids for laboratory staff. Transport and communication means were unavailable in rural facilities. The best out comes in the core functions and systems attribute were reported to levels when support surveillance functions performed well. The human resource was found to be an output determinant to IDSR apart from the technological and technical issues.

Conclusion: Implementation of IDSR was associated with improved surveillance and response efforts. The challenges identified were largely "systemic" in nature. However, nonexistent budgetary support from the monthly grants allocation erodes gains. Reviewed efforts from government and stakeholders are necessary to sustain and expand progress. Strengthening support surveillance functions alongside the six building blocks of the health care system at implementation levels remains cardinal.

Corresponding Author: -Emmanuel Hakwia Kooma.

……

Introduction:-

Integrated Disease Surveillance(IDSR) brings many surveillance activities together to try and make sure that priority diseases can be controlled and prevented more effectively. Data collection, analyzing and reporting priority communicable diseases has several advantages. Firstly, the IDSR has been found to be cheap, since the same health personnel and reporting forms are also used for routine reports and reporting of health –related data. Secondly, it also creates an opportunity to computerize all the available data at the central level. Thirdly, IDSR provides training and capacity building opportunities for health personnel to develop new skills. Fourth, it encourages community participation to detect and respond to disease epidemics(WHO,2010).

IDSR has been a cost-effective surveillance system that addresses the major public health problems in developing countries (IDSR,2010). It involves active and passive surveillance systems. Communicable diseases are caused by bacteria, viruses, protozoa, fungi and parasites that make a huge contribution to the burden of a disease, disability and death more especially in developing countries like Zambia. Some communicable diseases are easily preventable through simple measures such as vaccination and changes in human behavior for example, handwashing with soap and observing hygienic standards.

However, the transmission of infectious agents will be difficult to reduce to minimum levels as seen in developed countries without significant reductions in the proportion of people living in impoverished social circumstances, with poor nutrition that leaves them more vulnerable to infection. To prevent or control the major communicable diseases, a concerted effort by health workers, the government, development partners and community members is crucial. Effective disease surveillance has remained an important operational tool in Zambia as the country always experiences recurrent epidemic prone diseases (NHSP 2017-2021). Insufficient knowledge among the staff on IDSR have been documented and rectified through intensified capacity building.

The scope of surveillance system has been broad from early warning systems for rapid response to communicable diseases, to planned responses to chronic diseases that generally have strong lag time between exposure and disease. The collection, collation, analysis, interpretation and dissemination of data in health care facilities have been unsatisfactory and this has been attributed partly to insufficient awareness and knowledge among health care workers on the importance of this process. Data has been quite important especially in the area of core IDSR activities such as case definition, case registration, case reporting and its management (WHO,2010).

There has been high recognition of the need for effective disease surveillance and response in growing world due to increased risks of infectious diseases associated with population mobility, globalization, emerging and resurging diseases. A strongly functioning surveillance system has been found to be essential to inform public health decisions and actions that can prevent and control these diseases(CDC,2013).

The IDSR concept has been straight forward and calls for countries to strengthen surveillance of priority infectious diseases; the use of simplified tools for data collection and analysis; integration of various channels for reporting and feedback; providing timely surveillance information for decision making.The technical determinants of IDSR performance include technical standards, information system design, data collection forms, data flow, availability of necessary technology and methods for analysis, reporting and communicating feedback, monitoring and evaluating outcome.

Technical determinants are what people often think of first and foremost when trying to improve surveillance systems; past efforts to improve system performance have often been limited to addressing weaknesses in these determinants alone. The technical determinants, however, require functioning organizational processes and mechanisms at work place to ensure that information flows where it is needed to districts. Facility personnel have resources at their disposal and responsibility and authority to make decisions based on the available data.

In Zambia infectious diseases (both endemic and epidemic-prone) are still the most common causes of morbidity and mortality. In order to effectively control these diseases, health systems have been found to need access to complete, accurate and timely information so that they can target scarce resources in the most effective manner. IDSR ensures the generation and provision of this information to decision makers at all levels of the health system

and to ensure that health staff can take informed and appropriate action to reduce morbidity and mortality from priority infectious diseases.

Zambia has been experiencing epidemics leading to considerable numbers of fatalities due to in part to the fact that effective early detection and response capabilities were not in place. The larger number of potential preventable cases and fatalities affect the systems throughout the province. Generally, data is usually recognized as incomplete if not received in time to be used and often of questionable validity. In addition, there are concerns about whether health system staff-particularly those at the facility and district levels-were able to analyze, interpret, and actually use surveillance data.

The barriers to effective surveillance and response(IDSR,2010) include surveillance system design issues, such as the existence of multiple vertical systems that focus almost exclusively on providing data for managers higher up in the system. There have been far links between those collecting and those analyzing the data and those responsible for decisions and planning related to public health response and or routine service delivery. Surveillance systems also suffer from general lack of resources and poor transportation and communication infrastructure. These infrastructure problems make reporting and experience transport being difficult, if not impossible for peripheral health facilities-particularly during annual rainy seasons. Funds for recurrent expenditures in health facilities and districts were lacking for such basic supplies as computers, pencils and paper as well as critical functions such as supervision and training.

The study describes and assesses the functions and activities of public health disease surveillance in Southern province of Zambia. The research paper presents the fundamentals of IDSR in the province in the clearest possible way. Subnational surveillance and response capacities have been found to be critical for effective regional surveillance that allows for greater efficiencies, effectiveness and sustainable capacity building to staff. Disease specific and multi-disease capacity strengthening and surveillance networks have been found to add value to surveillance efforts for public health action.

The specific research questions of the study are based on the four components of the Conceptual Frame Work WHO, 2004) for monitoring and evaluation of public health disease surveillance and response systems (http://www.who.int/wer).

Methodology:-

We used a descriptive cross-sectional study and chose a qualitative descriptive research design because it best served to answer the questions and purposes of the study. The qualitative descriptive approach was designed to gain more information through observations, descriptions and review of document aspects of the IDSR situation in Southern province of Zambia as it naturally happens (Polit & Beck,2004). Our intention was to discover new meaning, what exists and determine the frequency with which IDSR implementation has been done.

The study was concerned with providing descriptions of phenomena that occur naturally without interventions of an experiment. The study involved collecting various but complementary data on public health disease surveillance using more qualitative and less quantitative methods. The study took on a pragmatist world data search to guide in the attempt to understand the research problem.

Data was collected and analyzed from only 77 facilities considered to be representative of the entire health system in Southern province of Zambia. The findings of the study were generalized to the entire provincial population of facilities (Nworgu, 1991). Public opinion from the key informants was solicited through interviews, checklists and guides.

We reviewed unpublished and published national policy documents and guidelines to document the IDSR articles, journals, research papers, implementation framework for Africa and relating it to occurrences in Southern province of Zambia. We further reviewed epidemic preparedness and response systems, guidelines including minutes of epidemic preparedness meetings at various levels. We reviewed reports and weekly trend data reports for both District Epidemic Preparedness (DEPC) and Rapid Response Teams (RRT) held for planning and monitoring of IDSR program in Southern province of Zambia during the study period.

Respective training curriculum in hospitals with training schools was reviewed (Chikankata, Monze, Livingstone and Macha) including training materials, the performance reports and the training data bases to understand the IDSR design organization and the way training is being done. The interview key informants were the surveillance officers at provincial health offices and those in the hospitals, district offices, rural health centers and the community. No private health facility was visited. We also reviewed the accounts documents including activity budgets, equipment, records, procurement supply vouchers including delivery notes and records to acquaint ourselves with resources and logistics being deployed across IDSR process and management.

3.1 Delimitation of the Study

In this study the opinions, perceptions and surveillance officers' attitudes were sought. The 77 facilities are show in the table below.

Table 1:-Name of districts and health care facilities and the community: The sampled facilities of study

S/N	Names of districts	Names of hospitals	Names of Rural Health Centers	Health Post	Community
01	Choma	Choma & Macha Hospital	Batoka RHC	Simooya	Bbombo
02	Monze	Chikuni & Monze Hospital	Monze Urban RHC	Muunyu Mabisi	Kayuni
03	Kalomo	Kalomo Hospital	Namwianga RHC	Nantale	Monde
04	Namwala	Namwala Hospital	Chitongo RHC	Moomba	Niko
05	Mazabuka	Mazabuka & Kafue Hospital	Kaonga UHC	Shimungalu	Nega-Nega
06	Siavonga	Siavonga &Mtendere Hospital	Sianyoolo RHC	Kabuyu	Namoonde
07	Livingstone	Livingstone Central Hospital	Simoonga RHC	mahuluhulu	Ngwenya
08	Kazungula	Kazungula Border Zonal Centre	Nyawa RHC & Sikute	Katondo	Kooma &Bwiiketo
09	Zimba	Zimba District Hospital	Malundu RHC,	Siampondo	Luyaba
10	Chikankata	Chikankata Hospital	Nansanga RHC	Chikani	Kasikili
11	Sinzongwe	Maamba Hospital	Sinazongwe RHC	Muziyo&GVDC	Kasikili
12	Pemba	PembaMain&Jembo Hospital	Moyo RHC	Hajamba	Singumba
13	Gwembe	Gwembe Hospital	Sinafala RHC	Gurumunyanga	Koma

Source: Kooma E.H, (2018)

Table 2:-Population of the study (Number of facilities)

S/N	National level	Provincial level	District level	Hospital	RHC	HP	Community
01	1	1	13	(21)6General Hospitals 1 Central Hospital 14 District Hospital	14	14	14

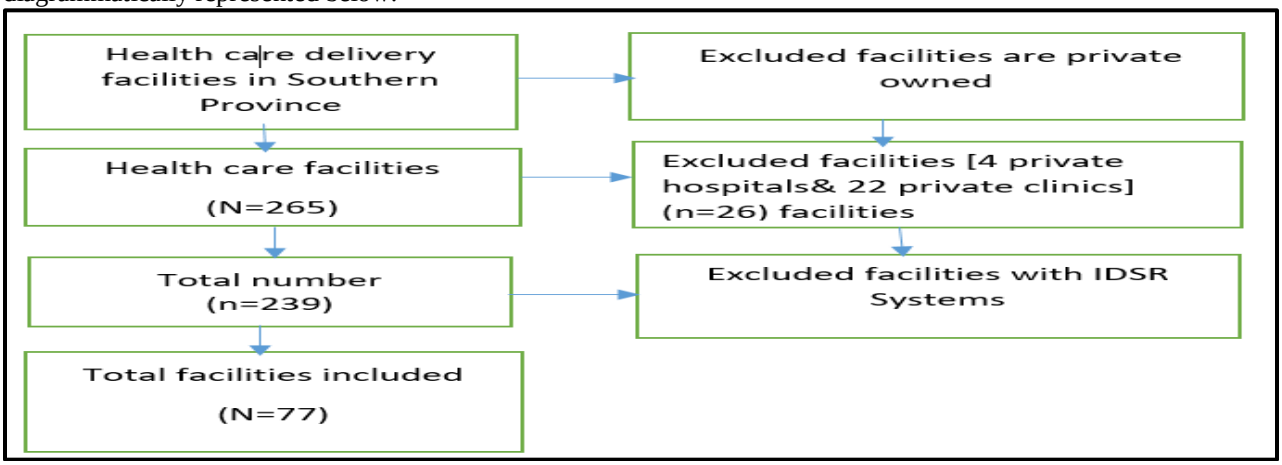
Source: Kooma E.H, (2018)

In this study, the target population included Surveillance Officers and the National Focal Point person, Provincial Surveillance Officers, District Surveillance Officers, Facility Surveillance Officers and the Community Health Assistants at community level were all considered appropriate as population of study because they are on hands on the job and most of them have several years of experience and therefore they are in the best position to furnish with information that was needed to answer the research question of this study.

Sample of the population (Sampling Criteria)

In each of the 13 districts one zonal rural health Centre, one health post and one community and 21 district hospitals were purposely sampled. In some districts more than two facilities were selected with maximum variation. Purposeful sampling with maximum variation as a strategy was used in qualitative study with the aim of capturing and describing the central themes or main outcomes that cut some cross interviewees (Patton, 1990). The sampled health care facilities were those under the Ministry of Health and under the leadership of the District Directors of

Health (DHDs) and where laboratories were functional. The selection and exclusion criteria has been diagrammatically represented below:

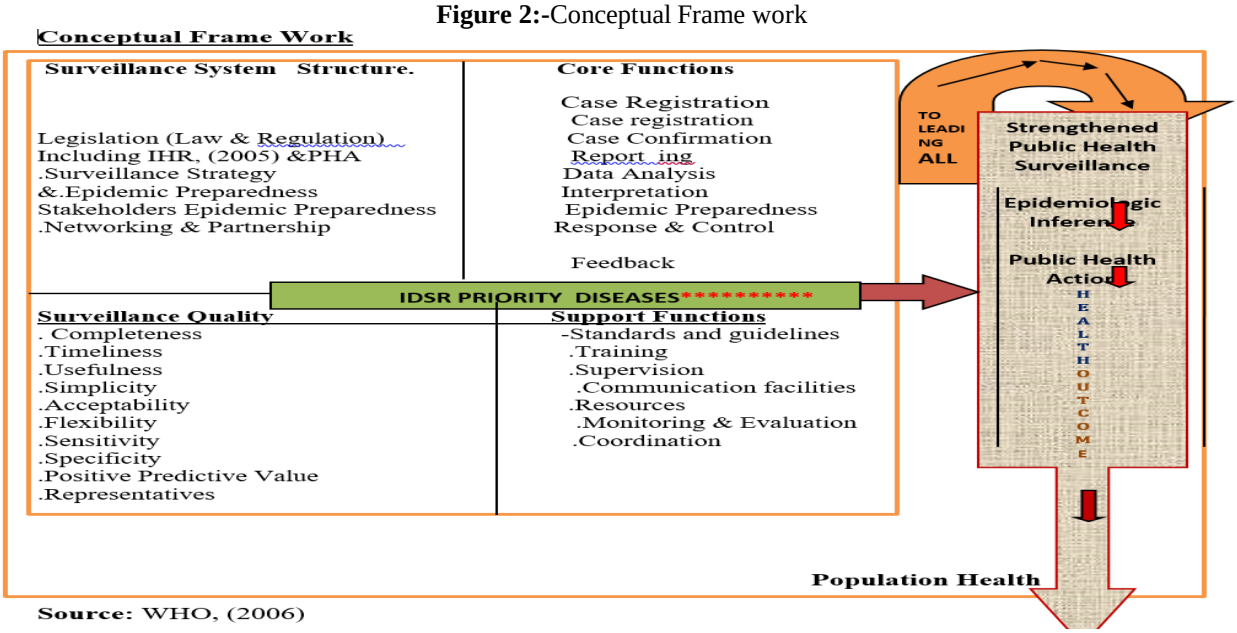


In-Depth Interviews to Participants

The study used purpose sampling and health workers were sampled (those in surveillance positions) as key interview informants. We interviewed a National IHR focal point, the provincial Surveillance Officer, the District Surveillance Officers, Hospital Surveillance Officers and Zonal Health Centre Surveillance Officers including laboratory personnel and 14 Community Health Assistants representing 14 communities. Not all facilities were found to have standard laboratories. The elements making up this sample are those that are actually studied in the sample of the population of this study. The study population comprised all departments that conduct disease surveillance, national (n=1) districts (n=13),PHO(n=1) General Hospital(n=6), Central hospital(n=1) hospitals (n=14) rural health facilities (n=14) and Community (n=14) all in Southern province of Zambia. Before gathering the data, a pilot study was conducted in Choma District (n=3) facilities for testing the feasibility and validity.

The WHO Conceptual Framework for monitoring and evaluating disease surveillance and response systems was used to assess public health disease surveillance system structure, core functions, surveillance quality and support functions including the IDSR priority diseases and public health surveillance, epidemic inference and public health action were at the center of focus for discussion of this paper. The Conceptual Frame work and its process to health Outcome has been explained in detail in the later sections of Chapter 5 to provide an over view in the Zambian context to enlighten and compare with the study out-come.

Figure 2:-Conceptual Frame work



Source: WHO, (2006)

Field work was conducted in all indicated health facilities in the province. Desk review of surveillance documents and checklist were used. The weekly and monthly records were reviewed at District Health Offices submitted by lower levels and at the hospitals; data was also reviewed at the reporting desk of environmental health disease surveillance.

The data was from all wards and units of each hospital visited. Community surveillance data was reviewed from at least three Community Health Assistants for each district who are based in the community. During the review of records report tracking tool for case investigation forms, out-break reports, results of analysis of data, epidemic preparedness plans, meeting minutes including the monday briefing minutes, schedules and reports given for health promotion and other activities were done.

The visits to facilities involved patient registers, weekly copies of reports, results for data analysis, reports and schedules of the community out-reach activities, case investigation forms and standard case definitions were also reviewed. The weekly reports submitted by all districts for the year 2016 were equally reviewed. The public health disease surveillance core activities such as case detection, case confirmation, reporting and registration, data analysis and feedback and the public health supportive function such as training, communication, supervision and general resources were measured using the WHO and CDC standards guide for IDSR indicators. Records review were conducted at the provincial and district levels. All district surveillance officers were administered with an interview guide including the health facility checklist while checks for quality of work of the reviewers were strictly conducted.

The public health surveillance in the province was measured using the WHO and CDC standards guide for IDSR indicators: [timeliness of reporting, usefulness of disease surveillance, events and conditions surveillance data including the surveillance system, the simplicity and the acceptability of the systems and flexibility of the surveillance systems, sensitivity and specificity in disease surveillance, positive predictive value and representativeness of public health surveillance system(WHO,2012).

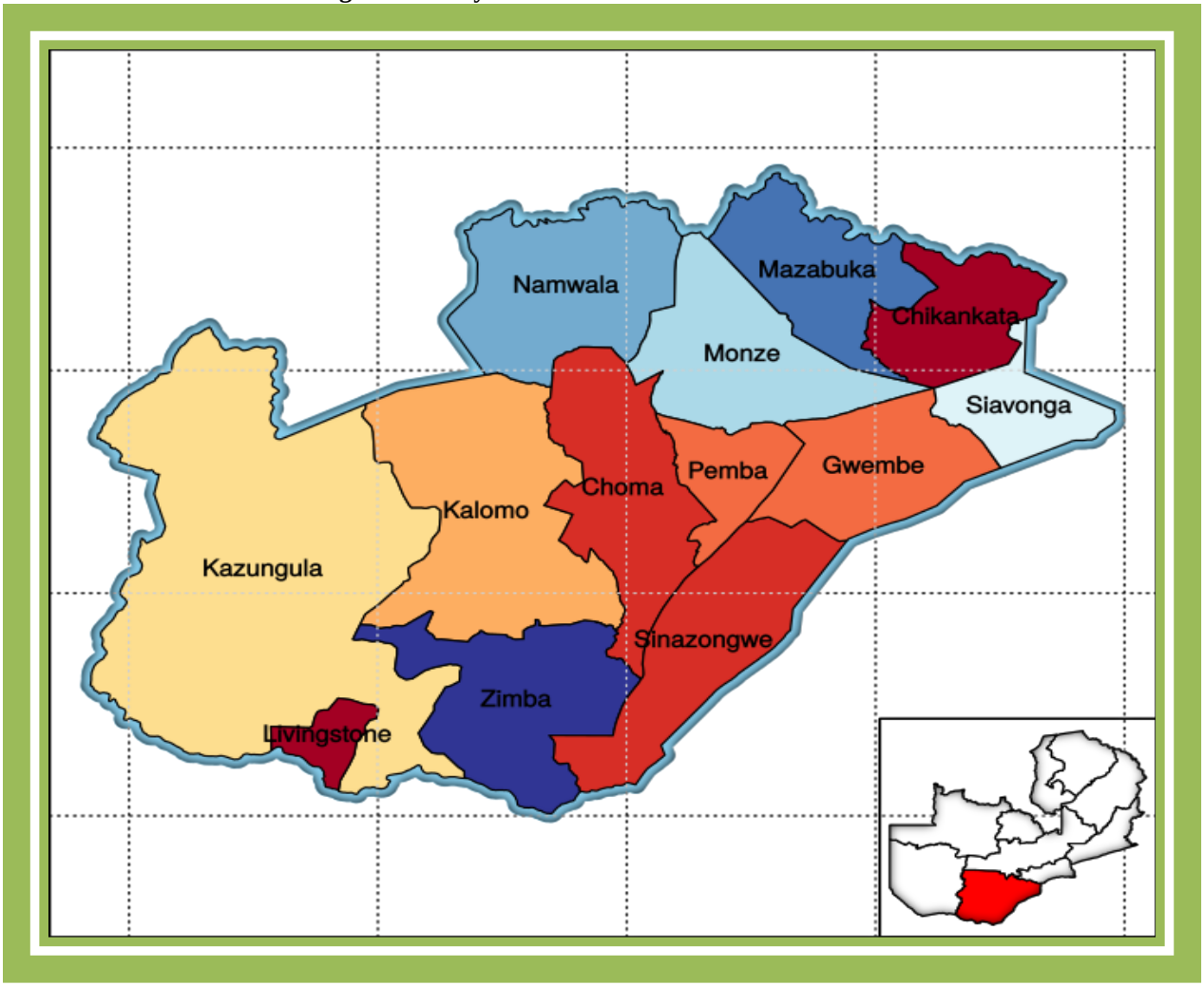
The Focus Group Discussions (FGDs) and personnel interview guide was used to assess the public health disease surveillance activities in the province. The participants to the interview were the representatives of the rural and urban districts, (n=13) districts and health facilities (n=27), Health Posts (14), Communities (14) and Provincial Health Office (1) and Central Level (n=1) District Offices (13), National level (1), Provincial level (1).
Thirteen (13) FGDs were conducted each with maximum of (10) members and minimum of (8) staff members and each FGD took about 2 hours with a break of 20 minutes in between. The trained public health surveillance officers moderated the discussions in English and local language together views and experiences about public health

surveillance activities were discussed. The participation rate in FGDs was calculated and qualitative focus group data was analyzed using content analysis based on themes arising from the data.

The recording tapes were used and discussion notes were summarized and coded according to the relevance of different issues arising from the discussions and unique quotes from participant's input were translated into English. No numerical analysis was carried out from the focus group discussion data. The significance of the qualitative research and in particular the FGD, was not determined by the frequency with which an option or view has been raised but rather the manner in which it was raised, discussed and negotiated by the Focus Group Discussion(Richie's,2005).

In order to find out the feasibility of implementing the improved public health system surveillance in Southern province based on the analysis and feedback from regional stakeholders was measured by using the summary of the findings of the research questions that were provided. Based on suggested improvement of public health system surveillance statements that were used to implement a face- to –face discussion meetings were arranged. A total of 60 health workers in the continuum of public health disease surveillance at National, Provincial and District, facility and community levels were chosen randomly to participate in the study.

Figure: 1 Study Area of Southern Province of Zambia



Source: Geographical Atlas Map.

Results

The findings on the **Legal and Regulatory Framework- Core functions – Surveillance Quality–Support Functions Model** of the Integrated Disease Surveillance Conceptual Framework for World Health Organization are presented in table 1 below. The relationships of the four thematic areas are presented in line with IDSR model that depends on the structure, the function, the quality performance and the functions that support the IDSR performance.

Table 1:-Findings on Legal and Regulatory Frame Work and Governance of IDSR in Southern Province

Functional Areas	**Availability of Legal and regulatory IDSR requirements**								
	MOH	**CH**	**PHO**	**GH**	**DHO**	**DH**	**RHC**	**Health Post**	**Community**
PHA Cap 295	Yes	-	Yes	-	Yes	-	-	-	-
IDSR Manual(2010)	Yes	-	Yes	-	Yes	-	-	-	-
IHR (2005)	Yes	-	Yes	-	Yes	-	-	-	-
HMIS Manual	Yes	-	Yes	-	Yes	-	-	-	-
IDSR Memos	Yes	-	Yes	-	Yes	-	-	-	-
Public Health Flags	Yes	-	Yes	-	Yes	-	Yes	-	-
Funding	Yes	-	Yes	-	-	-	-	-	-
Epidemic Preparedness Committee	Yes	-	Yes	-	Yes	-	-	-	-
Rapid Response Teams	Yes	Yes	Yes	-	Yes	-	-	-	-
Emergency Committee	Yes	Yes	-	Yes	Yes	-	-	-	-
Risk Communication Plan	Yes	-	-	-	-	-	-	-	-
Quality Management Committee Assessment	Yes	-	-	-	-	-	-	-	-
Supervisory plan	-	-	-	-	-	-	-	-	-
WHO Guidelines	Yes	-	-	-	Yes	-	-	-	-
Protocols, SOPs, Policies, Procedures &Guidelines	Yes	-	Yes	-	Yes	-	-	-	-
Reports	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes
Minutes	Yes	Mortality	Yes	Mortality	Yes	Mortality	Yes	-	Yes
Committee TORs	Yes	-	-	-	-	-	-	-	No committees
Job Descriptions	-	-	Yes	-	-	-	-	-	Yes
Public Private Partnership Involvement (PPP)	Yes	-	-	-	-	-	-	-	-
Performance IDSR Indicators	Yes	-	Not clear	-	Yes but not all indicators	-	-	-	-

Source: Field data

Table 2:-Findings on the Performance indicators (selected) and support to infectious diseases surveillance in Southern Province

Functional Areas	**Availability of Legal and regulatory IDSR requirements**								
	National (MOH) (1)	**CH (1)**	**PHO (1)**	**GH (6)**	**DHO (13)**	**DH (13)**	**RHC (14)**	**Health Post (14)**	**Community (14)**
Capacity to transport specimens to higher levels	Not done	Yes	Yes	Yes	Yes	Yes	11/14	4/14	0/14
Adequacy of supplies for reporting forms during preceding six months	Adequate	adequate	Adequate	adequate	adequate	adequate	2/14	3/14	9/14
Data Analysis	Yes	Yes	Yes	Yes	7/13	2/13	6/14	1/14	6/14
✓ **Availability of trend graphs**									
✓ **Described by place**	Yes	Yes	Yes	Yes	Yes	1/14	4/14	1/14	3/14
✓ **Calculated rates**	Yes	Nil	Yes	0/6	Yes	Yes	0/14	0/14	0/14
Response within 48 hrs of most recently reported epidemic	Yes	Yes	Yes	1/6	10/13	2/13	12/14	1/14	13/14
Reported an out-break during preceding 12 months	Yes to WHO	Yes	Yes	2/6	7/13	13/13	6/14	3/14	10/14
Risk Mapping	Yes	Not available	Not done	0/6	13/13	2/13	4/14	0/14	0/14
Availability of feedback Bulletin	Yes from WHO	Not available	Available from MOH	Not available	9/13	4/13	3/14	2/14	Not available
Received performance review during the preceding 6 months	Yes	Yes	Yes	6/6	13/13	13/13	14/14	14/14	0/14
Received training in IDSR	Yes	Nil	Yes	Nil	2/13	Nil	0/14	0/14	0/14
Availability of electricity	Yes	Yes	Yes	Yes	Yes	Yes	5/14	1/14	0/14
P PEs									
Availability of contact tracing forms/Sheets	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Existence of Response Simulation plan	Nil	Yes	Nil	2/6	Nil	Nil	Nil	Nil	Nil
Availability of	Yes	Yes	Nil	3/6	Nil	Nil	Nil	Nil	Nil

post emergence plan									
Stockpiles of emergency preparedness kits	Yes	Yes	Nil	1/6	5/13	1/13	Nil	Nil	Nil
Plan for resource mobilization	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Existence of stock inventory checklist	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Availability of IDSR Bulletin	Yes	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Stand by Generator	Yes	Yes	Nil	4/6	Nil	2/13	0/14	0/14	0/14

Source: Field data

Table 3:-Laboratory Structures in the visited health care facilities in Southern Province of Zambia

Availability of Copies for reports	**RHC(14)**	**District Hospital(13)**	**General Hospital(6)**	**Total**
	8 (57%)	8 (62%)	5 (83%)	21 (64%)
Lab Samples adequately labeled	10(71%)	7 (54%)	6 (100%)	23 (70%)
Temperature Sheets (Refrigerator, freezer incubator)	13 (93%)	13(100%)	13(217%)	39 (118%)
Availability of manual for test procedure	7 (50%)	5 (38%)	3 (50%)	15 (45%)
Reagents accurately labeled	3 (21%)	0 (0)	3 (50%)	6 (18%)
Reagents Expiry dates (accurate)	7 (50%)	6 (46%)	8 (133%)	21 (64%)
Sharp container with disinfectant	5 (36%)	6 (46%)	3 (50%)	14 (67%)
Sufficient gloves	9 (64%)	8 (62%)	12 (200%)	29 (88%)
Bio-waste disposed systems operating	10 (71%)	8 (62%)	9 (150%)	27 (82%)

Source: Field data

About 70% of medical decisions are based on laboratory tests where quality and accuracy of tests is of vital importance.The quality is very much related to the manner in which the laboratory is organized and managed.The Gold Standard for medical laboratory,in particular,ISO that defines the particular requirements for quality management system required.Table:3.1 shows the compromised health and safety,insufficient equipment and weak evidence of procedures to implement the required health and safety procedures to ensure a safe laboratory environment for the staff,patients and visitors.The proper procurement and management of equipment ensures that the laboratory can fulfill the needs and requirements of users for quality performance.

Table 4:-Findings for Diagnostic Tests Performed at Referral Laboratories in Southern Province

Disease	**Test Provided**	**# of District referral Labs(13)**
Measles	1gm per capture Elisa	0 (0%)
Cholera & other pathogens	Culture	6 (46%)
	Sensitivity	5 (38%)
	Serotyping	3 (100%)
Typhoid	Serological tests (Typhoid	5 (38%)
	Blood culture	7 (54%)
	Antimicrobial sensitivity	3 (23%)
	Including Isolation Confirmation	
	With specific antisera	
Bacterial meningitis	Rapid latex agglutination	2 (67%)
	Gram stain & culture	1 (8%)
	(SC examination-Wet mount	7 (54%)
	Antimicrobial Sensitivity	7 (54%)

Hepatitis A/E	Igm per capture Elisa	1 (8%)
Malaria	RDT	1 1 (84%)
	Microscopy	13 (100%)

Source: Field data

Diagnostic testing has become indespensible every where in the world for diagnosing and monitoring diseases for providing prognosis and for pre-dicting treatment responses. The **"ASSURED"** (Affordable, sensitive,specific,userfriendly,rapid and robust,equipment-free and deliverable to end users).This criteria must be used as a bench mark for identifying the most approapriate diagnostic tests for resource-constrained settings.The six steps that have been identifying in selecting diagnostic tests;the need to define tests, purposes,review of the market and checking on each products specification;review the tests regulatory approval;obtain data on the diagnostic accuracy of tests under ideal conditions i.e in laboratory-based evaluations to obtain data on the diagnostic accuracy of the test in clinical practice;and monitor the tests performance as routine.In view of the above, in the table the Provincial Health Office has to indulge and improve in the diagnostic tests more especially dysentery tests.

Table 5:-Findings on laboratory core surveillance functions (n (%)

Functional Areas	Availability of selected performance laboratory indicators in facilities					
	CH (1)	**GH (6)**	**D H (13)**	**RHC (14)**	**Health p (14)**	**Community (14)**
Availability of Standard case definitions(SCDs)	1(100%)	6/6(100%	5/13 (38%)	7/14(50%)	1/14(7%)	
SCDs stated correctly	1(100%)	6/6(100%)	4/13(31%)	2/14(14%)	Not done	Not done
Complete IPD Registers	8/10 sampled (80%)	3/6(50%)	1/13(8%)	6/14(43%)	14/14 (100%)	Not done
Complete OPD Registers	5/10 sampled (50%)	3/6(50%)	7/13	12/14(86%)	6/14(43%)	Not done
Perform trend analysis(regular data)	4/10 (40%)	2/6(33%)	2/13(15%)	3/14(21%)	3/14(21%)	Not done
Compare present and previous data	0/10 sampled	0/6	0/13	0/14	0/14	0/14
Calculate incidence and prevalence diseases	3/10 sampled (30%)	1/6(17%)	3/13(23%)	5/14(36%)	2/14(14%)	0/14
Have an action threshold for the priority disease for the MOH	3/10sampled (30%)	0/6	0/13	2/14(14%)	0/14	0/14
Stated correct threshold for malaria, cholera, polio, measles, meningitis, Diphtheria	Not available	Not available	Not available	Not available	Not available	Not available
Availability of manual for standard case management	Yes	Yes	Not available	Not available	Not available	Not available
Copies of reports available	Yes	Yes	Yes	Yes	Not available	Not available
Manual for test procedures	Yes	Yes	5/13(38%)	2/14(14%)	Not available	Not available

Source: Field data (health facilities)

Emerging natural and man-made threats to the health of the provincial population require development of a seamless laboratory network to address preventable health risks; this can be achieved only by defining the role of the provincial public health laboratories in districts and private laboratory service delivery. Established and defined core functions and capabilities for the laboratories must provide a basis for assessing and improving quality laboratory activities. The laboratory functions must be defined in support of public health programs and interventions as the beginning of the process of developing performance standards for laboratories, against which the laboratories, and eventually local public health and clinical laboratories, must establish and implement best laboratory practices. In

the 21st century Public health is changing, and as a part of that change, public health laboratories must advocate for and implement improvements for public health testing and surveillance.

Table 6:-Findings on the available resources at district level and health care facility surveillance units

Resources/Services	Central Hospital (1)	General Hospital (6)	District Hospital (13)	RHC (14)	Health posts (14)	Total facilities (48)
Logistics (1)						
Electricity Availability	1 (100%)	6 (100%)	14 (100%)	8 (57%)	2 (14%)	31 (65%)
Inverter	1 (100%)	5 (83%)	15 (87%)	2 (14%)	10 (71%)	33 (69%)
Vehicles	36 (100%)	20 (30%)	18 (72%)	7 (50%)	0 (0%)	81 (59%)
Data management (2)						
Stationary types	14 (7.1%)	20 (30%)	24 (54%)	26 (54%)	26 (54%)	10 (21%)
Calculation	10 (10%)	24 (25%)	36 (36%)	38 (37%)	8 (57%)	24 (50%)
Printers	10 (10%)	16 (38%)	20 (65%)	34 (41%)	6 (47%)	1 (2%)
Communication(3)						
Telephone Service	4 (25%)	16 (38%)	18 (72%)	38 (37%)	0 (0%)	1 (2%)
Fax	1 (100%)	8 (75%)	10 (77%)	0 (0%)	0 (0%)	1 (2%)
Computer with Internet	2 (20%)	12 (50%)	14 (93%)	4 (29%)	0 (0%)	6 (12%)
IEC materials (4)						
Posters	7 (14%)	7 (86%)	22 (59%)	10 71%)	12 (86%)	12 (25%)
Megaphone	10 (10%)	14 (4%)	26 (50%)	14 (100%)	16 (86%)	13 (27%)
VCR & TV/Projector	12 (0.8%)	12 (5%)	32 (41%)	2 (14%)	12 (86%)	8(38%)
Hygiene & Sanitation (4)						
Materials Spray Pump	2 (50%)	30 (20%)	24 (54%)	40 (35%)	60 (23%)	200 (24%)
Disinfectant	12 (8.3%)	14 (63%)	28 (2.4%)	44 (31%)	48 (29%)	60 (17%)
Protection material	18 (6%)	24 (3.7%)	36 (36%)	36 (39%)	36 (39%)	100 (29%)

Source: Field data

The table:6, examined the availability and utilization of facillitating resources for the improvement of IDSR and concluded that most facilities did not have the required resources that are required for quality performance.

Table 7:-District reporting completeness and Timeliness in Southern Province

District	Received facility reports	Number of expected facility reports	Completeness (%)	Timeliness
Livingstone	22	22	100	T
Pemba	16	18	89	T
Kazungula	19	22	86	T
Kalomo	30	31	97	T
Zimba	11	12	92	T
Choma	32	32	100	T
Chikankata	14	18	78	T
Gwembe	13	16	81	T
Namwala	19	20	95	T
Sinazongwe	11	14	79	T
Siavonga	10	10	100	T
Monze	34	41	83	T
Mazabuka	33	43	77	T
Southern	264	299	88	100%

Source: Integrated Disease Surveillance Weekly Reports for Southern Province

Table 8:-Findings from the number of assessments with reported problem/gaps in each aspect of surveillance

IDSR Surveillance Function Assessed	Activity	Reported problems/gaps from the Total Assessments
Core functions	▪ Case detection	56
	▪ Case confirmation	45

	▪ Case registration & Notification	67
	▪ Data Management	54
	▪ Data Analysis	48
	▪ Out-break preparedness	70
	▪ Out-break response	65
	▪ Feedback	72
Support Functions	▪ Laboratory structure	39
	▪ Supervision	75
	▪ Training	54
	▪ Human, logistic and equipment resources	50
	▪ Coordination	14
System attributes	▪ Data accuracy	30
	▪ Acceptability	3
	▪ Representatives	4
	▪ Timeliness	1
	▪ Completeness	3

Source: Field data

Table: 8 Shows gaps identified in the core function areas. As the momentum to scale up the provincial response to communicable diseases increases, surveillance officers must constantly review their performance in detecting and responding to communicable diseases and fill up the identified gaps through full utilization of the core functions for disease surveillance. At the same time, they must account for the planned activities, policies and resources to a variety of stakeholders. The staff working at different levels of surveillance must t report accurate data in a timely manner to the next higher level to ensure timely and effective responses to contain communicable disease outbreaks. The provincial and district staff must report on progress to their district partners and the community, but most importantly, surveillance information must be used locally(PHO,DHO,RHC,HP and COMMUNITY) to address and resolve public health problems related to control of communicable diseases and strengthen evolving disease surveillance related diseases. Monitoring and evaluation core functions are keys to establishing and maintaining effective and efficient surveillance and response systems.

Discussion:-

The discussion summarizes the general overview of the IDSR and policy implementation. The discussion reviewed thematic areas of the conceptual frame work and the variables. In order to keep in view, the importance of disease surveillance and performance in public health disease surveillance program cardinal variables were selected for the current study: Surveillance System Structure **(Sub Variables-9),** Core Functions **(Sub Variables-8),** Support Functions **(Sub Variables-9)** and Surveillance Quality (**Sub Variables-10).**

The integrated disease surveillance approach means that data on all important diseases has to be collected, analyzed, interpreted in the same way by the same people who normally submit routine report forms on health related data. Proper understanding of IDSR, the case definitions and reporting methods have been found to enable one identity, register, analyze and report priority diseases quickly and accurately to the proper authorities. These activities are essential in order to ensure that priority diseases in every community can be prevented and controlled.

The important communicable diseases within a community are integrated and reported to higher levels in the health system, using the usual human and other resources of the health facility. The IDSR system has been found to be cheap and provides training opportunity for health workers and makes data about all priority diseases available at central level. Priority diseases are the major causes of illness and death in the population, they can easily cause epidemics, they can be controlled and prevented and can be identified using standard or community case definitions. The notifiable diseases are immediately reported diseases and have to be reported to higher level within 30 minutes, using verbal method [radio, phone, text, internet] etc followed by written reports using official reporting format. Weekly reports are usually sent every Monday of every week.

Core Functions-
The core functions are at levels, community, health facility, district, province, national level and WHO (Regional Office). The core functions included case detection; case confirmation; case registration; case reporting; data management; data analysis; out-break preparedness; out- break response and feedback.

The discussions in the dissertation are around the legal framework for IDSR. The pros and cons of IDSR are discussed around IDSR core functions and activities by the health system level: identification of cases, reporting the cases, how to analyze and interpret, investigate and confirm, respond to the situation, communicate and give two-way feedback, evaluate the intervention and prepare if emergency occurs(IDSR,2010). The discussion went into details as evidenced in the paper.

Support Functions-
The discussion around this thematic area detailed the requirements for multi-sectoral and strong collaboration among all stakeholders. The core functions include guidelines, laboratory; supervision; training; resources(financial,human.material/equipment) and coordination. The monitoring and evaluation was discussed as a need for continuous monitoring and supervision necessary for rapid corrective action and motivation of health workers. There is a need for capacity building as a backbone of IDSR. There is need for government commitment being essential for sustainable and effective results. The involvement of the community in disease surveillance is critical for early detection of public health events. The need for strategic and efficient preparedness has been found to be crucial to re-doing attributable to morbidity and mortality.

Laboratories have to be strengthened and decentralized through strengthening of human capacity at different levels of the health system. Event- based surveillance needs to be implemented to complement indicator-based surveillance and robust community surveillance. Designation of national focal point and establishment of confirmatory facilities for priority pathogens and level of standards and policy are very crucial for the success of IDSR. The IDSR data need to be shared with stakeholders and partners. Surveillance and response information products need dissemination to the public. There must be a need for Cross-border Malaria Initiative, Intersectoral collaboration and coordination the (IHR,2005).

Quality Attributes-
Incidence and prevalence data obtained from diseases surveillance could be biased by the response rate as well as by the completeness and quality of the reports. The quality attributes included usefulness; simplicity; flexibility; representativeness; timeliness; completeness; consistency; sensitivity; specificity; positive predictive value; data accuracy; acceptability and stability. It appears crucial to analyze the quality and surveillance systems itself and thereby validating the quality of data. The research study aimed to analyze the quality of the data and compliance with surveillance system implemented on routine activities.

Establishment of sustainable and evidence-based surveillance systems are recommended for the prevention of disease out-breaks. The attributes of surveillance systems(qualitative) have been simplicity, flexibility, acceptability and stability while those quantitative in nature have been sensitivity, positive predictive value(PPV) representativeness and timeliness(CDC,2010).

The IDSR system must be simple and ease to operate and the system must be able to adapt to changing information needs and operating conditions with minimal additional cost. The data to be of quality must be complete and valid by being collected through the system. The system has to be accepted by willing operators and institutions to participants in the system, including those who operate the reported cases of the disease or use the data.

The surveillance system has to be sensitive and ability of the system to monitor changes in a number of cases over time such as out-breaks. Cases have to be accurately diagnosed and the system has to accurately describe the occurrence of disease over time and its distribution in population by place and person. The delay between steps in a surveillance system and availability of information for the control of the disease under surveillance have to be considered.

The system has to collect, manage, provide data without failure and be operational when needed. The attributes of IDSR system often compete and inversely related. As one becomes stronger others become weak. Therefore, not all of the attributes can be at the highest level for a particular system. Efforts to improve certain attributes might detract

from others and affect the overall effectiveness of the system. A conscious effort is needed to determine which attributes are most critical for a surveillance system so that the objectives of the system can be achieved.

Conclusion:-

Implementation of IDSR was associated with improved surveillance and response efforts. The challenges identified were largely "systemic" in nature. However, nonexistent budgetary support from the monthly grants allocation erodes gains. Reviewed efforts from government and stakeholders are necessary to sustain and expand progress. Strengthening support surveillance functions alongside the six building blocks of the health care system at implementation levels remains cardinal.

References:-

1. CDC (2000). Assessment of infectious diseases in Uganda
2. CDC, (2005). Integrated Disease Surveillance and Response: Objectives of Integrated Disease and Response(IDSR)
3. CDC, MMWR, 2012). Introduction and Opportunities in Public Health Surveillance. A CDC Perspective. MMR, 2012
4. Center for Disease C, (2007). Integrated Disease Surveillance and Responses
5. Center for Disease Control (2013). Vision: Public Health Surveillance of the 21st century, MMWR, and VOL.61.
6. Centers for Disease Control and Prevention (CDC) Assessment of infectious disease surveillance—Uganda, 2000. MMWR Morbidity and Mortality Weekly Report.
7. Heymann, D.L (2006) . Control, elimination, eradication and the re-emergence of infectious diseases: Getting the message right. Retrieved from Bulletin of the World Health Organization
8. http:// www.CDC.GOV/globalhealth/dpbswd/idsr.pdf)
9. http://www.who.int/wer
10. Integrated Disease Surveillance and Response (2010). Technical Guidelines for IDSR in the African Region.2nd Edition
11. John etal. 2011; Nsubuga. etal. (2010) .Journal of Public Health Management Practice(1996). Laboratory reporting and disease surveillance
12. Kooma E.H(2018). Assessment of the Integrated Disease Surveillance and Response Implementation in Selected Health Facilities of Southern Province of Zambia
13. Nworgu, B.G. (2006). A Compendium of research in educational Measurement and Evaluation. Enugu: Samireen Publishers
14. Nworgu, B.G. (2006). A Compendium of research in educational Measurement and Evaluation. Enugu: Samireen Publishers
15. Patton**, M. (**1990**).** Qualitative evaluation and research methods.
16. Polit(2016). The politics of surveillance and response to disease out-breaks
17. Porta M (2008). Dictionary of epidemiology. 5th Ed. International Epidemiological Association. New York, NY: Oxford University Press
18. Public Health Surveillance, (2012). **Public Health Surveillance**: Towards a **Public Health Surveillance Strategy for England** . **Public Health Surveillance**:
19. Public health surveillance(2012) Retrieved May16,2012 from world Health Organization
20. Rathgeber E.M (2000). Global infectious disease and detection
21. Revati K etal, (2013). Challenges with the Implementation of an Integrated Disease Surveillance and Response (IDSR) system: Systematic reviews of lessons learnt. Health policy and planning advanced access
22. Revati K Phalkey, Shelby Yamamoto, Pradip Awate and Michael Marx (2013). Challenges with the implementation of an Integrated Disease Surveillance and Response (IDSR) system: systematic review of the lessons learned
23. Thacker etal (1978). Public Health Surveillance in the United States: Evolution and Challenges
24. Thacker S.B & Berkelman, R.L(1988).Public health surveillance in the United States of America
25. Thacker S.B, Benkelman R.L, (1992). Training and service in public health practice. Epidemic Intelligence Service
26. Thacker SB, Berkelman R.L (1988). Public health surveillance in the United States.
27. Thacker, S.B, (1992). Methods: Study design epidemiology

28. WHO (2006). Communicable disease surveillance and response systems: guide to monitoring and evaluating. World Health Organization, Geneva
29. WHO (2006). Communicable disease surveillance and response systems: guide to monitoring and evaluating. World Health Organization, Geneva
30. WHO (2008). Disease Control Priorities Project (DCP2 (http://www.dcp2.org/file/153/dcpp-surveillance.pdf).
31. WHO (2008). Disease Control Priorities Project (DCP2 (http://www.dcp2.org/file/153/dcpp-surveillance.pdf).
32. World Health Organization and Center for Disease Control and Prevention (2010). Technical Guidelines for Integrated Disease Surveillance and Response in the African Region, Brazzaville, Republic of Congo
33. World Health Organization (2005) International Health Regulations (2005)
34. World Health Organization (2008).& International Health Regulations (2005)
35. Zambia National Health Strategic Plan (2011-2015)