

Research Article

Assessment of Factors Affecting the Implementation of the Integrated Disease Surveillance and Response in Public Health Care Facilities - The Case of Rufunsa District, Zambia

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ABSTRACT

Late reporting of disease outbreaks and other health related events of public health significance have been linked to poor implementation of the Integrated Disease Surveillance and Response (IDSR). As such strengthening the capacity of health workers involved in IDSR implementation is required. The main objective of this study was to assess the factors affecting the implementation of the IDSR in public health care facilities in Rufunsa District, Zambia.

A cross-sectional facility based descriptive study design as well as observation was done in which 34 study subjects were conveniently sampled from the 9 health facilities in the district. Data collection was done using a pretested semi structured questionnaire and an institutional- tailored observational checklist. Analyses were done using SPSS version 18.

The study revealed that factors that affected the implementation of the IDSR were low knowledge levels among Health Workers about IDSR as only 36.3% of them received training in IDSR in the last 12 months at the time of this study. Other factors that created gaps in the implementation of IDSR were negative attitudes of the health workers as 9.0% of them were of the opinion that the IDSR system wasted much of their time, as its implementation interfered with their clinical work and about 51.5% were demoralised as they felt that support from the managers at the District, Province and Ministry of

Health Headquarters was inadequate. Poor practices of health workers towards IDSR was also identified as a factor affecting IDSR Implementation. For instance, it was revealed that about 27.3% of the health workers either infrequently or never reported a disease which required mandatory reporting in the last 12 months as they stated that the process of reporting was cumbersome as the forms were too many and complicated. They further echoed that IDSR implementation lacked prompt feedback from the Managers at the District. Resource- wise, all facilities in the district lacked adequate resources for IDSR implementation. For example between 11.1 to 44.4% of the health facilities lacked one or more types of reporting forms. Other resources lacking were electricity, and good network connectivity since about 51.5% relied on mobile phones for sending reports which required prompt feedback.

Therefore, to ensure effective IDSR implementation, adequate funding directed to the strengthening of IDSR activities should be deliberately put in the budget's yellow book. Regular IDSR trainings are to be offered to health workers which should be followed by mentorship and supervision by the District and Provincial Health Offices as well as the Ministry of Health.

Keywords: Integrated disease surveillance and response; Implementation; Disease reporting

Key points of what the paper will add to the topic:

1. Integrated Disease Surveillance and Response (IDSR) as a strategy by the World Health African Regional Office (WHO-ARO), helps in keeping the countries alert about notifiable diseases occurrences.
2. It promotes generation of quality data about disease trends in a given area at a Health Facility level moving up, to the policy makers
3. IDSR is a part of Health Information Management System which is one of the building blocks of a health system. Hence IDSR, contributes to improving health service delivery
4. Will eventually lead to the improvement in the alertness of the country against notifiable diseases that occur in a sudden manner and spread at a faster rate and overall, improves the delivery of all health services by providing information useful for health services planning and implementation.

Key points of what the paper will add to the topic:

1. Will reveal the quality of IDSR implementation in Rufunsa District, Zambia
2. Will identify the factors that are affecting the proper implementation of IDSR
3. Will suggest possible solutions for the purpose of improving the implementation of IDSR

Will give eventually lead to the improvement of alertness of the country against notifiable diseases that occur in a sudden manner and spread at a faster rate and overallly, improves the delivery of all health services by providing information useful for health services planning and implementation.

Introduction

A functioning Integrated Disease Surveillance and Reporting (IDSR) System, involves the continuous scrutiny of disease on an individual, local, national and international level [1]. It depends on, but not limited to health care workers in the public and private sector who are charged with responsibilities of identifying, collating, analyzing and promptly disseminating data on the occurrence of diseases and other health related events of public health significance for public health action [2].

Effective IDSR systems have been a serious challenge to many developing countries. For instance, in 1977 and 1978, Zambia experienced the first cholera outbreak in which ineffective surveillance and prompt notification were noted as some of the contributing factors that made the outbreak difficult to contain [3]. Since then, many efforts have made in trying to strengthen the surveillance, notification and reporting capabilities of many health facilities of which IDSR is one of such efforts [4].

Despite being one of the best strategies, IDSR's implementation has continued to face challenges especially at the Health Centre level where inadequate health information is generated and recorded [5]. Inadequate and low quality information generated by the Health Facilities places the district at a high risk of providing inappropriate financial and technical support because decisions by managers are made based on the quality of information provided to them by health facilities [6].

In an attempt to improve the IDSR implementation in Rufunsa District, a research was done to identify the gaps in the system that act as barriers in the generation of quality data by health personnel in the health facilities. The areas that were concentrated on were the knowledge levels of the health personnel about IDSR, their attitudes and practices towards IDSR implementation, and the availability of resources dedicated to strengthening the IDSR System. The whole purpose of this study was to contribute to the solving of the problem of having inadequate and low quality data being generated and reported by the health personnel from the health facilities.

Methodology

Study area and population

The study was conducted in Rufunsa District in Lusaka Province of Zambia. The study population was composed of Health Care Workers serving in the Health facilities in the district. These included health care workers involved in either disease diagnosis, surveillance or notification such as Nurses,

Environmental Health Workers, Laboratory Technologists, Clinical Officers and Medical Officers as they are the people who directly interact with patients in health facilities.

Study setting

The study was conducted in all the 9 Public Health Care Facilities located in Rufunsa District. These facilities included 1 hospital, 6 Rural Health Centers and 2 Health Posts.

Study design and sampling techniques

A cross-sectional facility based descriptive study was conducted. Observation was also done.

Sample size

The sample size was calculated using EPI-Info 7 from a population of 370 Health Care workers in the 9 Public Health Facilities in the District.

Using 90% confidence level, 34 participants were conveniently sampled from all the 9 health facilities (Table 1).

Data collection techniques

Data was collected from thirty-four respondents using a pretested semi structured interviewer-administered questionnaires. Additionally, a checklist was also used to check for completeness and availability of the ND1, ND2 and the ND3 forms. Additionally, the availability of resources devoted towards the IDSR System was also assessed. Two health care workers who were not included in the study were recruited to collect data. Upon collection, data was manually cleaned up and validated. Thereafter, analysis was done using SPSS version 18. Frequency and contingency tables were generated to show the distributions of data.

Ethical considerations

Ethical clearance was sought from the Research and Ethical Committee of The University of Lusaka and clearance to start

Table 1: Sample size calculation from Epi-Info output.

Confidence level	Sample size
80%	25
90%	34
95%	71
99%	107
99.9%	148
99.99%	178

data collection in Rufunsa District was obtained from the Rufunsa District Health Office. Consent was verbally obtained from the study participants.

Results

Thirty-four questionnaires were administered and thirty- three were completed and returned with a response rate of 97.1%.

Sociodemographic characteristics of respondents

The majority of the respondents (78.1%) were between the ages of 20 and 39 years with a majority (48%) in the 20 to 29 years age bracket and the least (12%) were above 50 years old. Most (51.5%) of the respondents were females with the majority being Nurses (21%) and Clinical Officers (21%), the least were Biomedical Scientific and Dental Technologists (Table 2).

Knowledge of the IDSR among respondents

The respondents overwhelmingly (81.8%) admitted to have knowledge about Integrated Disease Surveillance and Response with the majority (45.5%) of those who expressed to know stating that IDSR is the reporting of diseases and other health events and 33.3% stating that it is act of primarily reporting infectious diseases.

Among those who expresses to know what IDSR was, about a quarter (18.2%) of them did not really know the meaning of IDSR and its importance. Among these 18.2%, the majority of them are Dental Therapists, Pharmacy Technologists and Physiotherapists (Figures 1 and 2).

Respondents opinions and awareness about the IDSR system

The majority (81.8%) of the respondents acknowledged that

IDSR is important in Health Services provision. The majority (79%) gave more than 1 correct response about the importance of IDSR. Among the correct responses given was that it helps in decision making based on the generated information from the local IDSR such as stepping up activities as the surveillance information reveals the patterns and geographical hot spots of epidemic prone and viable disease outbreaks.

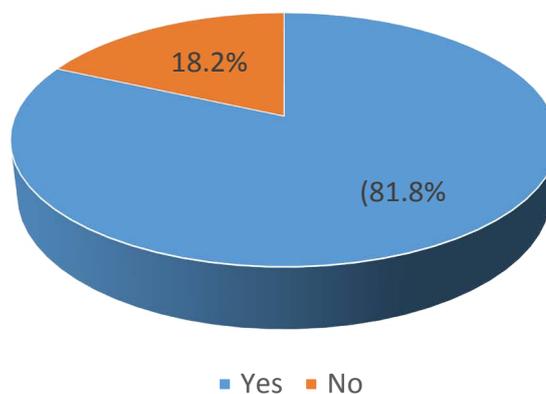


Figure 1: Knowledge of the IDSR among respondents.

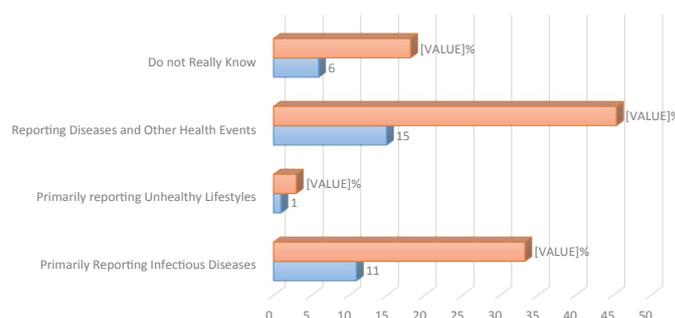


Figure 2: Responses about the meaning of IDSR.

Table 2: Sociodemographic characteristics of respondents.

Variable	Category	Frequency (n=33)	Percentage
Age (Years)	20-29	16	48.0
	30-39	10	30.3
	40-49	3	9.1
	>50	4	12.0
Gender	Male	16	48.5
	Female	17	51.5
Profession of Health	Biomedical Scientist	1	3.0
	Community Health Assistants	2	6.0
	Clinical Officers	7	21.0
	Dental Therapist	1	3.0
	Environmental Health Technologist	5	15.0
	Health Information Officer	2	6.0
	Laboratory Technologist	2	6.0
	Nurse	7	21.0
	Pharmacy Technologist	2	6.0
	Physiotherapist	2	6.0
	Records Clerk	2	6.0

Slightly above half (51.5%) of the respondents knew all the types of IDSR forms and among these, between 89 and 97% gave correct responses about the uses of these forms such as, ND1 is used individual case reporting, ND2 for laboratory results reporting and ND3 for weekly reporting to the District Health Office (Table 3).

Attitude of disease reporting among respondents

All the respondents felt that IDSR was necessary. Despite the stated feeling, about 9% of them were of the opinion that it wasted time and interfered with clinical work, and that it was a cumbersome activity. However, the majority (45.5%) of the respondents were of the opinion that IDSR was helpful in facility planning and in disease surveillance. Furthermore, about one-third (33.3%) of the respondents felt that IDSR does not limit the transmission of diseases in the instances where prompt feedback from the higher authority offices in the Ministry of Health lack.

Additionally, more than half (51.5%) of the respondents were of the opinion that IDSR lacked local support such as periodical training followed by mentorship, regular and scheduled supervisory assistance as well as some form of financial aid from the superiors at a Health Facility level, District Health Office, Provincial Health Office or even the Ministry of Health Headquarters. Furthermore, 63.5% of the respondents were of the opinion that prompt feedback when diseases are reported to the higher levels was lacking.

Similarly, about 52% of the respondents felt that there was a lack of adequate coordination and communication between the Health Facilities and the District Health Office, Provincial Health Office as well as the Ministry of Health Headquarters. About 42.4% of the respondents were of the opinion that the Provincial Health Office needed improvement and so was the opinion of about 27.3% of the respondents concerning the attitude of the District Health Officers.

Furthermore, the majority (45.5%) of the respondents felt that IDSR implementation could be improved by strengthening all aspects devoted to IDSR such as improved funding, periodical training and re-training of health workers in IDSR, mentorship and regular provision of prompt feedback to reporters among others (Table 4).

Disease reporting practices among the respondents

All the respondents attested that disease reporting is done at their facilities in the district and the majority (72.7%) had reported the disease before in the last 12 months. Among these, a majority (78.8%) always reported diseases despite having about 27.3% who had never reported a disease during the same period. These (27.3%) included professionals who were Dental Therapists, Physiotherapists and Pharmacy Technologists. More than half (51.5%) of the respondents used the Telephone/SMS as a primary method of reporting and no health facility used a Post Box for such an activity.

A majority (63.6%) of the respondents had neither received training nor retrained in IDSR guidelines in the last 12 months, but of those (21.2%) that received training, a majority (21.2%) indicated that the Provincial Health Office provided such training to them (Table 5).

Resources availability for IDSR at health facility

Nine public health facilities exist in the district. In terms of logistic support/services, only one facility was powered with electricity and 5 had internet/network facilities which were accessible while seven had either a mobile or telephone. On the other hand, all the facilities had a functional Post Box.

Upon inspection, it was observed that only less than half (44.4%) of the facilities had ND1 forms and only one Health Facility had ND2 forms. The majority (88.9%) had ND3 forms.

In terms of transportation, all the facilities had at least one mode of

Table 3: Respondents opinions and awareness about the IDSR system.

Variable	Category	Frequency	Percentage
Do you think IDSR is Important (n=33)	Yes	27	81.8
	No	6	18.2
Number of Correct Responses of the Importance of IDSR in Health Service Delivery (n=29)	=1 Correct Response	3	9.0
	>1 Correct Response	26	79.0
Aware of the disease reporting forms (n=30)	Yes	17	51.5
	No	13	39.4
Type of IDSR form you know (n=33)	ND1	29	87.9
	ND2	32	97.0
	ND3	32	97.0
	Individual Case Reporting	25	89.3
Use of ND1 (n=28)	Laboratory Results Reporting	27	96.4
	Weekly Reporting to DHO	28	100
	Individual Case Reporting	30	96.8
Use of ND2 (n=31)	Laboratory Results Reporting	27	87.1
	Weekly Reporting to DHO	29	93.5
	Individual Case Reporting	32	97.0
Use of ND3 (n=33)	Laboratory Results Reporting	30	90.9
	Weekly Reporting to DHO	28	84.8

Table 4: Attitudes of disease reporting among health care workers.

Variable	Category	Frequency	Percentage
Do you feel that the IDSR System is necessary	Yes	33	100
	No	0	0.0
Respondent's views about the IDSR	Does not limit disease transmission	11	33.3
	Helpful in Facility Planning, Helpful in Disease Surveillance	15	45.5
	It is cumbersome	3	9.1
	Violates Patients Privacy	1	3.0
	Wastes time and interfere With Clinical Work	3	9.1
Do you feel that you receive adequate IDSR Local Support	Yes	17	51.5
	No	11	33.3
	No opinion	5	15.2
Most Coordinated in the Provision of IDSR Support to Health Facilities (n=30)	Ministry of Health HQ	1	3.0
	Provincial Health Office	14	42.4
	District Health Office	9	27.3
	Health Facility Level	6	18.2
Aspects of IDSR to be Improved	All aspects	15	45.5
	Availability of Forms	1	3.0
	Redefined Indicators	5	15.2
	Prompt feedback	12	36.4

Table 5: Disease reporting practices among the respondents.

Variable	Category	Frequency	Percentage
Disease reporting done at Facility (n=33)	Yes	33	100
	No	0	0.0
Ever reported a disease before (n=33)	Yes	24	72.7
	No	9	27.3
Frequency of Disease Reporting (n=33)	Sometimes	7	21.2
	Always	26	78.8
Primary method of reporting(n=33)	Post Box	0	0.0
	Telephoning/SMS	17	51.5
	Internet based	9	27.3
	Cycling/Driving	5	15.2
	Messengering/walking	2	6.1
Trained/ retrained in the last 1 year	Yes	12	36.3
	No	21	63.6
Provider(s) of the IDSR Training (n=12)	Health Facility	1	3.0
	District Health Office	1	3.0
	Provincial Health Office	7	21.2
	Ministry of Health (Headquarters)	2	6.1

transport though in the area of equipment less than one-third (33.3%) of the facilities had a computer, printer or generator. The majority of the health facilities had a health map and a calculator (Table 6).

Discussion

The study assessed the factors affecting the IDSR implementation in Rufunsa District of Zambia. The focus was specifically in the areas of knowledge, attitudes and practices of the Health Care Workers towards the implementation of the IDSR in all Public Health facilities in the District.

Sociodemographic characteristics of respondents

Unlike the results of the study done in a South Eastern State

in Nigeria which showed that most of the Health care workers involved in IDSR were predominantly in the age bracket of 40 to 49 years [7]. This study showed that most of the Health Workers involved in the IDSR in Rufunsa were between 20 to 29 years old. This result may provide both an advantage and disadvantage to the IDSR System. The advantage is that the workers are more youthful and may easily adapt to new technological developments as compared to those above 49 years and the disadvantage is that they lack experience in practice as most of them are recent graduates, hence having high chances of making mistakes as they need to learn more [8].

The majority of the Health Care Workers were females, nurses and Clinical Officers. This distribution of predominantly

Table 6: Resources availability for IDSR at health facility.

Variable	Category	Health Facilities (n=9)	
		Frequency	Percentage
Logistic Support/services	Electricity	1	11.0
	Telephone/Mobile Phone	7	77.8
	Internet facilities/services	5	55.6
Disease reporting forms	Post box	9	100.0
	ND1	4	44.4
	ND2	1	11.1
	ND3	8	88.9
Transport	Motorcycle	9	100.0
	Bicycle	6	66.7
	Car/Van	1	11.0
Equipment	Computer	6	66.7
	Printer	3	33.3
	Calculator	8	88.9
	Generator	1	11.0
	Health map	6	66.7

females with majority of participants being nurses and Clinical Officers shows a disparity with the study that was done in Ethiopia which showed that the majority of people involved in IDSR were Environmental Health Officers and Community Health Extension Officers [9].

These above two findings showed that Rufunsa District of Zambia was more Clinical oriented when addressing diseases unlike their counterparts in Ethiopia who were more preventive oriented. This is because Clinical Officers and nurses are based mainly at Health facilities providing curative and rehabilitative medical services. On the other hand, Environmental Health Technologists and Community Health Extension Officers are community- oriented professionals specially trained to work in the communities. The practice of using Nurses and Clinical Officers tends to overburden them as in their inadequate numbers may not be able to handle that much multi- tasking, hence, they tend to concentrate more on clinical work than the IDSR. This assertion is in agreement with what Tsitsi and colleagues in their study discovered. They discovered that health workers tend to concentrate less on IDSR if they have other priority activities in their job delivery [10].

Knowledge and attitudes of the IDSR among respondents

Despite the majority of the health care workers saying that they knew what IDSR was, and its importance in health service delivery, it was observed that about 9% of them gave only one correct response about the importance of IDSR, and more so, about 18.2% of the respondents felt that disease reporting was not necessary. These findings suggested that health care workers in Rufunsa, Zambia were more knowledgeable about IDSR as compared to those in Beitbridge district, Zimbabwe where 38% said that disease reporting using IDSR was not necessary [11]. This fact about Rufunsa District still brought doubts about the quality of training in IDSR, as it is expected that due to their training as health care workers, they should all know exactly what IDSR is and its importance; and therefore, appreciate its necessity in disease prevention and control.

As a result, it is not unexpected that the present study observed that about 39.4% of them did not know or correctly identify the uses of one type of form or the other. This observation was further highlighted on inspection of the health institutions, where it was reported that only less than half to about one third of them (11.1 to 44.4%) had any of the disease reporting forms. This was opposite to what was observed in a study in Tanzania also reported that 73% of the health facilities had disease reporting forms [12].

Disease reporting practices among the respondents

This study revealed that there were serious existing inadequacies of the health care workers in disease reporting because about 27.3% of the respondents had never reported diseases. These (27.3%) were Dental Therapists, Physiotherapists and Pharmacy Technologists. The reason for this practice could be that they were not trained; hence they did not appreciate the importance of reporting in IDSR and moreover might have lacked knowledge about the reporting tools thereof. Among those who have ever reported a disease, 21.2% were not consistent in reporting citing the process of reporting as being cumbersome as they felt that the forms were too many and complicated. Additionally, they further echoed that IDSR implementation lacked prompt feedback from the Managers at the District and the Provincial Health Offices.

However, it is in line with this fact that one can resort to believing that the population in Rufunsa District is at a high risk of contracting highly infectious diseases which can be controlled and prevented by interventions that may come as a result of prompt reporting and feedback through IDSR implementation.

Considering these findings, a study done in the Kingdom of Bahrain about determining reasons for under-reporting of notifiable communicable diseases, revealed that consistent reporting about diseases can contribute about 75% reduction of notifiable diseases and that orientation of newly recruited health care officers increases the level of consistence in disease reporting [1].

Additionally, from the above mentioned study and this present study, show a need for additional and periodic training of health care workers in IDSR. For instance, in this study it was revealed that only 63.6% of the respondents had received training in IDSR. Similarly, consistent lower levels of training were also observed in a similar study done by Nnebue and his colleagues who reported that only 32% of the health care workers had been trained in Anambra state, Nigeria [13]. Similarly, a study done by Awunor, Omuemu and Adam, in Enugu State, Nigeria reported a worse situation, where only 8% of the health care providers employed by the Local Government were trained in IDSR [14].

However, though a previous report for Adis Ababa County in Ethiopia by the Ministry of Health about IDSR implementation revealed that training effectively closes the knowledge gap and therefore improves attitude and practice of health care workers in disease reporting (Ministry of Health Ethiopia, 2016) and further showed that training improved disease reporting either by improving knowledge, improving health workers appreciation of the value of reliable data, improving awareness and use of IDSR indicators or the completeness and timeliness of reporting [15]. Therefore, in the case of Rufunsa District, training and retraining of health workers in IDSR, and disease reporting were the factors that needed to be prioritised at all management levels unlike leaving it to the Provincial Health Office that mostly provided training to about 21.2% of the respondents in the present study.

Observational check list of health facilities in Rufunsa district

All Health facilities surveyed had functional Post Boxes available for sending ND1, ND2 or ND3 forms. Despite having functional Post Boxes, the use of such in reporting proved to be ineffective as most of the health facilities were located far from the post office. The furthest Health facility was 32 km from the main tarred road (The Great East Road). This was better than other studies in Mozambique and Malawi were 67% and 74% of Health Facilities in 21% of rural districts respectively did not have functional Post Boxes [16].

The study further reviewed that Health Care Workers in Rufunsa had a better option of reporting notifiable diseases by using motorcycles and Mobile Phones as opposed to post boxes since all the facilities had motorcycles. However, the use of mobile phones proved not to be much reliable because only one health facility had electricity provided by means of a diesel- powered generator, hence posing challenges of running equipment such as computers, printers and charging mobile phones. The findings showed a worse effectiveness IDSR performance over the 2012 IDSR assessment in Nigeria, where 29% of Health facilities had computers and were powered by electricity through the use of generators and solar energy [17].

Reporting to the District Health Office by the use of mobile phones proved to be relatively fast and cheap but was being inconvenienced due lack of connectivity network and if present, was of lower quality.

Conclusion

The implementation of the IDSR in Rufunsa was not effective because it was faced by many challenges. For instance, the IDSR implementers lacked regular trainings coupled with mentorship and supervision by the officers from the District and Provincial Health Offices as well as the Ministry of Health Headquarters. Lack of such trainings, mentorship and supervision, demoralised the health workers who in the long run viewed the whole IDSR as a cumbersome process that interfered with their other routine duties.

Additionally, complicated procedures of the IDSR process discourage some of the health workers to be consistent in reporting diseases. Furthermore, lack of internet and network connectivity as well as electricity impacted heavily on network (connectivity) - dependent equipment as they become unreliable and dysfunctional thereby hindering the proper IDSR implementation process.

Therefore, to ensure effective IDSR implementation, strategies that secure adequate funding, specifically directed towards the strengthening of IDSR activities should be deliberately put in the budget's yellow book, and regular IDSR trainings are to be offered to health workers. This should be followed by mentorship and regular supervisory support by the District and Provincial Health Offices.

Recommendation

With the purpose of improving the implementation of IDSR in public health care facilities in Rufunsa District:

- i. The Ministry of Health need to ensure that resources are secured and made available towards the provision of regular IDSR trainings targeting health care workers engaged in IDSR implementation.
- ii. Higher levels of authority in the Ministry of health should ensure that mentorship, regular and scheduled supervisory support is offered to the implementers of IDSR in the District.
- iii. At all levels of management in the health sector budgeting system, a financial allocation should be made to specifically support IDSR activities, and resource procurement for IDSR implementation.

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