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Challenges of integrated disease surveillance response reporting among healthcare personnel in Mangu, Plateau State, Nigeria

Luret Albert Lar[1*], Tolulope Olumide Afolaranmi[1], Yetunde Olubusayo Tagurum[1], Benjamin Uzochukwu[2] and Ayuba Ibrahim Zoakah[1]

[1]Department of Community Medicine, Faculty of Medical Sciences, University of Jos, P.M.B .2084, Jos, Plateau State, Nigeria.
[2]Department of Community Medicine, College of Medicine, University of Nigeria, Enugu Campus, Enugu State, Nigeria.

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Integrated disease surveillance and response comprises data collection, analysis, interpretation and feedback on communicable and non-communicable diseases like cholera and hypertension. It assists health workers detect and respond to these diseases. The regional office for Africa of the World Health Organization implemented it in 1998. Nigeria has embraced this strategy, but there are challenges regarding implementation. This interventional study determined challenges faced by healthcare workers on reporting these priority diseases. One hundred and eight respondents were recruited using multi-stage sampling. Pre-tested, interviewer-administered questionnaires and baseline data were collected on respondents' knowledge, practices and factors affecting the reporting. Training was given and post-intervention data collected. Data was analysed using Epi info and a p-value of ≤ 0.05 was statistically significant. Mean knowledge scores improved from 2.92 ± 1.72 to 4.61 ± 1.03, post-intervention; those of practice increased from 1.90 ± 2.8 to 2.86 ± 3.4. The availability of the forms for reporting was the most challenging factor among 30 (27.8%) respondents, pre-intervention. There were statistically significant associations with the availability of reporting forms (p < 0.0001), the receipt of commendation (p < 0.0001) and feedback (p = 0.0007), post-intervention. Though this strategy is not challenge free, training healthcare personnel can minimize challenges.

Key words: Setbacks, disease reporting, West Africa.

INTRODUCTION

Integrated Disease Surveillance and Response (IDSR), or public health surveillance can simply be defined as information that is gathered for action to be taken on it. (Mghamba et al., 2004). It involves an ongoing and systematic collection, collation, analysis, interpretation and dissemination of the collected data. IDSR comprises of databases, personnel and materials that are organized to collect data which are utilized for informed decision

*Corresponding author. E-mail: luret_shown@yahoo.com.

making. (Nnebue et al., 2013). The collected data is used in disease detection, tracking, outbreak control and in allocating resources, appropriately. In resource-poor settings, it is a very pragmatic strategy. (Phalkey et al., 2013).

IDSR has evolved over the past decade and more since its adoption (Cash and Narasimhan, 2000). During the last 10 years, a lot of health, social, economic, technical and environmental changes have occurred in Africa. There has been mixed progress towards coordinated, integrated surveillance systems, but almost every country in the region has strengthened their capacity to respond to public health threats in time to avoid unnecessary illnesses, disabilities and deaths (Cash and Narasimhan, 2000). These have been achieved through investments in human and material resources. The guidelines have been revised from the previous edition in order to incorporate Non-Communicable Disease (NCD), threats hypertension, coronary heart disease and Diabetes Mellitus (DM), due to their increasing incidence (Centre for Disease Control (CDC), 2013). The adoption of the International Health Regulations (IHR, 2005), which is a legal document binding all World Health Organization (WHO) member states, preventing the spread of international diseases, without trade and traffic interference addresses the threat to international public health security caused by emerging and re-emerging diseases (Nigerian Academy of Science (NAS), 2010; WHO and CDC, 2010). It calls for strengthening surveillance and response through national health systems (NAS, 2010; WHO and CDC, 2010.)

Countries grappling with the challenges of Communicable Disease (CD) surveillance face multiple challenges with this strategy (Phalkey et al., 2013). Decision-makers do not have information to identify problems and needs, formulate evidence-based policies and programmes, and allocate scarce resources optimally. This is evidenced by a study conducted in Sabon Gari, Kaduna, North Western Nigeria, where focal persons were verbally mentioned by the health personnel in the facility, without visible records of their contact addresses (Abubakar et al., 2010).

Data are often not available in most developing countries, like Nigeria that have the greatest need, owing to under investment in the systems for their collection, analysis, dissemination and use. (Wagner et al., 2001). If and when data are available, they are often out of date, rendering trend assessment particularly difficult. This is in keeping with the study conducted in Sabon Gari, Kaduna State where there was missing, incomplete and untimely reporting of IDSR data. Furthermore, the need to collect data to be able to act still falls below expectations (Abubakar et al., 2010). The information data bases exist, but have revealed their limitations in helping to determine priorities, to carry out the mobilization of resources and early detection to enable the prevention and control of epidemics (Federal Ministry of Health (FMoH) Nigeria, 2006).

An assessment of IDSR implementation in Nigeria carried out in 2009 revealed that 68% of the health facilities surveyed had no case definitions for any of the 5 selected notifiable diseases, and health workers had not been trained on the clinical presentations of these diseases (Omozua et al., 2008). In the case of in-patients, discharge summaries are often not provided in patient case notes, therefore health information officers who compile routine notification reports have no means of determining the diagnostic category to which each patient belongs (Omozua et al., 2008). The district level is the focus for integrating surveillance functions because it is the first level in the health system with full-time staff dedicated to all aspects of public health such as monitoring health events in the community, mobilizing community action, encouraging national assistance and accessing regional resources to protect the district's health. The FMoH in Nigeria recognizes the need for the implementation of an IDSR system where personnel, materials and other resources could be used more effectively and efficiently. This will contribute to reduction of mortality, morbidity and disability from diseases through accurate, complete and timely information with regards to data gathering and transmission for effective prevention and control of CDs (WHO, 2004).

There are still gaps on indepth knowledge of the strategy among healthcare personnel, unavailability of the forms in most facilities, incomplete and timely reporting of the collected information by trained personnel and constant feedback from the focal persons to the various health facilities. Therefore, this study sought to identify the root causes of challenges with IDSR implementation. These gaps were highlighted by this study, emphasizing the need for retraining of relevant health personnel to address these observed gaps.

MATERIALS AND METHODS

Plateau State, located in North Central Nigeria has Jos as its capital city. Mangu, one of its seventeen Local Government Areas (LGAs) was the study area. Mangu LGA has a population of 295, 000 with a slightly higher female population of 149, 000 compared with 146, 000 males (Encyclopedia Britannica, 2013). It is bound to the North by Jos East LGA, Bauchi State to the South, by Qua'an Pan LGA, Shendam and Pankshin LGAs to the East and to the West by Barkin Ladi and Bokkos LGAs respectively (Encyclopedia Britannica, 2013). There are 94 health facilities out of which 6 are secondary health facilities and the rest (88) are Primary Health Care (PHC) facilities (Encyclopedia Britannica, 2013).

The current structure of IDSR is based on the 3 levels of government; Federal, State and Local levels (FMoH. 2005). Focal persons are designated at each level to collect data on IDSR from designated focal sites or facilities (both publically and privately owned) at the LGA level. They collate the results and forward them to the State Ministry of Health. They are responsible for providing feedback to the health facilities (Abubakar et al., 2013). The State Disease Surveillance and Notification Officer (DSNO), who is resident at the State Epidemiological units then compiles the information and forwards it to theEpidemiology unit of the FMoH,

Table 1. Socio-demographic characteristics of nursing mothers and their children.

Characteristics	Frequency n=108	Percentage (%)
Age group (years)		
28-37	46	42.6
38-47	43	40.0
48-57	19	18.0
Sex		
Female	55	50.9
Male	53	49.1
Highest educational level		
Tertiary	58	53.7
Secondary	50	46.3
Occupation		
*CHEW	45	41.7
Nurse	16	14.8
Lab scientist	11	10.2
**CHO	10	9.3
Lab technician	8	7.4
***EHO	8	7.4
Midwife	7	6.5
Doctor	3	2.8
Working experience		
(Years)	51	47.2
>10	42	38.9
5-10 <5	15	13.9

*Community Health Extension Worker, ** Community Health Officer, ***Environmental Health Officer.

following appropriate analysis and feedback to the health facilities, and planning appropriate strategies for disease control (Abubakar et al., 2013). The information may be forwarded to development partners.

This was a quasi-experimental study involving 108 health personnel of PHCs in Mangu LGA. They were selected using computer generated random numbers by Winpepi software, version 11.25. The ratio of the staff strengths of the public to private PHC centers in Mangu LGA was 4:1. Eighty four respondents were selected from the public health facility in Mangu LGA and 24 in the private facilities, based on this ratio. Ethical clearance was obtained from the Jos University Teaching Hospital (JUTH) Ethical Clearance Committee. Verbal and written permission was obtained from Chairmen and PHC Directors of both LGAs and verbal and informed consent was also gotten from all respondents, and they were given the opportunity to opt out of the study without any penalties.

Using pre-tested, structured, interviewer-administered questionnaires consisting of 4 sections; section A gathered information on respondents' demographic data, (such as age, sex and years of working experience, among a few), section B on knowledge, (such as the definition of IDSR, diseases reported and who dose the reporting), section C on practices of IDSR reporting (such as whether they are involved in reporting and questions regarding their level of involvement) and section D on factors responsible for IDSR reporting, (such as training issues) baseline data was collected from the respondents. A checklist was also filled alongside the questionnaire. Using the checklist, it was observed whether or not forms were available, whether or not trained healthcare personnel were filling the forms and if they were correctly filled. Two Resident doctors of the Department of Community Medicine, Jos University Teaching Hospital and 5 staff of the LGA health department served as research assistants. They were given a one day training by the Principal Investigator (PI) in the LGA secretariats on the nature of the study and how to administer the questionnaires. A week after this, a two day training was given by the PI, assisted by the State Epidemiologist on theoretical and practical aspects of IDSR reporting. There was a monthly reinforcement of the lessons learnt by the research team who independently visited the PHC centres thrice during the study period. This served as supportive supervision. After three months, another assessment was carried out with the use of the same instrument. This time interval was given to allow time for the knowledge gained to be translated into practice.

Data generated at pre and post intervention were collated and analysed with EPI info version 3.5.3 statistical software. Quantitative data like knowledge and practice scores were presented as means and standard deviations. There were 6 questions regarding knowledge and 9 on practices of IDSR reporting and one mark was awarded for a correct answer, while zero was awarded for a wrong answer. The mean scores for both of these variables was analysed based on these totals.

The student t-test was used to assess differences in mean knowledge and practice scores at pre and post intervention. The Chi-square test was used to determine any association between knowledge, practices and factors affecting IDSR reporting in the study group. A confidence interval of 95% was used in this study and a p- value of ≤ 0.05 was considered statistically significant.

RESULTS

The mean age of respondents was 39.99 ± 6.78 years. Majority of the respondents; 55 (50.9%) were females and 58 (53.7%) of them had tertiary level of education. Forty five (41.7%) of them were Community Health Officers and minority; 3 (2.8%) of them were Doctors. Most of the respondents; 51 (47.2.5) of them had more than ten years working experience (Table 1). The presence of the IDSR forms was observed in 86 (97.7%) of the 88 facilities at post intervention. Trained personnel filled 56 (63.6%) of them (Table 2). Mean knowledge score of respondents in the intervention group increased from 2.92 out of a total of 6 at pre-intervention to 4.61 out of the same total after training. This difference was statistically significant with a p-value <0.0001 (Table 3). There was no statistically significant differences in the mean practice scores at both pre and post intervention; p=0.2482. However, the increase was from 1.90 ± 2.8 to 2.86 ± 3.4 at post-intervention (Table 4). There were statistically significant associations with availability of the forms, commendations for filling them and feedback on them after the training. However, though it was easier to

Table 2. Observational checklist findings in the studied Primary Healthcare Centers.

Observation	Pre-Intervention (n=88)		Post-Intervention (n=88)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Presence of forms	78	88.6	86	97.7
Filling by trained personnel	30	34.1	56	63.6
Correct filling	13	14.8	43	48.9
Timely forwarding	23	26.1	38	43.2
Observed feedback	18	20.4	43	48.9

Table 3. Mean knowledge score of integrated disease surveillance response reporting among the healthcare personnel.

Parameter	Pre-intervention	Post-intervention
	Mean ± Std deviation (max score=6)	Mean ± Std deviation (max score=6)
Mean knowledge score	2.92 ± 1.72	4.61 ± 1.03
Total	108	108

t-test = 8.77; df =1; p < 0.0001.

Table 4. Mean practice score of integrated disease surveillance response reporting among the respondents.

	Pre- intervention	Post-intervention
Parameter	Mean ± Std deviation (max score=6)	Mean ± Std deviation (max score=6)
Mean practice score	1.90±2.8	2.86±3.4
Total	108	108

t-test = 1.16; df = 1; p = 0.2482.

fill and interpret the forms at post intervention, it was not statistically significant; p = 0.4240 (Table 5).

DISCUSSION

The presence of forms was observed in majority of the health facilities at both pre and post-intervention. This was similar to a Tanzanian study, where 19 (73%) health facilities had adequate supplies of forms (Nsubuga et al., 2002). This was contrary to the findings of a study conducted among key personnel in Sabon Gari LGA of Kaduna State, Nigeria, where there was no indicator available (Abubakar et al., 2013). In this study, the availability of the forms can be explained by the fact that they are generally made available in facilities for disease surveillance by the relevant authorities.

Correct and timely filling of the forms by trained health personnel, timely forwarding of the forms to the State Epidemiological unit and receipt of feedback from them was observed to have been less than half (50%) with an improvement above that in only the form filling by trained personnel at post-intervention. These findings were similar to those of a systemic review conducted in the USA where lack of knowledge of which diseases to report, understanding of how or to whom to report, an assumption that someone else will report the case, intentional failure to report to protect patient privacy and insufficient reward for reporting or penalty for not reporting were factors related to manpower and affecting IDSR reporting (Doyle et al., 2002).

The most important factor in any system is manpower, which must be adequate in quantity and competent in quality, which incorporates attitude and training issues. These findings were also similar to a study conducted in Mauritius where generalized shortage of staff contributed to poor compliance with the surveillance (Kintu et al., 2005). Several Nigerian studies also agreed with the findings of this study. In the study conducted among health workers on IDSR reporting in Yobe State, Nigeria, timeliness of reporting was 0% (Bawa et al., 2003). In another study conducted among health workers in the same State, 47 (85.5%) of the respondents that were aware of the reporting requirements listed lack of training on disease surveillance as one of the factors affecting disease reports (Bawa and Olumide, 2005). The training

Table 5. Factors relating to practices of integrated disease surveillance response reporting among the study group.

Characteristics	Pre- intervention		Post-intervention		X^2	df	p-value
	Frequency	Percentage (%)	Frequency	Percentage (%)			
Availability	**(n=108)**		**(n=108)**				
Yes	30	(27.8)	65	(60.2)	23.02	1	<0.0001
No	78	(72.2)	43	(39.8)			
Easy to fill /interpret	**(n=30)**		**(n=65)**				
Yes	21	(70.0)	40	(59.7)	0.64	1	0.4240
No	9	(30.0)	25	(40.3)			
Commendation	**(n=30)**		**(n=65)**				
Yes	29	(96.7)	45	(67.7)	-	-	*<0.0001
No	1	(3.3)	20	(32.3)			
Feedback	**(n=30)**		**(n=62)**				
Yes	28	(93.3)	45	(67.7)	-	-	*0.0007
No	2	(6.7)	20	(32.3)			

*Fisher's exact.

and retraining of health workers responsible for data generation, collection and forwarding in health facilities on disease notification, regular feedback on diseases reported and provision of forms were recommended in order to improve the disease surveillance system, as concluded by the study (Bawa and Olumide, 2005).

Feedback was also observed to be very poor in this study. This was not different from a study conducted in Riyadh among Physicians, where 46.7% never received any feedback, 4.5% always received feedback, 8.6% received it mostly, 24.1% received it sometimes and 16.1% rarely received feedback (Field Epidemiology Training Programme, 2007). With the majority not receiving feedback, motivation to put more effective efforts at ensuring timely and complete reporting of priority diseases and better control may not be possible. Another was conducted in 7 facilities in 3 selected LGAs in Kaduna State among the Medical Officers of Health, DSNOs and State Epidemiologist. Relevant findings to practices regarding IDSR and its reporting revealed that only 2 (13%) of the PHCs reported receiving feedback from their respective LGAs (Abubakar et al., 2013). The study therefore concluded the poor implementation of IDSR in Kaduna State, which is the general state of the country, as depicted by all these studies.

These observational results translated into inadequate practices in this study. Mean practice scores were not statistically significant. This was however not similar to findings in a quasi experimental study conducted in Lagos State, South Western Nigeria among DSNOs of the 20 LGAs, where the mean paired difference in score of 33.3% (SD, 10.4) pre and post intervention was statistically significant p<-0.0001 (Adeoye et al., 2011).

Conclusion

In this study, there was a statistically significant increase in knowledge scores, at post-intervention. This finding was similar to that conducted among healthcare workers in private hospitals in Riyadh, Saudi Arabia where majority of them had more than 70% of the total score (> 26 out of 36), though not statistically significant (Field Epidemiology Training Programme, 2007). Globally, the awareness of healthcare workers on disease surveillance and reporting has improved. This is more marked at the district level and may be as a result of the fact that this surveillance system was initially established to strengthen the district level and inevitably the national level. However, this awareness may not necessarily be translated to an increase in knowledge. In another study carried out in Yobe State among 144 healthcare workers, the mean knowledge score was 0.85 ± 8SD before the training intervention (Bawa et al., 2003). This was lower than the findings of this study, but similar in being both low at pr-intervention, prior to the training. Common to all these studies, is the poor knowledge on various aspects of IDSR knowledge. These findings were all similar to all the studies reviewed elsewhere in the world. The same conclusion of poor knowledge regarding the scheme and its practices will all affect appropriate practices and therefore the effective local,

regional and global control of these diseases.

Practices regarding IDSR reporting need to be strengthened by ensuring that trained health personnel correctly fill and compile the results at the facility level and send complete and timely reports. This should be implemented by the PHC Co-ordinators and DSNOs. The constant availability of IDSR forms in the facilities should be enforced and maintained by the LGA health department to ensure continuity of reporting and improve on the effectiveness of the system.

LIMITATION OF THE STUDY

The main limitation faced during the study period was the ongoing strike action health workers embarked upon during the study period in some parts of the State. More LGAs would have been included to have a better external validity of the study.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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