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Study of Utilization of Integrated Disease Surveillance and Response Data in Controlling Infectious Diseases among Public Health Facilities in Kiambu County, Kenya

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ABSTRACT

Integrated Disease Surveillance and Response entails data collection, analysis, interpretation, and feedback on communicable and non-communicable diseases. It enables health workers to detect and respond to these diseases. Poor utilization of disease surveillance and response data was identified as a core factor responsible for increasing mortality and morbidity due to infectious diseases in developing countries like Kenya. This study assessed utilization of Integrated Disease Surveillance and Response data in control of infectious diseases among Public health facilities in Kiambu County, Kenya. It specifically investigated the proportion of Health workers trained on IDSR, level of knowledge regarding IDSR and Health system factors influencing IDSR utilization. This was a descriptive cross-sectional survey. It involved public health facilities with key respondents being the health care workers providing curative and preventive health services within the selected health facilities. Stratified sampling technique was used to stratify the 108 health facilities into levels of health care while proportionate sampling was used to select 143 participants in the respective level of care. An interviewer-administered questionnaire was used to collect data which was entered and analysed using the Statistical Package for Social Sciences (SPSS) software version 20. Chi-square test of independence was used to assess the associations between utilization of IDSR data, training, level of knowledge and health system factors while Regression analysis was used to establish the predictors of utilization of IDSR data. Utilization of IDSR index score shows 64.9% inadequate utilization of IDSR data. The available data has not been adequately utilized to inform action plans, public education, and resource mobilization. The study shows that 13.7% of health care workers had been adequately trained on IDSR while 75% had moderate knowledge of IDSR function. Accordingly, 54.6% of respondents had the opinion that there were inadequate essential supplies for IDSR. Chi-square analysis shows that the respondent's duration of practice $\chi 2$ (2.437, df=3, p=0.045) and level of knowledge on IDSR were associated with utilization of IDSR data $\chi 2$ (0.227 df=2, p=0.048). Logistic regression analysis illustrates that the level of knowledge (A.O. R=1.55, p=0.041) and Cadre of respondents (A.O. R=0.827, p=0.023) were predictors of utilization of IDSR data.

Key Words: *Integrated Disease Surveillance and Response, Utilization, Infectious diseases, Control.*

1. INTRODUCTION

In Africa, infectious diseases are still the most common causes of morbidity and mortality. To effectively control these diseases, health systems need access to complete, accurate and timely Information for effective planning [1]. The Integrated Disease Surveillance and Response (IDSR) strategy was instituted by World Health Organization Africa Regional Office in 1998 with an objective to strengthen the availability and use of surveillance data for detecting, reporting, investigating, confirming, and responding to preventable priority diseases as well as other Public health events [2]. Kenya adopted the IDSR strategy in 1998 following the World Health Organization Resolution in Harare

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and started implementation in 2002. The country selected a total of 35 priority diseases for reporting that are epidemic prone, targeted for elimination or eradication, or are of public health importance [3].

Communicable diseases remain the leading cause of morbidity and mortality in Kiambu County. According to County records, incidences of infectious diseases such as Diarrhoea, Cholera, Typhoid, Dysentery, Rabies, Anthrax, Measles, Meningococcal meningitis, and malaria have been on the increase since 2015. The county reported 136 cases of cholera with 7 deaths (CFR 5.1%) in 2015 alone. Conditions such as maternal deaths and non-communicable diseases such as hypertension and diabetes have also been on increase. This is despite all Public health facilities adopting IDSR strategy which is expected to strengthen the availability and use of surveillance data for detecting, reporting, investigating, confirming, and responding to preventable priority diseases as well as other public health events. Poor utilization of Integrated Disease Surveillance and Response data was identified as one of the major factors responsible for increasing mortality and morbidity due to infectious diseases in developing countries like Kenya [4]. There is no available information on utilization of disease surveillance data in Kiambu County. This therefore creates need to assess the utilization of IDSR Data among health workers in Public Health facilities

The study aimed at assessing utilization of Integrated Disease Surveillance and Response data in control of infectious diseases among Public health facilities in Kiambu County. The specific objectives were.

a) To determine the proportion of Health workers trained on Integrated Disease Surveillance and Response among Public health facilities in Kiambu County.
b) To determine the level of knowledge regarding Integrated Disease Surveillance and Response among Public health facilities in Kiambu County.
c) To establish the Health system factors influencing utilization of Integrated Disease Surveillance and Response data among Public health facilities in Kiambu County.

2. MATERIALS AND METHODS

A descriptive cross-sectional study design was used for this survey. The design was meant to describe the respondents' views and opinions on the utilization of Integrated Disease Surveillance and Response data among health workers in Public health facilities at a particular point in time. The dependent variable assessed was the utilization of Integrated Disease Surveillance and Response data to control infectious diseases. It was measured as a categorical variable as adequate utilization and inadequate utilization from the Likert scale for seven attributes. The overall utilization was obtained from averaging response statements on the utilization of integrated disease responses. Independent variables were;

a) **Proportion of Public health workers trained on Integrated Disease Surveillance and Response** was measured as a categorical variable of having trained or not trained.
b) **Level of knowledge regarding Integrated Disease Surveillance and Response** was determined by asking respondents 10 item questions regarding integrated disease surveillance. Respondents who got responses less than 4 questions correct were regarded as having poor knowledge. Those who got at 5-7 questions were regarded as having moderate knowledge, while those who got 8-10 questions were regarded as having good knowledge as ordinal variables.
c) **Health system factors influencing the utilization of Integrated Disease Surveillance and Response** data included Resource Availability, Technical determinants, and finance. They were measured as categorical nominal variables.

The study was carried out in Kiambu County, Kenya. There is a total of 108 Public health care facilities spread across the county categorized as follows: 70 Dispensaries offering Level 2 Services, 23 Health Centres providing Level 3 Services, 11 Hospital providing Level 4 Services and 3 Hospitals offering Level 5 Services. The study involved public health facilities, with key respondents being the health care workers providing curative and preventive health services

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within the selected health facilities. These people directly interact with the IDRS system through disease diagnosis, surveillance, or notification. Key respondents to the study were disease surveillance officers, Nurses, Public Health Officers, Community Health Extension Workers, Laboratory Technicians, Clinical Officers, Medical Officers, and Health record officers.

Stratified sampling technique was used to stratify the 108 health facilities into levels of health care while proportionate sampling was used to select 143 participants in the respective level of care. An interviewer-administered questionnaire was used to collect data which was entered and analysed using the Statistical Package for Social Sciences (SPSS) software version 20. Chi-square test of independence was used to assess the associations between utilization of IDSR data, training, level of knowledge and health system factors while Regression analysis was used to establish the predictors of utilization of IDSR data.

3. RESULTS AND DISCUSSION

3.1 Utilization of Integrated Disease Surveillance and Response Data

Utilization was operationalized as data for planning purposes, continuous training of health care workers, coordination of outbreak investigations, public sensitization on notifiable diseases, and review of procedures and policies at the county level. The outcome was measured as a binary variable wherein; utilization was classified as either adequate or inadequate of use of IDSR. Findings illustrate that overall, 64.9% of respondents claimed that there was inadequate utilization of IDSR data among health care workers. About a third were on the contrary. A close examination of utilization parameters reveals that more than half (61.7%) of the sampled respondents disagreed that IDSR data in the study area had been used for planning for disease surveillance activities.

Table 1: Utilization of Integrated Disease Surveillance Data

Utilization Attributes	Level of Agreement	Frequency	Percentage (%)
IDSR data adequately used in planning for disease surveillance activities	Agree	54	38.3%
	Disagree	87	61.7%
	Total	**141**	**100%**
IDSR data informs continuous training needs for health care workers	Agree	54	38.3%
	Disagree	87	61.7%
	Total	**141**	**100%**
IDSR data used to improve coordination of outbreak investigation and response	Agree	76	53.9%
	Disagree	65	46.1%
	Total	**141**	**100%**
IDSR data used for Public sensitization on notifiable disease prevention	Agree	42	29.8%
	Disagree	99	70.2%
	Total	**141**	**100%**
IDSR data used to inform infrastructural improvement in implementing disease surveillance	Agree	64	45.4%
	Disagree	77	54.6%
	Total	**141**	**100%**
IDSR data used to inform resource mobilization before, during and after outbreak investigations	Agree	39	27.7%
	Disagree	102	72.3%
	Total	**141**	**100%**
IDSR data informs the review of procedures and policies for disease surveillance	Agree	17	12.1%
	Disagree	124	87.9%
	Total	**141**	**100%**

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Table 2: Overall Utilization of Integrated Disease Surveillance Data

Extent of utilization of IDSR Data	Frequency	Percent
Agree	49	35.1%
Disagree	92	64.9%
Total	**141**	**100%**

1. Proportion of health care workers trained in Integrated Disease Surveillance and Response

This study has established that a large proportion of respondent (86.5%) had not been trained on integrated diseases surveillance within the past I year. When stratified across the health facilities level, those working in level V facility had not been trained entirely. Integrated disease surveillance is wholly managed at the national disease surveillance unit responsible for training purposes. The decentralization of health services has created parallel reporting channels, and as such, conflicts of interest may arise between the two levels of government. Consequently, refresher training opportunities for integrated disease surveillance become limited and far in between. Lack of training compounds several aspects of surveillance.

Table 3: Proportion of health care workers trained on Integrated Disease Surveillance and Response

Facility Type	Training on IDSR	Frequency	Percent
Level II	Not Trained	25	71.4%
	Trained	10	28.6%
	Total	35	100.0%
Level III	Not Trained	30	83.3%
	Trained	6	16.7%
	Total	36	100.0%
Level IV	Not Trained	34	91.9%
	Trained	3	8.1%
	Total	37	100.0%
Level V	Not Trained	33	100.0%

Table 4: Overall Proportion of health care workers trained on Integrated Disease Surveillance and Response

Training on IDSR	Frequency	Percent
Not Trained	122	86.5%
Trained	19	13.5%
Total	**36**	**100.0%**

3.2 Level of Knowledge and utilization of Integrated Disease Surveillance and Response Data

This study assessed health care workers' level of knowledge based on the disease target for elimination and eradication. Findings show that, overall, about three-quarters of respondents (75.2%) had a moderate level of knowledge of notifiable diseases. Across all cadres, Clinical officers, Nurses and Doctors exhibited good knowledge of notifiable diseases. Inferential analysis in the current study has found a statistical difference with the utilization of

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IDSR data. Logistic regression analysis establishes that the level of knowledge on matters of IDSR is a predictor of utilizing IDSR data for decision making.

Table 5: Level of knowledge regarding Integrated Disease Surveillance and Response among Health workers

Gender	Cadre	Level of knowledge	Frequency	Percent
Female	Clinical Officers	Good Knowledge	4	50.0%
		Moderate Knowledge	4	50.0%
	Community Health Officer	Moderate Knowledge	1	100.0%
	Laboratory Technologist/Technician	Poor Knowledge	1	6.7%
		Good Knowledge	3	20.0%
		Moderate Knowledge	11	73.3%
	Medical Officer	Good Knowledge	1	33.3%
		Moderate Knowledge	2	66.7%
	Nurse	Poor Knowledge	1	2.3%
		Good Knowledge	8	18.2%
		Moderate Knowledge	35	79.5%
	Nutritionist	Moderate Knowledge	2	100.0%
	Pharmaceutical Technologist	Good Knowledge	2	40.0%
		Moderate Knowledge	3	60.0%
	Public Health Officer/Technician	Good Knowledge	2	22.2%
		Moderate Knowledge	7	77.8%
Male	Clinical Officers	Poor Knowledge	3	27.3%
		Good Knowledge	3	27.3%
		Moderate Knowledge	5	45.5%
	Laboratory Technologist/Technician	Moderate Knowledge	8	100.0%
	Medical Officer	Moderate Knowledge	4	100.0%
	Nurse	Good Knowledge	3	27.3%
		Moderate Knowledge	8	72.7%
	Nutritionist	Moderate Knowledge	1	100.0%
	Pharmaceutical Technologist	Poor Knowledge	1	16.7%
		Good Knowledge	1	16.7%
		Moderate Knowledge	4	66.7%
	Public Health Officer/Technician	Good Knowledge	2	15.4%
		Moderate Knowledge	11	84.6%
		Total	**141**	**100%**

Table 6: Overall level of knowledge regarding Integrated Disease Surveillance and Response among Health workers

Level of knowledge on IDSR	Frequency	Percentage
Poor Knowledge	6	4.3%
Good Knowledge	29	20.6%
Moderate Knowledge	106	75.2%
Total	**141**	**100%**

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3.3 Health Systems factors influencing the utilization of Integrated Disease Surveillance and Response data

The success of effective disease surveillance is dependent on the availability of a responsive health system. Finance is a core component of a responsive health system as a key determinant of an integrated disease surveillance system performance. The present study has established that many healthcare workers asserted that there were inadequate funds for IDSR activities within the county. Limited allocation of supplies for IDSR, was also mentioned by about half of the respondents. The unavailability of essential supplies for IDSR activities increases the probability of ineffective response to potential epidemics should it occur. The availability of job aids improves the technical capacities of health workers. About 75% of health workers attested that job aids for integrated disease surveillance and response were available in plenty at their workplaces. Inferential analysis at both bivariate and logistic regression did not establish a statistical difference.

Table 7: Health system factors influencing the utilization of Integrated Disease Surveillance and Response data.

Health system factors	Perceived Availability	Frequency	Percent
Job Aids for Case Definitions	No at all	18	12.8%
	Not for all Diseases	17	12.1%
	Yes	106	75.2%
	Total	**141**	**100.0%**
Supplies for IDSR Activities	Non available	27	19.1%
	Supplies adequate	37	26.2%
	Supplies inadequate	77	54.6%
	Total	**141**	**100.0%**
Funds for IDSR Activities	Funds are inadequate	64	45.0%
	Do not Know	68	48.6%
	Funds are adequate	9	6.4%
	Total	**141**	**100%**

3.4 Test of Associations between independent and dependent variables

Table 8 shows the bivariate analysis between independent and dependent variables. Chi-square analysis shows that the respondent's duration of practice χ^2 (0.227 *df=2, p=0.045*) and level of knowledge on IDSR were associated with utilization of IDSR data χ^2 (0.227 df=2, *p=0.048*).

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Table 8: Cross-tabulations between independent and Dependent Variables

	Utilization of Integrated Disease Surveillance and Response Data		
Age	**Adequate Utilization (%)**	**Inadequate Utilization (%)**	
20-29 Years	10(45.5)	12(54.5)	3.268 (*df=4*) (*p=0.514*)
30-39 Years	30(54.5)	25(45.5)	
40-49 Years	24(57.1)	18(42.9)	
Above 50 Years	14(66.7)	7(33.3)	
Gender			
Female	50(57.5)	37(42.5)	0.426 *(df=1) (p=0.514)*
Male	28(51.9)	26(48.1)	
Cadre of Respondents			
Clinical Officers	10(52.6)	9(47.4)	2.057 *(df=6) (p=0.957)*
Community Health Officer	1(100)	0(0)	
Laboratory Technologist	13(56.5)	10(43.5)	
Medical Officer	4(57.1)	3(42.9)	
Nurse	31(56.4)	24(43.6)	
Pharmacy Technologist	7(63.6)	4(36.4)	
Public Health Officer	11(50)	11(50)	
Duration worked			
10-20 Years	11(64.7)	6(35.3)	2.437*(df=3) (p=0.045)*
5-10 Years	19(59.4)	13(40.6)	
Less than 5 years	47(53.4)	41(46.6)	
More than 20 Years	1(25)	3(75)	
Training on IDSR			
Trained on IDSR	83(69.2%)	37(30.8%)	0.04 *(df=1) p=0.948*
Not Trained on IDSR	13(68.4%)	6(31.6%)	
Level of Knowledge on IDSR			
Poor Knowledge	4(66.7%)	2(33.3%)	0.227*(df=2) p=0.048*
Good Knowledge	21(72.4%)	8(27.6%)	
Moderate Knowledge	72(67.9%)	34(32.1%)	
Availability of Funds for IDSR			
No, Funds are inadequate	46(73%)	17(27%)	1.466(*df=2*), *p=0.480*
Not aware	45(66.2%)	23(33.8%)	
Funds are adequate	5(55.6%)	4(44.4%)	

Logistic regression analysis was used to establish the predictors of utilization of IDSR data. Regression analysis illustrates that respondents' Cadre was a predictor of the utilization of IDSR data. The log odds of the utilization of IDSR increase by 0.827 with respect to the Cadre of health care workers. The level of knowledge on IDSR was a predictor of the utilization of integrated disease surveillance data.

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Table 9: Logistic Regression analysis of predictors of Utilization of Integrated Disease Surveillance and Response data

Variables	Sig.	Exp (B)	95% C.I. for EXP(B)	
			Lower	Upper
Level of Facility	*0.388*	0.848	0.583	1.233
Age	*0.308*	1.226	0.828	1.816
Gender	*0.455*	1.342	0.620	2.905
Cadre	***0.041***	0.827	0.689	0.992
Level of Knowledge	***0.023***	1.550	0.696	3.449
Availability of Supplies for IDSR	*0.679*	0.897	0.537	1.499
Training in IDSR	*0.898*	1.078	0.339	3.428
Constant	*0.401*	0.228		

4. CONCLUSION

Utilization of IDSR data collected in Public health facilities is inadequate and available data has not been adequately utilized to inform action plans, public education, and resource mobilization. A large proportion of health care workers in the study area have not been adequately trained for a significant proportion of the time. Study participants had moderate knowledge of IDSR function, with a majority being conversant with all notifiable diseases. The level of knowledge on matters of IDSR is a predictor of utilizing IDSR data for decision making. Healthcare workers identified the inadequacy of essential supplies. Financing for IDSR activities is perceived to be insufficient.

REFERENCES

[1] Adokiya Martin Nyaaba, John Koku Awoonor-Williams, Inuwa Yau Barau, Claudia Beiersmann, and Olaf Mueller (2015); Evaluation of the integrated disease surveillance and response system for infectious diseases control in northern Ghana

[2] Athman Juma Mwatondo, Zipporah Ng'ang'a, Caroline Maina, Lyndah Makayotto, Moses Mwangi, Ian Njeru,and Wences Arvelo (2013); Factors associated with adequate weekly reporting for disease surveillance data among health facilities in Nairobi County, Kenya.

[3] MOH Kenya (2012). Technical Guidelines for Integrated Disease Surveillance and Response in Kenya-2nd Edition. Ministry of Public Health and Sanitation.

[4] Bruckner C, Checchi F. (2011); Detection of infectious disease outbreaks in twenty-two fragile states, 2000-2010: a systematic review. Conflict and Health.

DOI: 10.31695/IJASRE.2021.33991