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Data Quality Assessment In The Health Management Information Systems In Health Facilities Partners Of Life-Net International In The South Kivu-Democratic Republic Of Congo

Bwanondo Kachelewa Sylvain[1], Joseph Muchiri[2] And David Niyukuri[3]
[1]*school Of Public Health - Mount Kenya University. Kenya*
[2]*senior Lecturer, Department Of Monitoring And Evaluation*
School Of Public Health
Mount Kenya University.
[3]*lecturer, Department Of Department Of Monitoring And Evaluation*
School Of Public Health
Mount Kenya University.

Abstract:
Background*: Tracking the efficacy and efficiency of data to enhance the delivery of healthcare services requires high-quality data from health management information systems (HMIS). Evidence, however, indicates that HMIS data in many resource-constrained contexts currently does not satisfy WHO criteria and is not used for program choices in DRC, particularly at lower levels of the health care system, and therefore remains a significant obstacle.*
Materials and Methods*: The design of the study was a facility-based cross sectional examination. Simple random sampling with the lottery method was used to choose 76 health centers, 163 focus individuals, and field staffs using a questionnaire.*
Results*: 80.2% respondents agreed that their health facility did systematically monitor its activities progress, 63% agreed that they were controls implemented during access of the database systems, 72% opined that the data is always cross-checked during data input. Almost half of the respondents indicated that they were not trained for data collection exercise, nevertheless, most of the health facilities had created a staff position responsible for data collection. The confidence threshold for the regression analysis was set at 95%.*
Conclusion: *This indicated that the HMIS's structure and capacity to gather and provide high-quality data had a significant impact on the data's quality.*
Keywords: *Burundi, Data, Data quality, Health Facilities Partners of Life-Net International, health management information systems (HMIS)*

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I. Introduction

The improvement of the overall population health should be the ultimate objective of public health, and this objective can be accomplished through the collaborative efforts of health facilities that are part of Life-Net International (LNI)[1]. Because of the importance of data, information, and knowledge to these three roles, the field of public health is essentially one that relies heavily on data. The availability of data of high quality is a precondition for improved information, better decision-making, as well as for enhanced public health[2]. In order to increase the efficacy and effectiveness of health services in response, HMIS unifies data collection, processing, reporting, and simplifies use at all levels[1,3]. Health facilities are the sites where HMIS gathers data, which includes statistics on health services, administration, and illness epidemiology. To track, assess, rank, and enhance the provision of healthcare services, high-quality data is crucial[4].

Studies conducted in Sub-Saharan Africa (SSA) have revealed issues with data quality, including incompleteness and timeliness, correctness, consistency, and inadequate use of HMIS technologies, regardless of the fact that the HMIS is the foundation of robust health systems[1,5]. Because of the incompleteness, obsoleteness, untimeliness, irrelevance, and incorrectness of received data for preferred purposes, Health Management Information System (HMIS) is confronted with substantial challenges in the majority of developing nations. The World Health Organization (WHO) reports that due to the poor quality of the data, one out of every 10 inpatients suffer from some form of medical error[6]. This study was conducted in October 2023

in Life-Net (LN) in its operational Health Facilities partners in DRC, especially in the 12 health Zones of Life-Net operation. Life-Net is an international Faith-Based Organization (FBO) currently operating in the Democratic Republic of Congo, Uganda, Burundi, Malawi, Kenya, and Ghana. Transforming African HealthCare through its work partner health facilities in various countries is its mission. Even though gains have been noticed in South Kivu HMIS performance, as documented in the Burundi 2020 annual health facilities performance report, there still exists a data quality challenge, particularly on indicators connected to infectious diseases and Antenatal care. According to the annual report for the South Kivu in 2020, there was a discrepancy between the accuracy, action-ability of the reports and their timeliness[7].

The purpose of the study was to investigate the data quality assessment in the health management information systems, especially in health facilities partners of Life-Net international in the south Kivu-Democratic Republic of Congo. The study's findings were not limited to academic circles; they also held practical implications for governmental and local healthcare entities. Policymakers at both federal and state levels utilized the findings to refine data quality assessment protocols, thereby enhancing the effectiveness of healthcare systems. The study had specific objective, which was to assess the structure and capability of the HMIS to collect and report data of high quality in Health Facilities Partners of Life-Net International in the South Kivu Democratic Republic of Congo. Therefore, this study was seeking to assess the data quality in health management information systems within South Kivu province.

II. Material And Methods

A procedural methodology is being employed in this investigation to ensure the acquisition of credible, objective, cost-effective, and precise answers to the research questions. All 76 Health Facility Partners of Life-Net International situated in the South Kivu region of the Democratic Republic of the Congo were encompassed within the study's population. Within these 76 health facilities, a total of 163 focal individuals and field staff were tasked with responsibilities related to data quality management.

Study Design: A facility-based cross-sectional study design was used for the research in South Kivu in the Democratic Republic of the Congo. A total of 76 health centres and 163 health professionals were chosen using a lottery approach to choose samples at random from within each selected health centre.

Study Location: This study was situated in the South Kivu region of the Democratic Republic of the Congo where all 76 Health Facility Partners of Life-Net International were encompassed within the study's population.

Study Duration: The time period covered was October through December of 2023.

Sample size: 171 Healthcare Workers.

Sample size calculation: The sample size was determined by applying a single population proportion formula, based on the assumption that 75% of individuals in the South Kivu region of the Democratic Republic of the Congo are competent in executing HMIS tasks. A desired precision degree of 5% and a confidence interval of 95% were used in the calculation. There are 76 health facilities in the zones of Life-Net operation, and 100 % of them were chosen based at random based on the request and the inclusion criteria. A total of 76 health centres were chosen through the use of a straightforward random sampling method. The computed sample size for respondents was proportionally distributed throughout each health centre. Next a total of 171 respondents were chosen using the inclusion criteria. The study only considered health facilities that have been operational for more than a year; on the other hand, health care professionals with less than six months of experience were not considered.

Procedure methodology

The PRISM (Performance of Routine Information System Management) assessment tools version 3.1 and the Health Management Information System user's guideline served as inspiration for the development of the questionnaire tools that were used. The questionnaire instrument for secondary data was designed in excel to contain questions designed to evaluate data quality, verify the quality of data that has been transmitted correctly to the next level of reporting, and determine the dimensions of HMIS data quality. A self-administered structured questionnaire was employed for the primary data that contained information about the respondents' backgrounds as well as the organizational, behavioral, and technical determinants of data quality in health facilities. The researcher distributed a self-administered questionnaire to the selected personnel and then requested that the respondents completed it out within the allotted period. The instrument was then pretested on five percent of the sample size in advance of the real data collection period, and those individuals were

excluded from the actual data collection. The use of KoBoCollect / toolbox made it easy to collect, save and manage research data.

Statistical analysis

The data that were collected, validated to ensure that it is complete and coded in KoboCollect before being exported the latest to SPSS version 28 for the purposes of analysis and processing using descriptive statistics. To obtain the highest possible data quality before, during, and after the data entry process, incomplete, invalid, and inconsistent data were cleaned up appropriately. For the purpose of evaluating the Health Management Information System (HMIS), we shall employ percentages, figures, and distribution of frequencies tables to explain the variables of the study. For assessing the responsibility of data aggregation in the health Facility, a chi-square test of independence was carried out to examine the relationship between Responsible for data aggregation and Educational level. In order to ascertain the strength and/or direction of the link between the research variables, multiple regression analysis was computed to evaluate and forecast the data quality assessment in the health management information systems in healthcare institutions.

III. Result

The study examined the sociodemographic characteristics of the respondents reflecting a diverse and experienced sample, comprising individuals from various age groups, gender, educational backgrounds, working experiences, and fields of study within the healthcare sector as indicated in this table:

Table 1. Sociodemographic characteristics of respondents

Variable		Frequency	(%)
Age	Below 21 years	0	0.0%
	21 - 30 years	51	32.9%
	31 - 40 years	36	23.2%
	41 - 50 years	47	30.3%
	Over 50 years	21	13.5%
	Total	**155**	**100.0%**
Gender	Male	110	71.0%
	Female	45	29.0%
	Total	**155**	**100.0%**
Education level	High School	7	4.5%
	Diploma	3	1.9%
	Undergraduate	103	66.5%
	Postgraduate	42	27.1%
	Total	**155**	**100.0%**
Working experience	Less than 1 year	6	3.9%
	1 - 2 years	13	8.4%
	2 years and above	136	87.7%
	Total	**155**	**100.0%**
Field of study	Nurse	92	59.4%
	Midwife	14	9.0%
	Health Officer	28	18.1%
	Health Information & Technology	9	5.8%
	Doctor/Physician	8	5.2%
	Others	4	2.6%
	Total	**155**	**100.0%**

Quality of Data in the Health Facility Registers, HMIS Reports, and DHIS2 Comparison.

The researcher investigated the general capability and structure of the Health Management Information Systems (HMIS) in health Facilities partnered with Life-Net International in South Kivu, Democratic Republic of Congo, summarized in Table 2.

Table 2 General capability and distribution of Roles related to Data Management in health centers

Responsible for data aggregation	Frequency	Percentage
Health Facility register Officer	80	51.6
HMIS Reports Focal Person	59	3.1
DHIS2 Focal person	16	10.3
Total	**155**	**100.0**

Assessment of the Data Management Information Systems Ability to Collect and Report Data of High Quality.

The researcher sought to find out the Data Management Information Systems ability to collect and report data of high quality based on its ability. The summaries of the findings are as outlined below in table 4.6.

Table 3 Assessment of the Data Management Information Systems

Data Collection and Reporting	Percentage, n=155	
	Yes	**No**
Monitoring Progress	149 (96,1%)	6 (3,9%)
Internal Data Management Issues		
Database Access	72 (46,5%)	83 (53,5%)
Data cross checked	130 (83,9%)	25 (16,1%)
Procedure of reported data	122 (78,7%)	33 (21,3%)
Data collectors trained	58 (37,4%)	97 (62,6%)
Staff position responsible for Data	68 (43,9%)	87 (56,1%)

IV. Discussion

The table 1 presents a demographic snapshot of 155 respondents out of 171, primarily consisting of healthcare professionals. In terms of age, the majority fall within the 21-50 range, with 32.9% between 21 and 30 years old and 30.3% between 41 and 50 years old. The gender distribution skews towards males, comprising 71% of the sample, while females account for 29%. Education-wise, the majority have completed undergraduate studies (66.5%), followed by postgraduate qualifications (27.1%). Moreover, a significant proportion of respondents (87.7%) have accumulated two or more years of working experience, indicating a seasoned workforce.

Examining the respondents' fields of study or professions, nurses represent the largest group (59.4%), followed by health officers (18.1%). Other fields such as midwifery, health information & technology, and doctor/physician are also represented, albeit in smaller proportions. This breakdown offers insights into the diverse expertise within the healthcare sector. Overall, the data underscores a predominantly male, educated, and experienced cohort of healthcare professionals, primarily comprising nurses and health officers, reflecting a broad spectrum of expertise crucial for effective healthcare delivery.

The level of education now has a bigger influence on how prepared and proficient staff members are with HMIS. According to research by Fathian et al[8], people with the fewest credentials were the least reluctant to use nurse management information systems at a hospital, while people with doctorates were the most proficient users.

In the allocation of roles related to data management within health facilities, three key positions are identified: Health Facility Register Officer, HMIS Reports Focal Person, and DHIS2 Focal Person. Among these roles, the Health Facility Register Officer is the most prevalent, comprising 51.6% of the total responses, indicating their significant involvement in data management activities. The HMIS Reports Focal Person follows closely behind, representing 38.1% of responses, highlighting their crucial role in overseeing HMIS reporting processes. In contrast, the DHIS2 Focal Person is less common, comprising only 10.3% of responses. These findings underscore the diverse responsibilities and distribution of roles within health facilities concerning data management, emphasizing the importance of coordination and collaboration among different personnel to ensure effective data collection, reporting, and analysis processes prior to submission to the next level.

The organization's data management practices are characterized by varying degrees of adherence to established procedures and standards. The majority of respondents (96.1%) involve monitoring progress, reflecting a widespread practice within the organization. However, there are notable disparities in data accessibility, with only 46.5% having access to databases. Despite this, there is a strong commitment to data accuracy, as evidenced by the significant proportion (83.9%) of cases involving cross-checking data. Nonetheless, there are areas for improvement, as only 78.7% follow a procedure for reported data, and a significant majority (62.6%) of data collectors lack training. Additionally, while 43.9% have a designated staff position responsible for data, a considerable portion (56.1%) lack such oversight, suggesting potential gaps in accountability and governance. These findings underscore the importance of standardized procedures, training initiatives, and enhanced accountability mechanisms to ensure data quality and integrity throughout the organization.

V. Conclusion

The assessment of the structure and capability of the HMIS in Health Facilities Partners of Life-Net International in South Kivu, Democratic Republic of Congo, revealed several key findings. Firstly, there is a significant correlation between education level and proficiency in HMIS utilization, suggesting that individuals with higher credentials demonstrate greater proficiency in managing HMIS. Additionally, while there is a presence of key roles related to data management within the HMIS structure, such as Health Facility Register Officer, HMIS Reports Focal Person, and DHIS2 Focal Person, there are notable deficiencies in electronic database competence among personnel. This highlights the importance of addressing educational needs and enhancing electronic database skills to optimize HMIS functionality within healthcare settings. These conclusions provide valuable insights for policymakers, healthcare practitioners, and stakeholders seeking to improve data management practices and decision-making processes within healthcare settings.

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