International Journal of Community Medicine and Public Health
Tom M et al. Int J Community Med Public Health. 2023 Apr;10(4):1362-1368
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20230911

Original Research Article

Technical factors influencing the use of data for evidence-based decision making amongst health workers at Kisumu County, Kenya

Morike Tom[1]*, Isaac Mwanzo[1], George Otieno[2], Peter Kamau[3]

[1]Department of Community Health and Epidemiology (KU), Nairobi, Kenya
[2]Department of Health Management and Informatics, Nairobi, Kenya
[3]School of Public Health (JKUAT), Nairobi, Kenya

Received: 16 February 2023
Revised: 19 March 2023
Accepted: 20 March 2023

***Correspondence:**
Morike Tom,
E-mail: tmorike@yahoo.com

ABSTRACT

Background: Health information system is a system that integrates data collection, processing, reporting, and use to influence policy-making, program action, and research, but 43% lack data analysis and interpretation skills and 42% use data to influence budget preparation.
Methods: Analytical cross-sectional design was used to study 205 HCWs in selected health facilities. Data was collected using a researcher-administered structured questionnaire and Key Informant Interview. Quantitative data analysis was conducted using SPSS version 26.0 and involved univariate and bivariate analysis. Chi-square were used to test the significance of the association between the dependent and independent variables ($p<0.05$). Qualitative data was analyzed by thematic content analysis.
Results: Over a third of respondents 77 (37.6%) rarely used routine data for decision making. Additionally, 66 (32.2%) and 62 (30.2%) sometimes and always use the routine data/health information generated for decision making. The results indicate statistically significant association between extent of training on data utilization ($\chi^2=8.690$, df=2, p=0.008), overall levels of competency ($\chi^2=14.340$; df 3; p=0.026) and access to routine data ($\chi^2=11.823$; df 1; p=0.003) with the use of routine data for decision making.
Conclusions: Healthcare workers use routine health information for decision making, but information culture is not yet achieved due to decisions based on health needs, cost, personal liking and superiors' directives. To create organizational culture, hospital management, donors and other stakeholders should provide continuous training to health workers with specific focus on use of routine health information.

Keywords: Health facilities, Healthcare Workers, Data Users, Data Entry, Routine Data

INTRODUCTION

Health information system (HIS) is a system that integrates data collection, processing, reporting, and use of the information and knowledge to influence policy-making, programme action and research. Health information is the foundation of the overall building blocks of health systems strengthening and availability of information will enable health workers to utilize the same for better policy-making, planning, implementation, and monitoring and evaluation of health programmes.[1] Globally, all countries in the world have adopted the system of health information system which first led to the output of high quality and timely data which are the foundation of the functionality of the health system and inform decision-making in each other five building blocks of the health care system that finally affect quality health service delivery and health outcomes.[2] On

the African continent, most countries, particularly Sub-Saharan countries such as Nigeria, have witnessed growing public sector engagement and interest in the role of public for-profit sector in health service provision.[3] This is also a similar case to most countries of the world of low and middle-income countries. In the Uganda context, health information dates back to 1985, at a time when it was a central health information system (HIS) focused on morbidity and mortality.[3] In the 1970s, driven by the international health agenda efforts were underway across Africa to improve the health care and reduce barriers to service uptake.[4] In the early 1970s, Kenya's Ministry of Health (MOH) recognized the need to establish the health information systems (HIS) which is a system for the collection and processing of data in various sources. The HIS was made of several data sources. Data collected focused on Ministry of Health headquarters needs. The information generated was expected to assist in the formulation of health policies, setting of priorities and evaluation of health care programmes. In the HIS, the Kenya health information system (KHIS) was created followed by subsequent units of vital health statistics unit and evaluation and research unit.[5] In Kenya, 43% of data producers lack data analysis and interpretation skills and 42% of health facility managers analyse and use data to influence budget preparation process and planning of clinical services.[6] Less than 37% of collected data is analysed and used for decision making, hence the ministry has a lot of data, not turned into information & knowledge to produce results. One of the most enduring traits of the information age is that we have focused too much on mastering transaction data and not enough on turning it into information and knowledge that can lead to business results.[5-8] According to DHIS (2019), since the inception of Universal Health Coverage pilot in Kisumu County, there has been a tremendous increase in health services utilization by 39% leading to more workload and inadequate resources to fulfil the demand. The data that has been generated has not been utilized to inform decisions towards the implementation of UHC in Kisumu County.[7]

METHODS

This was an analytical cross-sectional design using both quantitative methods (issuing self-administered questionnaires to the healthcare workers) and qualitative methods (use of Key Informant Interviews from Health information officer and Chief administrator) of data collection that was carried out between February 2022 to May 2022. Systematic random sampling method was used among 205 healthcare workers from Kisumu referral hospital, Kombewa County hospital, and Ahero County hospital in Kisumu County. The study included respondents with work experience of 6 or more months, who were available during data collection period, and respondents who were willing to participate and consented for the study. Further, it excluded respondents on leave such as annual leave, study leave, maternity leave, paternity leave, sick leave etc. and healthcare workers who failed to consent for the study. Self-administered structured questionnaires were used to collect quantitative data while Key Informant Guide was used to collect qualitative. Quantitative data was analyzed using statistical package for social science (SPSS) version 26.0. Descriptive data was presented using frequencies, percentages, means and standard deviation while inferential statistics used chi-square test to measure association between independent and dependent variables. P values less than 0.05 were considered statistically significant.

RESULTS

Socio-demographic characteristics of study respondents

The study involved 205 health workers. Of these, e 64 (31.2%) were aged between 30-39 years. As shown in the (Table 1), 106 (51.7%) were female, with nurses 41 (20.0%) contributing the highest number, medical officers 26 (12.7%) and PHO 19 (9.3%) were the least healthcare workers (Table 1).

Table 1: Socio-demographic characteristics of study respondents.

Characteristics		N	%
Age (years)	20-29	40	19.5
	30-39	64	31.2
	40-49	54	26.3
	50-59	38	18.5
	60 and above	9	4.4
Gender	Male	99	48.3
	Female	106	51.7
Cadre	Medical officer	26	12.7
	Clinical officer	30	14.6
	Nurse	41	20.0
	Pharmacy technologists	25	12.2
	Laboratory technologists	29	14.1
	Health records	35	17.1
	Public Health Officer	19	9.3
Highest education	Diploma	66	32.2
	Higher diploma	50	24.4
	Degree	54	26.3
	Masters	28	13.7
	Ph.D.	7	3.4
Working experience	Less than 3 years	18	8.8
	3-6 years	27	13.2
	7-10 years	48	23.4
	11-15 years	60	29.3
	More than 15 years	52	25.4
Duration at facility	Less than 1 year	36	17.6
	1-4 years	62	30.2
	5-9 years	63	30.7
	10-14 years	30	14.6
	More than 14 years	14	6.8

Most 66 (32.2%) of the respondents had diploma as their highest attained education level followed by 54 (26.3%) had degree. Regarding work experience, 112 (54.6%) had a working experience of more than 10 years and 107 (52.2%) have been working in selected health facilities for five years and above during the time of the study (Table 1).

Extent of routine information use for decision making

The percentage use of the routine data/health information generated for decision making was determined in each hospital and presented an overall data use. Over a third of respondents 77 (37.6%) rarely used routine data for decision making. Additionally, 66 (32.2%) and 62 (30.2%) sometimes and always use the routine data/health information generated for decision making (Figure 1).

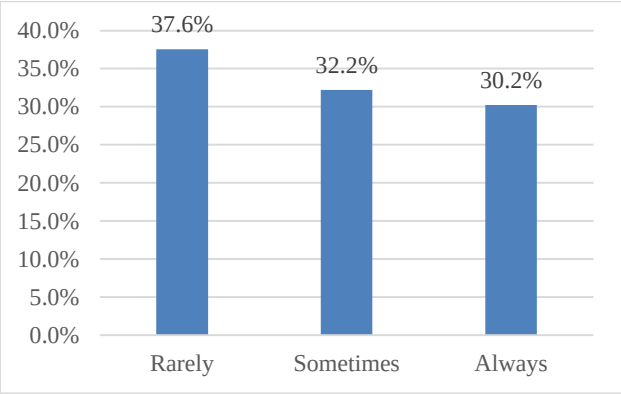

Figure 1: Routine data use among healthcare workers.

Table 2: Extent of routine data use for decision making.

Are of data use	Mean	Percentage score
Day-to-day program management	2.669	73.0
Medical supply & drug management	2.765	74.8
Formulating plans	3.121	77.3
Review financial statement and Budget preparation	1.792	69.9
Deciding budget reallocation	1.908	71.2
Human resources management	2.635	72.7
Monitoring key objectives and policy	2.705	74.1
Identification of emerging epidemics	2.913	75.8
Data use index	2.564	73.6

Extent of routine data use for decision making

In the study respondents self-rated the extent to which they use data for decision making in each of the eight areas in a scale of 1 to 4 with a rating score of 0% to 100% where 1 meant rarely with a rating score of (0-25 %), 2 meant sometimes with a rating score of (26-50%), 3 meant often with a rating score of (51-75%), and 4 meant always with a rating score of (76-100%). According to analysis results shows use of routine health information for formulation of planning had a mean 3.12 (77.3%), identification of emerging epidemics 2.91 (75.8%) and medical supply & drug management 2.77 (74.8%). Deciding budget reallocation and review financial statement and budget preparation had a mean score of 1.91 (71.2%) and 1.79 (69.9%) respectively. The overall routine data use index was calculated by taking the mean of all eight dimensions which come to 73.6% (Table 2).

Socio-demographic characteristics influencing routine data use

Further analysis with an aid of chi-square test was carried out in order to establish association between respondent's socio-demographic characteristics and use of routine data for decision making. The Pearson chi-square shows a statistically significant association between level of education (χ^2=26.616; df 3; p=0.0001) and routine data use for decision making. Age (χ^2=3.764; df 3; p=0.096), gender of the health worker (χ^2=5.767; df 1; p=0.056), Cadre (χ^2=1.949; df 5; p=0.090), duration at the facility (χ^2=3.732; df 3; p=0.713) and working experience (χ^2=3.807; df 3; p=0.703) had no statistical relationship to use of routine data for decision making, p>0.05 (Table 3).

Technical factors

Continuous professional training: The extent of continuous professional training in aspects of routine data use, that is, HMIS, survey, data utilization, data analysis, planning and computer software. The findings revealed that 114 (55.6%) and 118 (57.6%) of healthcare workers had training on data analysis and data utilization respectively. Further analysis was done to establish whether the extent of training in various areas had any statistically significant association with routine data use by use of chi-square test of independence and results were displayed (Table 4). The results indicate statistically significant association between extent of training on data utilization (χ^2=8.690, df=2, p=0.008) with routine data use among the health workers participated in the study (Table 4).

Training on planning, computer software and data analysis has no statistically significant relationship to use of routine data for decision making, p>0.05. This was amplified by quote where one of the respondents thus said: "the nurse is not well trained on some aspects on data like the records officer, it is work of the records to analyze, present and give us the data, because some cadres like the nurse is always busy with the patient'' (KII 2). Another participant during the KII pointed out that: "since devolution there is a lot of confusion and resources are also scarce……we are rarely supervised, workshops and seminars have reduced but still those who have opportunity to go rarely give feedback and departmental data review meetings are lacking in some unit" (KII 3).

Table 3: Socio-demographic characteristics influencing routine data use.

Variables		Rarely N (%)	Sometimes N (%)	Always N (%)	Significance
Age group (years)	20-29	17 (22.1)	14 (21.2)	9 (14.5)	χ^2=3.764 df 3, p=0.096
	30-39	25 (32.5)	19 (28.8)	20 (32.3)	
	40-49	24 (31.2)	19 (28.8)	11 (17.7)	
	≥50	11 (14.3)	14 (21.2)	22 (35.5)	
Gender	Male	30 (39.0)	39 (59.1)	30 (48.4)	χ^2=5.767 df 1, p=0.056
	Female	47 (61.0)	27 (40.9)	32 (51.6)	
Level of education	Diploma	35 (45.5)	19 (28.8)	12 (19.4)	χ^2=26.616 df 3, p=0.0001
	Higher diploma	21 (27.3)	15 (22.7)	14 (22.6)	
	Undergraduate	16 (20.8)	23 (34.8)	15 (24.2)	
	Postgraduate	5 (6.5)	9 (13.6)	21 (33.9)	
Cadre	Medical officer	5 (6.5)	9 (13.6)	12 (19.4)	χ^2=1.949 df 5, p=0.090
	Clinical officer	9 (11.7)	14 (21.2)	7 (11.3)	
	Nurse	13 (16.9)	15 (22.7)	13 (21.0)	
	Pharmacy	15 (19.5)	5 (7.6)	5 (8.1)	
	Laboratory	13 (16.9)	10 (15.2)	6 (9.7)	
	Health records	13 (16.9)	11 (16.7)	11 (17.7)	
	PHO	9 (11.7)	2 (3.0)	8 (12.9)	
Working experience	≤ 6 years	19 (24.7)	17 (25.8)	9 (14.5)	χ^2=3.807 df 3, p=0.703
	7-10 years	18 (23.4)	14 (21.2)	16 (25.8)	
	11-15 years	20 (26.0)	21 (31.8)	19 (30.6)	
	>15 years	20 (26.0)	14 (21.2)	18 (29.0)	
Duration at facility	<1 year	13 (16.9)	14 (21.2)	9 (14.5)	χ^2=3.732 df 3, p=0.713
	1-4 years	24 (31.2)	17 (25.8)	21 (33.9)	
	5-9 years	21 (27.3)	24 (36.4)	18 (29.0)	
	≥10 years	19 (24.7)	11 (16.7)	14 (22.6)	

Table 4: Continuous professional training.

Variables		Use routine data			Significance
		Rarely N (%)	**Sometimes N (%)**	**Always N (%)**	
HMIS	Yes	27 (35.1)	35 (53.0)	29 (46.8)	χ^2=4.851 df 2, p=0.088
	No	50 (64.9)	31 (47.0)	33 (53.2)	
Survey	Yes	38 (49.4)	35 (53.0)	33 (53.2)	χ^2=0.275 df 2, p=0.872
	No	39 (50.6)	31 (47.0)	29 (46.8)	
Data analysis	Yes	49 (63.6)	30 (45.5)	35 (56.5)	χ^2=4.785 df 2, p=0.091
	No	28 (36.4)	36 (54.5)	27 (43.5)	
Data utilization	Yes	46 (59.7)	39 (59.1)	33 (53.2)	χ^2=8.690 df 2, p=0.008
	No	31 (40.3)	27 (40.9)	29 (46.8)	
Planning	Yes	40 (51.9)	29 (43.9)	23 (37.1)	χ^2=3.097 df 2, p=0.213
	No	37 (48.1)	37 (56.1)	39 (62.9)	
Computer software's	Yes	38 (49.4)	35 (53.0)	28 (45.2)	χ^2=0.792 df 2, p=0.673
	No	39 (50.6)	31 (47.0)	34 (54.8)	

Table 5: Competence in routine data/information management tasks.

Variables		Use routine data			Significance
		Rarely N (%)	Sometimes N (%)	Always N (%)	
Level of competence	Low	35 (45.5)	19 (28.8)	15 (24.2)	χ^2=14.340, df 3, p=0.026
	Moderate	25 (32.5)	29 (43.9)	19 (30.6)	
	High	9 (11.7)	8 (12.1)	16 (25.8)	
	Very high	8 (10.4)	10 (15.2)	12 (19.4)	
Easy to access routine data	Yes	34 (44.2)	26 (39.4)	42 (67.7)	χ^2=11.823, df 1, p=0.003

On overall level of competence in routine data/information management tasks, 73 (35.6%) rated to be moderate, 69 (33.7%) low and 30 (14.6%) very high (Table 5). Additionally, 103 (50.2%) said it's not easy to access routine data/information whenever needed. Further analysis results displayed in (Table 5) shows there is a statistical significance between overall levels of competency (χ^2=14.340; df 3; p=0.026) and access to routine data (χ^2=11.823; df 1; p=0.003) with the use of routine data for decision making (Table 5). During interview, one of the key informants pointed out that: "being a doctor, we are not trained on data issues in medical schools therefore not very good and again when appointed in offices with new mandates and roles there are no induction… we learn issues of data in the hard way either during meeting or when asked by county offices'' (KII, 3).

DISCUSSION

The study revealed 73.6% use of routine health information generated for decision making among the health workers selected health facilities. This is inconsistent with a study by Yarinbab and Assefa from South Africa indicated that the overall percentage of HMIS information use was 65%.[9] A study finding by Doolan-grimes from Cote D'Ivoire using performance of routine information system management (PRISM) framework showed an overall health information utilization score of 38% at healthcare facilities.[10] The study also disagrees with Nicol et al which emphasized that little of vast amount of data is used by those who are collecting the data and by local health management at health facility or district levels.[11] An information culture is achieved when everyone asks for facts and clear indicators to make decisions. A positive information culture is characterized by information that is being used on a regular basis. The main areas of routine health information use reported by health workers were mainly on planning (77.3%), identification of emerging epidemics 2.91 (75.8%) and medical supply & drug management 2.77 (74.8%). Deciding budget reallocation and review financial statement and budget preparation had a mean score of 1.91 (71.2%) and 1.79 (69.9%) respectively. This is consistent with the current practice whereby facilities develop yearly plans and must use previous year data as their baseline information during the planning process. This is consistent with my findings from the KII. The participants in the KII stressed that routine health information was very crucial especially in preparation of annual work plans and monitoring of activities and disease trends. This finding also corresponds with a study result by in India, Zimbabwe and Uganda which showed that most staff at district level reported using routine health information for program related management especially planning, monitoring, medical supply and drug management.[5,8,12] A similar study done in Uganda by Asiimwe, showed that staff in most of the facilities reported using HMIS data for medical supply and drug management, staffing decisions, and service improvement.[3] The level of education and professional training played a significant role in the utilization of data/information. Participants with postgraduate reported to use information always compared to under graduates. This indicates that education is likely to be associated with routine data use. It appears those health workers who are better-educated places more value on information and use it more often. This concurs to a study by Shaw done in South Africa, changes have been made to identify information needs by the technical team of the health information management system so as to ensure that it has an impact on the level of utilization of routine health information. Information systems are developed to meet the needs of multiple data users throughout a health system. Because of the many types of data users that access information systems and their diverse needs, the resulting data may not necessarily respond to the specific information needs of all data users.[13] The study revealed that with regards to extent of training the study participants had received showed that more than half had received little/minimal training in information areas that is, HMIS, planning, and computer software, additionally, slightly more than half had training on data analysis, data utilization and survey indicating a need for more training for health workers. Possible explanation for this is that training function is under the national government and not devolved to the county government and because of several emerging issues the national government has not been able to implement this function as expected. Inadequate analytic and data use skills were a hindrance to routine data use.[14] This concurs with studies done in Mutemwa in Zambia, Munda in Kenya and Tabesh in India which indicated that a well-designed HMIS does not directly translate to quality data and use of information generated,

but continuous capacity building is imperative.[1,5,15] According to Teklegiorgis, training in data management and its importance at facility level may improve information use.[16] In this way the system may become a promoter for good quality data to be used in decision making processes.[16]

Limitations

The study was conducted to only government health facilities in Kisumu County. The privately owned facilities and the faith-based facilities were excluded. The study also did not focus on level one facility like the community health workers. This is because they are not under KHIS but they are under the community health management information system (CHMIS). Given that the study is descriptive, the determinants may be temporal or do exist overtime. With the health workers shortages, the sample size will be small due to the fact that health care workers are very few at the facilities. However, the KII interview methods will be employed to supplement for the small sample.

CONCLUSION

Healthcare workers use of routine health information for decision making with majority using it for formulation of planning, identification of emerging epidemics and medical supply & drug management. Information culture has not yet been achieved as some of the decisions were based on health needs, cost, personal liking and superiors' directives and not on facts which may lead to inefficiency and poor health outcomes. Among the respondents who participated in the study 30.0% had received minimal training at all in information areas like data analysis, data utilization, and computer software. Moreover, 50.2% of the health workers at selected health facilities said it's not easy to access routine data/information whenever needed. The county health management team should create organizational culture through increased demand for and use of routine health information for evidence-based decision making in all levels of health care. There is need for hospital management, donors and other stakeholders to provide continuous training to health workers with specific focus on use of routine health information through on- job trainings, mentorship for those already working and for sustainability, strengthening the curriculum in health training institutions through integrating HMIS module in all cadres.

ACKNOWLEDGEMENTS

Authors exhibit special gratitude goes to school of health science for guidance and support. Authors are also thankful to all hospital administration, Kisumu County director of health, and healthcare workers who took part to make this study successful.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Tabesh N. From data to decision: An implementation model for the use of evidence-based medicine, data analytics, and education in transfusion medicine practice. ProQuest Diss Theses. 2015;47(12):289-97.
2. Health Information Systems. Toolkit on monitoring health systems strengthening. World Heal Organ Libr. 2015;46(6):11-6.
3. Asiimwe AK. Determinants of Effective Utilization of Routine Health Information within Private Facilities in Kampala-Uganda. BMC Public Health. 2016;110(2): 1110-8. d
4. Whitaker D. The Use of Evidence-Based Design in Hospital Renovation Projects. J Soc Sci Res. 2018; 77(6):1142-6.
5. Mutemwa R. HMIS and decision-making in Zambia: Re-thinking information solutions for district health management in decentralized health systems. Health Policy Plan. 2016;21(1):40-52.
6. Scientific Symposium Report. Data Driven Decision Making to Control the HIV Epidemic moving to and beyond 2020. Mesh Consort. 2020;20(3):31-9.
7. Ministry of Health. Guidelines for Evidence Use in Policy-Making. USAID. 2020;45(5):100-11.
8. Chikanda A. Skilled health professionals' migration and its impact on health delivery in Zimbabwe. J Ethn Migr Stud. 2016;32(4):667-80.
9. Yarinbab TE, Assefa MK. Utilization of HMIS Data and Its Determinants at Health Facilities in East Wollega Zone , Oromia Regional State , Ethiopia : A Health Facility Based Cross-Sectional Study. J Med Heal Sci. 2018;7(1):4-9.
10. Doolan-grimes M. Evidence-Based Practice from the perspectives of Mid-level and Frontline Nurse Managers A Qualitative Descriptive Study. Health Aff. 2014;36(1):99-106.
11. Nicol E, Bradshaw D, Uwimana-Nicol J, Dudley L. Perceptions about data-informed decisions: An assessment of information-use in high HIV-prevalence settings in South Africa. BMC Health Serv Res. 2017; 17(2):65-76.
12. Hardee K, Johnston A, Salentine S, et al. A Conceptual Framework for Data Demand and Information Use in the Health Sector. Int J Intell Inf Syst. 2015;161(28): 10-8.
13. Shaw C. How can hospital performance be measured and monitored? Heal Evid Netw Rep. 2014;3(1):1-6.
14. Cheburet SK, Odhiambo-Otieno GW. Process factors influencing data quality of routine health management information system: Case of Uasin Gishu County referral Hospital, Kenya. Int Res J Public Environ Heal. 2016;131(6):132-9.
15. Munda ME, Odhiambo-Otieno G, Wambui Kaburi L, Kainyu Kinyamu R. Routine Health Management

Information Use in the Public Health Sector in Tharaka Nithi County, Kenya. Imp J Interdiscip Res. 2016;2(3):2454.
16. Teklegiorgis K. Factors associated with low level of health information utilization in resources limited setting, Eastern Ethiopia. Int J Intell Inf Syst. 2014;3(6):69-77.

Cite this article as: Tom M, Mwanzo I, Otieno G, Kamau P. Technical factors influencing the use of data for evidence-based decision making amongst health workers at Kisumu County, Kenya. Int J Community Med Public Health 2023;10:1362-8.