Level of Commitment and associated factors to Use District Health Information System (DHIS2) for decision making among health providers in a resource limited settings: Cross-sectional survey

Shuma Gosha Kanfe (shumagosha33@gmail.com)  
Mettu University  https://orcid.org/0000-0001-9118-296X

Nebyu Demeke Mengiste  
University of Gondar

Binyam Tilahun  
University of Gondar

Mohammedjud Hassen Ahmed  
Mettu University

Berhanu Fikadie Endehabtu  
University of Gondar

Research article

Keywords: Commitment, District health information system, Decision making

DOI: https://doi.org/10.21203/rs.3.rs-77360/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License
Abstract

**Background:** Changing information use culture, one of the transformation agenda of the Ministry of Health of Ethiopia, can't be real unless health providers have commitment to use locally collected data for evidence based decision making. Performance Monitoring Team (PMT) members' commitment has a very paramount influence on district health information system data (DHIS2) utilization for decision making. Evidence is limited on performance monitoring team members’ commitment to use DHIS2 data. Therefore, this study will fill the evidence gap.

**Objective:** This study aimed to assess the level of commitment and its associated factors among Performance Monitoring Team members to use DHIS2 data for decision making at health facilities in Ilu Aba Bora Zone of Oromia national regional state, Ethiopia 2020G.C.

**Method:** Cross sectional quantitative study supplemented by qualitative methods was conducted to assess commitment level of PMT members’ to use DHIS2 data. A total of 264 participants were approached. SPSS version 20 software was used for data entry and analysis. Descriptive and analytical statistics including Bivariable and Multivariable analyses was done. Thematic analysis was conducted for qualitative part.

**Result:** Overall 121(45.8%) of the respondents had commitment to use DHIS2 data (95% CI: [40.00, 52.8]). Feedback [AOR= 1.85, 95% CI: (1.02, 3.33)], Supervision [AOR= 2.84, 95% CI: (1.50, 5.37)], Information use culture [AOR=1.92,95% CI: (1.03, 3.59)],Motivation [AOR=1.80, 95% CI: (1.00, 3.25)], Health need [AOR=3.96, 95% CI: (2.11, 7.41)] and Competency [AOR=2.41, 95% CI:(1.27,4.55)] were variables associated with level of commitment to use DHIS2 data.

**Conclusion:** In general, less than half of the study participants had commitment to use DHIS2 data for decision making. Information use culture, Motivation, Competency, Health need, Supervision and Feedback were the most determinant factors. Providing regular supportive supervision and feedback, increasing motivation and changing attitude will help to bring cultural transformation of data use.

Introduction

Performance Monitoring Team (PMT) is a team of multidisciplinary health workforce that is primarily responsible to improve data quality, use information regularly, monitor progress and improve performance of health care delivery at all levels of the health system. PMT is one of the major platforms for health information Use in Ethiopia. Changing information use culture, one of the transformation agenda of the Ministry of Health of Ethiopia, can’t be real unless health providers have commitment to use locally collected data for evidence based decision making. PMT members’ commitment to use DHIS2 data could provide comprehensive and dependable information which is the basis for better decision making (1–3). This is because DHIS2 data has global initiatives by Sustainable Development Goals and Countdown to 2030 that emphasize its contribution to monitor service delivery of healthcare providers (4). District health information system is used in more than 60 countries and most global initiatives are
more interested in using DHIS2 data for monitoring the health performance (5–7). Facility based data (DHIS2 data) is one of the major identified strategies to achieve SDG especially for maternal mortality and neonatal mortality by 2030 to a global average of 70 per 100,000 live births (2, 8).

As the World Health Organization (WHO), healthcare providers’ commitment have a very paramount influence on district health information system data utilization for decision making that will also be the basis for quality health service (9). The World Health Organization (WHO) and Institute for Health Metrics and Evaluation (IHME) have stated that to improve the accuracy and utility of health information for decision making, the commitment of healthcare providers are the base (10). This because improving the quality of health service is affected by unresponsive to highly generated data which is but a mandatory step on the path to reaching the Sustainable Development Goals and Universal Health Coverage (11).

Many studies have identified that commitments of healthcare providers are required where over 90% of available data are generated within only two years (2, 12). The standard procedure for data use and measurement of the health system in sub-Saharan Africa was too low due to poor commitment among healthcare providers (13). This is because the quality in healthcare is the result of dedication and commitments among those who provide the service (2). Being committed to use DHIS2 data will favor high quality health system data giving relevant advancements towards achievement of sustainable development goals (2, 12).

However, over the years an evident for low commitment to use data was undetected where decisions are not based on data (2). Poor responses are there for poor consistency of data, which is due to low level of commitments (14, 15). The government’s health facilities were not committed to report data on a regular basis, not used data for setting target programs and unresponsive to timely decision making (2, 12). The World Health Organization (WHO) has stated that those factors that affect commitments to use DHIS2 data are critical factors that affect quality of health service (9, 10).

PMT members’ commitment has a very paramount influence on district health information system data (DHIS2) utilization for decision making (16, 17). As to the knowledge of the authors, evidence is limited on PMT members’ commitment to use DHIS2 data. Therefore, this study aimed to fill the evidence gap on PMT members’ commitment to use DHIS2 data for decision making.

**Methods**

**Study design and setting**

A quantitative cross-sectional study design supplemented by qualitative study design was conducted from February 26 to April 17, 2020. The study was conducted among health facilities in Ilu Aba Bora zone, Oromia, Ethiopia. Ilu Aba Bora zone is one of the zones of the Oromia region of Ethiopia which is 600KM distance from Addis Ababa, Ethiopia. Ilu Aba Bora zone has forty-one (41) health centers, two (2) hospitals (one Referral hospital and one primary hospital).
Study participants and Sample size determination

All selected professionals who handle data, generate data, use generated data for their decision making and those who serve as a focal person within their department collectively known as PMT members according to Ethiopian health system context were study participants of this study. Since the total numbers of study participants within the zone were 264. So, a census was conducted. For the qualitative study, purposive sampling techniques were used and the level of saturation was considered and saturated at the seventh participant.

Operational definition

PMT Members

The PMT members are those healthcare providers serving as a focal person from their respective department (HMIS Officer, Medical director, MCH head, TB focal, Triage head, Primary healthcare unit manager, ... etc.) according to Ethiopian health system contexts and the fact that they are members of PMT.

PMT members’ commitment level

PMT members’ Commitment level to use district health information system 2 data was measured using eleven (11) questions of Likert scale and respondents who scored the median and above the median were categorized as committed to use district health information system 2 data and those who score less than the median values were categorized as not committed to use district health information system 2 data.

Data collection tools and procedures

For the quantitative approach, a self-administered English version questionnaire was used. For qualitative data, in-depth interviews were conducted using an interview guide and tape recorder. The maximum and minimum times for in-depth interview were 49 and 31 minutes respectively.

Data quality control

Data was collected by trained data collectors using questionnaires. Before the actual data collection, a pre-test was conducted among 5% of samples at Buno Bedele general hospital and health center at Bedele town. The validity of the questionnaire was determined based on the view of experts and the reliability was obtained by calculating the value of Cronbach’s alpha (α = 0.82). The qualitative data was collected by investigator after debriefing an in-depth interview, arranging favorable time, and place for interviewee.

Data processing and analyzing

The data entry and analysis was done by SPSS version 20. To explain the study population in relation to relevant variables, descriptive statistics was used. Associations between dependent and independent variables were checked and their strength was presented using odds ratios and 95% confidence intervals. Both bi-variable and multivariable logistic regression was used to assess the association between
outcome and explanatory variables. A P-value < 0.05 was considered statistically significant in the multivariable logistic regression. The qualitative data was analyzed by thematic analysis methods.

Results

Socio-demographic Characteristics

A total of 264 participants were approached with 100% response rate. Majority of the study participants were from Health Centre 234(88.6%). Nearly one third of the participants were male 147(76.5%). Majority 203(76.9%) of the study participants had 4 years and above work experience.

| Variables         | Category            | Frequency (%) |
|-------------------|---------------------|---------------|
| Age               | ≤ 30 years          | 186(70.5%)    |
|                   | > 30 years          | 78(29.5%)     |
| Sex               | Male                | 147(55.7%)    |
|                   | Female              | 117(44.3%)    |
| Type of facility  | Referral hospitals  | 16(6.1%)      |
|                   | Primary hospitals   | 14(5.3%)      |
|                   | Health Centre       | 234(88.6%)    |
| Educational level | Master’s degree     | 23(8.7%)      |
|                   | BSc degree          | 156(59.1%)    |
|                   | Diploma             | 85(32.2%)     |
| Experiences       | ≤ 3 years           | 61(23.1%)     |
|                   | > 4 years           | 203(76.9%)    |
| Position at facility | Head position | 101(38.3%) |
|                   | Expert position     | 163(61.7%)    |

Commitment level of performance monitoring team members’ to use district health information system 2 data for decision making

One hundred twenty one (45.8%) of the respondents had high commitment to use DHIS2 data for decision making purposes (95% CI: [40.00, 52.8]) (Fig. 1).
Level of commitment to use district health information system 2 data for decision making in by socio-demographic variables

Among a total of 117 female respondents, only 50(42.7%) had commitment to use DHIS2 data. Master’s degree holders had more commitment than diploma and degree holders. And when considering their experiences, those who were more experienced had high commitment level 16(57.1%) to use DHIS2 data than less experienced. Health informatics professionals had high commitment to use DHIS2 data 26(60.5%) as compared with health officer professionals. The detail is presented in table Table 2. Respondents serving as head positions 60(59.4%) were more committed than those serving as expert positions.

Table 2
Commitment level to use district health information system in accordance with the socio-demographic characteristics

| Variables                  | Commitment level to use district health information system2 data(n = 264) | Not committed | Committed |
|----------------------------|------------------------------------------------------------------------|---------------|-----------|
|                            | Frequency (%) |                                  | Frequency (%) |
| Sex                        | 67(57.3%)     | 50(42.7%)                         |
|                            | 76(51.7%)     | 71(48.3%)                         |
| Ages                       | 96(51.6%)     | 90(48.4%)                         |
|                            | 47(60.3%)     | 31(39.7%)                         |
| Type of facilities         | 10(62.5%)     | 6(37.5%)                          |
|                            | 6(42.9%)      | 8(57.1%)                          |
|                            | 127(54.3%)    | 107(45.7%)                        |
| Educational level          | 11(47.8%)     | 12(52.2%)                         |
| Master’s degree            | 87(55.8%)     | 69(44.2%)                         |
| BSc degree                 | 45(52.9%)     | 40(47.1%)                         |
| Position at facility       | 80(49.1%)     | 83(50.9%)                         |
| Expert position            | 41(40.6%)     | 60(59.4%)                         |
| Experiences                | 34(55.7%)     | 27(44.3%)                         |
| ≤ 3 years                  | 87(42.9%)     | 16(57.1%)                         |
| > 4 years                  |
Factors associated with commitment level to use district health information system 2 data for decision making

The odds of PMT members that received feedback to their DHIS2 data use were 1.85 times [AOR = 1.85, 95% CI: (1.02, 3.33)] more likely to have a high commitment level to use DHIS2 data than those who have not received feedback. The odds of PMT members those who have a regular supervision and managerial support on their day to day use of DHIS2 data for decision making were 2.84 times [AOR = 2.84, 95% CI: (1.50, 5.37)] more likely to have high commitment to use DHIS2 data than those who have no supervision. Similarly the odds of respondents who have a good competency to use DHIS2 data for their decision making were 2.41 times [AOR = 2.41, 95% CI: (1.27, 4.55)] more likely committed to use DHIS2 data than those who have no good competency in DHIS2 task. The odds of PMT members those have good culture of information use for decision making were 1.92 times [AOR = 1.92, 95% CI: (1.03, 3.59)] more likely committed to use DHIS2 data for decision making than those didn't have good culture of information use. Similarly, PMT members those that inquire for DHIS2 data for health were 3.96 times [AOR = 3.96, 95% CI: (2.11, 7.41)] more likely committed to use DHIS2 data than those who didn't need DHIS2 data for health. The odds of PMT members’ having motivation to use DHIS2 data were 1.80 times [AOR = 1.80, 95% CI: (1.00, 3.25)] more likely committed to use DHIS2 data when compared to those who have low motivation to use DHIS2 data for their decision making. The detail is presented in Table 3.
Table 3
Factors associated with level of commitment to use DHIS2 data among PMT members at health facility in Ilu Aba Bora zone, Oromia region 2020

| Variable       | Category          | Commitment level | Crude OR   | AOR           |
|----------------|-------------------|------------------|------------|---------------|
|                |                   | High Commitment  | Low commitment |             |
| Information use culture | Good          | 83(50.6%)        | 81(49.4%)   | 1.67(1.00-2.77)* | 1.92(1.03-3.59) ** |
|                | Poor              | 38(38.0%)        | 62(62.7%)   | 1             | 1             |
| Health need    | Yes               | 76(58%)          | 55(42%)     | 2.70(1.64-4.45) | 3.96(2.11-7.41) *** |
|                | No                | 45(33.8%)        | 88(66.2%)   | 1             | 1             |
| Motivation     | Motivated         | 71(52.2%)        | 65(47.8%)   | 1.70(1.04-2.77) * | 1.80(1.00-3.25) ** |
|                | Not motivated     | 50(39.1%)        | 78(60.9%)   | 1             | 1             |
| Feedback       | Yes               | 71(50.7%)        | 69(49.3%)   | 1.52(0.93-2.48) | 1.85(1.02-3.33) ** |
|                | No                | 50(40.3%)        | 74(59.7%)   | 1             | 1             |
| Supervision    | Yes               | 84(59.6%)        | 57(40.4%)   | 3.42(2.05-5.71) | 2.84(1.50-5.37) *** |
|                | No                | 37(30.1%)        | 86(69.9%)   | 1             | 1             |
| Competency     | High              | 76(57.1%)        | 57(42.9%)   | 2.54(1.54-4.19) | 2.41(1.27-4.55) ** |
|                | Low               | 45(34.4%)        | 86(65.6%)   | 1             | 1             |

**Note:** * P-value < 0.05 for Bivariable analysis
** P-value < 0.05 for multivariable analysis,
*** P-value ≤ 0.001, 1 = reference

Qualitative Result

Interview questions were expected to be directed towards three categories of investigation: Level of commitment to use DHIS2 data for decision making, factors that could facilitate level of commitment and challenges to use DHIS2 data for decision making. Analysis of interview transcripts revealed key themes grouped into one of the above three categories.
Most of the interviewee agreed that they were to use DHIS2 data, being competent and devoted their time, resources, and efforts that they were committed to use DHIS2 data. One of respondent has explained as, “Having taken training and also supervision from my managers, I thirst dhis2 data on where and when to do our activities. So that I have confidence to say that I am familiar with effective utilization of dhis2 data for decision making” 27 year's old HMIS Officer. Respondents had explained culture of information use will help them in their confidence to use DHIS2 data, “There is a good culture of information using. This enables us to carry out our attention to use effectively dhis2 data. For this we are able to compute with technology that inquires oneself to update himself with dhis2 data used for decision making” 29 years old medical directors.

Another respondents has explained the members’ commitment to use DHIS2 data as, “The PMT members are those who raise why and how questions to make effective use of data for decision making. As a manager of the health Centre, I’m also playing a role even more than what is expected of me. We are always ready to cut off the problems encountered with using dhis2 data for decision making. Even we are in need that always like to be guided by dhis2 data” 30 years old TB Focal.

At some areas, certainly there is feeling of low responsibility towards using DHIS2 data for decision, “Some are unresponsive to what they are required to do, some are unaccountable to their duty. We are also facing a lack of budget to use dhis2 data for decision making. As on the behalf of the facility we have no much such materials like computers, internet connections, Wi-Fi, adequate trained human resources” 26 years old Triage focal.

To achieve high level of commitment, respondents had met problems as, “On the behalf of our facility, we have encountered numerous problems, like insufficient computers, no sufficient internet access, and no sufficient trained human power. All of the above the use of dhis2 data for decision making is at an optimum stage in our facility and we are expected to do more in future” 31 years old HMIS officer.

Another study participant explained the challenges encountered as, “Sometimes there is incomplete data. Sometimes there is too late data. This is due to misunderstanding about using dhis2 data. Resource is not provided at required stages. Example, we will be out of internet connection for three weeks, our computer may fail but may not be fixed until one month. We are asked to be supported but no response” 29 years old MCH Head.

Discussion

In this study, the commitment level of PMT members to use DHIS2 data for decision making was 45.8% (95% CI: [40.00, 52.8]), which is greater than the study conducted in Iran 35.75% (18). This might be due to the fact that nowadays the government of Ethiopia has given special attention to the utilization of health information systems for decision making and the internal commitment of healthcare providers to use data (19).
The result of this study is lower than the study conducted in Ghana 77.3% (20). This might be due to the fact that infrastructures and advancements in technology. This study is also lower than a study conducted in Nigeria which stated that professionals’ commitment to use a routine health information system was from 60–80% (22) and to the extent, very far away from WHO’s target standard of commitments to use a health information system that was targeted in 2010 which was 90% (23). The possible explanations for this variation will be gone to the size of study participants, their scope of roles, availability of infrastructure and availability of resources like internet connection and other related electronic devices.

This result was supported by qualitative finding as follows:

We familiarized ourselves with DHIS2 data even more than expected from us. We are dedicated to accepting and using DHIS2 data, those who were taken by training everywhere else have given training to those who have not been taken. However we lack some requirements like sufficient internet connection and skills to amend our tools like computers, internet related materials (In words of a 31 years old Primary healthcare unit manager).

Almost by what we have, we sacrificed our efforts to use DHIS2 data for our decision making though we encounter some difficulties from the resources limitation (In the words of a 29 years old HMIS officer).

The odds of good competency in DHIS2 data tasks were 2.41 times more likely to have a high commitment to use DHIS2 data for decision making when compared to those with poor competency with [AOR = 2.41, 95% CI: (1.27, 4.55)]. This study is in line with the study conducted in Ethiopia (24), Ghana (2), Nairobi, Kenya (25) and another study conducted at health facilities in Kenya (p = 0.026) [AOR = 4.32 CI:(2.34,7.98)] (26). But this study was inconsistent with the study conducted in Kenya which indicated that competency in RHIS task has no associations with performance of health information systems (27).

This result was supported by qualitative finding as follows:

We ought to have sufficient competency to use DHIS2 data, even we have a good competency in using DHIS2 data tasks though we don’t have enough internet access and sufficient computer devices (In words of 30 years TB focal).

The current study revealed that feedback was positively associated with PMT members’ commitment level to use DHIS2 data for their decision making in Ilu Aba Bora zone health facilities with [AOR = 1.85, 95% CI: (1.03, 3.31)], which is in line with the study conducted in Ethiopia (28) and Ghana (2). This result was inconsistent with the study conducted in Ghana (29).

The odds of promotion of information use culture was 1.92 times more likely to have high commitment to use DHIS2 data as compared to those who didn't have culture of information use with (P-value = .001) [AOR = 1.92, 95% CI: (1.03, 3.59)]. This study was in line with the study conducted in Ethiopia (28), Kenya(30) and Ghana (P-value = 0.041) (2). This result was supported by qualitative finding as follows:
We need to use DHIS2 data for clinical decision making that it enables us to perform our duty more quickly and with full evidence
(In words of 27 years Psychiatry head)

As this study revealed, commitment levels to use DHIS2 data for decision making were based on Health need [AOR = 3.96, 95% CI: (2.11, 7.41)]. The cross sectional study conducted in Ghana is inconsistent with this study which implied that commitment level to the use of DHIS2 data for decision-making do not depend on the health need(2). This result was supported by qualitative method as follows,

Applying and using of DHIS2 data for decision making could be tied to Health needs, because it is when there is Health needs that DHIS2 data will be put in to considerations that it helps us to deal with our focuses
(In words of 32 years triage head focal)

Regarding study participants motivation to use DHIS2 data, respondents’ with high motivation were 1.80 times more likely to have high commitment when compared to those who has low motivation to use DHIS2 data for their decision making[AOR = 1.80, 95% CI: (1.00, 3.25)]. This study (P-value = .033) was in line with study done in Ethiopia (24) and Ghana (P-value = .014) (2).

The odds of respondents with regular supportive supervision visits were 2.84 times more likely to have a high level of commitment among PMT members than those who did not have regular supportive supervision[AOR = 2.84, 95 CI:( 1.50, 5.37)]. The result was similar to study conducted in Ethiopia (24, 28) and Ghana that shows commitment to use DHIS2 data was directly associated with the day to day managerial supervision one has (P-value = .045) (2).

Our study used a mixed method and gives evidence on commitment level of PMT members’ to use DHIS2 data for decision making and the barriers to use it. However, there are some limitations that should be noted. First, the study was facility based cross sectional study which couldn't tell as the causal inference. Second, the study was conducted at health facilities in one zone and might not be generalizable to all administration of the country.

Conclusion

Level of commitment to use DHIS2 data by PMT members was forty six. Information use, Motivation, Competency in DHIS2 tasks, Health need, Supervision, and Feedback were the most determinant factors for commitment level to use DHIS2 data for decision making. The study has found significant factors that affect PMT members’ level of commitment to the use of DHIS2 data for their decision making. Providing regular supportive supervision and feedback, increasing motivation and changing attitude will help to bring cultural transformation of data use.

Abbreviations
AOR: Adjusted Odds Ratio, CI: Confidence Intervals, DHIS2: District Health Information System 2, FMOH: Federal Ministry of Health, HMIS: Health Management Information Systems, IHME: Institute for Health Metrics and Evaluation, MCH: Maternal and Child Health, PMT: Performance Monitoring Team, PRISM: Performance of Routine Information Systems Management, SDGs: Sustainable Development Goals, WHO: World Health Organization

**Declarations**

**Ethics approval and consent to participate**

The study protocol was reviewed and approved by the ethical review board of University of Gondar and Informed consent was obtained from each study participant. Permission letter also obtained from each Health facilities. Names of participants and other personal identifiers were not included in the data collection tool.

**Consent for publication**

Not applicable.

**Availability of data and materials**

The datasets generated and/or analyzed during the current study will be available upon reasonable request from the corresponding author.

**Competing of interest**

Authors have declared that no conflict of interest has been met.

**Funding**

Not applicable

**Authors’ contributions**

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agreed to be accountable for all aspects of the work.

**Acknowledgements**

The authors would like to thank the University of Gondar institute of public health for the approval of ethical clearance and health facilities and data collectors, supervisors and study participants.
References

1. Cardoso IR. How top-management commitment in information system implementation influences IS usage and benefits achievement? Atas da Conf da Assoc Port Sist Inf. 2014;14(Capsi):174–94.

2. Effah F. Commitment among Senior Managers to the Use of District Health Information Management System 2 Data for Decision Making in Maternal and Neonatal Health in. 2019;(10602635). Available from: http://ugspace.ug.edu.gh/handle/123456789/30846

3. Aqil A, Lippeveld T, Hozumi D. PRISM framework: A paradigm shift for designing, strengthening and evaluating routine health information systems. Health Policy Plan. 2009;24(3):217–28.

4. Corbett J, Mellouli S. Winning the SDG battle in cities: how an integrated information ecosystem can contribute to the achievement of the 2030 sustainable development goals. 2017;(September 2015):427–61.

5. Statement E, Messages K. Enhancing Health Information System for Evidence based decision making in the Health Sector. 2018;

6. Building Resilient and Sustainable Systems for Health (RSSH) Information Note. 2019;(August).

7. Ogega PM. Data use challenges and the potential of live data visualization tools Data use challenges and the potential of live. 2017;

8. Moran AC, Jolivet RR, Chou D, Dalglish SL, Hill K, Ramsey K, et al. A common monitoring framework for ending preventable maternal mortality, 2015 – 2030: phase I of a multi-step process. BMC Pregnancy Childbirth [Internet]. 2016;1–13. Available from: http://dx.doi.org/10.1186/s12884-016-1035-4

9. WHO - A commitment to improve global health information.

10. WHO-IHME MoU_052218.pdf.

11. Khan SI, Hoque A, Ullah M. National Health Data Warehouse Bangladesh for Remote Health Monitoring: Features, Problems and Privacy Issues. Remote Heal Monit Work. 2016;

12. Kayode GA, Amoakoh-Coleman M, Brown-Davies C, Grobbee DE, Agyepong IA, Ansah E, et al. Quantifying the validity of routine neonatal healthcare data in the Greater Accra Region, Ghana. PLoS One. 2014;9(8).

13. Mutale W, Chintu N, Amoroso C, Awoonor-Williams K, Phillips J, Baynes C, et al. Improving health information systems for decision making across five sub-Saharan African countries: Implementation strategies from the African Health Initiative. BMC Health Serv Res. 2013;13(SUPPL.2):1–12.

14. Muhindo R, Joloba EN, Nakanjako D. Review of Public Administration and Management Health Management Information System (HMIS); Whose Data is it Anyway? Contextual Challenges. 4(2).

15. J.K. A-W, A.A. B, F.K. N, R. A, A. OOO, A. OOO, et al. The Ghana essential health interventions program: A plausibility trial of the impact of health systems strengthening on maternal & child survival. BMC Health Serv Res [Internet]. 2013;13(SUPPL.2):S3. Available from: http://www.biomedcentral.com/1472-6963/13/S2/S3

16. Tull K. Designing and Implementing Health Management Information Systems. 2018;
17. Bhattacharyya S, Berhanu D, Tadesse N, Srivastava A, Wickremasinghe D, Schellenberg J, et al. District decision-making for health in low-income settings: A case study of the potential of public and private sector data in India and Ethiopia. Health Policy Plan. 2016;31:ii 25–34.

18. Raeisi AR, Saghaeian Nejad S, Karimi S, Ehteshami A, Kasaei M. District health information system assessment: A case study in Iran. Acta Inform Medica. 2013;21(1):30–5.

19. Workshop N, Action H, August PD, Hotel C, Ababa A. Information Revolution. 2016;

20. Okyere Boadu R, Adzakpah G, Agyei-Baffour P. The Role of Quality Improvement Process in Improving the Culture of Information among Health Staff in Ghana. Adv Public Heal. 2019;2019:1–9.

21. Article O. Hospital managers’ attitude and commitment toward electronic medical records system in Isfahan hospitals. 2017;

22. ASSESSMENT OF THE ROUTINE HEALTH MANAGEMENT INFORMATION SYSTEM IN NIGER STATE, FEDERAL REPUBLIC OF NIGERIA. 2012;(September).

23. Europe WHO/RO for. Support Tool. 2015;(Lc):3–5.

24. Zone H, Id HW, Woldie M, Melese D, Lolaso T, Balcha B. Utilization of routine health information and associated factors among health workers in. 2020;1–11. Available from: http://dx.doi.org/10.1371/journal.pone.0233092

25. Peter Mugendi N. Factors Influencing Utilization of Routine Health Data in Evidence Based Decision Making in HIV/AIDS Services By Public Health Facilities in Nakuru County. Imp J Interdiscip Res [Internet]. 2015;58(3):538–545. Available from: http://erepository.uonbi.ac.ke:8080/xmlui/bitstream/handle/11295/90875/Njoka_Factors Influencing Utilization Of Routine Health Data In Evidence Based Decision Making In HIVAIDS Services By Public Health Facilities In Nakuru County.pdf?sequence=3&isAllowed

26. University of Ghana http://ugspace.ug.edu.gh SCHOOL OF PUBLIC HEALTH COLLEGE OF HEALTH SCIENCES UNIVERSITY OF GHANA, LEGON USE OF AGGREGATE DATA FOR HEALTH DECISION MAKING AT DISTRICT LEVEL: CASE STUDY OF GA WEST MUNICIPALITY OF THE GREATER ACCRA REGION. 2019;(10305304).

27. Nicholas S. FACTORS INFLUENCING PERFORMANCE OF ROUTINE HEALTH INFORMATION SYSTEM: THE CASE OF GARISSA SUBCOUNTY, KENYA. 2017;

28. Teklegiorgis K, Tadesse K, Mirutse G, Terefe W. Level of data quality from Health Management Information Systems in a resource limited setting and its associated factors, eastern Ethiopia. SA J Inf Manag. 2016;18(1):1–8.

29. Amaniampong RO, Agyei-baffour P, Hospital SDA, Box PO, Asamang A-. Knowledge of Health Information for Healthcare Decision Making: A Cross Sectional Study of Health Staff in Kumasi. 2017;40(September 2011):30–7.

30. Kuyo RO. Use of district health information system data to facilitate decision making in Uasin-gishu sub county hospitals, Kenya. KeMU; 2019.