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MINISTRY OF HEALTH - ETHIOPIA



# Data Use Partnership (DUP)

## Doris Duke Charitable Foundation

### Supported Research Abstract

### Booklet 2024

March 2024  
Addis Ababa, Ethiopia

# Data Use Partnership (DUP)

Doris Duke Charitable Foundation

Supported Research Abstract Booklet 2024



**Editors:**

- Wubshet Denboba
- Dr. Abebaw Gebeyehu
- Dr. Asmamaw Atnafu

**Note:** **P** stands for Published abstract, and **U** stands for unpublished abstracts.

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## Acronyms

<b>AAU</b>	Addis Ababa University
<b>AAU-CMHS</b>	Addis Ababa University, College of Medicine and Health Sciences
<b>ARM</b>	Annual Review Meeting
<b>BMGF</b>	Bill & Melinda Gates Foundation
<b>CBMP</b>	Capacity Building and Mentorship Program
<b>CHIS</b>	Community Health Information System
<b>DDCF</b>	Doris Duke Charitable Foundation
<b>DHIS2</b>	District Health Information software, version 2
<b>DUP</b>	Data Use Partnership
<b>eCHIS</b>	Electronic Community Health Information System
<b>EMR</b>	Electronic Medical record
<b>FGD-ECR</b>	Focus, Gap analysis based on standards, Develop action Plan Execute and evaluate, Cascade the change, and Recognize and reward.
<b>HIS</b>	Health Information System
<b>HU-CSH</b>	Hawassa University College of Health Sciences
<b>HrU-CMHS</b>	Haromaya University, College of Medicine and Health Sciences
<b>HU-CMHS</b>	Hawassa University, College of Medicine and Health Sciences
<b>IR</b>	Information Revolution
<b>JU-IH</b>	Jimma University, Institute of Health
<b>JSI</b>	JSI Research & Training Institute, Inc.
<b>MOH</b>	Ministry of Health
<b>MRU</b>	Medical Record Unit
<b>PRISM</b>	Performance of Routine Information System management
<b>UoG-CMHS</b>	University of Gondar, College of Medicine and Health Sciences
<b>UTAUT2</b>	Unified theory of acceptance and use technology 2

## Preface

JSI has been working in Ethiopia for more than 25 years and implementing over 60 projects related to health system strengthening and service provision. One of its engagements was generating evidence which has significant contribution in different health policy decisions. JSI-DUP, through the supports of DDCF, did capacity building activities that promote the growth of expertise among researchers and implementers. This empowers them to contribute to and benefit from health system research. DUP has allocated a significant number of resources towards Health Information System (HIS) related activities, with the aim of generating scientific evidence to support the health system in general, and HIS in particular.

Through collaborative efforts with key stakeholders such as the Ministry of Health, Regional Health Bureau, and esteemed academic institutions, including CBMP universities, DDCF has fostered the generation of rich evidence, documentation, and publications. This evidence provides valuable insights into the effective implementation of HIS interventions, utilizing varied modalities to address the unique healthcare challenges faced by communities.

DUP's commitment to research and learning extends across various domains, including implementation research, operational research, support for postgraduate student research, and evaluation of health information system effectiveness. This abstract booklet includes more than 80 research abstracts from CBMP universities and DUP head office. Each abstract represents DUP's collective dedication to advancing healthcare outcomes and building a healthier future for all. I would like to extend my heartfelt gratitude to all those who have contributed to these endeavors.

Looking forward to see you all at the closing ceremony!

### **Wubshet Denboba**

DUP, JSI, Project Director  
Addis Ababa, Ethiopia





# 1. Addis Ababa University College of Medicine and Health Sciences (AAU-CMHS)

## 1.1. AAU-CMHS 01P: Assessment of routine health information utilization and associated factors among Health Professionals in Public Health Centers of Addis Ababa, Ethiopia.

Meskerem Mengistu, Girma Taye, Wondimu Ayele, Tigist Habtamu, Ephrem Biruk.

Ethiop. J. Health Dev.2021; 35(SI-1)/ Vol. 35 No. 1 (2021): Special Issue

### Abstract

**Background:** - RHIS is an integrated approach combining people, processes, and technology to provide relevant information for efficiently managing healthcare operations. Healthcare providers must document, analyze, and improve healthcare services' quality, coverage, and continuity. Unfortunately, in Ethiopia, the use of routine health information among health professionals is weak. Therefore, this study aims to evaluate its use and identify key factors influencing it.

**Method:** In March-April 2020, a facility-based cross-sectional study was conducted among 408 health professionals in 22 public health centers. Data was collected using a semi-structured questionnaire and an observational checklist, entered into EpiData version 3.1 and analyzed in SPSS version 20. Stepwise regression was used to select variables for multiple logistic regression analysis, with variables having a p-value of less than 0.05 considered statistically significant factors for using RHIS.

**Result:** In this study, the Routine health information utilization rate among health professionals was 37.3% (95% CI: 32.6%, 42.1%). The findings also showed a significant positive association between routine health information utilization and health professionals who use of Both manual and computer-based files (AOR = 1.474, 95 % CI =1.043-2.082); Organizational rules, values, and practices (AOR = 1.734, 95 % CI =1.212-2.481); Human resource (AOR = 1.494, 95 % CI = 1.056-2.114); Had problem-solving skill on HIS tasks (AOR = 2.091, 95 % CI = 1.343-3.256); Professional who believe that routine health information use is important (AOR = .665, 95 % CI = .501- .883); Planning and monitoring practice (AOR = 1.464 95% CI (1.006-2.131)) and Knowing duties and responsibilities (AOR = 1.525, 95 % CI = 1.121-2.073)

**Conclusion and Recommendations:** Health professionals' health information utilization status in Addis Ababa was low. Use of recording information; Organizational rules, values, and practices; Inadequate Human resource; Problem-solving skill of health professionals on HIS tasks; Professionals who believe that routine health information use is essential; the Collected information used for planning, monitoring, and evaluation of facility performance; and Staff know their duties and responsibilities in their workplace were found significantly associated with routine health information use. Thus, significant improvements must be made in equipping health professionals to utilize their information by improving the healthcare system's key findings/factors. Health professionals also have to use routine health information for evidence-based decision-making in health facilities to achieve a better quality of healthcare system implementation. [Ethiop. J. Health Dev. 2021; 35(SI-1):05-14].

**Keywords:** Routine Health Information Utilization, Health centers, Health professionals, Information Use, healthcare data

## 1.2. AAU-CMHS02P: A mixed-methods assessment of Routine Health Information System (RHIS) Data Quality and Factors Affecting it, Addis Ababa City Administration, Ethiopia, 2020.

Biniyam Haftu, Girma Taye, Wondimu Ayele, Tigist Habtamu, Ephrem Biruk.

Ethiop. J. Health Dev.2021; 35(SI-1)/ Vol. 35 No. 1 (2021): Special Issue

### Abstract

**Background:** Effective and efficient healthcare services need evidence-based decisions that rely on information from high-quality data. However, despite many efforts, routine health data is still claimed to be not at the required level of quality. Previous studies have primarily focused on organization-related factors, while little emphasis was given to the perception and knowledge of service providers' gaps. Therefore, this study aims to evaluate the quality of data generated from routine health information systems and factors contributing to data quality from diverse aspects.

**Objective:** This study aims to assess the quality of routine health information system data generated from health facilities in Addis Ababa city administration, provide the level of data quality of the routine health information system, and examine factors affecting it.

**Method:** A cross-sectional study was conducted on 568 health professionals from 33 health centers selected randomly using a two-stage sampling method. A qualitative study was also conducted using 12 key informants.

**Result:** The overall regional data quality level was 76.22%. Health professionals' motivation towards routine health care data has shown a strong association with data quality ( $r(31) = .71, p < .001$ ). Lack of adequate Health information system task competence, non-functional PMT, and lack of supervision were also commonly reported reasons for poor data quality.

**Conclusion:** This review has documented the data quality of routine health information systems from health centers in Addis Ababa city. Overall data quality (76.22%) was found to be below the national expectation level, which is 90%. The study emphasized the role of behavioral factors in improving the quality of routine healthcare data. [Ethiop. J. Health Dev. 2021; 35(SI-1): 15-24 ]

**Keywords:** RHIS, Accuracy, completeness, timeliness, consistency, Addis Ababa

### 1.3. AAU-CMHS03P: Electronic Medical Record Utilization, Determinant Factors and Barriers Among Healthcare Providers at Selected Health Facilities in Addis Ababa, Ethiopia

Gebretsadik Keleb, Girma Taye, Wondimu Ayele, Berhan Tassew, Ephrem Biruk, Tigist Habtamu, Daniel Getachew, Mesfin Addise.

**Electronic Medical Record Utilization, Determinant Factors and Barriers Among healthcare Providers at Selected Health Facilities in Addis Ababa, Ethiopia | Ethiopian Journal of Health Development (ajol.info)**

#### Abstract

**Background:** Electronic medical records (EMR) is a longitudinal collection of patient information that can be created and managed by authorized clinicians. In developing nations, the adoption of EMR is extremely slow, and the fundamental barriers are not addressed. Despite the effort to digitize the health system in Ethiopia, evidence shows that the progress of utilizing EMR is plodding, with only limited individuals utilizing the system over ten years since its inception. Therefore, this study aims to assess the utilization of EMR and its determinants among healthcare providers in Addis Ababa.

**Method:** A mixed study was conducted, enrolling 367 healthcare providers and 12 key informants at selected health facilities in Addis Ababa from May to August 2020. A multi-stage sampling technique was used to identify participants. STATA version 15 was used to analyze quantitative data, while Atlas.ti was used to manage qualitative data. Descriptive statistical summary measures were used to describe variables. Stepwise logistic regression was used to select variables. Variables with a p-value of less than 0.05 in the multivariable logistic regression model were considered statistically significant.

**Result:** A total of 353 respondents, mainly nurses (48.2%) and physicians (11.6%), were enrolled, yielding a response rate of 96.2%. The overall rate of EMR utilization was 68.5% (95% CI = 63.7, 73.4). EMR utilization was significantly associated with access to EMR training (AOR, 5.8; 95% CI = 1.6, 20.7), age (AOR, 0.37; 95% CI = 0.1, 0.9), type of health institution (AOR, 7.17, 95 % CI=3.2, 16.2), being pharmacists (AOR=9.61, 95% CI=1.97, 46.8) and having a favorable attitude (AOR, 2.3; 95% CI = 1.2, 4.5). On the other hand, qualitative exploration revealed that power fluctuation, shortage of EMR administrators, absences of guidelines, and vendor phase-out were hindering the utilization of EMR.

**Conclusion:** EMR utilization was found to be relatively low, owing to a lack of EMR training, age, being a pharmacist, the attitude of healthcare professionals, and the type of health institution. The absence of clear EMR guidelines, vendor phase-out, and power fluctuation hinder EMR utilization and need intervention. We recommend periodic training, deploying EMR admins, and making the EMR interface friendly. Furthermore, a strict binding agreement and clear phase-out strategy with EMR vendors are recommended.

#### 1.4. AAU-CMHS 04P: Routine Health Information Utilization and Associated Factors among Public Health Center Managers in Addis Ababa, Ethiopia: A Cross-Sectional Study.

Alem Sebsbie, Mesfin Addise, Mengistu Yilma, Ephrem Biruk, Adiam Nega, Tamiru Demeke, Girma Taye.

**Routine Health Information Utilization and Associated Factors among Public Health Center Managers in Addis Ababa, Ethiopia: A Cross-Sectional Study.** | [Ethiopian Journal of Health Development \(ajol.info\)](http://Ethiopian Journal of Health Development (ajol.info))

##### Abstract

**Background:** In many low—and middle-income countries (LMIC), the use of routine health information systems (RHIS) for decision-making remains unsatisfactory. Conversely, evidence regarding the level and factors associated with the use and non-use of RHIS is limited. Therefore, this study aimed to assess the level and factors associated with RHIS utilization among public health centers in Addis Ababa.

**Methods:** An institution-based cross-sectional study was conducted in 49 randomly selected public health centers from August to September 2020. A simple random sampling technique was used to identify study participants (health managers). A self-administered structured questionnaire was used to collect data. EPI-info version 7 and SPSS version 20 software were used for data entry and analysis. A binary logistic regression model was fitted to identify factors associated with RHIS. Variables having a p-value of less than 0.05 in the multivariable analysis were considered statistically significant.

**Results:** The overall utilization rate of RHIS among health center managers was 66.6%. Use of computer software for data analysis (AOR = 3.76, 95% CI; 1.84–7.65), data analysis and interpretation training (AOR = 3.03, 95% CI; 1.31–6.99), supervisory visit feedback (AOR = 3.07, 95% CI; 1.34–7.02), and information utilization culture (AOR = 2.16, 95% CI; 1.11–4.21) were significantly associated with routine health information utilization.

**Conclusions:** The rate of RHIS utilization is low when compared to the national target and other data in the region. To boost RHIS utilization, stakeholders could promote the use of computer tools for data analysis, train health professionals in data analysis and interpretation, and provide written feedback. [Ethiop. J. Health Dev. 2022;36 (SI-1)]

**Keywords:** Routine Health Information System, Health Information Utilization, Health Center, Addis Ababa.

## 1.5. AAU-CMHS 01U: Design Considerations for Mobile Application to Address Non-adherence of Cardiovascular Disease Patients

Dagmawit Mohammed, Rahel Bekele (PhD), Girma Taye (PhD)

### Abstract

Cardiovascular disease (CVD) patients are facing many challenges; one of the main challenges is errors happening in the medication stages. In addition to health professionals' mistakes, errors committed by patients such as non-adherence are threatening patient safety. CVD patients do not adhere to instructions due to a lack of medication knowledge; lack of patient-centered information from HPs; verbal and written information provided to the patient; forgetfulness; involvement of more than two caregivers to treat one patient; and management of more than two drugs. In light of this gap, the overall objective of this work is to specify design considerations for the mobile application to be designed in order to address non-adherence of CVD patients. This research followed a design science research methodology, by adopting (Peppers et al., 2007) process model. Amharic or English speaker outpatients at Tikur Anbessa Specialized Hospital cardiology unit were the target population. The sample was taken from them using a convenience sampling method. Data was collected using interviews and document review, which is followed by data analysis using the thematic analysis method. After identifying the existence of the problem in the study area, the objectives of the solution were well specified. Then, a solution was designed to meet the objectives. Design considerations were mapped from the data analysis result. The design and development stages were conducted following a participatory approach and using tools. After this, the artifact was iteratively demonstrated. Then, it was evaluated by both the researcher and end-users. The evaluation result indicated 85.667% usability scoring, and this shows a higher usability result. Finally, the study addressed the research questions and met the objective. The major limitations were the study was limited to Tikur Anbessa Specialized Hospital, and the application, and its content were designed in the Amharic language. As a way forward, this study indicated conducting the study in different areas and considering more language options.

**Keywords:** Cardiovascular, Patient, Non-Adherence, Medication, Mobile Application

## 1.6. AAU-CMHS 02U: Gap Analysis in Service Quality at Oncology Center of Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2022

Girmachew Admasu, Mesfin Addise, Adiam Nega, Awgichew Kifle, Amanuel Yosef

### ABSTRACT

**Background:** Some studies in Ethiopia measured service quality in cancer and non-cancer settings. However, these studies measured patient perceptions only, missing out on their expectations or the gap analysis between clients' expectations and perceptions. Therefore, this study aims to measure the gap between cancer patients' expectations of oncology service and perceptions of the actual service.

**Objective:** To assess the level of the gap in service quality at the oncology center of Tikur Anbessa Specialized Hospital, Addis Ababa, 2022

**Methodology:** An institutional-based quantitative cross-sectional study design was conducted from March to April 2022 on a sample of 256 hospitalized cancer patients. Simple random sampling was used to select the study samples. Pre-tested and structured questionnaire based on the SERVQUAL tool was used to collect the data. The paired Wilcoxon test and Kruskal-Wallis tests were used to determine statistically significant differences between expectation and perception and to quantify the strength of association between the independent and dependent variables, respectively. Principal Component Analysis was used to identify important service quality dimensions and key service quality constructs.

**Result:** Among a total of 256 study participants, the majority were female (55.5%) and the median age was 49 years. A significant proportion of patients were treated for gynecological malignancy (43%) and most received chemotherapy only (37.1%). The overall mean level of gap score ( $\pm$ SD) in service quality at the oncology center of Tikur Anbessa Specialized Hospital became  $-1.41(\pm 0.41)$ . The majority of the gap (52.4%) in service quality was explained by the dimensions of Tangibility, Assurance, and Reliability. Gender, educational status, type, and stage of cancer showed significant association with the level of gap in service quality.

**Conclusion and recommendation:** Patient perceptions were lower than their expectations in all service quality dimensions at the oncology center of Tikur Anbessa Specialized Hospital, creating a negative gap in service quality. Therefore, the hospital and other stakeholders should strive to exceed patient expectations and overall quality of care.

**Keywords:** Cancer, Service quality, SERVQUAL, Ethiopia.

## 1.7. AAU-CMHS 03U: Knowledge and Attitude of health professionals towards Health Information system utilization at selected health facilities in Addis Ababa, Ethiopia.

Deborah Endrias, Dr. Girma Taye, Dr. Adugnaw Birhane

### Abstract

**Background:** As stated by the WHO, health information is a system designed for the collection, processing, use, and dissemination of health and health-related data with the goal of improving health outcomes. Though using health information systems is related to higher quality of service, cost reduction, and assuring patient safety, more than half of medical information systems are not used. Studies show that data management and utilization are poor in Ethiopia even though using the same data entry and management tools.

**Objective:** to identify the relationship that exists between the Knowledge and attitude of health professionals and Health Information system utilization at selected health facilities in Addis Ababa, Ethiopia, 2021.

**Method:** The study used a mixed method with a convergent parallel design to examine the relationship between health professionals' knowledge, attitude, and Health Information System utilization. Data was collected through questionnaires and in-depth interviews in various study areas. Numeric data was presented descriptively, and qualitative data was coded and analyzed using an open-code approach.

**Result:** From the 506 respondents 58.1% of them had poor knowledge (41.9%) had good knowledge. According to the multivariable analysis, field of medical training ( $P=0.003$ ), year of employment/experience, perceived self-efficacy towards performing HMIS tasks, and problem-solving skills were found to be statistically significant with the knowledge of participants toward the HMIS.

**Conclusion:** The study conducted in selected health facilities in Addis Ababa, Ethiopia in 2020 aimed to assess the knowledge and attitude of health professionals about the health information system (HMIS). The results of the study showed that the overall knowledge of the respondents was low in regards to the HMIS. Additionally, the study indicated that as the number of years of employment increased, so did the knowledge of the professionals regarding the HMIS. Furthermore, the study also revealed that those who scored low on the knowledge score also had low problem-solving skills. Therefore, it is crucial to focus on increasing health professionals' motivation to perform their tasks related to the HMIS and provide feedback to the facilities concerning the health information system.



## 1.8. AAU-CMHS 04U: Tracer Study of Health Informatics Graduates at Addis Ababa University 2010-2017: the effectiveness of the Health Informatics Master's program curriculum and its relevance to the graduates' skills development.

Tigist Habtamu, Wondimu Ayele, Epherm Biruk, Girma Taye, Berhan Tassew, Adiam Nega

### **Abstract:**

**Background:** The purpose of this tracer study is to re-initiate the health informatics master's training program to fill the high demand for a health information system workforce in the country. To improve the quality of data and information used in healthcare it is essential to develop the workforce, knowledge, and skill of professionals are the determinant factor to have quality data and information for decision making. The health informatics field of study is expected to include the interdisciplinary study of the application of technology and knowledge to strengthen the health information system in the country using adequate numbers and motivated and skilled human resources trained with the subject matter.

**Objectives:** This paper aims to identify the effectiveness of the Health Informatics master's program curriculum and its relevance to the graduates' skills development.

**Methods:** A cross-sectional study design was used to trace the status of Health informatics graduates of Addis Ababa University who completed their studies between 2010 and 2017. The data was collected via an online survey using Google Forms, then cleaned and summarized using SPSS.

**Results:** The respondents were not happy with the skills and knowledge that they acquired from the department and they suggested that course content should be developed by considering the current health sector demand in the country.

**Conclusion:** The study points to the inadequacy of the curriculum and the need for a content review to align with the job market, which requires basic ICT application and health sector knowledge.

**Keywords:** Tracer study, Health Informatics

## 1.9. AAU-CMHS 05U: Improving Outpatient and Inpatient Medical Recording Data Quality in Yerer General Hospital, 2021

Hanna Aboye, Mesfin Addise, Adiam Nega, Wondimu Ayele, Girma Taye, Epherm Biruk, Tigist Habtamu

### ABSTRACT

**Background:** Medical recording is an essential part of information use, dissemination, decision-making for the health needs of the community health care system, and quality service delivery. The medical recording quality is a serious issue to be addressed, especially in Africa which has been measured using different data quality dimensions, and the percentage result is below standard. In Ethiopia, the Ministry of Health (MoH) has focused on the information revolution, setting a five-year transformation plan, and has developed tools for a standard of data quality measurement. Those tools are used to measure the medical recording data quality in Yerer General Hospital for selected dimensions.

**Objective:** To improve medical recording of outpatient and inpatient data quality in Yerer General Hospital by the end of 2021 EC

**Method:** It is a pre-post-study; we carried out an intervention with baseline assessment using an infinite sample size calculation and proportional simple random sampling of cards which was admitted to the hospital between the end of 2018 and the end of 2019 time frame, and post-intervention was in 2021 January to measure the improvement. After the intervention, a finite population sample size was used and a proportional random sampling method was applied for those admitted from January 21 to February 21 2021.

**Result:** Training on health management information systems was given as an intervention after the pre-intervention result was observed. The total completeness of outpatient and inpatient MR was 79.12% and 51.59%, respectively. On post-intervention results, it decreased to 57% and 41%, respectively. Pre-intervention total accuracy of outpatient and inpatient MR was 63.6% and 55.7%, respectively. On post-intervention results, it increased to 80.73% and 81.67%, respectively. The timelessness has improved. The cards are returned to the medical recording room 24 hours after the intervention.

**Conclusion and recommendation:** The intervention has improved Total accuracy and timeliness but decreased the score of Total completeness of medical recording in Yerer General Hospital. Thus, continued training and follow-up are required to strengthen the data quality.

**Keywords:** Data quality, Completeness, Accuracy, Timelessness and Medical Recording

## 1.10. AAU-CMHS 06U: Utilization of District Health Information For Decision Making And Its Associated Factors Among Case Team Heads In Selected Public Health Institutions Of Addis Ababa City Administration, Ethiopia.

Belay Fanta Duressa, Dr. Girma Taye (Msc, Ph.D. Associate Professor), Mr. Wondimu Ayele (Msc, Ph.D. Fellow).

### Abstract

**Background:** The district health information system is critical in supporting evidence-based decision-making for all system pillars. These systems are available and in use in public health institutions of Addis Ababa City Administration; however, health workers do not fully utilize district health information for decision-making.

**Aim:** The study aimed to assess the utilization of district health information for decision-making and its associated factors among case team heads in selected public health institutions of Addis Ababa City Administration, Ethiopia, from February to April 2020.

**Method:** A cross-sectional study design was conducted using a quantitative approach. A pre-tested and standard PRISM tool was administered to collect quantitative data from 240 case team heads in 23 selected health institutions. Logistic regression was used to assess factors associated with outcome variables, and findings were reported using crude and adjusted odds ratios and the corresponding 95% confidence interval.

**Result:** 234 case team heads participated in the study with a response rate of 97%. Out of the total, 55.1% were females. Over the proportion of utilization of district health information among case team heads in health institutions was about 41.5% (95%CI: 35.09-47.81). Among other factors ICT infrastructure (AOR 5.03, 95% CI 4.02-9.67), financial support (AOR 5.68, 95% CI 9.84-15.39), access of training (AOR 3.64 95% CI 4.75-7.28), supportive supervision (AOR 2.50, 95% CI 1.23-3.16), were significantly associated utilization of DHIS2 data.

**Conclusion and recommendation:** Generally, this study revealed poor utilization of district health information among the case team heads in health institutions. Inadequate ICT infrastructure, poor supportive supervision, shortage of financial support, and training gaps among the users, reduced the utilization of district health information.

**Key Words:** Health information systems, utilization of DHIS, DHIS2 software

## 1.11. AAU-CMHS 07U: Assessment of Data Quality in Addis Ababa Population Based Cancer Registry, Addis Ababa, Ethiopia, 2019/20.

Shibabaw Yirsaw

### Abstract

**Background:** Population-based cancer registries systematically collect information on all new cancer cases in a defined geographic area. The value of cancer registries is highly dependant on the quality of the data that they collect, but the level of data quality for the population-based cancer registry in Addis Ababa was not evaluated and well understood.

**Aim:** This study aimed to assess the data quality status and gaps in Addis Ababa population-based cancer registry.

**Methods:** Convergent parallel mixed study design; comparability, completeness, validity, and timeliness with key informant interviews were used. Cancer cases registered from 2012 to 2016 were included. Polynomial and linear regression, one-way ANOVA, and non-parametric tests were performed using SPSS.

**Results:** Coding and classification in the registry agreed with international agreements. There was variability in annual trends in ASR and age-specific incidence curves for both sexes. Childhood incidence rate per 100,000 for males 0-4 and females in age groups 5-9 and 10-14 were below the world reference. MV% was 87.2% among males and 90.2% among females. DCO was 0.11% in males, and 0.14% in females. The overall proportion of other and unspecified cases was 2.6%. The meantime between identification ad registrations of cases was 92 days.

**CONCLUSION:** The AACCR was comparable in using international agreements, there was a reasonably high level of validity in the registry, with the variability of completeness and delay registration. Budget and ownership were major gaps identified.

**Key Words:** Cancer Registry, Data Quality, Comparability, Completeness, Validity, Timeliness



## 2. Haramaya University College of Medicine and Health Sciences (HrU-CMHS).

### 2.1. HrU-CMHS01P: Experiences, barriers, and facilitators of health data use among performance monitoring teams (PMT) of health facilities in Eastern Ethiopia: A qualitative study.

Admas Abera, Abebe Tolera, Biruk Shalmeno Tusa, Adisu Birhanu, Weldesenbet, Assefa Tola, Tilahun Shiferaw, Alemayehu Girma, Rania Mohammed, Yadeta Dessie

<https://pubmed.ncbi.nlm.nih.gov/37167309/>

#### Abstract

#### Background

Routine health data is crucial in decision-making and improved health outcomes. Despite the significant investments in improving Ethiopia's Performance Monitoring Team (PMT), there is limited evidence on the involvement, implementation strategies, and facilitators and barriers to data utilization by these teams responding to present and emerging health challenges. Therefore, this study aimed to explore the PMT experiences, facilitators, and barriers to information use in healthcare facilities in Eastern Ethiopia.

#### Method

This study employed a phenomenological study design using the Consolidated Framework for Implementation Research (CFIR) to identify the most relevant constructs, aiming to describe the data use approaches at six facilities in Dire Dawa and Harari regions in July 2021. Key informant interviews were conducted among 18 purposively selected experts using a semi-structured interview guide. Thematic coding analysis was applied using a partially deductive approach informed by previous studies and an inductive technique with the creation of new emerging themes. Data were analyzed thematically using ATLAS.ti.

#### Results

Study participants felt the primary function of PMT was improving health service delivery. This study also revealed that data quality, performance, service quality, and improvement strategies were among the major focus areas of the PMT. Data use by the PMT was affected by poor data quality, absence of accountability, and lack of recognition for outstanding performance. In addition, the engagement of PMT members on multiple committees negatively impacted data use leading to inadequate follow-up of PMT activities, weariness, and insufficient time to complete responsibilities.

#### Conclusion

Performance monitoring teams in the health facilities were established and functioning according to the national standard. However, barriers to operative data use included PMT engagement with multiple committees, poor data quality, lack of accountability, and poor documentation practices. Addressing the potential barriers by leveraging the PMT and existing structures have the potential to improve data use and health service performance.

## 2.2. HrU-CMHS02P: Health workers with good self-perceived competency have lower actual competency levels on HIS in Eastern Ethiopia: A cross-sectional study.

Admas Abera, Biruk Shalmeno, Adisu Birhanu Weldesenbet, Tilahun Shiferaw, Abebe Tolera, Alemayehu Girma, Rania Mohammed, Mohammed Ahmed, Yadeta Dessie.

<https://www.ajol.info/index.php/ejhd/article/view/245133>

### Abstract

**Introduction:** Utilization of health information is critical to meeting service performance goals and making informed decisions. However, in resource limited countries, health data is rarely used in decisions around program improvements. This study aimed to assess the determinants of competency levels for health workers who utilized data from health information systems in Eastern Ethiopia.

**Methods:** A cross-sectional study was carried out from April - May 2021 at selected public health facilities in the Dire Dawa City and Harar regions. A total of 129 health professionals were included in the study and simple random sampling techniques were used to select health facilities. Data was collected using face-to-face interviews and competency levels were measured using a tool adapted from the Performance of Routine Information Systems Management (PRISM) framework. STATA version 16 was used for data analysis. A linear regression model was applied to determine the linear relationship between self-perceived competency and the actual competency levels of the healthcare workers. Adjusted beta ( $\beta$ ) along with a 95% confidence interval (CI) was used to measure the strength of the association with a p-value < 0.05.

**Results:** The overall mean for the actual competency levels of health workers who utilized data was 20.45 [95% CI: 16.71, 24.19]. Being head of a hospital/health center ( $\beta$ : 19.24, 95% CI: 4.42, 34.06), perusing HIS training ( $\beta$ : 14.38, 95% CI: 6.10, 22.67) and good perceived competency to perform RHIS tasks ( $\beta$ : -12.96, 95% CI: -25.49, -0.43) were significantly associated with actual competency levels.

**Conclusion:** The Health workers with high perceived competency levels were found to have low competency levels. Health information system-focused training was found to be positively associated with actual competency levels, and being a hospital or health center head was associated negatively with health workers' actual competency levels. This research has found that providing health information system training for health workers could be beneficial. There is also a need for initiatives to enhance competency to improve the health information systems related competency levels and data use.

### 2.3. HrU-CMHS03P: Health Facilities Performance Monitoring Team focused motivation interventions to improve the use of health information for better decision-making: An implementation research study protocol.

Admas Abera, Tilahun Shiferaw, Alemayehu Girma, Rania Mohammed, Mohammed Ahmed, Biruk Shalmeno, Adisu Birhanu Weldesenbet, Abebe Tolera, Yadeta Dessie.

<https://www.ejhd.org/index.php/ejhd/article/view/5374>

#### Abstract

**Background:** In many resource-limited settings, including Ethiopia, data use is a significant challenge in the health sector. The transformation of health data use requires a concerted effort to address barriers linked to technical, behavioral, and organizational factors. Although the importance of data-driven decision-making is recognized, there is a paucity of evidence on effectively achieving this goal. This implementation research, therefore, aims to implement interventions that can enhance the competence and motivation of the Performance Monitoring Team (PMT) to improve the culture of information use among health facilities in the Dire Dawa Administration and Harari regions.

**Methods:** Between January 2021 and February 2022, a quasi-experimental study, including a pre- and post-assessment of data utilization, was conducted at two hospitals and two health facilities in Ethiopia's Dire Dawa and Harari regions. All PMT members at the health facilities were part of the study population. The research was carried out in four phases, with the following approaches: (i) baseline situational analysis and prioritization of HIS issues; (ii) data collection and identification of implementation barriers and facilitators influenced by the Consolidated Framework for Implementation Research (CFIR); (iii) developing and implementing PMT-focused interventions; and (iv) monitoring and evaluating interventions using the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) model. Focused capacity building, best-performer recognition, data-day celebration forums, and PMT motivating interventions were to be improved based on the formative and formative assessments. These will be the implementation strategies. Descriptive and regression analyses, as well as thematic analysis, were used for the quantitative and qualitative studies, respectively. Ethical clearance has been obtained from the Haramaya University College of Health and Medical Sciences, Institutional Health Research Ethics Review Committee (IHRERC).

**Expected Outcomes:** This implementation research is expected to inform the barriers and facilitators of data use among health facilities and its implementation. The interventions proposed are expected to enhance the use of data for informed decision-making. Furthermore, the feasibility, adoption, and maintenance of the intervention strategies are the alternate outcomes of this study.



## 2.4. HrU-CMHS04P: Barriers and Enhancers of Data Quality in Health Sector of Somali Regional State, Eastern Ethiopia

Tesfaye Gobena, Daniel Berhanie, Hirbo Shore, Abera Kenay, Yakob Wondirad, Mohammed Ayanle  
<https://www.ejhd.org/index.php/ejhd/article/view/5562>

### Abstract

**Background:** Health data quality and use remain weak within the health sectors of low and middle-income countries (LMICs). Health data quality is important for improving health management and prevailing practices. However, it is not satisfactory in the health sector of Ethiopia, including in the public health facilities of the Somali Regional State. Thus, this qualitative study aimed to explore the potential barriers and enhancers of health data quality in the health sector of the Somali Regional State, Ethiopia.

**Methods:** A qualitative case study design with an in-depth interview technique was conducted as part of the baseline assessment of implementation research in Jiggiga Woreda of the Somali regional State, Ethiopia. The study was conducted in three randomly selected public health facilities: the Woreda Health Office and the Somali Regional Health Bureau. Data were collected from 17 purposively selected key informants using in-depth interviews and observations of facilities and health administration units. Data were transcribed, coded, and analyzed using thematic content analysis to identify pre-defined themes. Open code version 3.4 was used for coding data and categorizing codes as thematic areas to identify the sector's barriers and enhance data quality.

**Results:** Behavioral and technique-related factors were the most dominant barriers to data quality in the study setting. Of these are low commitment to data recording and compilation, negligence of the workforce on recording, lack and inadequate training on Health Information Systems, low value given to data, and low motivation of the workers. Additionally, a lack of accountability for data recording and documentation, a lack of commitment from the Performance Monitoring Team to regular meetings, and a lack of regular supervision from PMT and immediate supervisors were the main institutional barriers to data quality in the region.

**Conclusions:** Behavioral and technique-related factors were the most dominant barriers to ensuring data quality in the study setting. Thus, the workers should receive tailored training on data recording and documentation, and PMT should continuously provide support and feedback to the workforce. Designing an intervention strategy to intervene in the contextual problems regularly and take immediate corrective action is also relevant.

## 2.5. HrU-CMHS05P: Routine Health Information System Data Quality and Associated Factors in Selected Public Health Facilities of Jigjiga Woreda, Somali Regional State's, Eastern Ethiopia

Tesfaye Gobena, Hirbo Shore, Daniel Berhanie, Abera Kenay, Abera Kenay, Yakob Wondirad, Mohammed Ayanle. <https://ejhd.org/index.php/ejhd/article/view/5375>

### Abstract

**Background:** Health data quality is limited within the health sectors of low- and middle-income countries (LMICs). Although public health decision-making mainly depends on the timely availability of quality data, the quality of health data is not satisfactory in some countries, including the Somali Regional State. Therefore, this baseline assessment aimed to assess the data quality level and its determinants in the Somali Regional State, Ethiopia, public health sector.

**Methods:** A baseline assessment was conducted as part of an implementation research project. The study was conducted in three selected public health facilities of the Jigjiga Woreda, including the Woreda Health Office and the Somali Regional Health Bureau. A total of 179 healthcare workers participated in the survey. Interviewer-guided self-administered, record review, and observation data collection techniques were used for data collection. Data was analyzed using descriptive, bivariate, and multivariate logistic models to identify predictors of data quality. A P-value of 0.05 was used as the statistical significance cut-off point.

**Results:** The overall data accuracy and content completeness in the studied facilities were 88.12% and 75.75%, respectively. Data accuracy was 92.2% in the Karamara Hospital, 83.1% in the Jigjiga Health Center, and 79.8% in the Ayardaga Health Center. Content completeness was 81.6% in the Karamara Hospital, 81.2% in the Jigjiga Health Center, and 69.7% in the Ayardaga Health Center. Their immediate supervisors' data recording value strongly predicted data accuracy for the studied variables in the study setting. The odds of those who felt supervisors did not value data recording had 0.26 times poorer data accuracy than their counterparts (AOR: 0.26, 95%CI: 0.10, 0.66).

**Conclusion:** The accuracy and completeness of health data in Eastern Ethiopia were inadequate. As a result, health workforce immediate supervisors and Performance Monitoring Teams (PMT) should undertake regular and ongoing supervision and provide timely feedback for corrective action. In addition, specialized training in data recording and documentation would be beneficial in bridging the gap between workers' skills.

## 2.6. HrU-CMHS06P: Electronic medical record use and associated factors among healthcare professionals at public health facilities in Dire Dawa, eastern Ethiopia: A mixed-method study

Abebe Tolera , Lamessa Oljira, Tariku Dingeta, Admas Abera and Hirbo Shore Roba

<https://www.frontiersin.org/articles/10.3389/fdgth.2022.935945/full>

**Background:** Despite the significant benefits of digital health technologies (ITs), developing countries are lagging behind their developed counterparts in the adoption of electronic medical records (EMRs) in a healthcare setting. EMRs have long been considered essential elements in improving the quality of healthcare. However, the rate of utilization of EMRs among healthcare providers still remains low, particularly in developing countries. Objective: This study aimed at exploring EMR use and its determinants among healthcare providers at public health facilities in Dire Dawa, eastern Ethiopia. Methods: A quantitative cross-sectional study was conducted among 402 health professionals working at public health facilities supplemented with an exploratory qualitative study in Dire Dawa, Ethiopia. Descriptive summary statistics and binary and multivariable logistic regression analysis were used to explore the determinant factors of EMR use, while qualitative data were thematically analyzed. Results: Overall, about a quarter (26.6%) of health professionals were using electronic medical records. A work experience of 6 years or less [adjusted odds ratio (AOR) = 2.23; 95% confidence interval (CI): [1.15–4.31]], a discussion on EMR (AOR = 14.47; 95% CI: [5.58–7.57]), the presence of an EMR manual (AOR = 3.10; 95% CI: [1.28–7.38]), and a positive attitude toward the EMR system (AOR = 11.15; 95% CI: [4.90–25.36]) and service quality (AOR = 8.02; 95% CI: [4.09–15.72]) were independent determinants of EMR use. Poor collaboration among stakeholders and dependence on the software programs of NGOs were the main challenges cited by key informants. Conclusion: The findings of this study indicate that EMR use by health professionals in the study area is very low. Several organizational, technical, and behavioral factors were identified for this low utilization. Therefore, there is a need to leverage EMRs through continuous technical support and commitment to enhance its use, which has the potential to improve health service performance. Developing locally applicable EMR software should be considered.

**Key words:** electronic medical record use, perceived EMR system quality, public health facilities, eastern Ethiopia, perceived service quality

## 2.7. HrU-CMHS07P: Assessment of quality of routine health information system data and associated factors among departments in public health facilities of Harari region, Ethiopia

Adisu Tafari Shama, Hirbo Shore Roba , Admas Abera Abaerei , Teferi Gebru Gebremeskel and Negga Baraki

<https://bmcmedinformdecismak.biomedcentral.com/articles/10.1186/s12911-021-01651-2>

### Abstract

**Background:** Despite the improvements in the knowledge and understanding of the role of health information in the global health system, the quality of data generated by a routine health information system is still very poor in low and middle-income countries. There is a paucity of studies as to what determines data quality in health facilities in the study area. Therefore, this study was aimed to assess the quality of routine health information system data and associated factors in public health facilities of Harari region, Ethiopia.

**Methods:** A cross-sectional study was conducted in all public health facilities in the Harari region of Ethiopia. The department-level data were collected from respective department heads through document reviews, interviews, and observation checklists. Descriptive statistics were used for data quality, and multivariate logistic regression was run to identify factors influencing data quality. The level of significance was declared at P value <0.05.

**Result:** The study found good-quality data in 51.35% (95% CI 44.6–58.1) of the departments in public health facilities in the Harari Region. Departments found in the health centers were 2.5 times more likely to have good-quality data than those found in the health posts. The presence of trained staff able to fill reporting formats (AOR=2.474; 95% CI 1.124–5.445) and feedback provisions (AOR=3.083; 95% CI 1.549–6.135) were also significantly associated with data quality.

**Conclusion:** The good data quality in the public health facilities was less than the expected national level. Lack of trained personnel able to complete the reporting format and feedback were the factors found to affect data quality. Therefore, training should be provided to increase the knowledge and skills of the health workers. Regular supportive supervision and feedback should also be maintained.

**Keywords:** Data quality, Routine health information system, Health facilities, Departments, Harari region, Ethiopia

## 2.8. HrU-CMHS08P: Utilization of health data and associated factors among department heads in public health facilities in Eastern Ethiopia: A cross-sectional study in Harari region

Adisu Tafari Shama, Admas Abera Abaerei, Dufera Rikitu Terefa, Adisu Ewunetu Desisa, Ebisa Turi

<https://www.sciencedirect.com/science/article/pii/S1386505623002472>

**Introduction:** Even though the information generated by routine health information systems is an essential element in the process of transforming the health sector, the information is systematically under-utilized by the health workers. Hence, this study was aimed to assess the utilization level and associated factors of routine health information system data among department heads in Eastern Ethiopia.

**Methods:** The cross-sectional study design was conducted among heads of departments in the health facilities of Harari region. The source populations and the study populations were all department heads. The data were collected by standardized tools through interviews, observations, and document reviews. The data were entered into Epi Data version 3.1 and then exported to SPSS version 25 for analysis. Multivariable logistic regression was performed to identify the associated factors and P-value < 0.05 was used to declare the statistically significant association.

**Result:** Of the respondents, 51.8 % live in urban, 82.4 % participated in performance review meeting, 61.7 % received feedback, 80.6 % engage in HIS, and 91 % feel responsible to HIS. Routine health information system data utilization among department heads was 177 (79.7 %); 95 % CI: [73.8 %, 84.8 %] in the Harari region. Factors associated with data utilization were urban residence (AOR = 2.891; 95 %CI: 1.147–7.286), getting feedback (AOR = 3.136; 95 %CI: 1.311–7.499), active engagement in health information system activities (AOR = 2.560; 95 %CI: 1.010–6.490), participation in performance review meeting (AOR = 3.847; 95 %CI: 1.563–9.464), and feeling responsibility (AOR = 3.727; 95 %CI: 1.071–12.961). Conclusion: Level of data use in this study was higher than the one in other studies in Ethiopia. Residence, feedback, level of engagement in health information system activities, sense of responsibility towards health information system, and performance review meeting were the determinants of data utilization. Important attention should be given by the officials at various levels to expand the information communication technology infrastructures and strengthen the feedback system.

## 2.9. HrU-CMHS09P: Willingness to Receive mHealth Services Among Patients with Diabetes on Chronic Follow-up in Public Hospitals in Eastern Ethiopia: Multicenter Mixed-Method Study

Dawit Firdisa Admas Abera, Jerman Dereje, Fekede Asefa

<https://www.tandfonline.com/doi/abs/10.2147/DMSO.S428210>

### Abstract

**Background:** Management of diabetes requires a long-term care strategy, including support for adherence to a healthy lifestyle and treatment. Exploring the willingness of patients with diabetes to receive mHealth services is essential for designing efficient and effective services. This study aimed to determine willingness to receive mHealth services and associated factors, as well as explore the barriers to receive mHealth services among patients with diabetes.

**Methods:** A multicenter mixed-method study was employed from September 1 to November 30, 2022. For the quantitative part, a total of 365 patients with diabetes receiving chronic follow-up at three public hospitals were enrolled. Data were gathered using structured questionnaires administered by interviewers, entered into Epi-data version 4.6, and analyzed using Stata version 17. A binary and multivariable logistic regression model was computed to identify the associated factors. For qualitative, eight key informants and seven in-depth interviews were conducted. After verbatim transcription and translation, the data were thematically analyzed using ATLAS.ti V. 7.5.

**Results:** Overall, 77.3% had access to a mobile phone, and 74.5% of them were willing to receive mHealth services. Higher odds of willingness to receive mHealth services were reported among patients with an age below 35 years [AOR = 4.11 (1.15–14.71)], attended formal education [AOR = 2.63 (1.19–5.77)], without comorbidity [AOR = 3.6 (1.54–8.41)], <1-hour travel to reach a health facility [AOR = 3.57 (1.03–12.36)], answered unknown calls [AOR = 2.3 (1.04–5.13)], and were satisfied with health-care provider service [AOR = 2.44 (1.04–5.72)]. In the qualitative part, infrastructure, health facilities, socioeconomic factors, and patients' behavioral factors were major identified barriers to receiving mHealth services.

**Conclusion:** In this study, the willingness to receive mHealth services for those who have access to mobile phones increased. Additionally, the study highlighted common barriers to receiving mHealth services.

**Keywords:** willingness, mHealth, mobile phone, diabetes, mixed method, eastern Ethiopia

## 2.10. HrU-CMHS10P: Level of implementation of district health information system 2 at public health facilities in Eastern Ethiopia.

Merkineh Mekebo, Tesfaye Gobena, Behailu Hawulte, Dawit Tamiru, Adera Debella, Elias Yadeta, and Addis Eyeberu

<https://journals.sagepub.com/doi/abs/10.1177/20552076221131151>

### Abstract

**Objective;** the major aim of this study was to assess the level of District health information system 2 (DHIS 2) implementation in the public health facilities (HFs) in Dire Dawa City Administration.

**Methods:** this study was employed both quantitative (cross-sectional) and qualitative (phenomenological) study designs. All public HFs found in Dire Dawa City Administration and health workers were participated in the study. Quantitative data were collected using a pre-tested, structured, self-administered questionnaire. The collected data were entered into Epi-Data and analyzed using STATA version 14 software. A descriptive summary was computed using proportion and frequencies. Qualitative data were collected from in-depth interview with key informants (KIs), and the results were then analyzed thematically.

**Results:** the overall implementation level of DHIS 2 was 80%, which shows good implementation. The main difficulties encountered in implementing DHIS 2 were a lack of power backup (64.3%), unreliable internet connectivity (43%), and a lack of training (34.6%). According to an in-depth interview with a 32-year-old professional, "...there is offline and online DHIS 2 software for data collection and reporting that is an opportunity for the health center, but there is a challenge of interruption of electricity lost unsaved data and hinder data to enter and view for making a decision...."

**Conclusion:** the level of DHIS 2 implementation in this study was good compared to other studies in Ethiopia. However, more than half of the HFs require infrastructure maintenance and support.





### 3. Hawassa University College of Medicine and Health Sciences (HU-CMHS).

#### 3.1. HU-CMHS01P: Improving PMT Functionality in Public Health Facilities for Better Utilization of Data: A Qualitative Study in the Sidama Region, Ethiopia

Alemu Tamiso, Hibret Alemu, Hiwot Belay, Abebaw Gebeyehu, Naod Wondirad, Desalegn Tsegaw Betelhem Eshetu, Ayile Lemma, Abera H/Mariam, Afrah Mohammedsanni, Keneni Gutema Negeri  
<https://www.ajol.info/index.php/ejhd/article/view/251149>

#### Abstract

**Introduction:** Although the importance of performance monitoring teams in the Ethiopian healthcare delivery system cannot be overstated, there is a paucity of literature on the enablers and obstacles of PMT functionality. Therefore, the present study aims to explore the facilitators and barriers to PMT functionality in public healthcare delivery systems to improve data quality and information usage in the Sidama Region of southern Ethiopia.

**Methods:** The data were collected through in-depth interviews with experienced, trained health professionals using a qualitative phenomenological research approach. A total of 37 professionals who are working on health information management systems (HIMS) and have first-hand experience were interviewed face-to-face using a semi-structured interview guide. The transcript form of interview data was transcribed first by hand and then into a computer open-code file. Emerging themes were refined twice by engaging additional transdisciplinary team members. Preliminary findings were also validated by workshop participants, who came from the targeted woreda/district and regional health bureaus.

**Results:** The study identified several facilitators and barriers to PMT functionality. The identified key facilitators to be considered are Input and process-related aspects, PMT structure, budgeting and other resources, capacity-building-related aspects, and the availability of PMT guidelines. On the other hand, barriers such as PMT member turnover, a lack of funding and other resources, a lack of PMT guidelines and their supply, a lack of training and other motivating concerns, PMT logbook formats, and a lack of precise appraisal and accountability framework guidelines were noted.

**Conclusion and Recommendations:** Several interfering factors with PMT operations were identified. Creating a sense of data ownership, looking towards strategies to retain workers, improving health information system budgets and supplies, availing of PMT guidelines, modifying logbook forms, and building an accountability framework are essential factors.

**Keywords:** Performance, Monitoring, Team, Functionality

### 3.2. HU-CMHS02P: The influence of the Performance Monitoring Team on the Use of Health Information by Health Facilities at Shabedino and Hawella Districts of Sidama, Ethiopia.

Alemu Tamiso, Betelhem Eshetu, Desalegn Tsegaw, Bezahegn Zerihun, Abera H/Mariam, Ayile Lemma, Naod Wondirad, Mesoud Mohammed, Wubishet Denboba, Hiwot Belay, Afrah Mohammedsanni Omer, Abebaw Gebeyehu, Kenei Ggutema Negeri

<https://www.ajol.info/index.php/ejhd/article/view/245144>

#### Abstract

**Background:** Routine health information system is vital for the decision-making process. However, evidence is critically lacking in many low-income settings, including Ethiopia. Therefore, this study aimed to assess the influence of the performance monitoring team on health facilities' utilization of health information in Shabedino and Hawella Districts, Sidama, Ethiopia.

**Methods:** A facility-based cross-sectional survey was employed in selected public health facilities of Shebedino and Hawella districts, Sidama Regional State, Ethiopia. The data were collected using a pretested, structured, and interviewer-administered questionnaire and an observational checklist. Data were entered into Epi-info version 7 and exported to STATA version 16 for analysis. Average score  $\pm$  standard error with the 95% CI was used to measure performance monitoring function and data utilization status. The performance monitoring function and data utilization status were compared among the 13 health institutions using a scatter plot. Spearman correlation was used to determine the association between PMT function and data utilization level.

**Result:** According to this study, the overall performance monitoring team functionality level was 71% (95%CI; 67%,75%), and the overall data utilization status was 53% (95%CI;48%,58%). The scatter plot showed a positive correlation between performance monitoring team function and data utilization status.

**Conclusion:** According to this survey, the overall data utilization status was low, and the performance monitoring team function slightly affects the utilization of health-related data. Therefore, strong collaborative work/engagement between partners, the Ministry of Health, the regional health bureau, Woreda health offices, and Health facilities must be prioritized to maximize data utilization status through PMT.

### 3.3. HU-CMHS03P: Health professionals' readiness to implement electronic medical recording system and associated factors in public general hospitals of Sidama region, Ethiopia.

Kibruyisfaw Weldeab Abore, Alemu Tamiso Debiso, Betelhem Eshetu Birhanu, Bezahegn Zerihun Bua, Kenehi Gutema Negeri.

<https://pubmed.ncbi.nlm.nih.gov/36256669/>

#### Abstract

**Background:** Electronic medical recording systems are an information technology that has proven beneficial in improving health service quality. A readiness assessment is recommended before implementing an electronic medical recording system to reduce the probability of failure.

**Objective:** To determine the level of health professional readiness to implement an Electronic medical recording system and associated factors in public general hospitals of the Sidama region in 2022.

**Methodology:** a cross-sectional study design complemented by a qualitative study was employed at three public general hospitals in the Sidama region with a sample of 306 participants. A pretested self-administered questionnaire was used to collect quantitative data, and an in-depth interview was used for the qualitative study. Bivariate and multivariate Binary logistics regression was performed to determine predictors of readiness at  $\alpha = 0.05$ , using an odds ratio and 95% confidence interval. Thematic analysis was done for qualitative data collected through in-depth interviews.

**Result:** The overall readiness for health professionals was 36.5%. Of the study participants, 201 (73.4%) were computer literate, 176(64.23%) had good knowledge, and 204 (74.45%) had a favorable attitude toward EMR. Only 31 participants had previous training (11.3%), while 64 (23%) had previous experience. EMR knowledge (AOR = 3.332; 95%CI: (1.662, 6.682)) and attitude towards electronic medical recording (AOR = 2.432; 95%CI: (1.146, 5.159)) were statistically significant predictors of readiness to implement electronic medical recording. Qualitative analysis has revealed a lack of training, ease of use concerns, information security concerns, and perceived inadequacy of infrastructures, including internet connectivity and electricity, as common barriers to health professional readiness to implement EMR.

**Conclusion:** Health professionals' readiness in this study was low. Before implementing the system, capacity-building efforts to increase their awareness and skills should be made.

### 3.4. HU-CMHS04P: Utilization of HIS Data and Associated Factors at Sidama Regional State, Southern Ethiopia Public Health Facilities- Health Information Utilization at Public Health Facilities.

Tegegn Tesema Leda, Alemu Tamiso Debiso, Akalewold Alemayehu, Keneni Gutema Negeri.

<https://www.ajol.info/index.php/ejhd/article/view/245141>

#### Abstract

**Background:** Health information plays a critical role in supporting evidence-based decision-making for all health system pillars. Although there have been marked improvements recently, routine health information utilization remains low in Ethiopia. Therefore, this study will assess health information systems data utilization and the associated factors in Sidama Regional state, South Ethiopia.

**Methods:** A facility-based cross-sectional study was conducted from December 2019 to December 2020 at public health institutions in the Sidama regional state, Southern Ethiopia. A systematic random sampling technique was used to select the study subjects. Data was collected using a structured, self-administered questionnaire through an interview and an observational checklist. The data were entered into EPIDATA version 3.5.3 and then exported to SPSS version 20 for analysis. Multivariable logistic regression was applied to identify factors associated with utilizing health information systems.

**Results:** The overall HMIS data utilization in the Sidama region was 57.8% (95% CI; 52.92, 62.68). HMIS data utilization was higher in hospitals (90%) than in health centers (48%). Receiving training on health management information systems (AOR =3.49; 95% CI, 1.89-6.70), data completeness (AOR, 2.98; 95% CI, 1.64-5.40), presence of eHMIS/computer (AOR, 2.53; 95% CI, 1.32-4.84), and having regular performance review on data use (AOR, 2.57; 95% CI, 1.43-4.63) were significantly associated with the utilization of health information system data.

**Conclusion:** Overall, HMIS data utilization in the Sidama region was low compared to the national figure. On-job HMIS training, electronic HMIS (eHMIS)/computer, data quality, and regular standard performance reviews were key predictors of good data use practice. Therefore, it is recommended that health staff be trained on data quality and information use and that information technology support be improved to improve data utilization for HMIS.

### 3.5. HU-CMHS05P: Utilization and Predictors of Maternal Health Care Services among Women of Reproductive Age in Hawassa University Health and Demographic Surveillance System Site, South Ethiopia: A Cross-Sectional Study

Elsabet Shudura, Amanuel Yoseph, and Alemu Tamiso

<https://doi.org/10.1155/2020/5865928>

#### Abstract

**Background.** Regular utilization of maternal health care services decreases maternal morbidity and mortality. However, significant predictors that influence the utilization of the existing maternal health care services are complex and differ from place to place. Therefore, assessing these predictors assists health planners in prioritizing promotion strategies and is a fundamental step for intervention. This study assessed the utilization and predictors of maternal healthcare services among women of reproductive age in the Hawassa Health and Demographic Surveillance System site, South Ethiopia, 2019.

**Methods.** A community-based cross-sectional study was conducted among 682 women of reproductive age from January to February in 2019. A two-stage stratified sampling method was utilized. Data were collected using a structured, face-to-face interviewer-administered questionnaire. The data were entered using Epi Data 3.1 and analyzed using SPSS version 20. The variables were entered into the multivariable model using the backward stepwise regression approach. Multivariable logistic regression analysis was used to identify factors associated with utilization of maternal health care. Adjusted odds ratios (AORs) with 95% confidence interval (CI) were computed to assess the presence and strength of associations.

**Result.** The overall utilization of ANC, institutional delivery, and PNC was 69.1, 52.1, and 32.7%, respectively. The odds of utilizing ANC were 4.72 times higher for women with formal education (AOR: 4.72, 95% CI=2.82–7.90) than those without formal education. The odds of utilizing institutional delivery were 5.96 times higher for women with ANC follow-up (AOR: 5.96; 95% CI=3.88–9.18) than those without ANC follow-up. The presence of information about the PNC (AOR: 3.66; 95% CI=2.18–6.14) and the autonomy of a woman to make decisions on health issues (AOR: 6.13, 95% CI=3.86–9.73) were positively associated with utilization of PNC.

**Conclusion.** The utilization of maternal health care services is far below the national target in the study area. Maternal and paternal education status, the woman's autonomy to make decisions on health issues, wealth status, and having a plan for the current pregnancy were significant predictors of maternal health care service utilization. Providing information and training about the model household to the women about maternal health care service utilization using various health education methods should be considered.

### 3.6. HU-CMHS01U: A New Paradigm for Creating Model IR Health Posts, Experience from Hawassa University's CBMP Program using an Extension of FGD-ECR Approach

#### Abstract

**Introduction:** Capacity Building and Mentorship Program (CBMP) is a unique platform between the Ministry of Health (MOH) and six Public Universities in which Hawassa University is the one. The program aims to create model districts and health facilities in the health information system. However, the inclusion of Health Posts (HPs) as model facilities, particularly within the framework of the revised composite index measures is a significant challenge. It is, in fact, highly resource-intensive, demanding a considerable allocation of time, manpower, and financial resources. The conventional approach to this issue, which might involve comprehensive evaluations of all HPs, is not feasible because of the large number of HPs, coupled with the diversity of their needs and the geographical spread, making it unthinkable to cover all HPs using traditional methods. Therefore, we aim to address this gap with evidence based innovative strategies that are less resource-intensive and more scalable, allowing us to effectively include creation of HPs as model facilities in our interventions

**Methods:** An integrated mentorship and training program was implemented in several woredas in Ethiopia to improve the capacity of health posts. The first layer of the program involved intensive mentorship and training for 26 selected health posts, which became model health posts. Changes were cascaded to other health posts using the Health Center-Health Post linkage focal approach, categorizing 78 health posts as the second layer of the first stage. The effectiveness of the program was assessed using paired t-tests for the first layer and the second layer of the first stage, and an independent t-test for the second layer of the second stage. Assumptions of homogeneity of variances and absence of outliers were tested to ensure the validity of the results

**Results:** Findings showed significant improvements in health information system assessment scores. A statistically significant difference was observed in all assessment criteria between pre and post intervention. In the second layer of the first stage, 78 health posts showed significant improvements with the support of the Health Center-Health Post focal persons. Before intervention, the mean score for the structure of health institutions was 9.14, which improved to 24.69 after intervention. Similarly, data quality scores increased from 13.82 to 26.39, and data use scores also improved significantly. Paired t-test results confirmed these improvements, showing significant mean score differences in all assessment criteria ( $P < 0.05$ ).

**Conclusion:** Overall, the program demonstrated a cost-effective method for establishing IR model Health Posts in the selected areas, with potential for scalability.

### 3.7. HU-CMHS02U: Barriers and Facilitators for the Sustainability of HIS change in CBMP-targeted Woredas of Southern Region Ethiopia: A Qualitative Study.

Alemu Tamiso, Betelhem Eshetu, Kenen Gutema, Endrias Markos, Tarekegn Solomon, Frehiwot Atsbeha, Nana Chea, Bezahegn Zerihun, Afrah Mohammed, Abebaw Gebeyew, Gebeyew Dejene, Azeb Hailu, Ayile Lemma.

#### Abstract

**Introduction:** While Ethiopia has made significant strides in implementing Health Information Systems, sustaining these changes presents a challenge. Hawassa University, in partnership with the Ministry of Health and regional health bureau, is actively engaged in capacity-building and implementation science research. Therefore, this study aims to explore barriers and facilitators for the sustainability of changes in Health Information System among Health facilities of capacity building and mentorship program targeted Woredas of Sidama and Southern Nations Nationalities and Peoples Region (SNNPR) in southern Ethiopia.

**Method:** A qualitative phenomenological design was used. Data collection involved key informant interviews and focus group discussions with 44 key informants and 19 participants actively involved in health information systems. Purposive sampling was used, and analysis was done using the Consolidated Framework for Implementation Research model. The data has been analyzed using ATLAS ti. Version 17.

**Results:** The study reveals barriers and facilitators for health information systems in four key domains. External support and existing policy systems were identified as facilitators in the outer setting. Conversely, issues like electric power, network interruptions, and a shortage of standardized medical recording tools were noted as barriers. Within the inner setting, a well-organized institutional structure, effective leadership, and capacity-building activities supported sustainability. Individual characteristics, including knowledge and willingness to engage with HIS, were facilitators, while negligence, dissatisfaction, and negative attitudes were identified as barriers. Factors such as regular supportive supervision, mentorship, and review meetings facilitated sustainability in the process domain.

**Discussion:** The study reveals critical factors affecting the sustainability of health information systems. External support and policies facilitate change, while challenges in power supply, tools, leadership, and attitudes mainly act as barriers. Supportive processes also enhance sustainability.

**Conclusion:** The research identified essential elements influencing the sustainability of Health Information Systems. External support and policy frameworks promote progress, but the lack of power supply, tools, and leadership effectiveness hinders it.

### 3.8. HU-CMHS03U: Sustainability of Health Information System Changes and the Associated Factors in Public Health Care Institutions of Southern Ethiopia

Keneni Ggutema Negeri, Betelhem Eshetu, Endrias Markos, Tarekegn Solomon, Frehiwot Atsebeha, Nana Chea, Bezahegn Zerihun, Tegegn Chote, Ayile Lemma, Naod Wondirad, Mesoud Mohammed, Azeb Lemma, Wubishet Denboba, Hiwot Belay, Afrah Mohammedsanni Omer, Abebaw Gebeyehu, Alemu Tamiso.

#### Abstract

**Background:** Sustaining effective change interventions is crucial for evidence-based decision-making among health planners, managers, and policymakers. Although significant progress has been made in health information systems in Ethiopia, challenges persist in data quality and the culture of information use, making it difficult to sustain evidence-based changes.

**Objectives:** This study analyzed the sustainability of health information system (HIS) changes and associated factors in public healthcare facilities in Southern Ethiopia.

**Methods:** A cross-sectional study was conducted from April 30, 2021, to December 30, 2022, involving 233 public health workers from 21 health institutions. Data were collected using a self-administered questionnaire and analyzed with SPSS and STATA. An ordinal regression model identified predictors of HIS change sustainability, with statistical significance set at  $p < 0.05$ .

**Results:** Of the participants, 25.6% perceived low sustainability, while 50.2% considered it medium. Significant differences were observed among districts in sustaining HIS changes ( $p < 0.001$ ). Shebadino district had higher sustainability (adjusted estimate = 0.84, 95% CI 0.36-1.31) compared to Cheha, while Wonago district had lower sustainability (adjusted estimate = -0.48, 95% CI -0.91 to -0.05). Sustainability in district health offices (adjusted estimate = -0.63, 95% CI -1.24 to -0.01) was lower compared to health centers. Furthermore, health facility heads (adjusted estimate = 0.67, 95% CI 0.16-1.23) were more likely to have higher sustainability than case team leaders.

**Discussion:** The study's findings show that perceptions of sustainability varied among participants, with a substantial proportion (25.6%) perceiving it as low and the majority (50.2%) as medium. Furthermore, significant differences in sustainability were observed across districts.

**Conclusion:** The study findings revealed that woreda type, the working facility of respondents, and their positions significantly influenced HIS change sustainability.

**Keywords:** Sustainability, Health Information System, Data Quality, Information Use, Change.



### 3.9. HU-CMHS04U: Sustainability of Health Information System Changes and Associated Factors in Public Health Care Institutions of Southern Ethiopia

Keneni Ggutema Negeri, Betelhem Eshetu, Endrias Markos, Tarekegn Solomon, Frehiwot Atsebeha, Nana Chea, Bezahegn Zerihun, Tegegn Chote, Ayile Lemma, Naod Wondirad, Mesoud Mohammed, Azeb Lemma, Wubishet Denboba, Hiwot Belay, Afrah Mohammedsanni Omer, Abebaw Gebeyehu, Alemu Tamiso

#### Abstract

**Background:** For health planners, managers, and policymakers to make evidence-based decisions, it is imperative that successful change initiatives be maintained. Even though Ethiopia's health information systems have advanced significantly, issues with data quality and information usage culture still exist, making it challenging to maintain evidence-based improvements.

**Objectives:** This study aimed to assess sustainability of health information system (HIS) changes and associated factors in public healthcare facilities in southern Ethiopia.

**Methods:** A cross-sectional study was conducted from April 30, 2021, to December 30, 2022, involving 233 public health workers from 21 health institutions. Data were collected using a self-administered questionnaire and analyzed with SPSS and STATA. An ordinal regression model identified predictors of HIS change sustainability, with statistical significance set at  $p < 0.05$ .

**Results:** Of the participants, 50.2% said sustainability was medium, while 25.6% thought it was low. Significant differences were observed among districts in sustaining HIS changes ( $p < 0.001$ ). Shebadino district had higher sustainability (adjusted estimate = 0.84, 95% CI 0.36-1.31) compared to Cheha, while Wonago district had lower sustainability (adjusted estimate = -0.48, 95% CI -0.91 to -0.05). Sustainability in district health offices (adjusted estimate = -0.63, 95% CI -1.24 to -0.01) was lower than health centers. Furthermore, health facility heads (adjusted estimate = 0.67, 95% CI 0.16-1.23) were more likely to have higher sustainability than case team leaders.

**Discussion:** The survey results demonstrate that feedback from participants of sustainability varied, with a sizable portion (25.6%) considering it to be low and the majority (50.2%) to be medium. Additionally, notable variations in sustainability were noted throughout the districts

**Conclusion:** The study's conclusions showed that respondents' positions, working environments, and woreda types all greatly impacted the long-lastingness of HIS changes.

**Keywords:** Sustainability, Health Information System, Data Quality, Information Use, Change.

### 3.10. HU-CMHS05U: Improvement in health information system: lessons learned in capacity building and mentorship program targeted districts in southern Ethiopia

Keneni Gutema, Alemu Tamiso, Betelhem Eshetu, Endrias Markos, Tarekegn Solomon Frehiwot Atsebeha, Nana Chiha, Bezahegn Zerihun, Gebeyew Dejene

#### Abstract

**Background:** Reliable information is the foundation of decision-making process. Health information system (HIS) is a key source for such information in health care system. The aim of this study was to assess the level of HIS change after the implementation of Capacity Building and Mentorship Program (CBMP) in districts in southern Ethiopia.

**Methods:** We conducted two cross sectional studies among four district health offices, four hospitals and 21 health centers in southern Ethiopia. The first survey was conducted in February 2018 before the implementation of the CBMP project and the second in December 2021 after the implementation. Structure, data quality and administrative data use were components of HIS assessed in both surveys using modified performance of routine information system management tool. The change in the mean score of HIS was evaluated using a paired samples t-test.

**Results:** After the implementation of the CBMP project, the overall mean score of HIS implementation was improved from 56 in February 2018 to 74 in December 2021 (mean difference (MD) =18, 95% CI=11-26,  $P<0.001$ ). We found improvement in structure (MD=11, 95% CI, 2-20,  $P<0.001$ ), data quality (MD=28, 95% CI, 16-41,  $P<0.001$ ), and administrative data use (MD=16, 95% CI, 7-26,  $P<0.001$ ).

**Conclusion:** Improvements in structure, data quality, and administrative data use have been observed after implementing the Capacity Building and Mentorship Program. Putting in place capacity-building activities and mentorship support in all health institutions could increase the country's HIS implementation.

**Keywords:** Health Information System, Modified PRISM, Ethiopia, paired t-test



## 4. Jima University, Institute of Health (JU-IH)

### 4.1. JU-IH01P: Health workers' use of routine health information and related factors at public health institutions in Illubabor Zone, Western Ethiopia

Amanuel Benti Abdisa, Kife Woldemichael Hajito , Dawit Wolde Daka, Meskerem Seboka Ergiba , Asaye Birhanu Senay, Ketema Lemma Abdi and Muluemebet Abera Wordofa

<https://rdcu.be/dAXiZ>

#### Abstract

**Background:** Proper utilization of health data is paramount for health service management. However, it is less practiced in developing countries, including Ethiopia. Therefore, this study aimed to assess routine health information utilization and identify associated factors among health workers in the Illubabor zone, Western Ethiopia. **Methods:** A facility-based cross-sectional study was conducted from March to June 2021 with a total of 423 randomly selected health workers. Data were collected using an interviewer-administered questionnaire that was developed based on the performance of the routine information system management (PRISM) framework. Based on existing data, we created composite variables for health workers' knowledge, attitude, abilities, and information utilization. Multivariate logistic regression analysis was performed, and the statistical association between the outcome and independent variables was declared using 95% CI and a  $P < 0.05$ .

**Results:** About two-thirds or 279 health workers (66.0%, 95% CI 61.3, 70.4) had good health information utilization. Two-thirds of health workers think organizational decision-making culture (67.1%, 95% CI 62.6, 71.5) and facility managers' or supervisors' promotion of information use (65.5%, 95% CI 60.9, 69.9) are positive. Over half of health workers (57.0%, 95% CI 52.2, 61.6) have a positive attitude toward data management, and the majority (85.8%, 95% CI 82.2, 88.9) believe they are competent in performing routine data analysis and interpretation activities. Only about two-thirds of health workers (65.5%, 95% CI 60.9, 69.9) were proficient in data analysis and interpretation.

**Conclusions:** The use of routine health information was lower than that of the national target and data from other literature. An unacceptably large number of health personnel did not use information. As a result, efforts should be made to increase health workers' data management knowledge and skills and the organizational culture of data utilization.

**Keywords:** Culture, Information use, Health workers, Knowledge, Perception, Skill, Ethiopia.

## 4.2. JU-IH02P: The Quality of Medical Records Management in Public Health Facilities in the Jimma Zone, Oromia Regional State, Southwest Ethiopia. *The Ethiopian Journal of Health Development*, 36(1). 2022.

Nigusu Getachew, Melese Teka, Bezawit Birhanu, Gelila Abraham

Vol. 36 No. 1 (2022): Special Issue

### Abstract

**Background:** Comprehensive medical records are the cornerstones for the quality and efficiency of patient care, as they can provide a complete and accurate chronology of treatments, patient results, and care plans. The study aimed to assess the quality of medical records in public health facilities in the Jimma Zone.

**Methods:** A facility-based cross-sectional study design supplemented by a qualitative method was employed from May 30 - July 29, 2020. 384 medical records were reviewed from 36 facilities using a facility inventory checklist. EPIData 3.1 software was used to enter the quantitative data, which was then analyzed using SPSS 23, and descriptive statistics were used to present the results. A thematic analysis approach was used for qualitative data and finally triangulated with the quantitative data.

**Result:** 384 medical records were reviewed from thirty-six public health facilities in the Jimma Zone with a 100% retrieval rate. Among the 36 health facilities, only one had a printer in the record room, and three (8%) had tracer cards. On the completeness of the medical records, mode of arrival and date of birth were the least recorded data elements (17% and 5%), respectively.

**Conclusion:** Most health facilities lacked trained and qualified recording personnel in the medical record units. Most medical records were incomplete regarding administrative, clinical, financial, and legal data. The quality of medical records in public health facilities in the Jimma Zone was low per the standard health facility requirements. It was recommended that qualified medical record unit personnel be hired and that the unit be standardized to improve the quality of medical records.

### 4.3. JU-IH03P: Quality of Health Data in Public Health Facilities of Oromia and Gambela Regions, Ethiopia

Muluemebet Abera Wordofa, Feyissa Tolessa Garedeew, Gurmessa Tura Debelew, Berhane Megerssa Ereso, Dawit Wolde Daka, Gelila Abraham, Tilahun Fufa Debela, Yisalemush Asefa Demissie, Ketema Lemma Abdi, Meskerem Seboka Ergiba, Asaye Birhanu Senay, Hailu Dawo Mio, Solomon Kassahun Gelaw, Chaine Hussen Ibrahim, Tamiru Regassa Turi, Lamessa Tadesse Amante, Abinet Feyisa Aredo, Negalign Berhanu Bayou

<https://doi.org/10.20372/ejhd.v36i2.5580>

#### Abstract

**Background:** The quality of routine health data in Ethiopia remains poor despite the existence of proven effective improvement strategies. Implementation research frameworks assist in analyzing, operationalize, and assess the implementation process by systematically addressing the “know-do” gap. The study aimed to assess routine health data quality status in public health facilities of selected districts in Oromia and Gambella regions of Ethiopia using the Consolidated Framework for Implementation Research (CFIR).

**Methods:** This study is part of a larger implementation research project that employed an institutional-based cross-sectional study design. A pre-intervention baseline assessment was conducted using qualitative and quantitative data collection methods. All health centers and hospitals in the selected districts and selected health posts based on their performance, one high, one medium and one low performer, a total of three from each primary health care unit, were included in the study.

**Result:** two hospitals, seven health centers, 35 health posts, and both district health offices were included in the study. Moreover, a total of 51 key informant interviews, four participants from each health facility, who have more connection with HMIS data like facility head, HMIS focal, MCH and outpatient department heads as well as HMIS focal person from the district, District health office head, plan and MCH heads one health extension worker per selected health post were included purposely. Structured checklists were developed from the Performance of Routine information system management (PRISM) assessment tool, which is nationally approved and used for quantitative data. For the qualitative data, semi-structured interview guides were developed by reviewing different literature. Descriptive analysis was done for quantitative data, while a thematic analysis approach was used for qualitative data. Results: A total of 46 HFs in 2 districts were involved in the study. Data quality in terms of accuracy, timeliness and completeness was assessed for eight selected indicators. Accordingly, three of the assessed data elements were in the acceptable range. These were delivery service (98%), Penta-3 (96%) and Measles (94%). The remaining 5 were out of the acceptable range, indicating the presence of over-reporting. In both districts, report completeness was 100% regarding timeliness 53.5% of the report in Digalu-Tijo and 79% in Godere submitted to the next level according to the national schedule for each level. Data were inconsistent both over time and between indicators. Supportive supervision and higher-level mentorship support were inadequate, although the extent varies between districts. The gaps were more pronounced in the Digalo-Tijo district than in the others. Internal supervision and mentorship were also missing in both contexts. Data quality review meetings were not conducted regularly. Many recording and reporting tools were unavailable on the assessment day or never available in health facilities. Many health workers did not receive training during the last 12 months on health management information system-related topics.

**Conclusion:** Data generated through routine health management information systems is generally low quality. Supportive supervision, mentorship, and review meetings are not accomplished as indicated in the strategy. Many health facilities lack important recording and reporting tools. Training on health management information system-related topics is inadequate. The findings highlight the need to design tailored and context-specific interventions to improve data quality.

**Keywords:** Data quality, health management information system, HMIS, implementation research, Gambella, Oromia, Ethiopia

#### 4.4. JU-IH04P: Health Workers' Knowledge, Perceptions, and Self-Efficacy Regarding the Use of Information Systems in Rural Districts of Oromia and Gambella Regions, Ethiopia

Muluemebet Abera Wordofa, Gelila Abraham, Feyissa Tolessa Garedew, Berhane Megerssa Ereso, Tilahun Fufa Debela, Yisalemush Asefa Demissie, Meskerem Seboka Ergiba, Dawit Wolde Daka, Ketema Lemma Abdi, Asaye Birhanu Senay, Solomon Kassahun Gelaw, Lamessa Tadesse Amante, Tamiru Regassa Turi, Chainé Hussien Ibrahim, Hailu Dawo Mio, Abinet Feyisa Aredo, Negalign Berhanu Bayou, Gurmessa Tura Debelew

<https://doi.org/10.20372/ejhd.v36i2.5581>

##### Abstract

**Background:** Sound and reliable information is the foundation for informed decision-making across all health system building blocks. However, there is a shortage of evidence regarding the organizational and behavioral performance of health information systems in Ethiopia. This study aimed to assess the organizational and behavioral performance of the routine health information system (RHIS) in the Digauna-Tijo and Godere districts of Oromia and Gambella regions.

**Methods:** Descriptive institutional-based cross-sectional study was conducted on purposively selected 67 health workers based on their experience in dealing with health data to design interventions that will help better RHIS performance. A self-administered semi-structured questionnaire was used to collect the data from March 19 - 27th, 2021. The data analysis was done using SPSS version 25. Chi-square was carried out to identify the relation between dependent and independent variables. Tables and figures were used to present the findings.

**Results:** Among the respondents, only 8(12.8%) correctly described at least three dimensions or aspects of data quality. In comparison, only 3 (4.5%) participants described at least three ways or mechanisms of correctly ensuring data quality. There is a negative perception toward emphasis given by managers/supervisors on data quality (13.5%) and the use of data to inform decision-making (7.5%). Perception of self-efficacy to perform RHIS tasks ranged from 4.98 to 8.25. Only 23.9% and 12% of respondents could compute data analysis and correctly interpret the presented data. There is a positive relation between self-efficacy and training at a P-value of 0.03. Moreover, being HIT/IT personnel and perceiving information use culture are positively related (P-value 0.049).

**Conclusion:** Few health workers could describe the dimensions of data quality and ways of ensuring data quality. Health workers have low perceptions toward managers/supervisors to seek input from relevant staff, emphasize data quality, and conduct routine data quality checks at points where data are captured, processed or aggregated. Health workers also have a very low perception of their self-efficacy to perform RHIS tasks. Similarly, only a few health workers were able to present the information and were able to interpret the figure correctly. It is recommended to provide need-based training and regular mentorship to have knowledgeable and skillful health workers improve RHIS performance at the low level of the health system.

**Keywords:** Knowledge, perception, self-efficacy, routine health information system, Oromia, Gambella

## 4.5. JU-IH05U: Implementation Evaluation of District Health Information System in Selected Districts of Jimma zone, Oromia Regional State, Ethiopia

Teyib Hassen, Elias Ali, Tilahun Kekeba

### Abstract

**Background:** The district health information system is a web-based, free, and open-source software used as a tool to collect, aggregate, validate, analyze, and present health care data used to monitor the performance of health service, improve disease surveillance, and speed up access to health data for health facilities. This program was introduced in the study area in 2018 and currently it is under implementation however, to our best knowledge there is no evidence about the implementation status. Objective: To evaluate the status of implementation of district health management information software in selected districts of Jimma zone, 2020.

**Methods:** Case study design was applied using mixed (quantitative and qualitative) data collection methods from May 29/2020 to July 29/2020. A total of 117 self-administered questionnaire, 14 in-depth interviews, 12 document review, and 31 resource inventory collected from 110 health facilities and six districts. Descriptive statistics was done the result was presented in percentage, frequency, and figures. Quantitative data collected, entered to EPIDAT version 3.1 and then, exported to SPSS version 23 software for analysis, and qualitative data analyzed manually. The result of the quantitative and the qualitative data was collected, analyzed and, summarized separately, and triangulation were done for comprehensive understanding.

**Results:** The availability of program resources was 75% and the judgment parameter results revealed that the availability dimension was implemented as good. The compliance of program activities was scored 45% and judgment parameter results showed this dimension was poorly implemented. The information utilization from the implementation of the program was scored 49% and the judgment parameter result showed this dimension was poorly implemented. Conclusions and recommendations: The overall implementation status of the program from the three dimensions was 55% as per the preset judgment criteria agreed with key stakeholders and judgment parameter results showed these dimensions were poorly implemented and it needs attention for improvement. The concerned body should work to improve information technology infrastructure, fix DHIS2 problems, allocate budget, support facility-level data entry, and strengthen data use, supervision, and mentorship and feedback system to improve the status of DHIS 2 program implementation.

**Keywords:** DHIS2, implementation status, Availability, Compliance, Information use



## 4.6. JU-IH06U: Developing mHealth for referral linkages among health facilities in Ethiopia

Zerihun Dejenu, Asaye Birhanu, Gizeaddis Lamesgin

A functional referral system is a key element of primary health care which is widely practiced throughout the world. Ethiopia has also prioritized patient referrals in its health policies and established a referral system within its primary healthcare facilities to maximize utilization of healthcare resources at all levels. The use of recently introduced health information technology could assist medical professionals in daily patient monitoring and examination. Particularly mobile applications can enhance the quality and timeliness of referral links, especially in under-resourced health systems. However, in many low and middle-income countries, including Ethiopia, patient referrals are still being communicated through referral slips and telephone conversations. This outdated method of referral communication can cause delays in patient diagnosis and treatment within these countries.

In this study, a dual interactive application (available on both web and mobile platforms) suitable for low-resource health settings, and effectively manage and facilitate communication between health facilities involved in patient referrals has been developed. A user centered designed approach was used to design and develop the mobile and web-applications. A survey including 40 participants from primary care settings to specialized hospitals was conducted to determine their needs, and SPSS version 26 software was used to analyze the data. Flutter was used to build mobile application while Laravel and PHP were utilized to develop web application. To evaluate applications usability and content validity, data from 25 respondents were collected and analyzed to ascertain the level of user satisfaction with the developed applications.

The results of the analyzed data shows, 21(87.5%) of respondents were agreed that using the applications will improve the referral system's timeliness and quality, while 6 (24%) respondents were states that the respondents have neither a positive nor a negative attitude towards the given subject. The developed application has the potential to leverage the referrals systems, which directly pulls up clinical outcomes and reduces the complexity and challenges in conventional referral system.

**Key words:** health tier system, referral management, e-health, m-health, Referral linkage system

#### 4.7. JU-IH07U: Process Evaluation of HMIS data quality in case of HIV program in Jimma town public health facilities

Samson Teshome, Tilahun Fufa, Birhane Megerisa

**Background:** Poor data quality is a critical challenge to meet the global and national health goals since performance of the health system cannot be adequately monitored. Despite significant investments, HIV/AIDS program data quality remains challenging in developing countries including Ethiopia to make informed decision.

**Objective:** To evaluate health management information system data quality and information use in case of HIV/AIDS program in Jimma town public health facilities, South West Ethiopia, 2022.

**Method:** Facility based case study design was employed from June 22 to July 06/2022 at five public health facilities providing Anti-Retroviral Therapy in Jimma town. Randomly selected 234 patient charts, ART registration, resources and 17 key informants were included in the study. Mobile based data collection method was employed. Collected data were exported into statistical package for social science version 26 for descriptive analysis. Qualitative data were analyzed manually and the finding was presented by triangulating with quantitative results. Finally, resource availability, data quality and information use were analyzed separately and judged as Very Good if scored  $\geq 85\%$ , Good if 70% – 84%, Fair if 55% – 69% and Critical if  $< 55\%$ .

**Results:** The overall resource availability, data quality and information use were 75.1%, 77.2% and 70.4% respectively. None of the providers working on Voluntary Counselling and testing service were trained on data quality. Moreover, there was a lack of SmartCare, internet and printers in some health facilities. Report timeliness, data completeness and data consistency were 46.7%, 91.1% and 84.2% respectively. Consistency of HIV test report between different service delivery points was 66.67%. Performance monitoring team meetings were not conducted monthly and some facilities didn't use the standard performance monitoring team logbook.

**Conclusion and Recommendation:** The overall level of resource availability, data quality and information use were judged as good for each. However, report timeliness, data consistency and information use was below recommended national standards. Data quality related training should be provided for health care provides. SmartCare, internet, printers and guidelines should be supplied for health facilities.

**Key words:** Evaluation, Health Management Information System, Data quality, Information use, HIV/AIDS

#### 4.8. JU-IH08U: The role of tailored HIS intervention in improving Data quality in rural district of Oromia region.

Muluemebet Abera Wordofa, Gelila Abraham, Feyissa Tolessa Garedew, Berhane Megerssa Ereso, Tilahun Fufa Debela, Yisalemush Asefa Demissie, Meskerem Seboka Ergiba, Dawit Wolde Daka, Ketema Lemma Abdi, Asaye Birhanu Senay, Solomon Kassahun Gelaw, Lamessa Tadesse Amante, Tamiru Regassa Turi, Chaina Hussien Ibrahim, Hailu Dawo Mio, Abinet Feyisa Aredo, Negalign Berhanu Bayou, Gurmessa Tura Debelew

##### Abstract

**Background:** Quality data for evidence-based decision making become a growing concern globally. Available information needs to be disseminated on time and used for decision making. Therefore, an effective Health Management Information System is essential to make evidence-based decision. Data quality remains weak within the health sector. Ministry of Health of Ethiopia has introduced several extensive reforms to ensure data quality, particularly at the peripheral levels of health system.

**Objective:** To evaluate the effect of national data quality assurance mechanisms in improving data quality in Digaluna-Tijo district, Arsi zone, Oromia region.

**Method:** The research was a quasi-experimental design in which data were collected before and after the intervention in Digaluna-Tijo district. The study has three phases (i) Baseline Assessment: Data was collected from March 19th–March 27th, 2021 to identify level of data quality and identify priority gaps in assuring data quality – Used to design/contextualize interventions. (ii) Interventions conducted: Based on areas identified in phase I, interventions were tailored to the context and implemented for six months (August to February, 2022). (iii) End-line Assessment: All information collected during the baseline assessment were re-assessed from July 6–20, 2022. Changes were determined through comparison and statistical tests (when applicable). Purposive sampling method was employed for both quantitative and qualitative study. Five health centers; one hospital and three health posts per health center based on their service performance (High, Medium and Low performer) and a total of 15 health posts were included in the study. Information was obtained from health workers who have exposure to data recording, documenting and reporting. All recording and reporting tools reviewed at the health facilities.

**Result:** The availability of registers at health centers was 67% during the pre-intervention period and increased to 98.2% after intervention. The overall, the mean score of knowledge of respondents on the reasons for collecting and using RHIS data was increased by 4.5 ( $P = 0.001$ , CI: -6.76, -2.29). Slightly greater than one-third (34%) know the data quality dimensions in pre-intervention and increased to 66%. Only one-fifth (21%) of respondents know data quality assurance mechanisms in pre-intervention and increased to 79% after intervention. Perception towards organization/department uses data or evidence for decision making didn't show significant change, though there is a positive change ( $P=0.166$ ). The overall self-perception on competence to perform RHIS tasks was increased from 76.6% in the pre-intervention to 89.75% in the post-intervention. The average completeness of registers was 54.96% at pre-intervention and 87.1% at post intervention. The overall report timeliness was 50% in pre-intervention. After intervention, report timeliness was 100% in health centers and hospitals but 80% in health posts, which makes overall report timeliness in the district to be 85.7%. There was 32% of an inconsistency between registers and report in pre-interventions and 33% in post-intervention in hospital. In health centers, there was 38% of a discrepancy between registers and report in pre-intervention but it was 0.91 which is in an acceptable range in post-intervention.

Discrepancy between registers and report was decreased from 28% in pre-intervention to 14% in post-intervention in health posts. All reports during the pre-intervention were consistent over time and no outlier data except for penta-3 that had moderate outlier, but during the post-intervention antenatal care four reports were not consistent.

**Conclusion:** After implementation of the tailored interventions, there was an improvement on availability of tools; health workers knowledge on use RHIS data, dimension of data quality and data quality assurance mechanisms. Additionally, self-perception of health workers on competence to perform RHIS tasks was increased. In contrary perception of health workers towards their organization or supervisors was not changed. Majority of health workers do not perceive their organization use data or evidence for decision making. Completeness, timeliness of report and consistency was improved after intervention. All reports were consistent over time in the pre-intervention, but during the post-intervention antenatal care four reports were inconsistent.

## 4.9. JU-IH09U: Improving Data Quality through Implementation of Data Quality Assurance Strategies in Godere Woreda, Gambella Region, Ethiopia

### Abstract

**Introduction:** Availability and access to a high-quality data is critical for program management and decision making in the health sector. The federal ministry of health (FMoH) has been working towards continuously improving data quality and information use across all setting of the health system. However, data quality is not at the required level and it was recognized that there are limitations to inform decisions on health policy, health programs, and allocation of resources. This implementation research aimed to examine whether the data quality improving strategies likely results to changes in health data quality in Godere district health facilities, Gambella region, Ethiopia.

**Methods:** The study was conducted in Godere woreda. Godere Woreda is located in Majang zone, Gambella region, 628 KM away from Addis Ababa. The study involved data collected before and after the data quality improvement interventions at one hospital, two health centers, thirteen health posts and woreda health office. To carry out the implementation research, a research team conducted baseline assessment, intervention and end line assessment. We used the CFIR and RE-AIM IR models. PRISM tool was used to assess indicators and variables for this implementation research. Availability of required recording and reporting tools were assessed. Data quality was measured using four major dimensions such as data accuracy; timeliness, completeness and consistency. Frequency, proportion, and mean scores were used to compare the findings. Key informant interviews (KIIs) were conducted to supplement the quantitative findings. The data quality improvement interventions took place between September 2021 and March 2022 and included training, mentorship, supportive supervision, review meeting, best practice identification, sharing, and recognition of best performers.

**Key Findings:** All required recording and reporting tools were available both during baseline and end line assessments, except that ambulances register absent during end line at woreda. The overall availability of required recording and reporting tools at health facility level was slightly reduced from 91.93% before to 90.86% after the intervention. The overall availability of required recording tools and reporting formats at the health posts was improved from 28.08% before to 51.82% after the intervention. Overall HMIS and data quality training status of health care providers improved from 44.5% to 64.8% at health facility level and from 25.0% to 65.0% for woreda health office experts. Training status of health extension workers (HEWs) on CHIS data recording, folder maintenance and reporting topic improved from 19.4% to 75.0% and on data quality topic from 22.2% to 77.8% after intervention. Two third of planned mentorship and supportive supervision at health facility and woreda health office was achieved and all planned review meetings were achieved. Contraceptive acceptance improved from 71.7% before to 94.8% after intervention. Antenatal care fourth visit improved from 112.5% before to 99.3% after intervention. Early postnatal care improved from 79.0% before to 98.0% after intervention. HIV positive pregnant women who received ART improved from 200.0% before to 112.5% after intervention (although, it is not in acceptable range). Data accuracy of skill birth attendant and pentavalent third dose remained with the acceptable range. However, data accuracy of measles first dose, tuberculosis all forms and pneumonia less than five years' old children was decreased and or not in acceptable range as compared to before intervention. At the health post level measles first dose improved from 57.5% to 100%; malaria from 18.3% to 77.3% and pentavalent third dose from 85.5% to 108.4% as compared to before intervention. Conversely, data accuracy of contraceptive acceptance and pneumonia less than five years old children was decreased and or not in acceptable range. Both pre and post-intervention assessments showed that all health facilities and health posts had 100% report completeness. The overall registers content completeness

improved from 91.8% to 92.6% at health facility level. The overall report timeliness improved from 80.9 to 90.5 at both health facility and health post levels. During baseline consistency overtime assessment; moderate outlier was observed on contraceptive acceptance, early postnatal care and measles. While antenatal cares fourth visit, skill birth attendance, HIV positive pregnant women who received ART and pentavalent third dose were with acceptable range during baseline assessment at health facility level. Conversely, during end line consistency overtime assessment; moderate outlier was observed only on HIV positive pregnant women who received ART and pentavalent third dose at health facility level. Perception of health workers on decision-making practice improved from mean ( $\pm$ SD), 3.44(0.66) to 3.83 (0.41), mean difference (MD) = 0.39, PV = 0.037 which is statistically significant. Perception of health workers about characteristics of supervisors improved from mean ( $\pm$ SD), 3.52 (0.96) to 4.15 (0.50), MD = 0.63, PV = 0.006 which is statistically significant. Perception of health workers about HMIS task performance by staff improved from mean ( $\pm$ SD), 3.85 (0.54) to 4.11 (0.70), MD = 0.25, PV = 0.171 but not statistically significant. Personal feelings of health workers about data quality and data use improved from mean ( $\pm$ SD), 3.67 (0.60) to 3.89 (0.47), MD = 0.22, PV= 0.200 but not statistically significant. The mean score knowledge of health workers on HMIS was remained the same from mean ( $\pm$ SD), 0.73 (0.07) to 0.73 (0.08). Six (21.4) respondent described three and above dimensions of data quality before and 14(48.3%) of respondents were able to described it after. Self-efficacy to perform HMIS tasks was improved from mean score of 6.25 to 7.75 before to 8.24 to 8.88 after the intervention. There was an improvement in data analysis and interpretation skills of participants after the intervention.

**Conclusion:** There was an improvement in training, mentorship, supportive supervision and review meeting after intervention. Also there was an improvement in data quality, namely, register content completeness, timeliness, and accuracy after implementation of the interventions.



## 5. University of Gondar (CMHS)

### 5.1. UoG-CMHS01P: Improving Data Use at Facility level doesn't need fancy interventions: Capacity Building, Mentoring and Recognition can take us miles.

Binyam Tilahun, Asmamaw Atnafu, Lemma Derseh, Berhanu Fikadie Endehabtu, Adane Mamuye, Tesfahun Hailemariam, Moges Asressie, Mesud Mohamed, Nuradin Assaid, Amare Minyihun, Getasew Amare, Teklehaymanot Gebrehiwot, Megdelawit Mengesha, Dawit Muluneh, Naod Wondirad

<https://www.researchgate.net/publication/374951328>

#### Abstract

Collecting quality data and using it for day-to-day decision making are essential components of a well-functioning health system (1). In Ethiopia, a health management information system has been implemented at all levels of the health care delivery system to ensure the information is used for evidence-based planning and decision-making (2). Because it is the basis for planning and policymaking at all levels of the health care system, the government of Ethiopia is still harmonizing the issue as one of the frontline agendas of the health sector transformation plan in the country (1). However, it still faces several challenges, and the changes are not as they should be. Theoretically, it is known that motivating and incentivizing staff enhances their performance and could improve service outcomes. A recent study showed that incentivizing health outcome improvement is an increasingly important attribute in the health system of low and middle-income countries (3). Moreover, availing and using healthcare data for clinical practices and administrative decision-making by health system leadership is a vital neglected step to improve better health outcomes in a given society



## 5.2. UoG-CMHS02P: Cost-effectiveness of Performance-based Non-financial Incentive (PBNI) intervention to improve health information system performance at Wogera District in Northwest Ethiopia:

Getasew Amare, Amare Minyihun, Asmamaw Atnafu, Berhanu Fikadie Endehabtu, Lemma Derseh, Tesfahun Hailemariam, Adane Mamuye, Teklehaymanot Gebrehiwot, Moges Asressie Chanyalew, Mesud Mohamed, Binyam Tilahun

<https://www.researchgate.net/publication/374951367>

### Abstract

**Introduction:** Several behavioral and moral factors, including healthcare motivation, influence health information use and practice. A performance-based non-financial incentive (PBNI) intervention was developed to improve the quality of data and information use practices in the Wogera district.

**Objectives:** This research aimed to assess the cost-effectiveness of PBNI interventions to improve data quality and information use practices in Northwest Ethiopia.

**Methods:** In the northwest Ethiopian districts of Wogera (the intervention site) and Tach-Armachiho (the comparison site), a quasi-experimental study was carried out. The study included health centers, departments, and health professionals. Six health centers and health professionals working at the health centers were included. PBNI intervention, including different motivation packages, was implemented at Wogera district health facilities. Before and following the intervention, the Wogera and Tach-Armachiho districts' performance in terms of health information was evaluated. The cost of the intervention was estimated using an activity-based, bottom-up approach. Calculations were made to determine the incremental cost-effectiveness and average cost-effectiveness ratio.

**Result:** The study enrolled eighty-six study departments. Of these, 42 (48.8%) were from the Wogera district. Compared to the comparative group's 52,078 ETB, the average cost-effectiveness ratio for the PBNI intervention was 20,970 ETB per unit percentage improvement in HIS performance. However, the incremental cost-effectiveness ratio (ICER) for the PBNI intervention showed 10,600.5 ETB/percentage point HIS performance improvement.

**Conclusion:** The performance of the health information system in healthcare institutions was improved through the integration of PBNI with implementation packages for health information. Therefore, PBNI should be designed as one motivational strategy by the health institutions to incentivize health providers to improve data quality and evidence-based decision-making with limited resources.

**Keywords:** Health information system, performance-based non-financial incentive, CEA, ICER

### 5.3. UoG-CMHS03P: Barriers and Facilitators of Implementing Performance-Based Non-Financial Incentives to Improve Data Quality and Use: Using a Consolidated Framework for Implementation Research

Lemma Derseh Gezie, Berhanu Fikadie Endehabtu, Tesfahun Hailemariam, Asmamaw Atnafu, Adane Mamuye, Mesud Mohamed, Teklehaymanot Gebrehiwot, Getasew Amare, Binyam Tilahun

<https://www.researchgate.net/publication/374951362>

#### Abstract

**Background:** Evidence shows that recognizing the best performers in organizations can motivate workers to make other remarkable achievements. However, there was scant information regarding the barriers and facilitators of implementing performance-based non-financial incentives (PBNI) to improve health data quality and information use by district health workers in northwest Ethiopia. Aim: The main objective of this research was to analyze the factors that hinder or support the successful implementation of the Performance-Based Non-Financial Incentives (PBNI) system to enhance the quality of data and its utilization among district health workers in northwest Ethiopia.

**Methods:** The research conducted in the Wogera district of Northwest Ethiopia utilized a phenomenological qualitative approach. To collect data, a record of qualitative information was compiled, focusing on the obstacles and aids to implementing PBNI (Performance-Based Non-Financial Incentives) for improved data quality and usage. These insights were derived from discussions during performance review meetings and health data days throughout the implementation phase. Additionally, qualitative data was obtained through interviews with 13 individuals purposefully selected for their knowledge and experience in the subject matter. Subsequently, the interviews and information log were transcribed, translated into English, and subjected to coding, organization, and thematic analysis using the Consolidated Framework for Implementation Research domains with the assistance of Open code-4.03 software.

**Results:** Factors explored as facilitators of PBNI implementation include positive pressure to implement PBNI, the availability of networked communication, the social architecture of facilities, and the presence of self-motivation and competitive spirit. On the other hand, the barriers included the wrong perception of PBNI that the participants had at the beginning of the implementation process, the presence of different prioritized agendas, the absence of a platform and guideline to acknowledge and motivate best-performing individuals, the need to appraise the performance of individuals, case-teams, and health facilities to identify and reward them accordingly, and the subsequent cost associated with the appraisal process.

**Conclusion:** A few challenges encountered were the need to appraise the performance of implementers to identify those who deserve the incentives, the cost associated with the appraisal process, and the staff's concern about the fairness and reliability of the performance evaluation process. However, the data-day platform and the government's interest in improving health data quality and information use are opportunities that future implementers can capitalize on.

**Keywords:** Performance-based, non-financial incentive, implementation research, Ethiopia

#### 5.4. UoG-CMHS04P: Effectiveness of Performance-Based non-Financial Incentive for Improved Health Data Quality and Information Use at Primary Health Care Units, Northwest Ethiopia:

Asmamaw Atnafu, Tesfahun Hailemariam, Lemma Derseh, Berhanu Fikadie Endehabtu, Adane Mamuye, Teklehaymanot Gebrehiwot, Moges Asressie Chanyalew, Mesud Mohamed , Getasew Amare , Binyam Tilahun

<https://www.researchgate.net/publication/374951439>

##### Abstract

**Introduction:** Several internal and external factors in the health system pose challenges to the quality and use of health data. One of the behavioral and moral variables that can impact data quality and information use practices is the motivation of the health workforce. A performance-based non-financial incentive intervention was implemented in primary healthcare units of rural districts. Objective: This research aimed to measure the effectiveness of the PBNI intervention on data quality and information use in rural districts of primary healthcare units in Northwest Ethiopia.

**Methods:** A quasi-experimental design using a facility-based survey was employed to form groups of incentivized and non-incentivized health facilities. The study was conducted in the Wogera and Tach-Armachiho districts as well as the intervention and control districts. Awards, certifications, scholarships, and promotions for the best-performing individual, department, or health facility were provided as incentives. The proportion and mean of the characteristics of participants were presented descriptively, and a difference-in-difference analysis was conducted to measure the effectiveness of PBNI on data quality and information use.

**Results:** 84 and 90 departments were included in the baseline and end-line in Wogera (Intervention) and control (Tach-Armachiho) districts. Wogera district had 40 (47%) and 44 (48.89%) departments during the baseline and end-line periods. In the Wogera district, the average level of data quality increased from 15% baseline at month 1 to 25% end line at month 2. In tach armachiho, however, the quality dropped from 11.7% at the start to 9.2% at the end. Evidence on using available information to inform decision-makers was found in 36% and 28% at the baseline and 50% and 60% in the end-line assessment in Tach Armachiho and Wogera districts, respectively. The average difference in information use between intervention and control groups was 30.4 percentage points (p-value=0.008) between the end-line and baseline assessments. The Difference in information use change in the intervention district compared to its counterpart was 25, at 95 % CI [2%, 47%] percentage points, P-value =0.003.

**Conclusion:** Performance-based non-financial incentives have significantly changed the quality of health data and the use of information at the intervention site. Thus, scaling up the intervention to other similar contexts is essential.

**Keywords:** Performance-based financing, data quality, information utilization, Amhara, Ethiopia

## 5.5. UoG-CMHS05P: Implementation Outcomes of Performance Based Non-financial Incentive: using RE-AIM framework.

Asmamaw Atnafu, Tesfahun Hailemariam, Berhanu Fikadie Endehabtu, Lemma Derseh, Adane Mamuye, Teklehaymanot Gebrehiwot, Moges Asressie Chanyalew, Mesud Mohamed , Getasew Amare, Binyam Tilahun

<https://www.researchgate.net/publication/374951442>

### Abstract

**Background:** Quality health data production is vital for effective evidence-based decision-making in the healthcare industry. Several factors challenge using complete and timely health data in practice. This study evaluated how the performance-based non-financial intervention (PBNI) intervention was reached, effective, adapted, implemented as per the protocol, and able to be sustained in the contextual environment using the RE-AIM framework. Aim: The study aimed to evaluate the implementation outcomes of PBNI with the coverage (reach), effectiveness, adoption, implementation, and maintenance of the intervention.

**Methods:** The intervention was implemented in Wogera district, northwest Ethiopia. The study used a mixed study design. The quantitative component has a quasi-experimental study design to assess the change in data use due to PBNI. The qualitative component has a phenomenological design to assess the lived experience of participants. The coverage (reach) and effectiveness of PBNI intervention were assessed with descriptive statistics. Key informant interviewees were used to evaluate the adoption, implementation, and maintenance of the PBNI implementation. The coverage and effectiveness of the intervention were assessed using proportions and numbers. Thematic analysis was employed to analyze the qualitative data.

**Results:** A total of 13 participants were involved in the qualitative assessment. Concerning the reach of PBNI, all (six) health centers, all (i.e., 42) departments, and all health workers in the six health centers were covered. Regarding its effectiveness, the data use has resulted in percentage changes of 31% ( $p$ -value < 0.001). Concerning the adoption of PBNI, the health management information system focal person confirmed that their health facilities would implement it even after the completion of the project. The implementers communicated, evaluated performance, and intervened consistently throughout the intervention period, showing the implementation's fidelity. The finding indicated that sustaining PBNI intervention needs strong governmental commitment and active HIS leaders to improve quality health data production and use.

**Conclusion:** The coverage of PBNI, its effectiveness, and the adoption of the implementation were promising. Moreover, there was a conducive environment at the individual, case-team, and facility levels to sustain PBNI. However, long-lasting sustainability would depend on the commitment of the implementer, donor, and government.

## 5.6. UoG-CMHS06P: Implementation strategies to performance-based non-financial incentive intervention for better data quality and use in resource-limited settings, Northwest Ethiopia.

Lemma Derseh Gezie, Berhanu Fikadie Endehabtu, Asmamaw Atnafu, Tesfahun Hailemariam, Adane Mamuye, Mesud Mohamed, Teklehaymanot Gebrehiwot, Getasew Amare, Binyam Tilahun

<https://www.researchgate.net/publication/374951236>

### Abstract

**Background:** Evidence showed that incentives motivate health workers and improve health-related data quality and use. However, due to context differences, proven interventions, including incentives, may not always improve data quality and use. In this regard, how performance-based non-financial incentive (PBNI) improves health-related data quality and use is unclear in Ethiopian settings.

**Objective:** The study aimed to develop strategies for implementing PBNI to improve health-related data quality and information use in northwest Ethiopia.

**Methods:** The study was implementation research that employed a qualitative design to improve data quality and information use among individuals, departments, and health centers through PBNI intervention. It was conducted in Wogera district, northwest Ethiopia, between October 2020 and July 2021. First, potential barriers and facilitators of implementing PBNI were identified through discussion meetings, observations, and interviews. Then, potential strategies that were helpful to overcome the barriers and capitalize on opportunities were identified and implemented in an iterative and tailored manner for six months until data quality and information use were sufficiently improved cost-effectively.

**Results:** The use of multi-layered methods to measure the performance of potential awardees and the creation and regular use of the data-day platform to recognize best performers and make constructive discussions about health-related data quality and use with higher officials were some strategies employed in the implementation research. The other strategies employed were also to show health workers' performance evaluation process and results transparently and publicly during the data day and reach out to all potential awardees fairly and equally when there was important information to communicate. In addition, utilizing the culture of transparent, professional, and constructive peer-to-peer criticism among staff members during the review meetings and data-days and building their trust in the research team were a few strategies employed and resulted in improved data quality and use.

**Conclusions:** The improved health-related data quality and information use after implementing PBNI with a reasonable cost was the effect of utilizing strategies mentioned in the results section through the data-day platform, transparent and multi-layered performance evaluation methods, and the strong directive messages from higher officials during the data-day take the lions share.

**Keywords:** Model strategies, barriers and facilitators, incentive, data quality, and information use

## 5.7. UoG-CMHS07P: Capacitating Health Sector Leaders to Improve Healthcare Data Quality and Use in Assosa District: Implementation Research

Lemma Derseh, Tesfahun Hailemariam, Asmamaw Atnafu, Berhanu Fikadie Endehabtu, Adane Mamuye, Dawit Muluneh, Megdelawit Mengesha, Nuradin Assaid , Binyam Tilahun

<https://www.researchgate.net/publication/374951416>

### Abstract

**Background:** Equipping leaders and creating responsibility for quality healthcare data and utilization is considered the most critical driver in the health sector. However, it is unclear how training of the health workforce improves the generation and use of quality health data in a resource-limited setting of Ethiopia.

**Objective:** The study aimed to measure the effect of implementing the training and post-training follow-up of the health sector leaders to improve the generation and use of healthcare data quality in Assosa district, Ethiopia.

**Methods:** A pre-post quasi-experimental study design was employed to measure the effect of training and post-training follow-up on data quality and use. One health center and one general hospital in the district were included to measure the effect of training and post-training follow-up intervention on the generation and use of quality health data. The intervention involved health system leaders in the district. The consistency of selected indicators and information use was presented using changes in percentage points before and after the intervention.

**Results:** Of the total departments, 9 (52.9%) were from the health center and 11(47.1%) were from the hospital. The study found that training and post-training follow-up interventions have positively affected data quality and information use. According to the findings, data accuracy and information use were improved by 23, 10.7, and 16.7 percentage points at the health center, hospital, and district levels, respectively. Similarly, information use was improved by 22.3, 34.1, and 28.2 percentage points due to the TPF intervention at health centers, hospitals, and districts.

**Conclusions:** Training followed by feedback, mentoring, and performance review meetings were effective implementation strategies for improving data quality and information use. The coverage and effectiveness of the implementation were also promising, and further scaling up in a similar setting can improve health system data quality and use.

**Keywords:** training, feedback, implementation research, data use, data quality, Assosa, Ethiopia

## 5.8. UoG-CMHS08P: Exploring the barriers and facilitators of training as well as post-training follow-up interventions to enhance data quality and utilization: Utilizing the CFIR Implementation Framework se in Assosa District: Implementation Research:

Asmamaw Atnafu, Tesfahun Hailemariam, Lemma Derseh, Adane Mamuye, Dawit Muluneh , Megdelawit Mengesha, Nuradin Assaid , Berhanu Fikadie Endehabtu, Binyam Tilahun

<https://www.researchgate.net/publication/374951357>

### Abstract

**Introduction:** Despite significant investments that have been made in improving data quality and information utilization, progress in this area continues to lag behind the target set by the government of Ethiopia. Data incompleteness and inaccurate reporting remain significant challenges to the healthcare system. While capacity building for healthcare system leaders is recommended to enhance the production and use of quality health data, existing evidence suggests that poor health data production and utilization continue to impede effective health system planning and decision-making. Consequently, this study explores the facilitators and barriers of training and post-training follow-up intervention to enhance health data quality and utilization in the Benishangul regional state.

**Objective:** The study aims to explore the barriers and facilitators of training and post-training follow-up intervention by capacitating health system leaders to enhance health data quality and use.

**Methods:** A phenomenological study was conducted among 11 participants from multiple sites. In-depth interviews were conducted to explore the barriers and facilitators of training and post-training follow-up intervention. The data were collected throughout the entire process, starting from the initiation of the implementation. The interview guide was adapted from the consolidated framework for implementation research (CFIR), and after transcribing and translating the data, the Open code version 4.03 was used to code and analyze them thematically. The results were presented under the CFIR domain and its framed constructs, along with quotations of participants' sayings.

**Results:** The findings showed that based on the intervention characteristics, positive staff attitude, regular performance monitoring team meetings, regular feedback mechanisms, and health system leaders' engagement were facilitators of the intervention. However, staff resistance, political instability, and workload challenged the implementation. From an outer-setting perspective, the policy initiative to engage health system leaders was mentioned as an implementation facilitator. On the other hand, limited awareness among staff regarding intervention packages and communication, lack of resources, and frequent campaign activities acted as barriers to implementation. Regarding the inner setting, implementers who were young showed interest in the intervention package and easily adapted to it. However, the implementation was constrained by the lack of peer-to-peer support, a poor culture of valuing health data, expectations of extensive training, and a shortage of trained personnel. Regarding the individual's characteristics, low beliefs and perceptions towards the intervention during the initial phase were barriers to implementation. However, health staff gradually accepted the intervention and began delivering it themselves. Lastly, a clear plan, leaders' involvement, evaluation, and monitoring of activities facilitated the implementation. However, the implementation schedule was not strictly followed as per the protocol due to political instability in the region.

**Conclusion:** The barriers and facilitators identified can be modified during the study. Providing capacity-building training and post-training follow-up intervention to the health system is paramount to enhance data quality and utilization. Focusing on the barriers and facilitators identified in this study could help to improve health data quality and utilization through the proper design of strategies and scaling up its effectiveness to larger settings where a similar contextual environment to the current study could enhance better data quality production and use.

**Keywords:** Barriers, facilitators, intervention, implementation, CFIR, framework, Benishangul Gumz, Ethiopia



## 5.9. UoG-CMHS09P: Intention to use electronic medical record and its predictors among health care providers at referral hospitals, north-West Ethiopia, 2019: using unified theory of acceptance and use technology 2(UTAUT2) model.

Mohammedjud Hassen Ahmed, Adina Demissie Bogale, Binyam Tilahun, Mulugeta Hayelom Kalayou, Jorn Klein, Shegaw Anagaw Mengiste & Berhanu Fikadie Endehabtu

<https://doi.org/10.1186/s12911-020-01202-1>

### Abstract

**Background:** electronic Medical Records (EMRs) electronically store patient information like medical histories, test results, and medications. They help to provide quality service by improving data handling and communication in healthcare settings. EMR implementation in developing countries is increasing exponentially. However, only a few have been successfully implemented. Healthcare providers' intention to use EMRs is crucial for successfully implementing and adopting EMRs. However, the purpose of healthcare providers to use EMRs in Ethiopia is unknown.

**Objective:** this study assessed healthcare providers' intention to use electronic medical record systems and their predictors for electronic medical record systems at three referral hospitals in northwest Ethiopia in 2019.

**Method:** an institutional cross-sectional explanatory study design was conducted from March to September among 420 healthcare providers working at three referral hospitals in northwest Ethiopia. Data were analyzed using a structural equation model (SEM). Simple and multiple SEM were used to assess the determinants of healthcare providers' intention to use EMRs. Critical ratio and standardized coefficients were used to measure the association of dependent and independent variables, and 95% confidence intervals and *P*-value were calculated to evaluate statistical significance. Qualitative data was analyzed using thematic analysis.

**Result:** the mean age of the study subjects was 32.4years  $\pm$ 8.3 SD. More than two-thirds, 293(69.8%) of the participants were male. Among 420 healthcare providers, only 167 (39.8%) were scored above the mean of intention to use EMRs. Factors positively associated with intention to use EMRs were performance expectancy ( $\beta=0.39, p <0.001$ ), effort expectancy ( $\beta=0.24, p <0.001$ ), social influence ( $\beta=0.18, p <0.001$ ), facilitating condition ( $\beta=0.23, p <0.001$ ), and computer literacy ( $\beta=0.08, p <0.001$ ). Performance expectancy was highly associated with the use of EMRs.

**Conclusion:** generally, about 40 % of health care providers scored above the mean of intention to use EMRs. Performance expectancy played a major role in determining health care providers' intention to use EMRs. The intention of health care providers to use EMRs was attributed to social influence, facilitating conditions in the organization, effort expectancy, performance expectancy, and computer literacy. Therefore, identifying prerequisites before the actual implementation of EMRs will help improve the implementation status.



## 5.10. UoG-CMHS10P: Healthcare providers' digital competency: a cross-sectional survey in a low-income country setting

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<https://doi.org/10.1186/s12913-020-05848-5>

### Abstract

**Background:** healthcare providers across all clinical practice settings progressively rely on and adapt information communication technologies to perform their professional activities. In this era of technology, healthcare providers, especially in lower-income countries, should have at least basic digital competency if they are to successfully apply technology. This study aimed to assess the digital competency of healthcare providers among seven public health centers in North-West Ethiopia.

**Methods:** A cross-sectional study design was applied to assess the basic digital competency of healthcare providers working in seven public health centers in the northeast Amhara regional state of Ethiopia. Self-administered questionnaires were adopted from the European Commission's digital competency framework for assessing digital competency. A multivariable logistic regression was performed to identify factors associated with basic digital competency with  $p$ -value $<0.05$  as a rule-out for statistical significance. The strength of association was explained in terms of coefficient estimate, adjusted odds ratio, and a 95% confidence interval (CI).

**Result:** Of the 193 healthcare providers included in the study, 167 responded, which is a response rate of 86.5%. The majority of respondents, 88 (52.7%), were males, and the mean age was 28.2 years, with a standard deviation of 5.5 years. The result indicated that all items demonstrated an adequate level of internal consistency with Cronbach alpha  $>0.7$ . Healthcare providers in those public health centers reported that problem-solving, safety, and communication are the most common challenges encountered. The multivariable logistic regression model indicated that sex, educational status, profession type, monthly income, and years of experience are statistically significant predictors.

**Conclusion:** The basic digital competency level of healthcare providers working in public health centers in this setting is relatively low. The results highlight the need to improve digital competency among healthcare providers, focusing on the identified skill gaps.

## 5.11. UoG-CMHS11P: Commitment Levels of Health Care Providers in Using the District Health Information System and the Associated Factors for Decision Making in Resource-Limited Settings: Cross-sectional Survey Study

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<https://doi.org/10.2196%2F23951>

**Background:** Changing the culture of information use, one of the Ministry of Health of Ethiopia's transformation agendas, cannot become real unless healthcare providers are committed to using locally collected data for evidence-based decision-making. The commitment of healthcare providers has a paramount influence on district Health Information System 2 (DHIS2) data utilization for decision-making. Evidence on health care providers' commitment to using DHIS2 data in Ethiopia is limited. Therefore, this study aims to fill this evidence gap.

**Objective:** This study aimed to assess healthcare providers' commitment levels and the factors influencing their commitment levels in 2020 when using DHIS2 data for decision-making at public healthcare facilities in the Ilu Aba Bora zone of the Oromia national, regional state, Ethiopia.

**Methods:** The cross-sectional quantitative study supplemented by qualitative methods was conducted from February 26, 2020, to April 17, 2020. 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, were performed. Thematic analysis was conducted for the qualitative data.

**Results:** Of the 264 respondents, 121 (45.8%, 95% CI 40.0%-52.8%) respondents showed high commitment levels to use DHIS2 data. The variables associated with the level of commitment to use DHIS2 data were found to be provision of feedback for DHIS2 data use (adjusted odds ratio [AOR] 1.85, 95% CI 1.02-3.33), regular supervision and managerial support (AOR 2.84, 95% CI 1.50-5.37), information use culture (AOR 1.92, 95% CI 1.03-3.59), motivation to use DHIS2 data (AOR 1.80, 95% CI 1.00-3.25), health needs (AOR 3.96, 95% CI 2.11-7.41), and competency in DHIS2 tasks (AOR 2.41, 95% CI 1.27-4.55).

**Conclusions:** Less than half of the study participants generally showed high commitment levels to use DHIS2 data for decision-making in health care. Providing regular supportive supervision and feedback and increasing the motivation and competency of the health care providers in performing DHIS2 data tasks will help promote their commitment levels and can result in the cultural transformation of data used for evidence-based decision-making in health care.

## 5.12. UoG-CMHS12P: Smartphone Medical App Use and Associated Factors Among Physicians at Referral Hospitals in Amhara Region, North Ethiopia, in 2019: Cross-sectional Study

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<https://doi.org/10.2196/19310>

### Abstract

**Background:** Information in health care is rapidly expanding and updated regularly, especially with the increasing use of technology in the sector. Due to this, healthcare providers require timely access to the latest scientific evidence anywhere. Smartphone medical apps are tools for accessing the latest reputable scientific evidence in the discipline. In addition, smartphone medical apps could lead to improved decision-making, reduced medical errors, and improved communication between hospital medical staff.

**Objective:** This study aimed to assess smartphone medical app use and associated factors among physicians working at referral hospitals in the Amhara region of Ethiopia.

**Methods:** An institution-based cross-sectional study design was conducted among physicians working at five referral hospitals in the Amhara region, Ethiopia, from February 5 to May 27, 2019. A simple random sampling method was used to select 423 physicians. A self-administered questionnaire was used to collect the data and analyzed using SPSS, version 21 (IBM Corp). Binary and multivariable logistic regression analysis was performed to assess factors associated with smartphone medical app use among physicians.  $P < .05$ , corresponding to a 95% CI, was considered statistically significant. The validity of the questionnaire was determined based on the view of experts, and the reliability of it obtained by calculating the value of Cronbach alpha ( $\alpha = .78$ ).

**Results:** In this study, most 417 respondents (375, 89.9%) had medical apps installed on their smartphones. Of those 375 respondents, 264 (70.4%) had used medical apps during clinical practice. The medical apps most commonly used by the respondents were UpToDate, Medscape, MedCalc, and Doximity. According to multivariable logistic regression analysis, attitude (adjusted odds ratio [AOR] 1.64, 95% CI 1.05-2.55), internet access (AOR 2.82, 95% CI 1.75-4.54), computer training (AOR 1.71, 95% CI 1.09-2.67), perceived usefulness of the app (AOR 1.64, 95% CI 1.05-2.54), information technology support staff (AOR 2.363, 95% CI 1.5-3.08), and technical skill (AOR 2.52, 95% CI 1.50-4.25) were significantly associated with smartphone medical app use.

**Conclusions:** Most respondents have a smartphone medical app and have used it in clinical practice. Attitude, internet access, computer training, perceived usefulness of the app, information technology support staff, and technical skill are the most notable factors that are associated with smartphone medical app use by physicians.

### 5.13. UoG-CMHS13P: E-health literacy and associated factors among chronic patients in a low-income country: a cross-sectional survey

Kirubel Biruk Shiferaw, Binyam Chakilu Tilahun, Berhanu Fikadie Endehabtu, Monika Knudsen Gullslett & Shegaw Anagaw Mengiste

<https://doi.org/10.1186/s12911-020-01202-1>

#### Abstract

**Background:** Chronic patients persistently seek health information on the internet for medication information, nutrition, disease management, information regarding disease preventive actions, and so on. The eHealth literacy skill is consumers' ability to search, find, appraise, and use health information from the internet. eHealth literacy is a congregate set of six basic skills (traditional literacy, health literacy, information literacy, scientific literacy, media literacy, and computer literacy). This study assessed eHealth literacy levels and the associated factors among internet users and chronic patients in northwest Ethiopia.

**Methods:** An institutional-based cross-sectional study design was conducted. A stratified sampling technique selected 423 study participants among chronic patients. The eHealth literacy scale (eHEALS) was used for data collection. The eHEALS is a validated eight-item Likert-scaled questionnaire used to assess the self-reported capability of eHealth consumers to find, appraise, and use health-related information from the internet to solve health problems. Statistical Package for Social Science version 20 was used for data entry and further analysis. Multivariable logistic regression was used to examine the association between the eHealth literacy skill and associated factors. Significance was obtained at 95% CI and  $p < 0.05$ .

**Result:** In total, 423 study subjects were approached and included in the study from February to May 2019. The response rate to the survey was 95.3%. The majority of respondents, 268 (66.3%), were males, and the mean age was  $35.58 \pm 14.8$  years. The multivariable logistic regression model indicated that participants with higher education (at least having the diploma) are more likely to possess high eHealth literacy skills with Adjusted Odds Ratio (AOR): 3.48, 95% CI (1.54, 7.87). Similarly, being government employee AOR: 1.71, 95% CI (1.11, 2.68), being urban resident AOR: 1.37, 95% CI (0.54, 3.49), perceived good health status AOR: 3.97, 95% CI (1.38, 11.38), having higher income AOR: 4.44, 95% CI (1.32, 14.86), Daily internet use AOR: 2.96, 95% CI (1.08, 6.76), having good knowledge about the availability and importance of online resources AOR: 3.12, 95% CI (1.61, 5.3), having positive attitude toward online resources AOR: 2.94, 95% CI (1.07, 3.52) and higher level of computer literacy AOR: 3.81, 95% CI (2.19, 6.61) were the predictors positively associated with higher eHealth literacy level.

**Conclusion:** Besides the mounting indication of efficacy, the present data confirm that the internet use and eHealth literacy level of chronic patients in this setting is relatively low, which clearly implicates that there is a need to fill the skill gap in eHealth literacy among chronic patients, which might help them find and evaluate relevant online sources for their health-related decisions.

## 5.14. UoG-CMHS14P: Mothers intention and preference to use mobile phone text message reminders for child vaccination in Northwest Ethiopia

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**Objectives:** With the unprecedented penetration of mobile devices in the developing world, mHealth applications are being leveraged for different health domains. Among the various factors that affect the use of mHealth interventions is the intention and preference of end-users to use the system. This study assessed mothers' intention and preference to use text message reminders for vaccination in Ethiopia.

**Methods:** A cross-sectional study was conducted among 460 mothers selected through a systematic random sampling technique. Initially, descriptive statistics were computed. Binary logistic regression analysis was also used to assess factors associated with the outcome variable.

**Results:** In this study, of the 456 mothers included for analysis, 360 (78.9%) of mothers have the intention to use text message reminders for vaccination. Of these, 270 (75%) wanted to receive the reminders a day before the vaccination due date. Mothers aged 35 years or more (AOR=0.35; 95%CI: 0.15 to 0.83), secondary education and above (AOR=4.43; 95%CI: 2.05 to 9.58), duration of mobile phone use (AOR=3.63; 95%CI: 1.66 to 7.94), perceived usefulness (AOR=6.37; 95%CI: 3.13 to 12.98) and perceived ease of use (AOR=3.85; 95%CI: 2.06 to 7.18) were predictors of intention to use text messages for vaccination.

**Conclusion:** In conclusion, most mothers intend to use text message reminders for child vaccination. Mother's age, education, duration of mobile phone use, perceived usefulness, and perceived ease of use were associated with the intention of mothers to use text messages for vaccination. Considering these predictors and user preferences before developing and testing text message reminder systems is recommended.

## 5.15. UoG-CMHS15P: Acceptability, Barriers and Facilitators of Mobile Text Message Reminder System Implementation in Improving Child Vaccination: A Qualitative Study in Northwest Ethiopia

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<https://doi.org/10.2147/jmdh.s298167>

### Abstract

**Background:** Mobile phone text message-based mHealth interventions have shown promise in improving health service delivery. Despite the promising findings at a small scale and in a few contexts, implementing new technologies as part of changes to healthcare services is inherently challenging. Though there is a potential to introduce mHealth initiatives to health systems of developing countries, existing evidence on the barriers and facilitators of implementation in different contexts is not adequate. Therefore, this study aimed to explore the acceptability, barriers, and facilitators of implementing a mobile text message reminder system for child vaccination in Ethiopia.

**Methods:** This study applied a phenomenological study design. It was conducted in northwest Ethiopia between July 28 and August 19, 2020. A total of 23 participants were purposively selected for the in-depth and key informant interviews. We used an interview guide to collect data, and audio recordings of interviews were transcribed verbatim. Coding was done to identify patterns, and thematic analysis was conducted using ATLAS ti7 software.

**Results:** The findings indicated that mothers were receptive to mobile text message reminders for their child's vaccination. Low mobile phone ownership, access to mobile networks, access to electricity, and illiteracy among the target population were identified as barriers affecting implementation. Confidentiality and security-related issues are not barriers to implementing text message reminders for child vaccination services. Facilitators for implementation include stakeholder collaboration, providing orientation/training to users, and willingness to pay by clients.

**Conclusion:** In this study, using mobile phone text message reminders for child vaccination services is acceptable by clients. Barriers identified were related to inadequate ICT infrastructure and other technical issues. Addressing the potential obstacles and leveraging the existing opportunities could optimize the implementation in resource-limited settings. Before actual implementation, program implementers should also consider providing orientation to users on the proposed mHealth program.

## 5.16. UoG-CMHS16P: Effect of Mobile Phone Text Message Reminders on the Completion and Timely Receipt of Routine Childhood Vaccinations: Superiority Randomized Controlled Trial in Northwest Ethiopia

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<https://doi.org/10.2196/27603>

### Abstract

**Background:** Nonattendance at vaccination appointments is a big challenge for health workers as it is difficult to track routine vaccination schedules. In Ethiopia, 3 out of 10 children have incomplete vaccinations, and the timely receipt of the recommended vaccines is low. Thus, innovative strategies are required to reach the last mile where mobile technology can be effectively utilized to achieve better compliance. Despite this promising technology, little is known about the role of a text message–based mobile health interventions in improving the complete and timely receipt of routine childhood vaccinations in Ethiopia.

**Objective:** This trial aimed to determine the effect of mobile phone text message reminders on the completion and timely receipt of routine childhood vaccinations in northwest Ethiopia.

**Methods:** A two-arm, parallel, superiority randomized controlled trial was conducted in 9 health facilities in northwest Ethiopia. A sample size of 434 mother-infant pairs was considered in this trial. Randomization was applied in selected health facilities during enrollment with a 1:1 allocation ratio by using sealed and opaque envelopes. Participants assigned to the intervention group received mobile phone text message reminders one day before the scheduled vaccination visits. Owing to the nature of the intervention, blinding participants was impossible. Primary outcomes of full and timely completion of vaccinations were measured objectively at 12 months. A two-sample test of proportion and log-binomial regression analyses were used to compare the outcomes between the study groups. A modified intention-to-treat analysis approach was applied and a one-tailed test was reported, considering the superiority design of the trial.

**Results:** A total of 426 participants were included for the analysis. We found that a higher proportion of infants in the intervention group received Penta-3 (204/213, 95.8% vs 185/213, 86.9%, respectively;  $P<.001$ ), measles (195/213, 91.5% vs 169/213, 79.3%, respectively;  $P<.001$ ), and full vaccination (176/213, 82.6% vs 151/213, 70.9%, respectively;  $P=.002$ ; risk ratio 1.17, 95% lower CI 1.07) compared to infants in the usual care group. Similarly, a higher proportion of infants in the intervention group received Penta-3 (181/204, 88.7% vs 128/185, 69.2%, respectively;  $P<.001$ ), measles (170/195, 87.1% vs 116/169, 68.6%, respectively;  $P<.001$ ), and all scheduled vaccinations (135/213, 63.3% vs 85/213, 39.9%, respectively;  $P<.001$ ; risk ratio 1.59, 95% lower CI 1.35) on time compared to infants in the usual care group. Of the automatically sent 852 mobile phone text messages, 764 (89.7%) were delivered successfully to the participants.

**Conclusions:** Mobile phone text message reminders significantly improved the complete and timely receipt of all recommended vaccines. Besides, they had a significant effect in improving the timely receipt of specific vaccines. Thus, text message reminders can supplement the routine immunization program in resource-limited settings. Studies on the implementation challenges of mobile health interventions are recommended considering different contexts.

## 5.17. UoG-CMHS17P: Timely completion of vaccination and its determinants among children in northwest, Ethiopia: a multilevel analysis

Zelege Abebaw Mekonnen, Kassahun Alemu Gelaye, Martin C. Were & Binyam Tilahun

<https://doi.org/10.1186/s12889-020-08935-8>

### Abstract

**Background:** Timely vaccination is key to preventing unnecessary childhood mortality from vaccine-preventable diseases. Despite substantial efforts to improve vaccination completeness, the effort towards timeliness of vaccination is limited, with non-attendance and delays to vaccination appointments remaining a big challenge in developing countries. There is also limited evidence on the timeliness of vaccination. Therefore, this study aimed to determine the magnitude and associated factors for timely immunization completion among children in Gondar city administration, north-west Ethiopia.

**Method:** This study employed a community-based cross-sectional study design. A sample size of 821 children aged 12 to 23 months was considered. Two-stage random sampling technique was used to select study subjects. To account for the effect of clustering, bivariable and multivariable multilevel logistic regression analysis were applied. The measures of association estimates were expressed as adjusted odds ratio (AOR) with their 95% confidence intervals (CIs).

**Results:** Of the 774 children included for analysis, 498 (64.3%) were fully vaccinated, while 247 (31.9%) were fully vaccinated on time. Caregivers who had secondary education and above (AOR=2.391; 95% CI: 1.317–4.343), from the richest households (AOR=2.381; 95% CI: 1.502–3.773), children whose mother attended four or more antenatal care visits (AOR=2.844; 95% CI: 1.310–6.174) and whose mother had two or more postnatal care visits (AOR=2.054; 95% CI: 1.377–3.063) were positively associated with on-time complete vaccination. On the contrary, caregivers aged above 35 years (AOR=0.469; 95% CI: 0.253–0.869), being vaccinated at health post (AOR=0.144; 95% CI: 0.048–0.428) and traveling more than 30 min to the vaccination site (AOR=0.158; 95% CI: 0.033–0.739) were negatively associated with on-time full vaccination. The random effects indicated that 26% of the variability in on-time full vaccination was attributable to differences between communities.

**Conclusion:** In this study, untimely vaccination was found to be high. Different individual and contextual factors were found to be associated with on-time full vaccination. Therefore, tailored strategies have to be designed and implemented to address people and the communities where they live. Moreover, timeliness of vaccination should be considered as important indicator of the immunization program performance in Ethiopia.



## 5.18. UoG-CMHS18P: Routine health information system utilization for evidence-based decision making in Amhara national regional state, northwest Ethiopia: a multi-level analysis

Moges Asressie Chanyalew, Mezgebu Yitayal, Asmamaw Atnafu & Binyam Tilahun

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### Abstract

**Background:** A Health Information System is the key to making evidence-based decisions. Ethiopia has been implementing the Health Management Information System (HMIS) since 2008 to collect routine health data and revised it in 2017. However, the evidence is meager on the use of routine health information for decision-making among department heads in health facilities. The study aimed to assess the proportion of routine health information systems utilization for evidence-based decisions and associated factors.

**Method:** A cross-sectional study was carried out among 386 department heads from 83 health facilities in ten selected districts in the Amhara region Northwest of Ethiopia from April to May 2019. The single population proportion formula was applied to estimate the sample size, taking into account the proportion of data use 0.69, the margin of error of 0.05, and the critical value of 1.96 at the 95% CI. The final sample size was estimated at 394, considering 1.5 as a design effect and 5% non-response. The study participants were selected using a simple random sampling technique. Descriptive statistics mean and percentage were calculated. The study employed a generalized linear mixed-effect model. Adjusted Odds Ratio (AOR) and the 95% CI were calculated. Variables with *p-value* < 0.05 were considered predictors of routine health information system use.

**Result:** The proportion of information used among department heads for decision-making was estimated at 46%. Displaying demographic (AOR=12.42, 95% CI [5.52, 27.98]) and performance (AOR=1.68; 95% CI [1.33, 2.11]) data for monitoring and providing feedback to HMIS unit (AOR=2.29; 95% CI [1.05, 5.00]) were individual (level-1) predictors. Maintaining performance monitoring team minute (AOR=3.53; 95% CI [1.61, 7.75]), receiving senior management directives (AOR=3.56; 95% CI [1.76, 7.19]), supervision (AOR=2.84; 95% CI [1.33, 6.07]), using HMIS data for target setting (AOR=3.43; 95% CI [1.66, 7.09]), and work location (AOR=0.16; 95% CI [0.07, 0.39]) were organizational (level-2) explanatory variables.

**Conclusion:** The proportion of routine health information utilization for decision-making was low. Displaying demographic and performance data, providing feedback to the HMIS unit, maintaining performance monitoring team minutes, conducting supervision, using HMIS data for target setting, and work location were factors associated with using routine health information for decision-making. Therefore, strengthening the capacity of department heads to display data, supervise feedback mechanisms, and engage senior management is highly recommended.

## 5.19. UoG-CMHS19P: Health professionals' readiness and its associated factors to implement Telemedicine system at private hospitals in Amhara region, Ethiopia 2021

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### Abstract

**Introduction:** In resource-limited settings, incorporating the telemedicine system into the healthcare system enhances the exchange of valid health information for practicing evidence-based medicine for the diagnosis, treatment, and prevention of diseases. Despite its great importance, the adoption of telemedicine in low-income country settings like Ethiopia was lagging and increasingly failed. Assessing the readiness of health professionals before the actual adoption of telemedicine is considered the prominent solution to tackle the problem. However, little is known about Health professionals' telemedicine readiness in this study setting.

**Objective:** Accordingly, this study aimed to assess health professionals' readiness and associated factors for implementing a Telemedicine system at private hospitals in the North West of Ethiopia.

**Materials and methods:** An institution-based cross-sectional study was conducted from March 3 to April 7, 2021. 423 health professionals working in private hospitals were selected using a simple random sampling technique. Multi-variable logistic regression was fitted to identify determinant factors of health professional readiness after the other covariates were controlled.

**Result:** In this study the overall readiness of telemedicine adoption was 65.4% (n = 268) [95% CI:60.1–69.8]. Knowledge (AOR = 2.5;95% CI: [1.4, 4.6]), Attitude (AOR = 3.2;95% CI: [1.6, 6.2]), computer literacy (AOR = 2.2; 95% CI: [1.3, 3.9]), computer training (AOR = 2.1;95% CI: [1.1, 4.1]), Computer skill (AOR = 1.9;95% CI: [1.1, 3.4]), computer access at office (AOR = 2.1;95% CI: [1.1, 3.7]), Internet access at office (AOR = 2.8; 95% CI: [1.6, 5.1]), Own personal computer (AOR = 3.0; 95% CI: [1.5, 5.9]) and work experience (AOR = 3.1; 95% CI: [1.4, 6.7]) were significantly associated with the overall health professionals readiness for the adoption of telemedicine using a cut point of p-value less than 0.05.

**Conclusion and recommendation:** Around two-thirds of the survey respondents showed excellent readiness for adopting telemedicine, implying that less effort is needed to improve readiness before implementing it. Building computer literacy and skills, confidence, and improving readiness through training, availability of computers, and good internet connection is essential. Further research is recommended. This study positively impacts the successful implementation and use of telemedicine by providing relevant information about health professionals' preparedness. Implementing telemedicine can significantly improve the health system's performance in terms of providing quality care, accessibility to health facilities, reducing costs, and creating a platform for communication between health professionals across different institutions to provide quality patient care.

## 5.20. UoG-CMHS20P: Current and Future Needs for Human Resources for Ethiopia's National Health Information System: Survey and Forecasting Study

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<https://doi.org/10.2196/28965>

**Background:** Strengthening the national health information system is one of Ethiopia's priority transformation agendas. A well-trained and competent workforce is essential to a strong health information system. However, this workforce has neither been quantified nor characterized well, and there is no roadmap of required human resources to enhance the national health information system.

**Objective:** We aimed to determine the current state of the health information system workforce and forecast the human resources needed for it by 2030.

**Methods:** We surveyed to estimate the current number of individuals employed in the health information system unit and the turnover rate. Document review and key-informant interviews collected current human resources and available health information system position data from 110 institutions, including the Ministry of Health, federal agencies, regional health bureaus, zonal health departments, district health offices, and health facilities. The Delphi technique was used to forecast human resources required for the health information system in the next ten years: 3 rounds of workshops with experts from the Ministry of Health, universities, agencies, and regional health bureaus were held. In the first expert meeting, we set criteria followed by expert suggestions and feedback.

**Results:** As of April 2020, 10,344 health information system professionals were working in the governmental health system. Nearly 95% (20/21) of district health offices and 86.7% (26/30) of health centers reported inadequate health information system positions. From June 2015 to June 2019, health information technicians had a high turnover (48/244, 19.7%) at all health system levels. In the next ten years, we estimate that 50,656 health information system professionals will be needed to implement Ethiopia's national health information system effectively.

**Conclusions:** Current health information system-related staffing levels were inadequate. To meet the estimated need of 50,656 multidisciplinary health information system professionals by 2030, the Ministry of Health and regional health bureaus must work on retaining existing and training additional health information system professionals in collaboration with partners and academic institutions.

## 5.21. UoG-CMHS21P: Level and contributing factors of health data quality and information use in Wogera and Tach Armacheho districts: social-ecological perspective

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<https://doi.org/10.1186/s12911-021-01741-1>

**Background:** The health management information system has been implemented at all levels of healthcare delivery to ensure quality data production and information use in Ethiopia. Various efforts have been made to improve the production and use of quality health data, including capacity-building activities and provision of infrastructure, though the results are still unsatisfactory. This study aimed to examine the quality of health data and use in the Wogera and Tach-Armacheho districts and understand its barriers and facilitators.

**Methods:** The study utilized a mixed method; for the quantitative approach, an institution-based cross-sectional study was conducted to determine the quality of health data and use by 95 departments in the two districts. The qualitative approach involved 16 in-depth interviewees from the Wogera district. A descriptive Phenomenological design was used to explore factors influencing the quality and use of health data. The quantitative data were expressed descriptively with tables, graphs, and percentages, whereas the qualitative data were analyzed with content analysis guided by the social-ecological model framework.

**Result:** the average levels of information used for the Wogera and Tach-Armacheho districts were estimated at 29 and 35.9, respectively. The average accuracy of reports for six different health services in the HCs of Wogera and Tach Armacheho districts was 0.95 and 0.86, respectively.

The qualitatively identified factors that influence the production and use of quality health data include valuing data, getting staff training, being a patriotic staff, and getting supportive supervision, were identified from individual-level characteristics; similarly, coaching, supportive supervision, and peer-to-peer learning from relational/interpersonal level characteristics, and organizational culture, incentive, infrastructure establishing accountability, and staff turnover, were identified from organizational level characteristics.

**Conclusion:** the quality of data and routine information utilization was low and were influenced by a number of actors presented in and around the health system including individual, interpersonal, and organizational characteristics. Incentive affects data quality and information use directly or indirectly after modifying factors at all levels of the social-ecological model. Therefore, interventions should gear towards addressing multiple social-ecological factors of the health system concomitantly or intervene on incentive which has a multifaceted effect on the outcome.

## 5.22. UoG-CMHS22P: Contributing Factors to Quality Health Data Production and Use in Benishangul Gumuze Region, Northwest Ethiopia: social ecological perspective

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<https://ejhd.org/index.php/ejhd/article/view/5378>

**Background:** Creating responsibility for quality healthcare data and utilization are among the basic functions of leadership. While the benefits of data quality and use are well known, the evidence around the role of healthcare information systems leadership and governance in sustaining data demand and use is limited. Therefore, this study investigated the level and contributing factors of health data quality and information use in Assosa district, Benishangule Gumuze Region.

**Methods:** A mixed approach design was used, using qualitative exploration and a facility-based quantitative cross-sectional approach. Seventeen departments from two health facilities were enrolled for the quantitative component, while 28 in-depth interviews were conducted to complete the qualitative part of the study. A phenomenological approach was used to explore factors influencing the quality and use of health data. Quantitative data was analyzed descriptively using tables and graphs, whereas qualitative data was analyzed using content analysis guided by the framework for the social-ecological model.

**Results:** The average information use and report accuracy levels were 38.6 and 119.33, respectively. Three themes emerged, explaining the main factors influencing quality data generation: individual characteristics, facility and environmental factors, and leadership and governance characteristics. Individual characteristics were motivation, capacity building, commitment, and digital literacy, while facility and ecological factors included infrastructure, healthcare information system resources, and supportive supervision. Furthermore, among the leadership and governance-related factors, healthcare data, assigning the right person, and system regulation were some identified factors.

**Conclusions:** Health data quality and its utilization were low during the Asossa city administration. The unfriendly physical and organizational working environments and high staff turnover, which negatively affected the leadership and governance of the health system, are some of the reasons that were sighted regarding the poor quality of data and information use. Therefore, interventions that have multifaceted effects on data quality and use, such as improving leadership and governance practices and behavior, should be implemented.

### 5.23. UoG-CMHS23P: Adherence to TB treatment remains low during continuation phase among adult patients in northwest Ethiopia

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<https://doi.org/10.1186/s12879-021-06428-6>

**Background:** Patients' failure to adhere to TB treatment was a significant challenge that led to poor treatment outcomes. In Ethiopia, TB treatment success was low as compared with the global threshold. Despite various studies done on TB treatment adherence, little was explicitly known in the continuation phase, where TB treatment is mainly patient-centered. This study aimed to determine compliance to TB treatment and its determinants among adult patients during the continuation phase.

**Methods:** we deployed a facility-based cross-sectional study design supplemented with qualitative data to explore the perspectives of focal healthcare providers. The study population was all adult ( $\geq 18$  years) TB patients enrolled in the continuation phase and focal healthcare workers in TB clinics. The study included 307 TB patients from 22 health facilities and nine TB focal healthcare providers purposively selected as key informants. A short (11-question) version of the Adherence to Refill and Medication Scale (ARMS) was used for measuring adherence. Data was collected using an interviewer-administered questionnaire and in-depth interviews for qualitative data. Binary logistic regression was applied to identify factors associated with patient adherence. We followed a thematic analysis for the qualitative data. The audio data was transcribed, coded, and categorized into themes using OpenCode software.

**Results:** Among 307 participants, 64.2% (95% CI (58.6–69.4%)) adhered to TB treatment during the continuation phase. A multi-variable analysis shows that secondary education (AOR=4.138, 95% CI; 1.594–10.74); good provider-patient relationship (AOR=1.863, 95% CI; 1.014–3.423); good knowledge of TB treatment (AOR=1.845, 95% CI; 1.012–3.362) and middle family wealth (AOR=2.646, 95% CI; 1.360–5.148) were significantly associated with adherence to TB treatment. The majority (58%) of patients mentioned forgetfulness, followed by 17.3% of them traveling away from home without pills as major reasons for non-adherence to TB treatment.

**Conclusions:** The study indicated that patients' adherence to TB treatment remains low during the continuation phase. The patient's education level, knowledge, family wealth, and provider-patient relationship were positively associated with patient adherence. Forgetfulness, traveling away, and feeling sick were significant reasons for non-adherence to TB treatment. Interventional studies are needed on those factors to improve patient adherence to TB treatment during the continuation phase.

## 5.24. UoG-CMHS24P: Outcome evaluation of Capacity Building and Mentorship Partnership (CBMP) program on data quality in the public health facilities of Amhara National Regional State, Ethiopia: a quasi-experimental evaluation

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<https://doi.org/10.1186/s12913-021-07063-2>

### Abstract

**Background:** Capacity Building and Mentorship Partnership (CBMP) is a flagship program designed by the Ethiopian Ministry of Health in collaboration with six local universities to strengthen the national health information system and facilitate evidence-informed decision-making through various initiatives. The program was initiated in 2018. This evaluation aimed to assess the outcome of CBMP on health data quality in the public health facilities of Amhara National Regional State, Ethiopia.

**Methods:** A matched comparison group evaluation design with a sequential explanatory mixed-method was used to evaluate the impact of CBMP on data quality. A total of 23 health facilities from the intervention group and 17 comparison health facilities from a randomly selected district were used for this evaluation. The Organization for Economic Cooperation and Development (OECD) evaluation framework with relevance, effectiveness, and impact dimensions was used to measure the program's outcome using the judgment parameter. The program's average treatment effect on data quality was estimated using propensity score matching (PSM).

**Results:** The overall outcome of CBMP was found to be 90.75%. The mean data quality in the intervention health facility was 89.06% [95 %CI: 84.23, 93.88], which has a significant mean difference with the comparison health facilities (66.5% [95% CI: 57.9–75]). In addition, the CBMP increases the data quality of pilot facilities by 27.75% points [95 %CI: 17.94, 37.58] on the nearest neighboring matching. The qualitative data also noted a data quality problem in the health facility, and CBMP improved the data quality gap in intervention health facilities.

**Conclusions:** The outcome of the CBMP was highly satisfactory. The program effectively increased the quality of data in health facilities. Therefore, the findings of this evaluation can be used by policymakers, program implementers, and funding organizations to scale the program at large to improve the overall health data quality for health outcome improvement.

## 5.25. UoG-CMHS25P: Assessment of data demand for informed-decisions among health facility and department heads in public health facilities of Amhara Region, northwest Ethiopia

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<https://doi.org/10.1186/s12961-023-01006-5>

**Background:** Evidence-based decision-making is a foundation of health information systems; however, routine health information is not utilized mainly by Amhara decision-makers. Therefore, this study aimed to explore the facility and department heads' perceptions regarding the demand for and use of routine health information for decision-making.

**Methods:** a phenomenological qualitative study was done in eight districts of the Amhara region from June 10/2019 to July 30/2019. We obtained written informed consent and recruited 22 key informants purposively. The research team prepared a codebook, assigned codes to ideas, identified salient patterns, grouped similar ideas, and developed themes from the data. Thus, data were analyzed thematically using OpenCode software.

**Results:** The study revealed that health workers collected data, but little was demanded and utilized to inform decisions. The majority of respondents perceived that data were collected merely for reporting. Lack of skills in data management, analysis, interpretation, and use were the technical attributes. Individual attributes included low staff motivation, carelessness, and lack of value for data. Poor access to data, low support for the Health Information System, limited space for archiving, and inadequate finance were related to organizational attributes. The contextual (social-political) factors also influenced the use of eHealth applications for improved data demand and use among healthcare providers.

**Conclusion:** In this study, health workers collect routine health data merely for reporting, and they did not demand and use it primarily to inform decisions and solve problems. Technical, individual, organizational, and contextual attributes contributed to the low demand and use of routine health data. Thus, we recommend building the technical capacity of health workers, introducing motivation mechanisms, and ensuring accountability systems for better data use.



## 5.26. UoG-CMHS26P: Facilitators and Barriers Affecting the Implementation of Capacity Building and Mentorship Program (CBMP) in Improving Evidence-Based Decision-Making in Amhara Region, Northwest Ethiopia: An Exploratory Qualitative Study

Moges Asressie Chanyalew, Mezgebu Yitayal, Asmamaw Atnafu, Shegaw Anagaw Mengiste, Monika Knudsen Gullslett, Binyam Tilahun

<https://www.ajol.info/index.php/ejhd/article/view/245143>

### Abstract

**Background:** The Capacity Building and Mentorship Program (CBMP) has been implemented in Amhara Region to enhance data use for decisions. Though the intervention effectively improves the routine health data use for decision-making, knowledge on the facilitators and barriers in implementing the CBMP is scarce. Therefore, this study sought to explore the facilitators and barriers that affect the implementation of the CBMP in improving evidence-based decision-making in the Amhara National Regional State of Ethiopia.

**Methods:** A hermeneutical phenomenology qualitative study was conducted in five districts of the Amhara region from June 5 to July 30, 2020. Using a heterogeneous purposive sampling method, the study recruited 25 key informants working at different health system levels. Codes were developed and assigned to the data, ideas of patterns were searched, and themes and subthemes were identified using abductive thematic analysis.

**Results:** The overarching thematic areas spanning were 1) The need for a Capacity Building and Mentorship Program (CBMP), 2) the Effectiveness of CBMP in Routine Health Information System (RHIS) Performances, 3) Implementation Facilitators, and 4) Implementation Barriers. The subthemes of implementation facilitators and barriers were human-related, technical, organizational, and socio-economic context-related. Human-related (a favorable attitude towards recommendations for mentors, staff motivation, and leaders' commitment), technical (skill in data management and use, and the capacity for conducting the performance monitoring team meeting), organizational (access to information, data availability, and resource supply), and contextual (policy support and government concern) were positive attributes. Human-related constraints include resistance to accepting the intervention at the early stage of the intervention period and lack of knowledge on the National Classification of Disease; technical barriers: lack of intra-facility information communication skills and inadequate training; organizational barriers: trained staff turnover and lack of technology for intra-facility data sharing; and contextual barriers (the onset of the COVID19 and security issues).

**Conclusion:** Human, technical, organizational, and contextual attributes played massive roles in facilitating the implementation. However, strengthening the capacity of health workers, supporting health workers for good use of NCOD, installing intra-facility level data sharing mechanisms, and continuous re-assessment of the context in implementing the CBMP is required.

## 5.27. UoG-CMHS27P: Routine health information system utilization for evidence-based decision making in Amhara national regional state, northwest Ethiopia: a multi-level analysis:

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<https://doi.org/10.1186/s12911-021-01400-5>

**Background:** The Health Information System is the key to making evidence-based decisions. Ethiopia has been implementing the Health Management Information System (HMIS) since 2008 to collect routine health data and revised it in 2017. However, the evidence is meager on the use of routine health information for decision-making among department heads in health facilities. The study aimed to assess the proportion of routine health information systems utilization for evidence-based decisions and associated factors.

**Method:** A cross-sectional study was carried out among 386 department heads from 83 health facilities in ten selected districts in the Amhara region Northwest of Ethiopia from April to May 2019. The single population proportion formula was applied to estimate the sample size, taking into account the proportion of data use 0.69, the margin of error of 0.05, and the critical value of 1.96 at the 95% CI. The final sample size was estimated at 394, considering 1.5 as a design effect and 5% non-response. The study participants were selected using a simple random sampling technique. Descriptive statistics mean and percentage were calculated. The study employed a generalized linear mixed-effect model. Adjusted Odds Ratio (AOR) and the 95% CI were calculated. Variables with p-value<0.05 were considered predictors of routine health information system use.

**Result:** The proportion of information used among department heads for decision-making was estimated at 46%. Displaying demographic (AOR=12.42, 95% CI [5.52, 27.98]) and performance (AOR=1.68; 95% CI [1.33, 2.11]) data for monitoring and providing feedback to HMIS unit (AOR=2.29; 95% CI [1.05, 5.00]) were individual (level-1) predictors. Maintaining performance monitoring team minute (AOR=3.53; 95% CI [1.61, 7.75]), receiving senior management directives (AOR=3.56; 95% CI [1.76, 7.19]), supervision (AOR=2.84; 95% CI [1.33, 6.07]), using HMIS data for target setting (AOR=3.43; 95% CI [1.66, 7.09]), and work location (AOR=0.16; 95% CI [0.07, 0.39]) were organizational (level-2) explanatory variables.

**Conclusion:** The proportion of routine health information utilization for decision-making was low. Displaying demographic and performance data, providing feedback to HMIS units, maintaining performance monitoring team minutes, conducting supervision, using HMIS data for target setting, and work location were factors associated with the use of routine health information for decision making. Therefore, strengthening the capacity of department heads on data displaying, supervision, feedback mechanisms, and engagement of senior management are highly recommended.

## 5.28. UoG-CMHS28P: Lessons and Implementation Challenges of Community Health Information System in LMICs: A Scoping Review of Literature

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### Abstract

**Background:** Accurate and timely information on health intervention coverage, quality, and equity is the foundation of public health practice. To achieve this, countries have made efforts to improve the quality and availability of community health data by implementing a community health information system that collects data in the field generated by community health workers and other community-facing providers. Despite all the efforts, evidence on the current state is scant in Low- and Middle-Income Countries (LMICs).

**Objective:** To summarize the available evidence on the current implementation status, lessons learned, and implementation challenges of community health information systems (CHIS) in LMICs.

**Methods:** We conducted a scoping review that included studies that were searched using electronic databases like PubMed/Medline, World Health Organization (WHO) Library, Science Direct, and Cochrane Library. We also searched Google and Google Scholar using different combinations of search strategies. Studies that applied any study design, data collection, and analysis methods related to CHIS were included. The review included all studies published until February 30, 2022. Two authors extracted the data and resolved disagreements by discussing and consulting a third author.

**Results:** 1,552 potentially relevant articles/reports were generated from the initial search, of which 21 were considered for the final review. The review found that CHIS is implemented in various structures using various tools across different LMICs. For the CHIS implementation, the majority used registers, family folders/cards, mobile technologies, and chalk/whiteboards. Community-level information was fragmented, incomplete, and mostly flowed only one way, with a bottom-up approach. The review also indicated that technology, particularly Electronic Community Health Information System (eCHIS) and mobile applications, plays a role in strengthening CHIS implementation in most LMICs. Many challenges remain for the effective implementation of CHIS with unintegrated systems, including the existence of parallel recording & reporting tools. Besides, lack of resources, low technical capacity, shortage of human resources, and poor Information Communication Technology (ICT) infrastructure were reported as barriers to the effective implementation of CHIS in LMICs.

**Conclusion:** Generally, community health information system implementation in LMICs is in its early stages. There was no universal or standard CHIS design and implementation modality across countries. There are also promising practices on digitalizing community health information systems. Different organizational, technical, behavioral, and economic barriers exist to effectively implementing CHIS. Hence, greater collaboration, coordination, and joint action are needed to address these challenges. Strong leadership, motivation, capacity building, and regular feedback are also essential to strengthen the CHIS in LMICs. Moreover, CHIS should be transformed into eCHIS by integrating different technology solutions. Local ownership is also critical to the long-term sustainability of CHIS implementation.

**Keywords:** CHIS, Community Health Workers, HIS, LMICs, Scoping Review

## 5.29. UoG-CMHS29P: The Effectiveness of the Capacity Building and Mentorship Program in Improving Evidence-Based Decision-making in the Amhara Region, Northwest Ethiopia: Difference-in-Differences Study

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<https://doi.org/10.2196/30518>

### Abstract

**Background:** Weak health information systems (HISs) hinder countries' ability to effectively manage and distribute their resources to match the burden of disease. To improve HIS performance, the Capacity Building and Mentorship Program (CBMP) was implemented in select districts of the Amhara region of Ethiopia; however, evidence about the effectiveness of the intervention was meager.

**Objective:** This study aimed to determine the effectiveness of routine health information use for evidence-based decision-making among health facilities and department heads in the Amhara region, Northwest Ethiopia.

**Methods:** The study was conducted in 10 districts of the Amhara region: five were in the intervention group, and five were in the comparison group. We employed a quasi-experimental study design in the form of a pretest-posttest comparison group. Data were collected from June to July 2020 from the heads of departments and facilities in 36 intervention and 43 comparison facilities. The sample size was calculated using the double population formula, and we recruited 172 participants from each group. We applied a difference-in-differences analysis approach to determine the effectiveness of the intervention. The heterogeneity of program effect among subgroups was assessed using a triple differences method (i.e., difference-in-difference-in-differences [DIDID] method). Thus, the  $\beta$  coefficients, 95% CIs, and P values were calculated for each parameter, and we determined that the program was adequate if the interaction term was significant at  $P < .05$ .

**Results:** Data were collected using the endpoint survey from 155 out of 172 (90.1%) participants in the intervention group and 166 out of 172 (96.5%) participants in the comparison group. The average level of information use for the comparison group was 37.3% (95% CI 31.1%-43.6%) at baseline and 43.7% (95% CI 37.9%-49.5%) at study endpoint. The average level of information use for the intervention group was 52.2% (95% CI 46.2%-58.3%) at baseline and 75.8% (95% CI 71.6%-80.0%) at study endpoint. The study indicated that the net program change over time was 17% (95% CI 5%-28%;  $P = .003$ ). The subgroup analysis also indicated that location showed significant program effect heterogeneity, with a DIDID estimate equal to 0.16 (95% CI 0.026-0.29;  $P = .02$ ). However, sex, age, educational level, salary, and experience did not show significant heterogeneity in program effect, with DIDID estimates of 0.046 (95% CI -0.089 to 0.182), -0.002 (95% CI -0.015 to 0.009), -0.055 (95% CI -0.190 to 0.079), -1.63 (95% CI -5.22 to 1.95), and -0.006 (95% CI -0.017 to 0.005), respectively.

**Conclusions:** The CBMP was effective at enhancing the capacity of study participants in using the routine HIS for decision-making. We noted that urban facilities had benefited more than their counterparts. The intervention has been shown to produce positive outcomes and should be scaled up to be used in other districts. Moreover, the mentorship modalities for rural facilities should be redesigned to maximize the benefits.

### 5.30. UoG-CMHS30P: Strengthening the national health information system through a capacity-building and mentorship partnership (CBMP) programme: a health system and university partnership initiative in Ethiopia

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<https://doi.org/10.1186/s12961-021-00787-x>

#### Abstract

**Background:** A robust health information system (HIS) is one of the essential building blocks for a resilient health system. Ethiopia's Ministry of Health (MOH) is working on different initiatives to strengthen the national HIS. Among these is the Capacity-Building and Mentorship Partnership (CBMP) Programme, which has been in collaboration with public universities in Ethiopia since November 2017. This study aims to evaluate the outcomes and share the country's experiences in working with universities to strengthen the national HIS.

**Methods:** The study employed a mixed-methods approach that included 247 health organizations (health offices and facilities) of CBMP-implementing woredas (districts) and 23 key informant interviews. The program focused on capacity-building and mentoring facilities and woreda health offices. The status of HIS was measured using a connected woreda checklist before and after the intervention. The checklist includes HIS infrastructure, data quality, and administrative use. Based on the score, the organizations were classified as emerging, candidate, or model. The findings were triangulated with qualitative data collected through key informant interviews.

**Results:** The results showed that the overall score of the HIS implementation was 46.3 before and 74.2 after implementing the program. The proportion of model organizations increased from 1.2% to 31.8% after the program implementation. The health system–university partnership has allowed higher education institutions to understand the health system and tune their curricula to address real-world challenges. The partnership brought opportunities to conduct and produce local- and national-level evidence to improve the HIS. Weak ownership, poor responsiveness, and poor perceptions of the program were significant challenges in program implementation.

**Conclusion:** The overall HIS has shown substantial progress in CBMP implementation woredas. Several facilities became models in a short period after the program's implementation. The health system–university partnership was found to be a promising approach to improving the national HIS and sharing the on-the-ground experiences with the university academics. However, weak ownership and poor responsiveness to feedback were the significant challenges identified as needing more attention in future program implementation.

### 5.31. UoG-CMHS31P: Data completeness and consistency in individual medical records of institutional births: retrospective cross sectional study from Northwest Ethiopia, 2022

Biniam Keyfalew Taye, Lemma Derseh Gezie, Asmamaw Atnafu, Shegaw Anagaw Mengiste & Binyam Tilahun

<https://doi.org/10.1186/s12913-023-10127-0>

#### Abstract

**Background:** Ensuring the data quality of Individual Medical Records becomes a crucial strategy in mitigating maternal and newborn morbidity and mortality during and around childbirth. However, previous research in Ethiopia primarily focused on studying data quality of institutional birth at the facility level, overlooking the data quality within Individual Medical Records. This study examined the data completeness and consistency within Individual Medical Records of the institutional birth service and associated factors.

**Methods:** An institution-based retrospective cross-sectional study was conducted in two districts of Northwest Ethiopia. Data were obtained by reviewing three sets of Individual Medical Records of 651 women: the delivery register, Integrated Individual Folder, and integrated card. The proportions of completeness and consistency were computed. A multilevel binary logistic regression was used to identify factors of completeness and consistency. An odds ratio with a 95% confidence interval was used to assess the significance level.

**Results:** Overall, 74.0% of women's Individual Medical Records demonstrated good data completeness ( $\geq 70\%$ ), 95%CI (70.5, 77.3), while 26% exhibited good consistency, 95%CI (22.9, 29.7). The presence of trained providers in data quality (AOR=2.9, 95%CI: (1.5, 5.7)) and supportive supervision (AOR=11.5, 95%CI: (4.8, 27.2)) were found to be associated with completeness. Health facilities' practice of root cause analysis on data quality gaps (AOR=8.7, 9%CI: (1.5, 50.9)) was statistically significantly associated with the consistency.

**Conclusions:** Most medical records were found to have good completeness, but nearly only a quarter of them were found to contain consistent data. Completeness and consistency varied on the type of medical record. Health facility's root cause analysis of data quality gaps, the presence of trained providers in data quality, and supportive supervision from higher officials were identified as factors affecting data quality in institutional birth service. These results emphasize the importance of focused efforts to enhance data completeness and consistency within Individual Medical Records, particularly through consideration of Individual Medical Records in future provider training, supervision, and the implementation of root cause analysis practices.

### 5.32. UoG-CMHS32P: Effect of a phone reminder system on patient-centered tuberculosis treatment adherence among adults in Northwest Ethiopia: a randomized controlled trial

Kassahun Dessie Gashu, Kassahun Alemu Gelaye, Richard Lester, and Binyam Tilahun

<https://doi.org/10.1136%2Fbmjhci-2020-100268>

**Objectives:** This study aimed to evaluate the effect of the phone reminder system on patient-centered TB treatment adherence during the continuation phase, where patients are responsible for taking medication at home.

**Methods:** We conducted a two-arm randomized controlled trial on adult patients with TB during the continuation phase. In the intervention arm, patients received routine care, phone-based weekly pill refilling, and daily medication reminders. In the control arm, participants received only routine care. A covariate adaptive randomization technique was used to balance covariates during allocation. The primary outcome was adherence to patient-centered TB treatment, and secondary outcomes included provider–patient relationship and treatment outcomes. We applied per-protocol and intention-to-treat analysis techniques.

**Results:** We randomized 306 patients to intervention (n=152) and control (n=154) groups. Adherence to patient-centered TB treatment was 79% (110/139) in intervention and 66.4% (95/143) in control groups, with a relative risk (RR) (95% lower CI) (RR=1.632 (1.162 to ∞); p=0.018, one-tailed). Good provider–patient relationship was 73.3% (102/139) in the intervention group and 52.4% (75/143) in the control group, p=0.0001. TB treatment success was 89.5% (136/152) in the intervention group and 85.1% (131/154) in the control group, p=0.1238.

**Conclusions:** Mobile phone-based weekly refilling with a daily medication reminder system improved adherence to patient-centered TB treatment and provider–patient relationship; however, there was no significant effect on treatment success.



### 5.33. UoG-CMHS33P: Does phone messaging improves tuberculosis treatment success? A systematic review and meta-analysis

Kassahun Dessie Gashu, Kassahun Alemu Gelaye, Zeleke Abebaw Mekonnen, Richard Lester & Binyam Tilahun

<https://doi.org/10.1186/s12879-020-4765-x>

**Background:** Compliance with anti-TB treatment is crucial in achieving a cure and avoiding the emergence of drug resistance. Electronic health (eHealth) interventions are included in the strategy to end the global Tuberculosis (TB) epidemic by 2035. Evidence showed that mobile messaging systems could improve patient adherence to clinic appointments for diagnosis and treatment. This review aimed to assess the effect of mobile phone messaging on anti-TB treatment success.

**Methods:** All randomized controlled trials (RCT) and quasi-experimental studies done before August 26, 2019, were included in the review. Studies were retrieved from PubMed, EMBASE, Cochrane, and ScienceDirect databases, including grey and non-indexed literature from Google and Google Scholar. The quality of studies was independently assessed using the Cochrane Risk of Bias Assessment Tool. Qualitative synthesis and quantitative pooled estimation were used to measure the effect of phone messaging on TB treatment success rate. PRISMA flow diagrams were used to summarize the article selection process.

**Results:** 1237 articles were identified, with 14 meeting the eligibility criteria for qualitative synthesis. Eight studies with 5680 TB patients (2733 in intervention and 2947 in control groups) were included in the meta-analysis. The pooled effect of mobile phone messaging revealed a slight increase in treatment success compared to standard of care (RR 1.04, 95% CI 1.02 to 1.06), with low heterogeneity ( $I^2 = 7\%$ ,  $p < 0.0002$ ). In the review, performance, detection, and attrition biases were reported as major risks of biases.

**Conclusions:** Mobile phone messaging showed a modest effect on improving anti-TB treatment success; however, the quality of the evidence was low. Further controlled studies are needed to increase the evidence base on the role of mHealth interventions in improving TB care.



### 5.34. UoG-CMHS34P: Feasibility, acceptability and challenges of phone reminder system implementation for tuberculosis pill refilling and medication in Northwest Ethiopia

Kassahun Dessie Gashu, Kassahun Alemu Gelaye, Binyam Tilahun

<https://doi.org/10.21203/rs.3.rs-229284/v1>

**Background:** Mobile health (mHealth) technologies have shown promising results in improving tuberculosis (TB) treatment adherence. However, their implementation was not well studied specifically in low-income settings. This study aimed to fill this evidence gap by exploring the feasibility, acceptability, and challenges of implementing a phone-based TB medication and pill-refilling reminder system during the continuation phase.

**Methods:** The study used a phenomenological study design to explore participants' lived experiences regarding the reminder system's feasibility, acceptability, and implementation challenges. This study was part of the Randomised Controlled Trial (RCT) that deployed the reminder system in Northwest Ethiopia. We purposively selected 15 TB patients from eight districts in Central Gondar Zone and Gondar Town Administration who were enrolled in the interventional group of the RCT. The simplified Consolidated Framework for Implementation Research (CFIR) guided the study. Data was collected using an in-depth interview, and events were captured by observation throughout the intervention period. Message delivery reports are generated from the Ethio-telecom database. Interpretation and analysis were conducted using thematic analysis.

**Results:** This study has shown that the local telecommunication infrastructure has supported the deployment of the new intervention and more than eight of ten reminder messages were delivered to the participants. All participants who received the reminder messages replied that the system was useful, and many of them suggested a broader scale-up. We identified challenges related to the inner and outer setting, as well as the implementation process and intervention characteristics.

**Conclusion:** Phone-based reminder systems could have promising feasibility and acceptability to support TB treatment and care in low-income settings with modifiable challenges throughout the implementation process. More implementation science studies are required to improve its effectiveness in more complex contexts.

### 5.35. UoG-CMHS35P: The Influence of Parallel Reporting Systems on Data Quality and Information Use in Northwest Ethiopia: A Qualitative Study

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<https://ejhd.org/index.php/ejhd/article/view/5379>

**Background:** Ethiopia utilizes the district health information system for health information management. However, the lower-level health structure seems inaccurate compared to the parallel reporting system, with limited evidence of its effect on data quality and information use. Therefore, the present study aimed to assess the influence of a parallel reporting system on data quality and information use at the lower-level structures of the Amhara region, Northwest Ethiopia.

**Methods:** The study was conducted in five districts of the Amhara region using an explanatory case study design. Twenty respondents were interviewed from the 1st – to the 30th of April 2021, using a semi-structured critical informant interview (KII) guide with multiple probes to explore relevant information. The data was transcribed into English and transferred to the Open-Code 4.02 software for analysis. Textual data were coded, and themes were identified from the synthesis. Inductive thematic analysis was applied to determine the relationships among the emerging themes to draw a relevant conclusion.

**Results:** Five themes emerged from the analysis, including the current practice of parallel reporting, a program area of parallel reporting, the influence of parallel reporting, reasons for parallel reporting, and the means to avoid parallel reporting. Likewise, parallel reporting was done at the district level and at the point of service delivery. The respondents described maternal and child health programs often using parallel reporting. Parallel reporting was described as having undesirable impacts on routinely collected health data quality and use. Moreover, it increases the work burden and affects service quality, the satisfaction levels of clients and staff, and overall efficiency. The main reasons for practicing parallel reporting were missing essential data elements in DHIS2, single language, varying stakeholders' interests, and lack of conducting a partner forum.

**Conclusion and implication:** Against the national health information system's guiding principles and vision, parallel reporting is practiced at the lower health system levels for various programs. Therefore, a corrective measure should be taken to achieve the country's information revolution (IR) agenda. To avoid parallel reporting mechanisms, it is recommended that regular partner forums at the district level must be strengthened, important data elements should be incorporated into the DHIS 2, and additional language platforms should be included in the DHIS2 system.

### 5.36. UoG-CMHS01U: Effect of health campaigns on the routine health service delivery and health information system in Central Gondar zone and Gondar City Ethiopia, 2023.

**Background:** Public health campaigns have become effective in improving healthcare performance and reducing morbidity and mortality of disease conditions for several decades. The Ethiopian government has been delivering different campaign activities in order to enhance community awareness and improve the health conditions of its population. However, little is known about the effectiveness of different public campaigns for improving HIS performance and service outcomes in the study setting. Therefore, this study aimed to assess the effect of health campaigns on the routine health service delivery and health information system in Central Gondar zone and Gondar City.

**Methods:** A descriptive qualitative study design with multiple data sources, of which 24 KII, five group interviews, and 19 document reviews were employed at the purposively selected health institutions from June to July 2023. The document review data was used and summarized to assess the practice of health institutions on the annual campaigns they implemented and the performance of the institutions on the selected health service and health information indicators. Textual data were coded, and themes were identified from the synthesis. A thematic content analysis approach was used to summarize and synthesize the information explored.

**Results:** The study showed that the campaign management practice has benefits/opportunities for routine services. However, the study participants and document review results also showed that the campaigns negatively affect routine service delivery and routine health information systems. Moreover, the study participants stated that campaigns have effects on service quality, service accessibility and coverage, patient satisfaction, patient waiting time, and community trust. Similarly, the health campaigns also have negative effects on routine health information systems such as integrated supportive supervision practice (ISS), data quality (data recording, report completeness, and timeliness, consistency), and data use practice (PMT meeting, performance monitoring, action plan development, and implementation). The participants also suggested that the strategies to overcome the challenges were rescheduling the campaign work, building a strong M&E system, building strong staff ownership, strengthening strong communication among the staff and stakeholders, and outsourcing the campaigning outside the routine health workers.

**Conclusions and recommendation:** Even if campaigns positively impact the health service performance coverage and utilization of the targeted population, it also negatively affect the HIS performance and routine quality of services. Therefore, policymakers and healthcare administrators better to consider the potential negative impacts and implement mitigation strategies. Balancing the goals of health campaigns with the ongoing delivery of routine health services is crucial for maintaining a robust and sustainable healthcare system.

**Keywords:** Effect, campaign, health information system, routine health service, Gondar,

### 5.37. UoG-CMHS02U: The practice and barriers of HIS accountability framework in Central Gondar zone and Gondar City Ethiopia, 2023

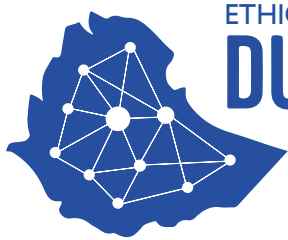
#### Abstract

**Introduction:** The government of Ethiopia has designed different initiatives for the HIS program since 2008, including an information revolution transformation agenda by 2015. With the ministry's collaboration, universities and other partners' different interventions have been designed and implemented targeting the skill and infrastructure challenges. However, the practice of designing behavioral-related challenges is limited across the system. Therefore, this study aimed to assess the practice and barriers of HIS accountability framework at the selected public health institutions.

**Method:** A descriptive qualitative study design was employed from June to July 2023. The study was conducted at the purposively selected key. A prepared pilot-tested semi-structured interview guide was used. A thematic content analysis approach was used to summarize and synthesize the information explored.

**Findings:** The study explored that the participants better understand the concept and benefit of the HIS accountability framework. It was believed that the HIS accountability framework would help govern and manage the behavioral-related challenges, such as recurring HIS errors, and enhance the commitment and adherence of the HIS actors, data handover practice, sustainable progress, and finally, improve data quality and use. However, even if it is stated as beneficial, the practice and experience are limited in implementing the HIS accountability framework. Lack of national guidelines on HIS governance, the poor culture of accountability, multiple responsibilities and workload, lack of political attention for the HIS program, high staff, leadership turnover, lack of motivation, and security problems were stated barriers to designing and implementing the HIS accountability framework. It was suggested that creating a conducive work environment, engaging health professionals and other actors during the protocol development, building the skills on HIS and leadership, making the HIS political agenda, and having the national HIS governance document to implement the intervention effectively.

**Conclusion and recommendation:** Even if there is a better understanding of the concept and benefit of the HIS accountability framework, its practice across the system is limited. It would be better to design the HIS accountability framework using human-centered design by engaging the key HIS actors and understanding their feelings and emotions.



ETHIOPIA  
**DUP**

DATA USE  
PARTNERSHIP

## 6. DUP/MOH team

### 6.1. DUP01P-Contribution of health information system to child immunization services in Ethiopia: Baseline study of 33 woredas

Abebaw Worku, Hibret Alemu, Hiwot Belay, Afrah Mohammedsanni, Wubshet Denboba, Frehiwot Mulugeta, Shemsedin Omer, Biruk Abate, Mesoud Mohammed, Mohammed Ahmed, Yakob Wondarad & Meskerem Abebaw

<https://doi.org/10.1186/s12911-022-01796-8>

#### Abstract

**Background:** Monitoring progress using appropriate data and a functional health information system (HIS) is believed to be crucial for the success of an immunization program. A baseline study was conducted to assess immunization service coverage, HIS performance status, and their relationships.

**Methods:** A linked facility and population-based survey was conducted concurrently from September 21 to October 15, 2020. A total of 3016 households were reached to interview mothers having children aged 12–23 months in the 33 woredas. Overall, 81 health posts, 71 health centers, and 15 hospitals were selected for the facility survey. The study used modified Performance of Routine Information System Management (PRISM) tools for the facility survey and a structured questionnaire for the household survey. Using STATA 14.0 software, mixed effect modeling was employed to control the effect of clustering and potential confounders.

**Results:** The proportion of fully immunized children was 58%. Coverages of measles (at least one dose) and penta3 immunization (received all 3 doses of DPT-HepB-Hib vaccine) were 86% and 85%, respectively. About 27% of mothers had missed their child's immunization card mainly due to misplacing or loss. Except for 'source document completeness' (85%) and 'use of data for planning and target setting' (84%), other data quality and use indicators like 'data accuracy' (63%), 'data use for performance review and evidence-based decision making' (50%), and 'data used to produce analytical reports' (31%) show low performance. The odds of fully immunized children is 37% lower in Muslims compared with Orthodox Christians (AOR, 0.63; 95%CI: 0.46, 0.88), higher by 42% with father's secondary education compared with no education (AOR, 1.42; 95%CI: 1.05, 1.92), and highest wealth quintile compared with lowest quintile (AOR, 2.49; 95%CI: 1.54, 4.03). For each additional score of HIS infrastructure availability, the odds of fully immunized children increased by 22% (AOR:1.22; 95% CI: 1.03, 1.44).

**Conclusions:** Child immunization coverages are promising. However, the current HIS performance is suboptimal. Both service user and HIS-related factors are essential for immunization service uptake. Documenting required information advising mothers to keep immunization cards by health workers and working to have functional HIS are recommended.

## 6.2. DUP02P: Embedding Research on Implementation of Primary HealthCare Systems Strengthening: A Commentary on Collaborative Experiences in Ethiopia, Ghana, and Mozambique

African Health Initiative Partnership Collaborative for Embedded Implementation Research

<https://doi.org/10.9745/GHSP-D-22-00390>

### ABSTRACT

Achieving universal healthcare coverage requires the adoption of primary healthcare policies and evidence-based delivery strategies. Although this has been confronted by manifold challenges, particularly in the health systems of sub-Saharan Africa, there are promising approaches for accomplishing this objective. Among these is embedding implementation research (i.e., the study of methods to promote the systematic uptake of evidence-based interventions (EBIs) into routine practice) into policy-making and implementation processes. Since 2007, the African Health Initiative of the Doris Duke Charitable Foundation has supported partnerships that strengthened primary health systems and policy implementation in 7 countries in sub-Saharan Africa using the embedded implementation research as a core strategy. This programmatic review and analysis aims to identify the core features and processes that characterized how the partnerships operationalized the embedded implementation research approach and understand the factors that helped and constrained partnerships' effective use. For this, we drew upon findings from a desk review comprising 30 examples of embedded implementation research conducted by 3 African Health Initiative partnerships between 2016 and 2021 in Ethiopia, Ghana, and Mozambique. In addition, we conducted and analyzed 13 in-depth interviews with embedded implementation research stakeholders of the three projects. Core features and processes of embedded implementation research were: (1) the leadership role of policy decision-makers and implementation leaders; (2) positioning research with program implementation at multiple levels of health systems; (3) multidisciplinary and multisectoral partnerships; (4) focus on research capacity building; and (5) real-time feedback loops and knowledge translation. Factors influencing the effectiveness of the embedded implementation research experiences involved (1) the implementation climate and leadership, (2) opportunities and capacities to circulate and absorb new information, and (3) stakeholders' baseline knowledge and embedded scientists' identification within their organizations.

### 6.3. DUP03P: Drivers and Barriers to Improved Data Quality and Data-Use Practices: An Interpretative Qualitative Study in Addis Ababa, Ethiopia

Hibret Tilahun, Biruk Abate, Hiwot Belay, Abebaw Gebeyehu, Mohammed Ahmed, Akiliu Simanese, Wondimu Ayele, Afrah Mohammedsanni, Barbara Knittel and Yakob Wondarad

<https://doi.org/10.9745/GHSP-D-21-00689>

#### Abstract

**Introduction:** An objective of the Information Revolution Roadmap of Ethiopia's Health Sector Transformation Plan was to improve health management information system (HMIS) data quality and data use at the point of health service delivery. We aimed to assess drivers of and barriers to improving HMIS data quality and use, focusing on key Information Revolution strategies including Connected Woreda, capacity building, performance monitoring teams, and motivational incentives.

**Methods:** We conducted an interpretative qualitative study across all 11 health centers in 3 sub-cities of Addis Ababa, Ethiopia: Yeka, Akaki-Kaliti, and Ledeta. We conducted 40 key informant interviews and 6 focus group discussions with 43 discussants. We coded information gathered line-by-line and grouped responses under thematic codes as they emerged. Findings were triangulated and validated.

**Results:** Our findings indicate that the main drivers of data quality and use at the point of service delivery were the use of the Connected Woreda strategy and its tools, capacity-building activities including mentorship, performance monitoring-team activities that led to active leadership engagement, and motivational incentives for data producers and users. Barriers to optimal data-use practices were the use of duplicative data collection tools at health facilities, under-developed health information system infrastructure, inadequate health information technician staffing and capacity limitations at the health facility level, insufficient leadership commitment, and unfavorable health worker attitudes toward data.

**Discussion:** Improvements in quality and use of HMIS data at health facilities are expected to deliver better-quality health services to the community as data enable health workers to identify gaps in health care, fix them, and monitor improvements. Future investments should strengthen promising data-use practices, resolve bottlenecks caused by duplicative data collection tools, enhance individual and institutional capacity, address suboptimal health worker attitudes toward data, and overcome infrastructure and connectivity challenges.



## 6.4. DUP04P: Lessons Learned From the Capacity-Building and Mentorship Program to Improve Health Information Systems in 11 Districts of Ethiopia

Hiwot Belay, Afrah Mohammedsanni, Abebaw Gebeyehu, Hibret Alemu, Naod Wendrad, Biruk Abate, Wubshet Denboba, Frehiwot Mulugeta, Shemsedin Omer, Barbara Knittel

<https://doi.org/10.9745/GHSP-D-21-00690>

### Abstract

**Introduction:** Health information systems (HIS) performance in Ethiopia is currently insufficient, and improvements are required to ensure that decision-making is data-driven. We share our experiences from the early-stage implementation of a package of HIS capacity-strengthening interventions as part of an innovative academic-government collaboration that addresses challenges in HIS performance.

**Methods:** We used routine program data to assess HIS performance using the Performance of Routine Information System Management (PRISM) assessment tools. The assessment employed a pre-post design and was conducted in a total of 24 selected health facilities (6 hospitals and 18 health centers) from 11 districts in Ethiopia at project baseline (2018) and midline (2020).

**Results:** The source document completeness rate reached less than 80% for the majority of the assessed data elements. Improvements were observed in quarterly report completeness (26% vs. 83%) and timeliness (17% vs. 48%). Though data inaccuracies are noted for all assessed data elements in 2020, the majority (83%) of skilled birth attendance and HIV reports (68%) fall within the acceptable range of reporting accuracy. The identification of performance-related problems using performance monitoring team (PMT) meetings, improved between 2018 and 2020 (67% vs. 89%). Similar improvements were also observed in developing action plans to solve identified problems via the PMT (52% in 2018 vs. 89% in 2020). Data use for planning and target setting (65% in 2018 vs. 90% in 2020), reviewing performance (58% in 2018 vs. 60% in 2020), and supervision (51% in 2018 vs. 53% in 2020) all improve among assessed health facilities.

**Discussion:** This study showed that a capacity-building and mentorship program that engages experts from multiple disciplines and sectors could improve the quality and use of health data. This partnership enabled engagement between government and academic stakeholders and allowed for a more robust exchange of resources and expertise toward HIS improvement

## 6.5. DUP05P: Improving Primary Care Quality Through Supportive Supervision and Mentoring: Lessons from the African Health Initiative in Ethiopia, Ghana, and Mozambique

doi: 10.9745/GHSP-D-21-00667

### Abstract

**Introduction:** supportive supervision and mentoring (SSM) is crucial to primary care quality and effectiveness. Yet, there is little clarity on how to design and implement SSM and make it sustainable in primary health care (PHC) systems. The 3 African Health Initiative partnership projects introduced strategies to do this in Ethiopia, Ghana, and Mozambique. We describe (1) how each partnership adopted SSM implementation strategies, (2) the dynamics of implementation and change that ensued after intervening within PHC systems, and (3) insights into SSM sustainability as a mainstay of PHC.

**Methods:** Researchers from each project collaboratively wrote a cross-country protocol based on those objectives. They adapted implementation science frameworks—the Exploration, Preparation, Implementation, and Sustainment model and the Consolidated Framework for Implementation Research—through a qualitative theme reduction process. This resulted in harmonized lines of inquiry on each project’s SSM strategy’s design, implementation, and potential sustainability. In-depth interviews and focus group discussions were conducted with stakeholders from PHC systems in each country, and thematic analyses ensued.

**Result:** across the projects, SSM strategies acquired multiple components to address individual, systems, and process-related determinants. Benefits arose from efforts that addressed worker-level attitudes and barriers, promoted a wider learning environment, and enhanced collaborative structures and tools for monitoring performance. Peer exchanges and embedded implementation research were critical to the perceived effectiveness of SSM strategies.

**Discussion:** despite differences in their approach to SSM implementation, there are common crucial ingredients across the SSM strategies of the 3 AHI partner projects from which essential lessons arise: (1) positioning learning and adaptation opportunities within the routine workings of PHC systems, facilitation, and technical support to reflect and utilize new knowledge; (2) multisectoral collaboration, particularly with academic organizations; and (3) building PHC decision-makers and implementation teams’ capacity for evidence-informed change.

## 6.6. DUP01U: Improving Data Quality and Information Use through Capacity Building and Mentorship Program in Ethiopia: Best Practices and Lessons Learned.

Hiwot Belay, Wubshet Demboba, Afrah Mohammedsanni, Asmamaw Atnafu, Keneni Gutema, Getasew Amare, Netsanet Abera, Abebaw Gebeyehu

### Abstract

**Background:** The Capacity Building and Mentorship Program (CBMP) is a collaborative initiative of the Federal Ministry of Health of Ethiopia (FMOH) and selected Universities to enhance the Information Revolution Agenda. Recently, the FMOH declared that some CBMP implementations are models. Therefore, assessing the best practices and lessons learned among the model woredas is essential for the success and scalability of the program. This study explores the best practices and lessons learned and their implications for creating a learning health system.

**Methods:** - A descriptive exploratory case-study design was conducted in four verified model woredas and one town administration across three regions: Amhara, Sidama, and Benishangul-Gumuz of Ethiopia. The study involved interviewing forty-two informants who were purposively selected from the model districts. A semi-structured interview guide was used to explore information on the Performance Monitoring Team (PMT), data management, analysis, visualization and use, capacity building, and infrastructure. The data collected was analyzed thematically using Atlas ti. 8 software.

**Results:** - Six themes were explored in this study: technical, behavioral, organizational intervention, health information system performance improvement, sustainability, and challenges. Need-based and practical capacity-building training, local resource mobilization, leadership engagement, HIS task audit, HIS accountability framework, reward, and recognition were some of the critical best experiences and lessons to be shared. Besides data visualization and dissemination, the Performance Monitoring Team (PMT) functionality and quality improvement project using strategic problem-solving approaches enhanced the intervention implementation. This study asserted local resource mobilization, leadership engagement, and institutional capacity building as critical factors for the sustainability of existing achievements. However, staff shortage and turnovers, job evaluation grading complaints, and low competency of medical record unit staff were existing challenges affecting the sustainability and scalability of the best experiences and lessons.

**Conclusion and recommendation:** - Numerous best experiences and lessons are identified among model districts. Need-based and practical HIS capacity-building training, leadership engagement, local resource mobilization, and HIS accountability framework were scalable and replicable best experiences and lessons. However, staff shortage and turnover, local Health Information Technician complaints, and contextual factors must be considered while scaling up to other areas.

**Keywords:** CBMP, HIS, Best experience, Lessons learned, Ethiopia.

## 6.7. DUP02U: Practical challenges, best practices, and lessons learned and recommendations of health data quality and use in Afar region, Ethiopia

Afrah Mohammedsanni, Abebaw Gebeyehu, Tefera Ashenafi, Asfaw Benti, Asmamaw Atinafu, Alemayehu Bogale, Benti Ejeta, Edres Darsa, Amin Arba, Naod Wendrad, Wubshet Denboba

### Abstract

**Background:** Ethiopia has been implementing a Routine Health Information System (RHIS) at all levels of healthcare delivery to ensure quality data production and use. Despite implementing RHIS in many low-income countries, including Ethiopia, data from most Health Information Systems (HIS) play little role in the decision-making process due to poor quality. Numerous empirical evidence indicated pastoral regions like afar need to catch up in the health service uptake compared to the national average. The quality and use of health data are essential for informing health policy, planning, and program implementation. However, there needs to be more empirical evidence on existing approaches, challenges, and best practices of health data quality and information use in pastoral regions. This study explored existing approaches, challenges, and best practices of health data quality and information use in Afar, Ethiopia.

**Method:** A descriptive exploratory case-study design entails an in-depth exploration of existing challenges, best experiences, lessons learned, and improvement strategies among 11 health institutions that were employed. Twenty-five purposively selected participants from the RHB to local health facilities were involved. A semi-structured interview guide explored current approaches to HIS interventions, existing challenges to ensure data quality and information use, and recommended strategies to improve HIS performance and existing opportunities and thematic analysis of the data performed during the analysis.

**Result:** This study revealed three primary themes: challenge, best practices and lessons and strategies, and recommendations to overcome the challenges with multiple sub-themes. Data quality and assurance mechanism, data management, analysis and display, data use for decision making, low HIS capacity and motivation of professionals, and lack of training were identified as challenges. Additionally, peer-to-peer learning, performance-based recognition, and motivation, regular performance review meetings (PMT), experience sharing with a neighboring health facilities, collaboration between health officers and nurses, and Health Information Technology (HIT) professionals as best practices and lessons were noted.

**Conclusion and recommendation:** Various challenges and best experiences are explored. Significant challenges identified include a lack of accountability and commitment of professionals and leaders to dispose of responsibilities, inadequate follow-up, supportive supervision and mentorship, limited HIS capacity, and high turnover of staff. Best experiences as a collaboration among health professionals and HITs, performance-based recognition, and regular PMT in some areas were exhibited. Therefore, in addition to sustaining the best practices, development, and adaptation of training and governance documents and guidelines, capacity building and advocacy, review meetings, and continuous evidence generation, translation, and adaptation to improve health data quality and use for decision-making in the Afar region are essential.

**Keywords:** HIS, best practice, challenges, Afar region, Ethiopia

## 6.8. DUP03U: Ethiopia's Journey to Unified DHIS2 to Strengthen Health Information System in Ethiopia

Wubshet Denboba, Amanuel Biru, Hiwot Belay, Benti Ejeta, Asmamaw Atnafu, Mesoud Mohammed, Abebaw Gebeyehu

### Abstract

Since 2008, the Ethiopian Federal Ministry of Health has implemented a Health Management Information System (HMIS) to create comprehensive and standardized national HMIS for evidence-based decision-making at all levels. However, using two different versions of HMIS has created significant challenges as they are not integrated and interoperable. Moreover, maintaining the two systems poses a challenge to the MOH, creating confusion while receiving data from two distinct versions and leading to complications in analysis and consumption. To address these challenges, in 2017, the Ethiopian Federal Ministry of Health decided to shift from HMIS to Digital Health Information Software 2 (DHIS2) to strengthen the integration/interoperability of data from all regions, systems/software, and programs that allow to conduct harmonized data use and analysis at all level of the health sector. Thus, this paper presents the pathways the Federal Ministry of Health, and its strategic partners have traveled to implement unified DHIS2 in Ethiopia's health sector.

Implementing a unified national health information system demands a strong commitment and collaboration among all stakeholders in the sector. Scientific approaches in tool selection, customization, engagement of all relevant stakeholders, building strong institutional capacity, and establishing effective governance mechanisms at all levels were the critical success factors in implementing DHIS2 in Ethiopia. However, challenges such as lack of adequate infrastructure, shortage of trained personnel, poor data quality, and integrating different health programs into DHIS2 still need attention to sustain the implementation of unified DHIS2 in the health system.

**Keywords:** DHIS2, HMIS, HIS, Health Sector, Ethiopia

## 6.9. DUP04U: The Impact of HIS Interventions on Maternal and Child Health Service Utilizations in Ethiopia: Quasi-Experimental Study

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### Abstract

**Background:** Health information system (HIS) is one of the six building blocks of the health system which helps to provide information on service delivery, health workforce, access to essential medicines, financing, and leadership. The Ethiopian MOH with JSI- Data Use Partnership project piloted a package of priority HIS interventions in selected woredas across all the regions of the country. This study was planned to examine the impact of HIS interventions on maternal and child health (MCH) service utilizations.

**Methods:** A 2-arm quasi-experimental study, with a linked health facility and household survey, was implemented in intervention and comparison woredas. Baseline and endline surveys were conducted for both arms in 2020 and 2022. At baseline, 3,016 mothers and 167 health facilities were selected. Similarly, at the endline, 3076 mothers and 160 health facilities were surveyed. Two-stage sampling procedure was applied to select target households. The study used modified Performance of Routine Information System Management (PRISM) tools for the facility survey and a structured questionnaire for the household survey. For the data analysis, data sets from the household and health facility surveys were carefully cleaned and linked for further analysis. Using STATA 14.0 software, difference-in-difference analysis using mixed effect modeling was employed to measure changes and to account for clustering and control for likely confounders.

### Results:

**Changes in HIS performance:** Data quality indicators like reporting completeness, timeliness, and completeness of source document data elements, and many data use indicators showed significant ( $P < 0.05$ ) improvement in intervention health facilities compared with the control sites. Positive changes were also observed in most parameters of performance monitoring team (PMT) functions.

**Changes in MCH service utilization:** Significant (DID:  $p < 0.05$ ) changes, between intervention and control sites, were observed in score of receiving essential ANC service components (37 to 55% vs 37 to 38%), skilled birth attendance (SBA) (75 to 81% vs 77 to 75%), contraceptive prevalence rate (58 to 64% vs 59 to 56%).

**Conclusions:** Higher/significant improvements were observed in many of the HIS performance (data quality and data use) indicators in health facilities receiving a package of HIS intervention compared with the control health facilities. In most of the MCH service utilization indicators, the change in the intervention sites were significantly higher compared with the control sites.

**Key implication:** Investing on HIS improves MCH service utilizations.

**Key words:** HIS performance, MCH service utilization, Ethiopia

## 6.10. DUP05U: Revisiting Strategies: A Hybrid Study on Effective Implementation of eCHIS for Improved Data Quality and Service Provision

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### Abstract

**Background:** Implementing an electronic community health information system (eCHIS) is a high-priority initiative of the Ethiopian Ministry of Health (MOH). Beyond data capturing and reporting tool, it serves as a job aid for Health Extension Workers (HEWs) and improve community-level provision of health health services. However, with the current implementation process, household profiling is getting late and also the service provision through eCHIS is limited. This implementation research was planned to evaluate the effectiveness of eCHIS implementation strategies, skill-oriented training and regular mentorship of HEWs.

**Methods:** A hybrid study design (evaluating the effectiveness of both intervention and implementation strategies) was applied in a phase-based and iterative approach from January, 2021- December, 2022. Fourteen health posts from 2 woredas, Dangla zuria and Welmera, were included in the study. All HEWs in the selected health posts were the target populations. Four rounds of survey, baseline and after 3 rounds of mentorship, were conducted to measure changes over time.

**Results:** After implementation of the selected strategies, HEWs skill on App initialization, managing digital family folder, use of reproductive, maternal newborn and child health (RMNCH) module, referral & communication, and use of eCHIS app were significantly improved. Significant improvement ( $P < 0.00$ ) was also observed in all indicators of service provision, service quality, and completeness of data elements when comparing endline with baseline data. The average lag time, for all forms, between form completion on the HEWs tablet to submission to eCHIS server reduced from 11.5 days at baseline to 4.1 days at the end of the follow up period (last round of survey). From the lists of reasons for incompleteness, “not understanding data elements” was the main one. Both over and under reporting were major data accuracy issues.

**Conclusion:** Implementation of eCHIS showed significant improvement in service provision and data quality. Combination of skill-oriented training and regular mentorship of HEWs are effective eCHIS implementation strategies.

**Key words:** Health extension workers (HEWs), eCHIS, skill-oriented training, mentorship, implementation research



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