

**ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES**

**SCHOOL OF PUBLIC HEALTH**



**Title: Improving Outpatient and Inpatient Medical Recording Data Quality in Yerer General Hospital, 2021**

**A CAPSTONE PROJECT SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF  
ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE MASTERS DEGREE IN HOSPITAL AND HEALTH CARE ADMINISTRATION**

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**Declaration**

This project report is my original Work and has not been submitted for any award of a Degree in any other university, and all those materials used for the cap stone project has been duly acknowledged

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## ABBREVIATIONS

DQR:	Data Quality Review
DQRC:	Data Quality Report Card
DHIS 2:	District Health Information Software – version 2
FMoH:	Federal Ministry of Health
HMIS:	Health Management Information System
HSTP:	Health Service Transformation Plan
HSDP:	Health Sector Development Program
IPD:	Inpatient Department
MoH:	Ministry Of Health
MR:	Medical Recording
OPD:	Out Patient Department
PMT:	Performance Monitoring Team
PRISM:	Performance of Routine Information System Management
RHIS:	Routine Health Information System
SA:	Service Assessment
SMT:	Senior Management Team
WHO:	World Health Organization

## 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 information revolution setting a five-year transformation plan, and has developed tools on a standard of data quality measurement. Those tools are used to measure the medical recording data quality in Yerer General Hospital for selected dimension.

**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 a pre intervention; with baseline assessment using an infinite sample size calculation and proportional simple random sampling of cards which was admitted to the hospital between end of 2018 to 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 system was given as an intervention after pre intervention result was observed .pre intervention total completeness of outpatient and inpatient MR was 79.12% and 51.59% respectively. On post intervention result 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 result it increased to 80.73% and 81.67% respectively. The timelessness has improved the cards are returned to the medical recording room in 24 hours after intervention.

**Conclusion:** The intervention has influence on improvement of Total accuracy and timeliness but decrease score of the Total completeness of medical recording in Yerer General Hospital

**Recommendation:** Continues trainings and follow up are required to strengthen quality department of Yerer General Hospital.

**Key words:** Data quality, Completeness, Accuracy, Timelessness and Medical Recording

## Section 1 Background

### 1.1 Organizational Description

Yerer General Hospital is a Modern High-level private Hospital established in February 2014. It is located in Bole sub-city, Addis Ababa. The hospital has ninety two medical staffs and fifty-six non-medical staffs. The hospitals main aims are to render both curative and preventive health care services to the public.

Yerer's General Hospital's commitment to providing internationally accepted quality healthcare for its patients in all aspects of medical services which is evident not only from the use of state of the arts technology imported from Europe and the USA but also by the availability of specialists with a high level of expertise and experiences. The hospital has different departments, well-equipped with the latest equipment which enables it provides the necessary healthcare services. For example, operation theatre rooms, Digital X-ray, Fluoroscopy, Video Endoscopy, Doppler Ultrasound, and Echocardiogram, 4D Ultrasound, Intensive Care Unit (ICU), and Neonatal ICU which ensures that hospital can provide the best possible treatment. The services provided at Yerer General Hospital are Internal Medicine, General Surgery, Gynecology & Obstetrics, Ophthalmology, Orthopedics, Dentistry, ENT, Gastroenterology, Adult ICU, Psychiatry, Dermatology, with 24/7( Emergency Service, Pharmacy, Laboratory, Natal Delivery Service, Ambulance service), Cardiology Admission NICU.

**The mission of Yerer General Hospital is:** to bring health care of international standards within the reach of every patient

**The vision of Yerer General Hospital is:** to be the most admired hospital for health care needs of its customers, patients, and their family

**The values of Yerer General Hospital is:** quality, integrity, compassion, and the excellent health service delivery

Yerer General Hospital's aim to be the leader in providing efficient care that can be observed from its dedicated medical staff who are striving their level best to meet every patient's needs. This put together with its carefully furnished wards with comfortable beds, TV sets, bathrooms, and tender care, people can make Yerer General Hospital a home (1).

## 1.2: Introduction

Healthcare data reports are done through a system of medical recording in every health care delivery facilities. Those reports and information of medical records will be used as national and international indicators to measure, disease surveillance, health care service quality and to determine health status calculations. So, every health care service providing facility has to give due attention to the quality of data contained in a medical recording which contains different formats to be filled and to provide information of an individual patient when required. The standard formats can be obtained from the ministry of health or could be developed by the health facility itself. If the format is electronic the information will be filled as required on the software which is used nationally as in practice currently, DHIS2 which has been in use in Ethiopia ministry of health, as well as in some African countries(2).

Measuring the data quality of medical records involves different tools with a set of dimensions. From some published articles on the data quality studies made in Africa, medical recording data quality has a gap that requires an attention. A study conducted on improving health information systems for decision making across five sub-Saharan African countries on, poor feedback loops have been discussed which involves frontline staff and managers improving data collection and its use for informing system improvement (2).

Accuracy study on births and deaths reports in Ethiopia, Malawi and Mali showed that there is an underestimation of the percentage expected including the completeness of those reports. The report result underestimation in Ethiopia is 28%, Malawi 32%, and Mali 9%(3).In Kenya, an article published on information quality lost at a clinical level has shown, wrong test results, missing registers, and inconsistencies in reports were the result (4).

The publication made in 2019 on Malaria Data Quality Practice in Ethiopia in Oromia Regional State, has discussed the data quality of those reports which showed timeliness was 69.7% and completeness was 73.7% compared to the standard set by the federal ministry of health (90%)(5). And a capstone intervention made in Menelik II Referral Hospital in Ethiopia from September 2015 to April 2016 on Completeness of Inpatient Medical Records of baseline assessment result showed 73% and after the intervention, it became 84%(6), the suggestion after the result was that comprising inpatient medical record format and training healthcare providers can bring a significant improvement in inpatient of medical records.

Efficient management of data in health care is an essential process of measuring health care service quality in public health. Ethiopias MoH developed a standard of practice for medical recording which comprises eight essential points and has to be used by quality unit for assessment in health facilities(7).

### 1.3 Problem Statement

#### **Data quality defect in the medical recordings of Outpatient and Inpatient of Yerer General Hospital**

MR documentation is essential to ensure the quality of care for every patient. All information regarding the patient and his/her course of care at the hospital should be recorded in the MR. This includes his/her present symptoms and medical history, any diagnostic test orders and results, All documentations from should contain or include:, care providers and consultants, interventions, diagnostics, medications, therapy, information and instructions at discharge. Any subsequent return visits to the hospital should be recorded in the same MR (8).Those list of forms have to be introduced to the medical staffs and medical recording staffs for a proper recording of patient information.

#### **1.4 Significance of the Study**

Improving the data quality in the medical recording will contribute to the quality of service in which Ethiopia's MoH has ratified in its Health Service Transformation Plan. The plan which is about information revolution, explaining that correct information guides on community-based policy designs and administrative decisions at all levels.

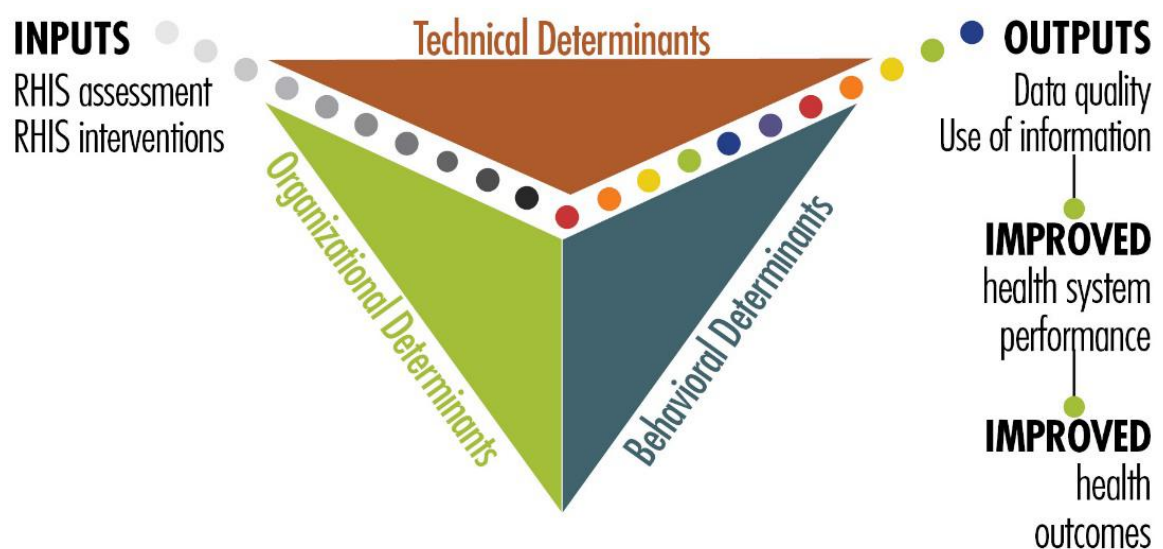
## Section 2: Literature Review

Data Quality Report Card (DQRC) is a tool developed by WHO to assess data quality from different dimensions by the ministry of health, comparing health facility source document to HIS report data (9). The DQRC puts on different dimensions which are completeness of reporting data, internal consistency of the reported data, external consistency of population data, and external consistency of coverage rate (10). These are modified for national use data quality assessment to assess for both electronic data and desk review data quality (11).

Because of the data information use for decision making is weak in low and middle-income countries; low-quality health care services provision is observed (12). Neglecting routine health information system (RHIS) will affect the quality of health care service measurement and assessment. Because it comprises the information collected from public, private, community-level health facilities and institution (12). Performance routine information system management (PRISM) is a tool developed for assessing (RHIS) globally (12). Ethiopian government developed a health sector transformation plan of five-year setting strategy pillar of excellence whose success is measured by “the quality of health service and how equitable health outcome is” (13).

To assist in assessing data on health care information system, PRISM developed data collecting instrument which includes, RHIS Overview Tool, Performance Diagnostic Tool, Electronic RHIS Performance Assessment Tool, Management Assessment Tool, Facility/Office Checklist, and Organizational and Behavioral Assessment Tool. All these tools are used in measuring the information system to be applied in the planning process (12).

Fig 1 **PRISM framework**



The electronic health recording system is becoming a concern of health system management because it greatly assists on research and population health information system though its completeness and timeliness information delivery to the responsible body have resulted in data accuracy problem (14), as health information management system is greatly affected by the data accuracy and timely submission. It also directly affects the data use for policy-formulation, managing resources, planning, implementation, evaluation and monitoring of health programs (15-16).

Currently in Ethiopia, the DHIS 2 Java tools which have been developed at the University of Oslo are in use (17). Regarding the utilization rate of HMIS at the health facility a study was conducted in a public hospital in the 2017 Addis Ababa city administration whose result

shows about 41.7% (15). The objective of the current study is to improve the data quality of the medical recording in IPD and OPD of Yerer General Hospital in 2020. So far, as long as the researcher' knowledge is concerned, there are no studies conducted on health data quality in private- hospitals in Addis Ababa city administration.

Application of health information system and supporting it with technology will greatly guarantee safe and quality care (18) which is one part of the strategies of transformation plan on an evidence-based decision making by harmonizing, the healthcare service infrastructure and resources. Furthermore, it helps to achieve success in service delivery and health facilities and have a better communication and data exchange to improve the quality of reporting and service provision (13).

Accuracy, completeness, availability, timeliness, integrity, confidentiality, assessability, and legibility of the forms that are to be included in patient recording have to be reviewed, as much literature has identified the forms that are supportive of each other to do a national survey on community health indicators. For example, the under-reporting of birth weight of neonates it may affect the death report of the neonate(19), the study was done on death and hospital record diagnosis also shows the agreement between cause and the diagnosis which is 72%, emphasizing the importance of proper recording(20).

In general, according to Ethiopian health transformation plan it is important to have a system of accurate medical recording and has a guideline and auditing system for follow-up.

### **Section 3: Objective**

#### **The general objective of this project is to:**

Improve the data quality of the medical recording in IPD and OPD of Yerer General Hospital in 2021EC

#### **Specific objective:**

##### **For the out patient**

To improve the accuracy rate from 63.6% to 90% for outpatient MR in 2021 EC

To improve the completeness rate from 79.12% to 90% for outpatient MR in 2021 EC

To improve the timeliness of returning the cards to MR in 24 hrs in 2021EC

##### **For the inpatient**

To improve the accuracy rate from 55.7% to 90% for inpatient MR in 2021 EC

To improve the completeness rate from 51.5% to 90% for inpatient MR in 2021 EC

## **Section 4: Root Cause Analysis**

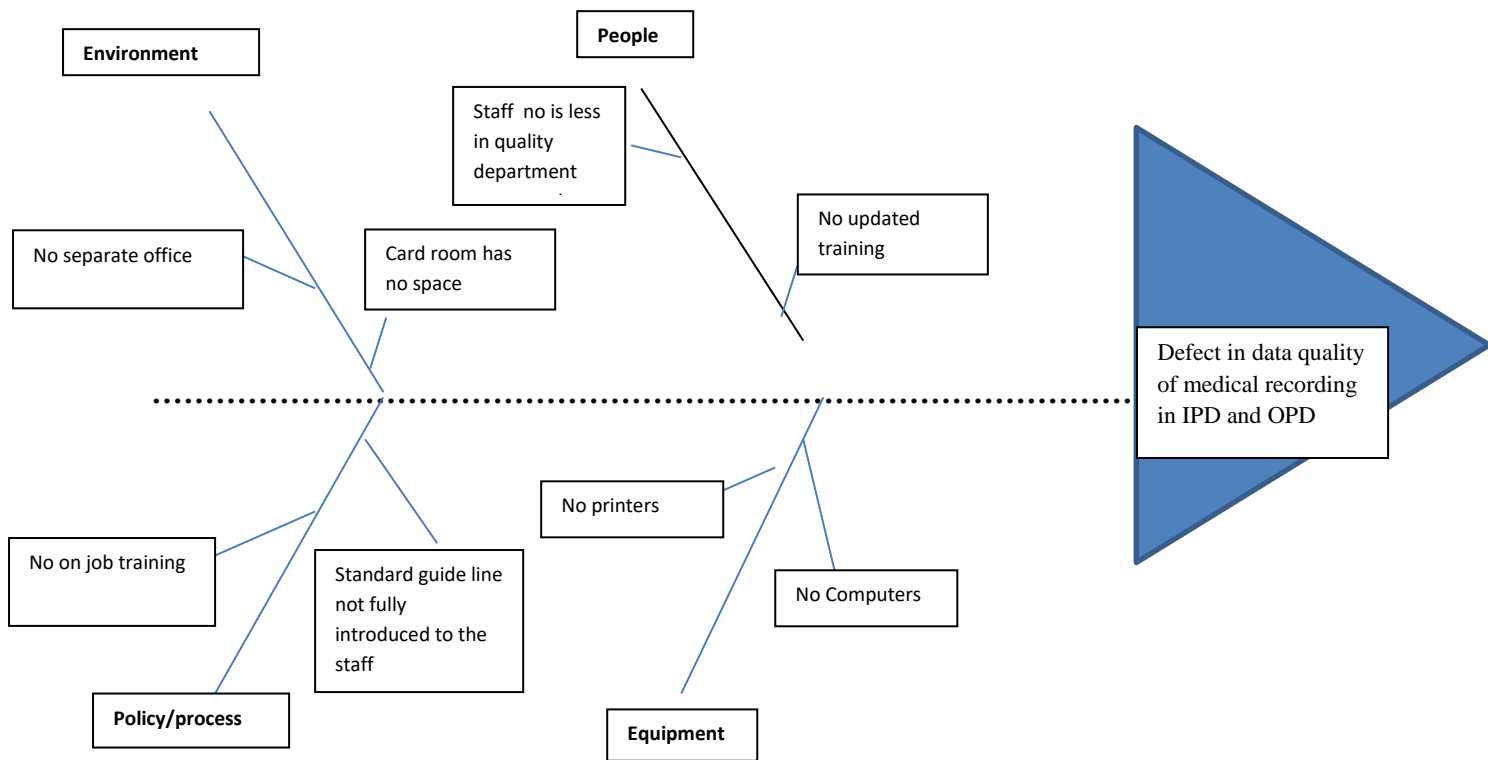
### **4.1 Management tools**

Several management tools can be employed to find the root causes of the problem, including the following three

- 1) Fishbone diagram,
- 2) Flowcharting, and
- 3) Histograms

The Root cause analysis will help identify the factors that cause the problem (9).in this project the fishbone diagram is selected to analyses the causes of the problem. The detailed analysis is done after sampling of cards, which is described in the methods section. The following fishbone is made after data quality assessment was done using the tools in the annex section.

Fig 2 Fishbone diagram



## 4.2 Verification

### People section

1. Staff number in the quality department is fewer; it is verified by interviewing the quality department head. He is a GP doctor in the position of handling quality department and at the same time doing his job as a doctor in a facility.
2. No updated training: obtained by interviewing of the quality department head, since Yerer General Hospital is a private hospital it is not invited to training frequently as in governmental sectors
3. Medical recording staffs are not invited to take part in training which according to the EHSTG it has to be conducted annually

### Equipment section

4. No separate computers ;verified by interview of the quality department head and management
5. No separate printer ;verified by interview of the quality department head and management

### Policy /process section

5. No on job training regarding medical records data checking which; is verified by interviewing the quality department head
6. Standard guideline and procedure not introduced to the quality department; is verified by interviewing the quality department head

### Environment section

7. No separate office; is verified by interviewing the management and quality department head
8. The medical recording room is very congested verified by observation

The **real root cause** for the problem definition of this project is

1. Standard guideline and procedure are not introduced
2. No on the job training about medical recording unit

### Result of root cause analysis

After doing a baseline assessment of the general MR room the checklist result shows 37.5% .which required additional assessment to be done to measure the MR data quality, on EHSTG volume I there are three KPI, one of the three is the completeness of medical recording in the inpatient department.

In this capstone, the tool is modified to measure the detail of completeness of inpatient department medical recording and also included outpatient department medical recording.

Additionally, the accuracy check was included to enable the researcher compare the recording made on the registry against what is written on the cards with data elements.

**Table 1 Root cause verification**

The symbol “x” indicates it is not real root cause and symbol “√” indicates it is the real root cause of the problem

Possible Root cause	Method of verification	real root cause
The number of Staff is few in the quality department	Interview	x
No updated training	Interview	x
No printers	Interview and Observation	x
No Computers	Interview and Observation	x
A Standard guideline is not fully introduced to the staff	Interview	√
No on job training	Interview	√
No separate office	Observation and interview	x
Congested MR room	Observation	x

## Section 5: Methods and Materials

**5.1: Study area and period:** Yerer General Hospital is found in Bole sub-city in Addis Ababa Ethiopia, the Capstone project work was performed from January 2020 to January 2021 .

**5.2: Study design:** Pre post-intervention design is used for the project; implementation plan was set to improve the medical recording data quality in a medical recording of Yerer General Hospital.

**5.3: Population pre intervention:** Outpatient and Inpatient of Yerer General Hospital. Random sampling of cards of patients admitted from June 2018 to June 2019 was done.

**5.4: Sample size for pre intervention:** The number of total patients admitted in a year was 15182. A proportional simple random sampling of those admitted with frequency 50% because, no assessment was done in private hospitals. The sample size is 384 cards. An outpatient and inpatient card is calculated proportionally and simple random sampling technique was used .The inpatient admitted during the study time frame was 1475 and the outpatient admitted was 13709, of these, 38 inpatient and 347 outpatient medical recording was selected and reviewed to assess medical record. One card has been discarded for analysis because the accuracy sheet was missing.

Calculation  $n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 P (1 - P)}{(P - P_0)^2}$

$$(P - P_0)^2$$

$$\frac{(1.96)^2 (0.5(1-0.5))}{(0.05)^2}$$

$$(0.05)^2$$

n =384.16

**5.5: Population post intervention:** Post intervention sample is different from pre intervention because after intervention the project designed to measure only one month changes due to budget issues and shortage of time for the project finalizing.

**5.6: Sample size for post intervention:**

The number of total patients admitted in a study period of January 7, 2021 to February 7, 2021 was 756. The sample size obtained with a calculation using a finite sample size calculation is 255 cards. An outpatient and inpatient card is calculated proportionally. The inpatient admitted during the study time frame was 146 and the outpatient admitted was 610. simple random sampling technique was applied. The cards randomly sampled were 50 for the inpatient and 206 for the outpatient.

$$\begin{aligned}
 n' &= \frac{n}{1 + \frac{z^2 \times p(1-p)}{\epsilon^2 \times N}} \\
 &= \frac{384}{1 + \frac{1.96 \times (0.5)^2}{(0.05)^2 \times 756}} \\
 &= 255
 \end{aligned}$$

**5.7: Data collection Method and Procedures** (instrument, personnel, technique,): Ethiopian Health Service Transformation Guideline ( EHSTG) Chapter 6 contains a checklist for medical recording management standards (8) which is also used for calculation of completeness of inpatient discharged, that is mentioned in Hospital Performance Monitoring

Improvement Manual second edition, The tools for this study were adapted from this checklist to enable the researcher to check on the completeness of outpatient. In addition, it is elaborated adding more data elements to be checked.

Performance routine information system management (PRISM) data quality dimensions were used to measure the data quality of the sample cards, from the quality department of Yerer General Hospital selected medical personnel's were invited and reviewed the cards.

After calculating the result of data quality assessment, a fishbone is used to assess the root causes and verification for these causes were identified.

The profession of the personnel who participated on the data collection procedure where medical staffs who were trained on how to fill the tool.

### **5.8: Study variables:.**

The formats in medical recording depend on the patient's admission

The completeness variables:

*For the inpatient:* (Demographic sheet, Progress notes, Physician order sheet, Nursing Process Forms, Medication Administration Record, Discharge summary, and a summary sheet of all visit dates)

*For the outpatient:* (Demographic sheet, Nursing Process Forms (vital sign check) and a summary sheet of all visit dates)

*The Accuracy variables* (Demographic sheet, a summary sheet, inpatient and outpatient registry data elements (Age of patient similar to the registry, sex similar to the registry, ID similar to the registry, Address similar to the registry, Diagnosis of a patient medical record similar to the inpatient/outpatient registry book, Disease classification for the patient is registered according to the national disease classification)

### **5.9: Operational definition:**

Data quality assessment dimensions

Operational definition taken from Health Data Quality Training Module  
Policy, planning and monitoring and Evaluation Directorate Dec 2018

**Timeliness:** in this project context, the ‘term timeliness’ refers to the discharge or death of a patient in a hospital and the time during which a patient’s medical records are processed and completed, coded and indexed within a specific time frame, the cards for the outpatient returned on same day.

**Completeness of reports:** refers to the extent to which data elements of the reports are filled, utilization of standard formats

Eg, Signature of the physician, the filling of all required information in the forms, availability of the forms

**Accuracy:** refers to proper recording from patient cards to the inpatient and outpatient registry. In any of those forms, the information conveyed properly.

### **5.10: Interventions**

The training is planned to be provided for health professionals in the inpatient and outpatient department and senior management staffs of the hospital, due to the pandemic a selected staffs only invited to attend.

#### **5.10.1: Alternative Intervention Options**

Possible alternative interventions were discussed and a table consisting of two possible Intervention options for the real root cause is developed and presented below:

Table 2: Alternative Intervention Options

<b>The root cause of the problem</b>		<b>Standard guideline and the procedure is not introduced</b>
<b>Alternative intervention</b>	Option 1	On job training prepared by the stakeholders( offered by the ministry of health regarding medical recording)
	Option 2	Changing the protocols and formats according to ministry of health requirements

### 5.10.2: Comparative analysis of alternative intervention and selection of the best intervention

Table 3: comparative analysis of the interventions

		<b>Impact on Productivity</b>	<b>Annual Expense</b>	<b>Political Feasibility</b>	<b>Time Required</b>	<b>Total Score</b>
Option 1	On job training prepared by the stakeholders	5	5	5	4	19
Option 2	Changing the protocols and formats according to ministry of health requirements	5	2	4	4	15

Points of evaluation     5=very high 4 =high 3= medium 2=low 1=very low

**On job training prepared by the stakeholders:** from the root cause of the problem it is shown most of the staffs are not trained to know the standards of the ministry of health in medical recording for that reason impact of training is given the highest point. The expenses of the training is going to be covered by the project, the political feasibility is also has got highest point because the training will be on standards set according to the ministry of health of Ethiopia. The time set for the project was adjusted by the quality department and the management of Yerer General Hospital.

**Changing the protocols and formats according to ministry of health requirements:** For option two the highest point is given only for the impact and is expected after training on the standards of formats as the hospital was implementing its own formats, it requires longer time

to make it applicable because the formats have to be printed out which requires a budget set by the management. Otherwise, if they are continuing using their own formats it requires to be accepted by the ministry of health which also gives the political feasibility high score not very high score.

Of the two presented alternatives, on-job training was suggested as the best option by all the stakeholders from Addis Ababa University Public Health Department who are area specialists.

### 5.11: Implementation plan and implement

- **The sequence of tasks for training** (refer Annexes GAANT chart of an implementation

1. Preparing documents to review with the quality department head
2. Setting time for a discussion with the quality head
3. Provision of stationeries to be used during discussing the matter
4. The discussion was held with the quality head

- **Providing a presentation list**

1. Quality department head prepared questions earlier than the day set
2. Discussion with the stakeholder regarding the questions

- **Continuous internal orientation and supervision**

1. Measuring data quality check in medical recording
2. Auditing medical recording department

- **population for the intervention**

1. Management staffs to approve the implementation process and evaluation plan
2. Head in charge of every department and selected staffs

As the comparative analysis of the interventions, an on job training was prepared by the stakeholders in Yerer General Hospital on the topic ‘Health Management Information System

Revised HMIS-2017". Selected number of staffs are invited from every department related to the medical recording and the intervention was held on December 04,2020.

An action plan is prepared by the management of Yerer General Hospital (see annex).

### 5.12: Evaluation/Measurement plan

After implementation measurement plan is shown below on table 4.

**Table 4 Evaluation plan in Yerer General Hospital**

No.	Project Indicators	Type of Indicator	Baseline	Target	Frequency	Responsible
1	# Data quality department staffs trained	Process	0	100%	yearly	QIteam /management
2	# months the data quality and auditing checks performed	outcome	0	100%	quarterly	QI team

**5.13: Data analysis procedure:** A percentage comparison of the variables was calculated using SPSS version 24 and Microsoft Excel for both the pre intervention and post intervention data. A Statistical analysis of chi square test was used to compare pre post intervention results.

**5.14: Data quality management:** all collected data were reviewed by health professionals who are trained to check the quality dimensions for this capstone project

**5.15: Ethical considerations:** Addis Ababa university public health faculty ethical committee has seen and approved the project. The purpose of the study was oriented to the management of the yerer general hospital and was approved.

MR should be maintained in the strictest confidence, as they contain personal and private information about patients, including their health status, personal, family, and contact information.

A comprehensive MR management system encompasses handling of the MR from the time of patient registration, during active care delivery, through patient discharge, and ongoing filing/storage of the MR, until removal/destruction of old MRs from storage. The flow of MR/charts is important to ensure the availability of clinical information and patient confidentiality (8).

**5.16: Dissemination plan:** The results of the project will be discussed with the staff and management of the hospital after designing the intervention plan. The result will also be shared with the ministry of health or any hospitals which might require doing a quality check in their MR department. The employed tool was modified and introduced as it allows detail assessment for data quality in outpatient and inpatient medical recording.

## Section 6: Result

### 6.1: Result of pre-intervention

#### 6.1.1 Result of Medical Recording Completeness and Accuracy of pre intervention

*Pre intervention Completeness of demographic sheet:* data elements, availability of the sheet itself, name of patient, phone number, sex and ID were documented 100%. While emergency contact and entries dated were not documented at all 0%, for both outpatient (table 6) and inpatient documentation (table 5).

**Table 5** pre intervention Completeness of demographic sheet for Inpatient MR

	Data elements	Response	Count	percentage
<b>Demographic sheet inpatient MR In patient cards=38</b>	age written	no	4	10.50%
		yes	34	89.50%
	address written	no	22	57.90%
		yes	16	42.10%
	Total percentage of completeness Demographic sheet	70.18%		

Table 6 pre intervention Completeness of Demographic sheet for Outpatient MR

	Data elements	Response	Count	percentage
<b>Demographic sheet for outpatient MR Outpatient cards=347</b>	Age written	no	1	0.30%
		yes	345	99.70%
	Address written	no	179	51.70%
		yes	167	48.30%
	Total completeness of Demographic sheet	72.00%		

*Pre intervention Progress note completion:* data elements of; the availability of progress note has the highest score 89.50% and the second highest is 78.90% progress note written, the other data elements has score of below 60% (table 7).

Table 7 pre intervention Completeness of Progress note for Inpatient MR

	Data elements	Response	Count	percentage	
<b>Progress note for Inpatient MR In patient cards=38</b>	Health centre progress note available	no	4	10.50%	
		yes	34	89.50%	
	IPD (ward) selected	no	37	97.40%	
		yes	1	2.60%	
	Name of patient written	no	16	42.10%	
		yes	22	57.90%	
	ID written	no	37	97.40%	
		yes	1	2.60%	
	Date and time written	no	32	84.20%	
		yes	6	15.80%	
	Progress note written	no	8	21.10%	
		yes	30	78.90%	
	Total percentage of completeness Progress note		33.68%		

*Pre intervention Completeness of health professional order sheet:* data elements; availability of the sheet and order written has a score of 81.6% and 84.2% respectively, the other data elements has a score of below 60% (table 8).

Table 8 pre intervention Completeness of health professional order sheet for Inpatient MR

	Data elements	Response	Count	percentage	
<b>Health professional order sheet for Inpatient MR In patient cards=38</b>	Health professional order sheet available	no	7	18.40%	
		yes	31	81.60%	
	Names written	no	17	44.70%	
		yes	21	55.30%	
	ID written	no	35	92.10%	
		yes	3	7.90%	
	Ward and bed number written	no	33	86.80%	
		yes	5	13.20%	
	Order written	no	6	15.80%	
		yes	32	84.20%	
	Date and Time order completed	no	26	68.40%	
		yes	12	31.60%	
	All entries dated and signed	no	22	57.90%	
		yes	16	42.10%	
	Total percentage of completeness health professional order sheet		48.27%		

*Pre intervention Nursing Care completeness:* data elements; V/S taken at least QID has the only score 89.5% for inpatient MR. Twenty six nursing care data elements (Is Nursing Care Plan forms available, Revised daily, Nursing assessment form available, name written on Nursing assessment form, age written Nursing assessment form, sex written Nursing

assessment form, ID written Nursing assessment form, Diagnosis written Nursing assessment form, address written Nursing assessment form, name written on nursing care plan, ID written on nursing care plan, goal written on nursing care plan. Expected outcome written on nursing intervention ,written on nursing care plan, nursing care plan dated and signed, ward and bed number written on nursing care plan, name written on nursing diagnosis form, ID written on nursing diagnosis form, ward and bed number written on nursing diagnosis form, telephone number written on nursing diagnosis form, problem number written on nursing diagnosis form, diagnosis/problem written on nursing diagnosis form, date identified written on nursing diagnosis form, date resolved written on nursing diagnosis form, name and designation written on nursing diagnosis form) has 0% completion for the inpatient MR (table 6).

For the outpatient MR, only vital sign taken is the data element with a score of 98.8 %( table 7).

**Table 9** pre intervention Completeness of Nursing Care for Inpatient MR

	Data elements	Response	Count	percentage
<b>Nursing Care for Inpatient MR In patient cards=38</b>	V/S taken at least QID for all admitted patient	no	4	10.50%
		yes	34	89.50%
	Total percentage of completeness Nursing Care	3.31%		

**Table 10** pre intervention Completeness of Nursing Care for Outpatient MR

	Data elements	Response	count	percentage
<b>Nursing care Outpatient MR for Outpatient cards=347</b>	V/S taken	no	4	1.20%
		yes	342	98.80%
	Total completeness of Nursing care	98.80%		

*Pre intervention Medication Administration Record:* This variable has the highest score of completeness 89.50% for the inpatient MR (table 11).

**Table 11** pre intervention Completeness of Medication Administration Record for Inpatient MR

	Data elements	Response	Count	percentage	
<b>Medication Administration Record for Inpatient MR In patient cards=38</b>	Medication Administration Record available	no	4	10.50%	
		yes	34	89.50%	
	Medication type written	no	4	10.50%	
		yes	34	89.50%	
	Time to give written	no	4	10.50%	
		yes	34	89.50%	
	all entries dated and signed	no	4	10.50%	
		yes	34	89.50%	
		Total percentage of completeness Medication Administration Record	89.50%		

*Pre intervention Discharge summary sheet:* data elements; Availability of the sheet, name writing, date of admission and discharge has the highest score 78.9%. Instruction for home, ward and bedroom writing has the lowest score 2.6% and 5.3% respectively (table 12).

**Table 12** pre intervention Completeness of Discharge summary sheet for Inpatient MR

	Data elements	Response	Count	percentage	
<b>Discharge summary sheet for Inpatient MR In patient cards=38</b>	A Health centre discharge summary sheet available	no	8	21.10%	
		yes	30	78.90%	
	Name written	no	8	21.10%	
		yes	30	78.90%	
	ID written	no	34	89.50%	
		yes	4	10.50%	
	Ward and bed room written	no	36	94.70%	
		yes	2	5.30%	
	Date of admission written	no	8	21.10%	
		yes	30	78.90%	
	Date of discharge written	no	8	21.10%	
		yes	30	78.90%	
	Hospital course written	no	30	78.90%	
		yes	8	21.10%	
	Diagnosis written	no	9	23.70%	
		yes	29	76.30%	
	Diagnosis procedure and diagnosis written	no	29	76.30%	
		yes	9	23.70%	
	Condition on discharge written	no	17	44.70%	
		yes	21	55.30%	
	Instruction for home written	no	37	97.40%	
		yes	1	2.60%	
	Medication and appointment written	no	12	31.60%	
		yes	26	68.40%	
	Dated and signed	no	9	23.70%	
		yes	29	76.30%	
		Total completeness of discharge summary	50.39%		

*Pre intervention Integrated folder/ summary sheet:* data elements; Service written and Serial numbers in registration book written have 0%score. Three data elements of summary sheet (Integrated folder summary sheet available, ID written, Name written) 100 % complete .for both IPD (table 13) and OPD (table 14) MR.

Table 13 pre intervention Completeness of integrated folder summary sheet **for** Inpatient MR

	Data elements	Response	Count	percentage
<b>Integrated folder summary sheet for Inpatient MR In patient cards=38</b>	Diagnosis /complication written	no	2	5.30%
		yes	36	94.70%
	Total completeness of summary sheet	65.78%		

Table 14 pre intervention Completeness of Summary sheet/ integrated folder **for** Outpatient MR

	Data elements		count	percentage
<b>Summary sheet/ Integrated folder outpatient MR Outpatient cards=347</b>	Diagnosis /complication written	no	2	0.60%
		yes	344	99.40%
	Total completeness of summary sheet	66.57%		

Table 15 pre intervention Total Completeness of Outpatient and Inpatient MR in Yerer General Hospital

<b>Total completeness</b>	<b>percentage</b>
<b>Total completeness of outpatient MR</b>	79.12%
<b>Total completeness of Inpatient MR</b>	51.59%

*Pre intervention Accuracy assessment:* data elements; ID similarity to the registry has the highest score 100% and address similarity to the registry has the lowest score for both IPD and OPD (Table 16).

**Table 16 pre intervention Accuracy of Inpatient and Outpatient MR in Yerer General Hospital**

Accuracy assessment		Type of card:			
Data elements	Response	Outpatient cards=347		Inpatient cards=38	
		count	percentage	count	percentage
Age of patient similar to the registry	no	62	17.90%	11	28.90%
	yes	284	82.10%	27	71.10%
Sex similar to the registry	no	35	10.10%	9	23.70%
	yes	311	89.90%	29	76.30%
ID similar to the registry	no	0	0.00%	0	0.00%
	yes	346	100.00%	38	100.00%
Address similar to the registry	no	283	81.80%	38	100.00%
	yes	63	18.20%	0	0.00%
Diagnosis of a patient medical record similar to the inpatient/outpatient registry book	no	122	35.30%	15	39.50%
	yes	224	64.70%	23	60.50%
Disease classification for the patient is registered according to the national disease classification	no	253	73.10%	28	73.70%
	yes	93	26.90%	10	26.30%
Total percentage of Accuracy assessment of inpatient and outpatient medical recording		63.63%		55.70%	

To summarize the outcome of pre intervention ;there is variation of completeness and accuracy of inpatient and outpatient MR, the lowest result of total completeness and accuracy is for the inpatient medical recording were 51.59%and 55.70% respectively. The figures below show the comparison.

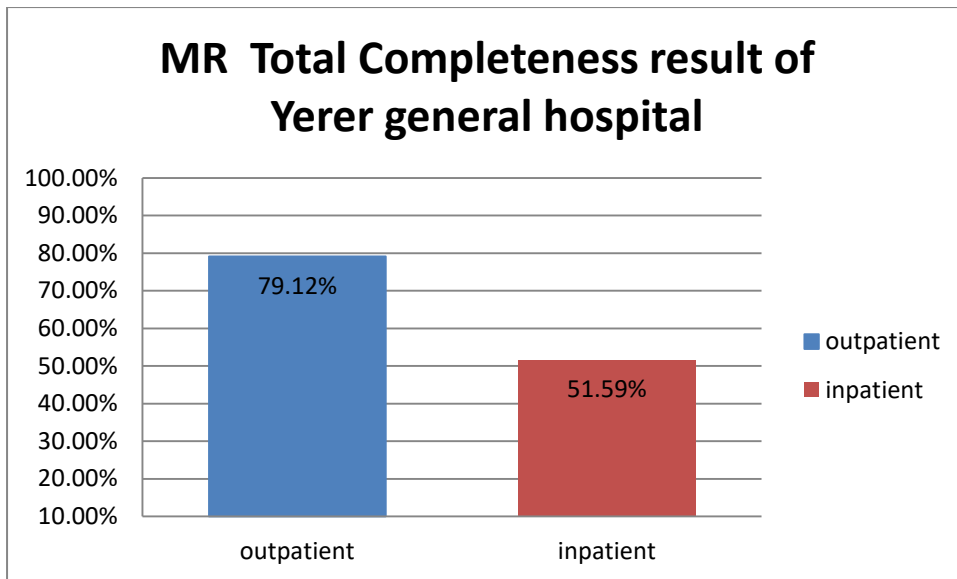


Fig 3 MR completeness of Yerer General Hospital pre intervention

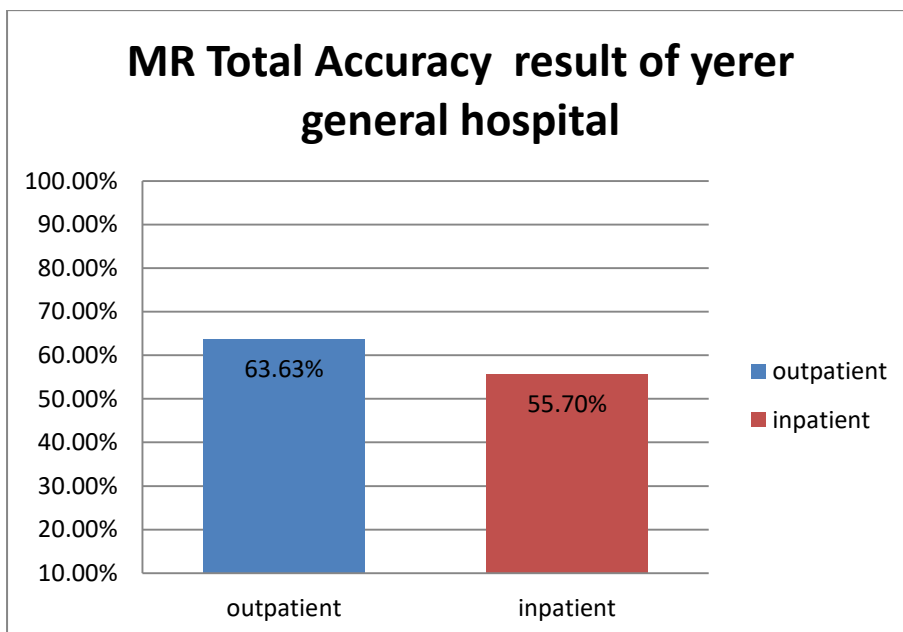


Fig 4 MR accuracy of Yerer General Hospital pre intervention

### 6.1.2 Result of pre intervention: an interview, observation, and document review

**Timeliness:** From the observation; there was no protocol that indicates the cards have to be returned to the MR room on the same day for the OPD MR. In MR department there were no written protocols that indicate the discharge or death of a patient in a hospital and patients' medical records were processed and completed, coded and indexed within a specific time frame.

**The document review;** The medical recording formats which are approved by the hospital to be used are merged together, For example, the integrated summery sheet, history sheet and demographic sheet, considered to be used together misses out data elements which have to be found according to ministry of health EHSTG medical recording sheets standard.

Patients that are registered on the computer in a given time frame were not found on the registry book easily or totally missing, Ethiopian and European calendar were used mixedly on the registry book, same ID was given for a different patients, Patients that come for certain examination were registered in other department without visiting that department; For example , some patient Cards show that a patient who came for eye problem but registered in gynaecology department being male and pregnant.

The cards were not easily traceable according to the registry, disease classification was mostly written in abbreviation on the registry book, address totally not written on the registry book except on emergency outpatient which allows phone number instead of woreda to be registered. Additionally, registry book was found to be illegible in IPD department.

**From the interview question result:** There was no auditing of cards done by the medical recording department.

## 6.2: Results of post intervention

### 6.2.1 Result of Medical Recording Completeness and Accuracy of post intervention

*Post intervention Completeness of demographic sheet:* data elements: availability of the sheet itself, name of patient, phone, sex and ID are documented 100%. While emergency contact and entries dated are not documented at all 0% for inpatient (Table 17) and outpatient (Table 18). The total percentage completeness of the demographic sheet in post intervention is almost the same to the pre intervention.

Table 17 post intervention Completeness of demographic sheet for Inpatient MR

	Data elements	response	Count	percentage
Demographic sheet for inpatient MR In patient cards=50	Age written	no	0	0.0%
		yes	50	100.0%
	Address written	no	35	70.0%
		yes	15	30.0%
	Total percentage of completeness Demographic sheet	70%		

Table 18 post intervention completeness of Demographic sheet for Outpatient MR

	Data elements	response	Count	percentage	
Demographic sheet for Outpatient MR Outpatient cards =206	Age written	no	1	0.5%	
		yes	205	99.5%	
	Address written	no	111	53.9%	
		yes	95	46.1%	
	Total percentage of completeness Demographic sheet		72%		

*Post intervention Progress note completion:* data elements of; the availability of progress note has the highest score 76% and the second highest is 72% progress note written, there is improvement on the other data elements completeness compared to pre intervention (table 19). Total percentage of progress note has increased percentage compared to the pre intervention which was 33.68 % (table 7).

Table 19 Post intervention completion of Progress note for Inpatient MR

	Data elements	response	Count	percentage	
Progress note for Inpatient MR In patient cards=50	Health center progress note available	no	12	24.0%	
		yes	38	76.0%	
	IPD (ward) selected	no	43	86.0%	
		yes	7	14.0%	
	Name of patient written	no	23	46.0%	
		yes	27	54.0%	
	ID written	no	42	84.0%	
		yes	8	16.0%	
	Date and time written	no	32	64.0%	
		yes	18	36.0%	
	Progress note written	no	14	28.0%	
		yes	36	72.0%	
		Total percentage of completeness Progress note	44.67 %		

*Post intervention Completeness of health professional order sheet:* data elements; availability of the sheet and Order written has a score of 86% and 84% respectively(table 20), the other data elements have some improvement which resulted increase on total completeness percentage compared to pre intervention Completeness result of health professional order sheet 48.27% (table 8).

Table 20 Post intervention Completeness of health professional order sheet for Inpatient MR

	Data elements	response	Count	percentage
Health professional order sheet for Inpatient MR In patient cards=50	Health professional order sheet available	no	7	14.0%
		yes	43	86.0%
	Names written	no	24	48.0%
		yes	26	52.0%
	ID written	no	42	84.0%
		yes	8	16.0%
	Ward and bed number written	no	45	90.0%
		yes	5	10.0%
	Order written	no	8	16.0%
		yes	42	84.0%
	Date and Time order completed	no	29	58.0%
		yes	21	42.0%
	Are all entries dated and signed?	no	15	30.0%
		yes	35	70.0%
	Total percentage of completeness health professional order sheet	51.43%		

*Post intervention Nursing Care completeness:* there is no change on the standard of the sheet which is used by the hospital after the intervention. so ,all data elements except for the V/S checks for the inpatient were not complete, the percentage result of the vital sign checks have decreased for both inpatient and outpatient medical recording compared to the pre intervention outpatient (98.8%) and inpatient (3.3%) completeness of nursing care.

Table 21 Post intervention completeness of Nursing Care for Inpatient MR

	Data elements	response	Count	percentage
Nursing Care for Inpatient MR In patient cards=50	V/S taken at least QID for all admitted patient? (for inpatient)	no	7	14.0%
		yes	43	86.0%
	Total completeness of Nursing Care	3.1%		

Table 22 Post intervention completeness of Nursing Care for outpatient MR

	Data elements	Response	count	percentage
Nursing care for Outpatient MR Outpatient cards= 206	V/S taken	no	9	4.4%
		yes	197	95.6%
	Total completeness of Nursing care	95.6%		

*Post intervention Medication Administration Record:* post intervention result has decreased percentage compared to pre intervention completeness 89.50% for the inpatient MR (table 11).

Table 23 post intervention Completeness of Medication Administration Record for Inpatient MR

	Data elements	Response	count	percentage
Medication Administration Record for Inpatient MR  In patient cards=50	Medication Administration Record available	no	9	18.0%
		yes	41	82.0%
	Medication type written	no	9	18.0%
		yes	41	82.0%
	Time to give written	no	9	18.0%
		yes	41	82.0%
	All entries dated and signed	no	9	18.0%
		yes	41	82.0%
	Total Completeness of Medication Administration	82.0%		

*Post intervention Discharge summary sheet:* data elements; the sheet availability has the highest score of 76% the other data elements has a score of less than 60 % ( table 24).The total percentage of post intervention result is less than pre intervention 50.39% (table 12).

Table 24 post intervention Completeness of Discharge summary sheet for Inpatient MR

	Data elements	Response	count	percentage	
Discharge summary sheet for Inpatient MR Inpatient cards=50	Health centre discharge summary sheet available	no	12	24.0%	
		yes	38	76.0%	
	Name written	no	23	46.0%	
		yes	27	54.0%	
	ID written	no	48	96.0%	
		yes	2	4.0%	
	Ward and bed room written	no	49	98.0%	
		yes	1	2.0%	
	Date of admission written	no	26	52.0%	
		yes	24	48.0%	
	Date of discharge written	no	29	58.0%	
		yes	21	42.0%	
	Hospital course written	no	44	88.0%	
		yes	6	12.0%	
	Diagnosis written	no	24	48.0%	
		yes	26	52.0%	
	Diagnosis procedure and diagnosis written	no	44	88.0%	
		yes	6	12.0%	
	Condition on discharge written	no	30	60.0%	
		yes	20	40.0%	
	Instruction for home written	no	43	86.0%	
		yes	7	14.0%	
	Medication and appointment written	no	44	88.0%	
		yes	6	12.0%	
	Dated and signed	no	26	52.0%	
		yes	24	48.0%	
	Total completeness of discharge summary		32%		

*Post intervention summary sheet:* Has a score of 0% because it is printed out but not implemented in a given period of post intervention time.

*Post intervention Accuracy assessment:* data elements; ID similarity to the registry has the highest score 100% and address similarity to the registry has the lowest score for both IPD and OPD (Table 25).

Table 25 post intervention Accuracy of Inpatient and Outpatient MR

Data elements	response	TYPE OF CARD			
		Inpatient cards=50		Outpatient cards=206	
		Count	percentage %	Count	percentage %
Age of patient similar to the registry	no	4	8.0%	35	17.0%
	yes	46	92.0%	171	83.0%
Sex similar to the registry	no	0	0.0%	23	11.2%
	yes	50	100.0%	183	88.8%
ID similar to the registry	no	0	0.0%	1	0.0%
	yes	50	100.0%	205	100%
Address similar to the registry	no	24	48.0%	67	32.5%
	yes	26	52.0%	139	67.5%
Diagnosis of a patient medical record similar to the inpatient/outpatient registry book	no	13	26.0%	56	27.2%
	yes	37	74.0%	150	72.8%
Disease classification for the patient is registered according to the national disease classification (please compare the national disease classification list with the registry)	no	14	28.0%	57	27.7%
	yes	36	72.0%	149	72.3%
Total percentage of Accuracy assessment of inpatient and outpatient medical recording		81.67%		80.73%	

To summarize the result of post intervention of MR in Yerer General Hospital, The total completeness score of post intervention has decreased compared to pre intervention, and the total accuracy score of post intervention has increased compared to pre intervention. The graphs below shows the summery of inpatient and outpatient post intervention results.

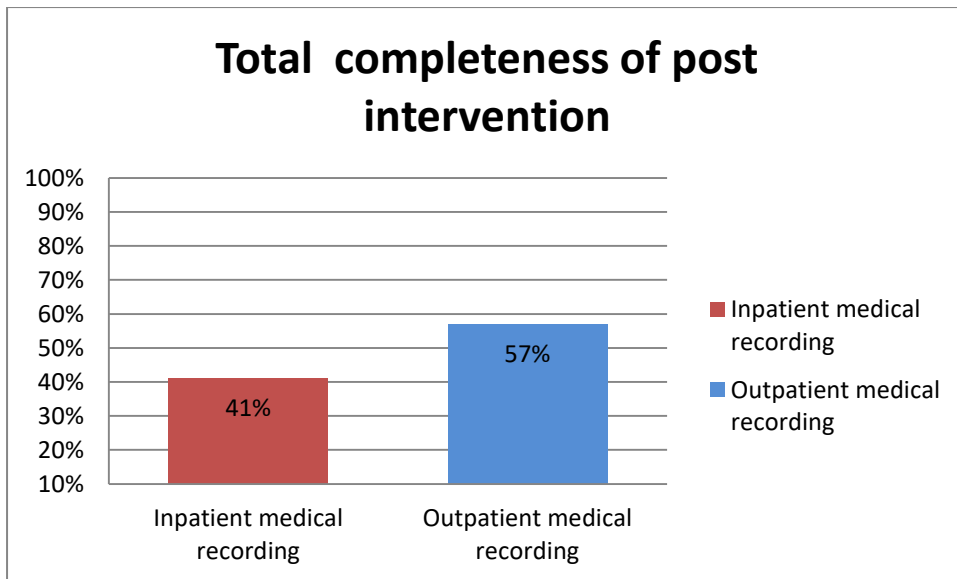


Fig. 5 MR completeness of Yerer General Hospital of post intervention

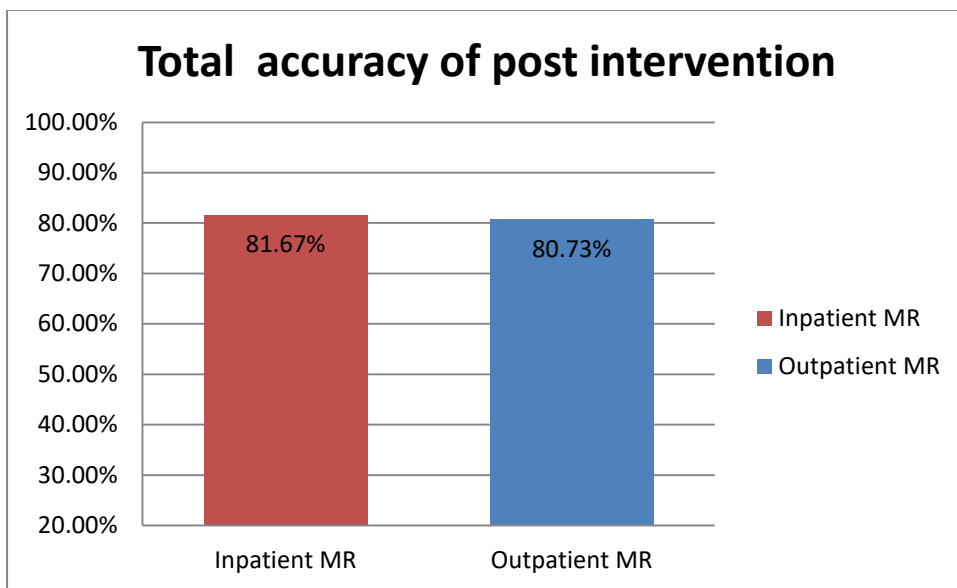


Fig. 6 MR accuracy of Yerer General Hospital of post intervention

### 6.2.2 Results of post intervention: interview, observation, and document review

**Timeliness:** From the observation; cards form the outpatient is returned on a same day

**The document review;** The medical recording formats which were approved by the hospital to be used instead of being merged a summery sheet is printed out after the action plan but not used, but the history sheet and demographic folder are still merged together as it was in pre intervention . The nursing form is still not printed out to be used by the hospital.

The registry book data elements like, address are not filled not only when it get missed on the demographic sheet but also while it is present, the disease classification was printed out and given to all departments.

**From the interview question result:** medical recording staffs, number are increased in medical recording room which makes easy to arrange and find cards''

### 6.3: Summary of changes of the pre intervention and the post intervention

Results of accuracy and completeness in medical recording registry in Yerer General Hospital and the outcome of the intervention on training the staff is summarized below.

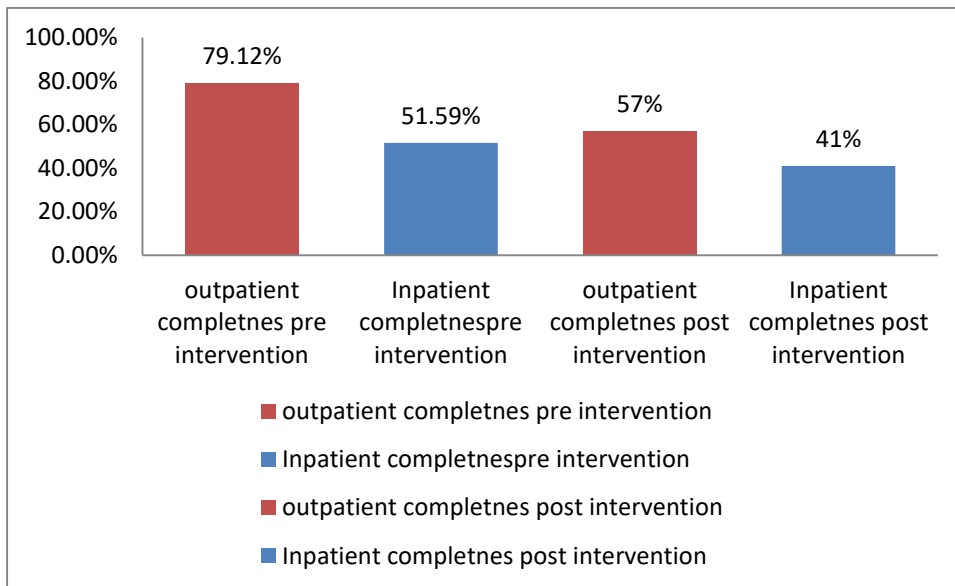


Fig. 7 Total completeness of MR post intervention and pre intervention scores

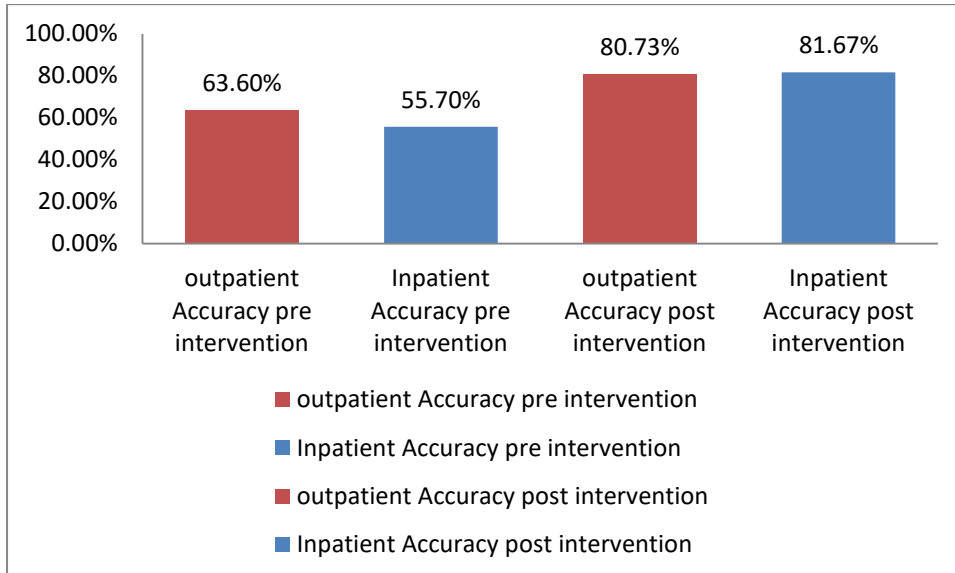


Fig. 8 Total Accuracy of MR post intervention and pre intervention scores

Table 26 pre intervention and post intervention changes of Inpatient MR Completeness in Yerer General Hospital

Data elements	pre intervention	post intervention
<b>Total percentage of completeness Demographic sheet inpatient</b>	70.18%	70%
<b>Total percentage of completeness Progress note inpatient</b>	33.68%	44.67%
<b>Total percentage of completeness health professional order sheet inpatient</b>	48.27%	51.43%
<b>Total completeness of Nursing Care in patient</b>	3.31%	3.10%
<b>Total Completeness of Medication Administration inpatient</b>	89.50%	82.00%
<b>Total completeness of discharge summery inpatient</b>	50.39%	32%
<b>Total completeness of summery sheet inpatient</b>	65.78%	0%
<b>Average</b>	51.5%	40.9%

Table 27 pre intervention and post intervention changes of outpatient MR completeness in Yerer General Hospital

Data elements	pre intervention	post intervention
<b>Total percentage of completeness Demographic sheet out patient</b>	72.00%	72%
<b>Total completeness of Nursing Care outpatient</b>	98.80%	95.60%
<b>Total completeness of summery sheet out patient</b>	66.57%	0%
<b>Average</b>	79.12%	56.9%

Table 28 chi square test of independence of the difference in the Accuracy between the pre- and post-intervention in Yerer General Hospital

			Accurate	Not Accurate	Total	Chi(X2) square	P-value
<b>outpatient</b>	Pre-intervention	observed	219	128	347		
		expected	241.6	105.4	347		
			63%	37%	100%	18.65	<0.001
	Post intervention	observed	166	40	206		
		expected	143.4	62.6	206		
			81%	19%	100%		
<b>Inpatient</b>	Pre-intervention	observed	21	17	38		
		expected	26.7	11.2	37.9		
			55%	45%	100%	7.41	0.007
	Post intervention	observed	41	9	50		
		expected	35.2	14.8	50		
			82%	18%	100%		
df=1, 95% Confidence interval							

There was a significant relationship between intervention and accuracy in the outpatient department,  $X^2$  (1df) 18.65,  $p < 0.001$ . Accuracy was more likely higher in the post-intervention than in the pre-intervention (83% to 63%), 95% CI 17.5% $\pm$ 7.4. Also, there was a significant relationship between intervention and accuracy in the inpatient department,  $X^2$  (1df) 7.41,  $p = 0.007$ . Accuracy was more likely higher in the post-intervention than in the pre-intervention (55% to 82%), 95% CI 26.7% $\pm$ 19.1.

Table 29 chi square test of independence of the difference in the completeness between the pre- and post-intervention in Yerer General Hospital

			complete	Not complete	Total	Chi(X2) square	P-value
<b>outpatient</b>	Pre-intervention	observed	275	72	347		
		expected	176.9	170	346.9		
			79%	37%	100%	30.34	<0.001
	Post intervention	observed	118	88	206		
		expected	105	100.9	205.9		
			57%	43%	100%		
<b>Inpatient</b>	Pre-intervention	observed	19.7	18	38		
		expected	22	15.9	37.9		
			52%	47%	100%	0.98	0.005
	Post intervention	observed	20.5	29	50		
		expected	28.9	21	49.9		
			41%	58%	100%		
df=1, 95% Confidence interval							

There was a significant relationship between intervention and completeness in the outpatient department,  $X^2$  (1df) 30.34,  $p < 0.001$ . Completeness was more likely lower in the post-intervention than in the pre-intervention (79% to 57%),  $22.0\% \pm 8.0\%$

Also, there was a significant relationship between intervention and completeness in the inpatient department,  $X^2$  (1df) 0.98,  $p = 0.005$ . Completeness was more likely lower in the post-intervention than in the pre-intervention (52% to 41%),  $10.6\% \pm 20.9\%$ .

## Section 7: Discussion of the result

The intervention of training on medical recording has brought positive and negative changes, the result outpatient total completeness of Yerer General Hospital it was 79.12% before and 57% after the intervention, inpatient total completeness 51.59% before and 41% after intervention which shows a decrease of the score after intervention. But some data elements of completeness have a positive result. Outpatient accuracy of Yerer General Hospital was 63.6 before and 80.73% after the intervention; Inpatient accuracy score was 55.7% before and 81.67% after the intervention which is a positive change. There was a significant relationship between intervention and accuracy in the outpatient and inpatient department,  $X^2$  (1df) 18.65,  $p < 0.001$  and  $X^2$  (1df) 7.41,  $p = 0.007$  respectively. Timelessness of returning cards on a same day is improved according to the observation and interview result. The intervention method of training has been successful as it was shown in other studies as well.

After training, Comparing the completeness of medical record documentation study done in Ethiopia, Improving Completeness of Inpatient Medical Records in Menelik II Referral Hospital, Addis Ababa, Ethiopia 2017, baseline assessments were collected and inpatient medical record completeness showed 73% score before and 84% after training health care professionals intervention Whereas ,the result of a study done in a Dalefage Primary Hospital Afar , the baseline assessment was 0% before and 73,6% after intervention(21).

The result of this study has shown the on job training intervention done in Yerer General Hospital has improved the accuracy and the timelessness, though, the Total completeness of medical recording percentage scores has decreased after post intervention with the intervention effect on the completeness has not contributed with the significant difference of lower score for outpatient and inpatient department  $X^2$  (1df) 30.34,  $p < 0.001$  and  $X^2$  (1df) 0.98,  $p = 0.005$  respectively.

Total Completeness of medical recording has a decreased score because, there was no enough follow up, shortage of budget of the hospital to print out the forms, enough staffs has not attended the training, the staffs which were on the training has not conveyed the training for the other staffs responsible for recording of the patient data and interventional gap can be mentioned as a reason. After intervention the summery sheet are not used separately but

printed out and was included in the medical folder which requires a follow up. The observation and document review of post intervention result confirms the reason for the decrease of total completeness.

Other intervention methods can be suggested which might bring a solution, because some additional intervention methods studies done on a similar topic but different intervention method have shown a positive result of completeness. for example, Intervention like auditing, follow up and accreditation which can be applied has brought improvement ,for example, in Indonesia on Completeness of Medical Record Documents to Improve the Service Quality at Puskesmas in Sukoharjo Regency was 66% before and 80% after accreditation intervention(22),in Iran study done on The Effectiveness of Continuous Quality Improvement System Establishment on Improvement of the Data Recording Quality in the Emergency Department: A Clinical Audit report states that Data registration rate by the medical staff was 73% before and 84% after the intervention(23).

A study done in Tanzania on An examination of inpatient medical record keeping in the Orthopaedic Department of Kilimanjaro Christian Medical Centre (KCMC), Moshi, Tanzania; a follow up method and auditing improved the medical recording(24),

A study was done in Iran on The Role of Accreditation in Improving Documentation of Medical Records: A Case Study in Besat Hospital, Hamadan University of Medical Sciences-Iran the result of the mean total completeness of documentation rate after accreditation was of positive impact change on the documentation medical recordings (25).

## **Section 8: Limitation and Strength**

### **Limitation**

The limitation of the project is, Because of the pandemic situation of corona viruses, the intervention process was challenging to include all the necessary attendees. For the same reason, the project took longer time than was planned on the proposal to get it finalized.

The other limitation is the method which was applied in this project for the sampling has differences because the project budget provided and the time limit do not allow waiting to measure a one year of post intervention data collection. For this reason only one month post intervention data sampling method was used to measure the result of the post intervention.

### **Strength**

The strength is that, in spite of the pandemic we arranged the meeting with the management staff to proceed on the intervention and designed an action plan.

## Section 9: Conclusion

In general, the finding of this study shows that after the intervention there is a decrease of the percentage score of total completeness. Because of, the interventional gap mentioned in discussion section, though some data elements have an increase of the percentage score in the post intervention. For instance, inpatient Progress note completeness was 33.68% before and 44.67% after intervention. Inpatient Completeness of health professional order sheet before intervention was 48.27% and 51.43% after the intervention.

The total result of accuracy has increased significantly for both inpatient and outpatient medical recording; outpatient MR accuracy has increased from 63.6% to 80.73% and the inpatient MR accuracy has increased from 55.7% to 81.67%, the timeliness has also improved.

Therefore, in addition to the intervention designed in this study other interventional methods might be required especially for completeness of medical recording.

## **Section 10: Recommendation**

### **For the Ethiopia Ministry of Health**

Continuous training programs have to be prepared for the health professionals on the standards of format, the importance of complete medical recording and Ethiopian ministry of health guidelines for private sectors in focus.

The tool which was used in this study provides a detailed check on the data filling of MR of an outpatient and inpatient .It can be adapted by the Ethiopia MOH, because the tool found in the hospital performance and monitoring improvement manual (2017) is only used for the inpatient MR completeness measurement.

Outpatient completeness check list have to be considered to be added to the hospital performance and monitoring improvement manual (2017), because some HMIS indicators require information which are registered on the outpatient MR.

### **For Yerer General Hospital**

After training Continuous auditing and follow up of the medical recording are required for correct medical recording which have to be implemented by the hospital HIS and Quality department.

At last, great attention has to be given to the quality department in private sectors of hospitals by providing office equipped with all necessary human and material resources.

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## Section 12: Annexes

### Information sheet

**Title of the project:** Improving Medical Recording Data Quality in Yerer Hospital, 2021

Good day! My name is Hanna Aboye. We are here on behalf of the quality department of Yerer Hospital conducting a study to help the hospital know more about how the recording department is performing.

Your unit was selected to participate in this study. We will be asking you questions about the health services and the reporting of those services. This information may be used by [*MOH AND/OR Yerer Hospital*], and researchers, to plan service improvement or to conduct more studies

I would like to invite you to take part in this capstone study. Before you decide you need to understand why the project is being done and what it would involve for you. Please take the time to read the following information carefully. Ask questions if anything you read is not clear or if you would like more information. Take time to decide whether or not to take part.

This capstone project will be on data quality in the medical recording department of Yerer Hospital which will be done in fulfillment of my master's degree in hospital administration and health care service from Addis Ababa University health science school of public health.

medical recording quality assessment of the cards using pre - post-intervention has done, and implementation plan which will be completed from June to december, 2020ec. A questioner will be prepared, document review and observation will be the methods used for a gathering of information.

**Risks and benefits of taking part:** providing the right answer for the question will help in designing the intervention and also will guide on to the improvement of Data quality in Yerer Hospital which will benefit the hospital and the workflow of the departments. There will b

**Confidentiality:** The individuals who are selected to answer the questioner are those who are directly involved with the medical recording and are considered to provide the required information for the root cause analysis.

Providing the right answer for the question will help in designing the intervention and also will guide on to the improvement of Data quality in Yerer Hospital which will benefit the

hospital and the workflow of the departments. There will be no risk since the management of the hospital fully cooperative with this capstone project.

Neither your name nor the names of any other respondent participating in this study will be included in the data set or any report. However, there is a small chance that any of these respondents may be identified later. Nevertheless, we are asking your help to ensure that the information we collect is accurate.

You may refuse to answer any question or choose to stop the interview at any time. However, we hope you will answer all of the questions, which will benefit the clients you serve and the nation.

If there are questions that would be more accurately answered by someone better informed of any specifics we ask about, we would appreciate if you would introduce us to that person to help us collect any missing or incomplete information

**Contact for further information:**

**Name of the investigator:** Hanna Aboye

Email: [hanicho3903@gmail.com](mailto:hanicho3903@gmail.com)

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Adiam Nega(BSc, MPH)

Email: adiamnega123@gmail.com

Wendimu Ayele (Ph.D. Candidate)

Email: wondaay@gmail.com

Thank you

## Informed Consent

A questioner is prepared to construct root cause analysis of medical recording data quality in Outpatient and Inpatient Yerer Hospital Addis Ababa Ethiopia.

Good day! My name is \_\_\_\_\_. We are here on behalf of the quality department of Yerer Hospital conducting a study to help the hospital know more about how the recording department is performing.

Your unit was selected to participate in this study. We will be asking you questions about the health services and the reporting of those services. This information may be used by [*MOH AND/OR Yerer Hospital*], and researchers, to plan service improvement or to conduct more studies.

Neither your name nor the names of any other respondent participating in this study will be included in the data set or any report. However, there is a small chance that any of these respondents may be identified later. Nevertheless, we are asking your help to ensure that the information we collect is accurate.

You may refuse to answer any question or choose to stop the interview at any time. However, we hope you will answer all of the questions, which will benefit the clients you serve and the nation.

If there are questions that would be more accurately answered by someone better informed of any specifics we ask about, we would appreciate it if you would introduce us to that person to help us collect any missing or incomplete information.

At this point, do you have any questions about the study? Do I have your agreement to proceed?

\_\_\_\_\_ / \_\_\_\_\_  
 \_\_\_\_\_ / \_\_\_\_\_

YERER GENERAL HOSPITAL DATA QUALITY STUDY CHECKLIST IN MEDICAL RECORDING IN OUTPATIENT AND INPATIENT WITH SELECTED DIMENSIONS

CHECKLIST FOR EACH SAMPLE OF MR CARD

<b>1. Medical Record Review Form for completeness check</b>					
MR Number:					
Type of card		Outpatient <input type="checkbox"/> Inpatient <input type="checkbox"/>			
For inpatient cards, all questions from 1.1- 1.7 calculate the percentage For outpatient card question, 1.1,1.4 and 1.7 calculate the percentage					
Section, please say yes or no for each question by putting this mark “√”	Yes	No	Remark	If all yes please tick this box	If one or more questions no please tick this box
1.1 Patient Card, Demographic sheet				<input type="checkbox"/>	<input type="checkbox"/>
101	Is there an available demographic sheet?				
102	Is the name of the patient written?				
103	Is the phone of the patient written?				
104	Sex of patient selected?				
105	Is ID written?				
106	Emergency contact information/ phone				
107	Is registration written?				
108	is the address written?				
109	Are entries dated?				
	Percentage of total yesx100/9				
1.2 health center progress note(for inpatient)				<input type="checkbox"/>	<input type="checkbox"/>
110	Is health center progress note available?				
111	Are the OPD/IPD (ward) selected?				

112	Is the name of the patient written?				
113	Has ID written?				
114	Are Date and time written?				
115	Is a progress note written?				
	Percentage yes x 100/6				
<b>1.3. Physician order sheet: (for inpatient)</b>				<input type="checkbox"/>	<input type="checkbox"/>
116	Is the health professional order sheet available?				
117	Are names written?				
118	Has ID written?				
119	Is the ward and bed number written? (for inpatient)				
120	Is the order written?				
121	Is the Date and Time order completed?				
122	Are all entries dated and signed?				
	The percentage for inpatient yes x 100/7 For outpatient yes x100/6				
<b>1.4. Nursing Care Plan:</b>				<input type="checkbox"/>	<input type="checkbox"/>
123	Is Nursing Care Plan forms available? (for inpatient)				
124	Revised daily? (for inpatient)				
125	V/S taken at least QID for all admitted patients? (for inpatient)				
126	V/S taken (for outpatient)?				
127	Is the Nursing assessment form available? (for inpatient)				
128	Is the name written on the Nursing assessment form? (for inpatient)				
129	age written Nursing assessment form? (for inpatient)				
130	sex written Nursing assessment form? (for				

	inpatient)		
131	ID written Nursing assessment form? (for inpatient)		
132	Diagnosis written Nursing assessment form? (for inpatient)		
133	Is address written Nursing assessment form? (for inpatient)		
134	is the name written on the nursing care plan? (for inpatient)		
135	is ID written on the nursing care plan? (for inpatient)		
136	Is the telephone number written on the nursing care plan? (for inpatient)		
137	Is the goal written on the nursing care plan?		
138	Is the expected outcome written on the nursing care plan? (for inpatient)		
139	Is intervention written on the nursing care plan? (for inpatient)		
140	Is the nursing care plan dated and signed? (for inpatient)		
141	Is the ward and bed number written on the nursing care plan? (for inpatient)		
142	Is the name written on the nursing diagnosis form? (for inpatient)		
143	Is ID written on the nursing diagnosis form? (for inpatient)		
144	Is the ward and bed number written on the nursing diagnosis form? (for inpatient)		
145	Is the telephone number written on the nursing diagnosis form? (for inpatient)		
146	Is the problem number		

	written on the nursing diagnosis form? (for inpatient)				
147	Is the diagnosis/problem written on the nursing diagnosis form? (for inpatient)				
148	Is the date identified written on the nursing diagnosis form? (for inpatient)				
149	Is the date resolved written on the nursing diagnosis form? (for inpatient)				
150	Are the name and designation written on the nursing diagnosis form? (for inpatient)				
	Percentage inpatient yes x100/27  For outpatient only one question				
<b>1.5. Medication Administration Record (for inpatient)</b>					<input type="checkbox"/>
151	Is Medication Administration Record available?				
152	Is the Medication typewritten?				
153	Is Time to give written?				
154	Are all entries dated and signed?				
	Percentage yes x 100/4				
<b>1.6. Discharge summary(for inpatient)</b>					<input type="checkbox"/>
155	Is the health center discharge summary sheet available?				
156	Name written?				
157	Is ID written?				
158	Are Ward and bedroom written?				
159	Is the Date of admission written?				

160	Is the Date of discharge written?				
161	Is the hospital course written?				
162	Is Diagnosis written?				
163	Is Diagnosis procedure and diagnosis written?				
164	Is Condition on discharge written?				
165	Is instruction for home written?				
166	Are medication and appointment written				
167	Is dated and signed?				
	Percentage yes x100/13				
<b>1.7. Integrated folder summary sheet</b> (One line per visit – not for clinical notes)				<input type="checkbox"/>	<input type="checkbox"/>
168	Is the Integrated folder summary sheet percentage?				
169	Is ID written?				
170	Had service written?				
171	Has diagnosis/complication written?				
172	Serial numbers in the registration book written?				
173	Is Name written?				
	Percentage yes x100/6				
<b>Total number of “Yes” and “No” Checks</b>					
Name of Reviewer: _____ Date of Review: _____				Percentage: number of yes x100/7 for inpatient_____	
				Percentage: number of yes x100/3for outpatient_____	

<b>2. Medical Record Review Form for accuracy check</b>				
MR Number:				
	Type of card please select	a. Inpatient	b. Outpatient	
Calculate the percentage of all questions answered below				
<b>Section</b>		<b>Yes</b>	<b>No</b>	<b>Remark</b>
2.1 Demographic sheet -is the patient name, sex, age, and ID is similar to the registry book of outpatient -is the patient sex, age, and ID is similar to the registry book of inpatient				
201	Is the age of the patient similar to the registry?			
202	Is sex similar to the registry?			
203	Is ID similar to the registry?			
204	Is the Address similar to the registry?			
2.2 Integrated folder summary sheet				
205	Is the diagnosis of a patient medical record similar to the inpatient/outpatient registry book?			
2.3 Outpatient registry /inpatient registry				
206	Is the disease classification for the patient is registered according to the national disease classification? (please compare the national disease classification list with the registry)			
<b>Total number of "Yes" and "No" Checks</b>		_____	_____	

Name of Reviewer: _____ Date of Review: _____	Percentage yes x100/6 for both inpatient and outpatient
--	---



3.1	Measuring data quality check in medical recording							Q.D
3.2	Auditing medical recording department							Q.D

### General assessment questioner and observation checklist

1 .Observation guideline				remark
1.1	Medical recording system	Paper base	electronic	
1.2	Enough space for the paper-based system	yes	no	
1.3	Enough computers for electronic system	yes	no	
1.4	Any written protocols available regarding medical recording	yes	no	
1.5	Is there registration book in inpatient and outpatient department?	yes	no	
1.6	Timelessness check			
1.6.1	Medical recording returned to medical recording room on the same day?	yes	no	
1.6.2	Patient medical records processed in a specific time frame?	yes	no	

<b>2 .Interview questions</b>				remark
2.1	Do you have trained staff in medical recording (question for management)	yes	no	
2.2	Do you have an auditing system(for the quality department)	yes	no	
2.3	What is the professional background of medical recording staffs	Write here please:		
2.4	Is the cards are easily traceable? (question for the recording department)	yes	no	
2.5	Do you have enough paper forms (question for the nursing head in outpatient and inpatient)	yes	no	
2.6	Do you need any technical assistant on managing medical records(question for medical recording and nursing head)	yes	no	

### Implementation checklist

This tool is not meant to measure attainment of each Operational Standard, but rather to provide a checklist to record implementation activities.


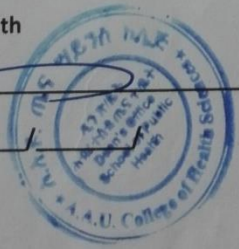
S. No	Elements of Checklists	Yes	No
1.	Unique medical record number assigned to a patient during his/her first visit of care.		
2.	The hospital shall have a single unified medical registration unit for all patients' registration.		
3.	The hospital utilizes paper and computer-based systems to register and retrieve medical records.		
4.	The hospital avails and utilizes a standard set of formats that comprise a complete medical record for a continuum of patient care.		
5.	The hospital shall implement and comply with national guidelines to manage access to a patient's medical records.		
6.	The Hospital's MRU head ensures the allocation and availability of all necessary resources to manage medical recording activities.		
7.	The hospital performs medical record auditing, data quality checks, archiving/culling procedures, and takes corrective actions regularly.		
8.	The hospital ensures a patient's medical records return from different service units to MRU at the end of each service day by medical record tracking system.		
Percentage			

## Action Plan in Yerer General Hospital

For the period of January 1, 2021 to February 7,2021			
Objectives:  List of team objectives	<b>Tasks :what to do to achieve the objectives</b>	<b>Success criteria: how to measure the achievement</b>	<b>Resources</b>
Quality department will prepare the formats and national disease classification	Search and print out formats to be used in medical recording	Using the tools prepared by the project	Paper ,printer
Outpatient nursing head have to make sure the required formats are filled accordingly	Discussion with the nursing staffs in OPD	Using the tools prepared by the project	-----
In patient nursing head have to make sure the required formats are filled accordingly	Discussion with the nursing staffs in IPD	Using the tools prepared by the project	-----

Medical recording head have to make sure the cards of OPD returned in same day	Discussion with the nursing staffs in MRD	Using the tools prepared by the project	-----
Medical recording staffs have to register the patients according to the data elements	Discussion with the nursing staffs in MRD	Using the tools prepared by the project	-----
The OPD and IPD registry book have to be written	Nursing head have to discuss with the nurses in charge	Using the tools prepared by the project	-----
Protocols have to be posted in medical recording department	The medical recording head and management have to prepare the protocol and post it	Using the tools prepared by the project	paper

## Ethical approval

	<b>ADDIS ABABA UNIVERSITY</b> <b>College of Health Sciences</b> <b>School of Public Health</b> <b>Ethical Clearance Form</b>		Version June 24, 2020
			Date: / <u>10</u> / <u>7</u> / <u>2020</u> / Ref. No. SPH/ <u>07</u> /2012
Project number / <u>001</u> /			
Date of approval (D/M/Y)    / <u>  </u> / <u>  </u> / <u>  </u>			
Project Title: Assessment of Improving medial recording data quality in Yerer Hospital,2020.			
Name of PI: Hanna Abaye		Phone Number: _____	
Institution		School of Public Health	
Department		Family Medicine	
Decision of Research and Ethics Committee:		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Approved with Recommendation <input type="checkbox"/> Resubmission <input type="checkbox"/> Disapproved	
Valid until		June 21. 2020 - June.23. 2021	
Dean, School of Public Health			
Signature: _____			
Date: / <u>  </u> / <u>  </u> / <u>  </u>			