Factors Influencing the Quality of Human Immune Viruses Data In Routine Health Information System In Njombe District Council, Tanzania

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FACTORS INFLUENCING THE QUALITY OF HUMAN IMMUNO VIRUSES DATA IN ROUTINE HEALTH INFORMATION SYSTEM IN NJOMBE DISTRICT COUNCIL, TANZANIA

By

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A Dissertation Submitted in (Partial) Fulfillment of the requirements for the Degree of Master of Public Health of

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CERTIFICATION

The undersigned certifies that he has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences dissertation entitled**: ‘‘Factors influencing the quality of human immuno viruses data in routine health information system in Njombe District Council, Tanzania’’,** in (partial) fulfillment of the requirement for the degree of master of Public Health of Muhimbili University of Health and Allied Sciences.

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Prof. David Urassa MD, (PhD)

(Supervisor)

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Date

DECLARATION AND COPYRIGHT

I, **Ferdinand F. Nachenga,** declare that this **dissertation** is my own original work and it has not been presented to any other University for similar or any other degree award.

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DEDICATION

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ABSTRACT

Introduction

Reliable and accurate HIV/AIDS data is essential for monitoring, evaluation and improvement of HIV/AIDS services delivery. As we try to fight against HIV/AIDS in the country, the quality of HIV/AIDS data remains a challenge.

Objective

This study was assessing factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe District Council, Tanzania.

Methods

A descriptive cross sectional study employing purposive sampling (quota) was used to select 42 Health Care Workers (HCWs) and other people who directly work on HIV/AIDS data within the district to identify factors influencing the quality of HIV/AIDS data. Descriptive statistics were used to summarize the characteristics of the respondents involved. The Frequency distribution tables were used to show distribution of both the outcome and explanatory variables. Data quality were assessed by using Likert scale where, the agreed response were coded as 1 and disagree response were coded as 0. The number of questions constituting each quality parameter were added for each respondents. For each questions the responses coded 1 were added. The total number of agreed response were divided by the number of questions constituting each quality parameter times 100 percent in order to get the average quality parameter percent for all 42 respondents and for all questions constituting each quality parameter precision.

Results

This study found an overall average integrity of 55.64%, an overall average reliability of 71.4%, an overall average completeness of 41.4%, an overall average precision of 11.9%, an overall average timeliness of 46.8% and overall average validity 34.1%. The study also found weakness in the institution support towards improvement of HIV/AIDS data at Njombe and weaknesses also were found in other general factors hypothesized to impact HIV/AIDS data.

Conclusion

Therefore in order to improve accuracy of HIV/AIDS data the problem of integrity, completeness, precision, timeliness and validity need to be addressed by involving all key stakeholders in HIV/AIDS data in Njombe District Council.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
ARV	Antiretroviral Virus
DMS	Data Management System
CTC	Care, Treatment and Counseling
DAC	District Aids Coordinator
HIV	Human Immunodeficiency Virus
LTF	Loss to follow up
MPH	Masters of Public Health
MoHCDGEC	Ministry of Health, Community Development, Gender, Elders and Children
MUHAS	Muhimbili University of Health and Allied Sciences
NBS	National Bureau of Statistics
NGO	Non-governmental organization
PLHIV	People Living with HIV
TACAIDS	Tanzania Commission for AIDS
UNAIDS	United Nations programs on AIDS
USAID	United States Agency for International Development
WHO	World Health Organization

DEFINITION OF KEY TERMS

Data

According to NACP, Data is any specific information that is meant to provide and fulfill the role for which it was collected/generated. Data maybe numerical or non-numerical.

Quality data

Quality data is the data that is reliable, precise, complete, accurately, valid, has integrity and timely present the measure it was intended to present

Data Quality (DQ) Dimension

This is a recognized term used by data management professionals to describe a feature of data that can be measured or assessed against defined standards in order to determine the quality of data.

Data quality assessment

DQA involves checking data against validity, precision, reliability, timeliness, integrity, Completeness and confidentiality.

Accuracy; Refers to the extent to which the data reflect the actual/correct information.

Completeness; Means that an information system from which the results are derived is appropriately inclusive: it represents the complete list of records (eligible persons, facilities, units) and the fields in each record are provided appropriately

Reliability Data are reliable if they are arguably complete and accurate, measure the intended indicator, are consistent and are not subject to inappropriate alteration over time.

Precision . This means that the data have sufficient detail. For example, an indicator requires the number of individuals who received HIV counseling & testing and received their test results, by sex of the individual. In this case, an information system lacks precision if it is not designed to record the sex of the individual who received counseling and testing.

Timeliness

Data are timely when they are up-to-date (current), and when the information is available on time. Timeliness is affected by: a) the rate at which the program's information system is updated, b) the rate of change of actual programs activities; and, c) when the information is actually used or required.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Introduction

Tanzania is one of the countries that has been affected by HIV/AIDS. Reports indicate that in 2015, about 1.4 million people were living with HIV in Tanzania. This equates to an estimated HIV prevalence of 4.7%. In 2015, 54,000 people were newly infected with HIV, and 36,000 people died from an AIDS-related illness. Despite the numbers, Tanzania has done well to control the HIV epidemic over the last decade. Scaling-up access to antiretroviral treatment has helped Tanzania minimize the impact of the epidemic. As a result, between 2010 and 2015, the number of new infections declined by more than 20% and the number of people dying from an AIDS-related illness halved. Overall, the epidemic has remained steady because of on-going new infections, population growth and increased access to treatment [1].

However, the country is faced by several challenges concerning the data quality related issues. Most of the HCWs at the health facilities do not know the importance or they do not prioritize HIV/AIDS data and this make hard for them to use the collected data in decision or policy making, especially at facility level. This affects even the government or donors in supplying medicines or any other services to PLHIV due to incorrect numbers and cause wastage of enormous resources unnecessarily. These challenges if not well addressed shall continue to weaken the nation's ability to track, report and respond the real number of PLHIV or the real needs for them and thus fail to achieve the 90-90-90 WHO goals by 2020[2]. The problems may also lead to a misalignment in the way resources are allocated in health sector, especially in the HIV/AIDS projects by failing to properly target the key subpopulations that need the highest resources by virtue of being at the highest risk of HIV infection. HIV/AIDS data normally are collected and aggregated with a purpose in mind; turning the data into meaningful information where patient care decisions are positively and responsibly influenced. Ensuring the reliability and integrity of HIV/AIDS data begins with the accuracy and the completeness of the data captured in the patient's health record as well as by the respective health worker knowing the importance of the particular data. For the CHMTs to

produce highly HIV/AIDS quality data continuously, they must not only be able to use data to positively affect the quality of care, contain costs, and manage patient populations but they should also know the importance of the HIV/AIDS data that they regularly collect.
Measuring quality healthcare data comes in different forms such as face validity checks or more sophisticated methods such as descriptive, predictive, and prescriptive analytics. At the region level, quality runs through the health care workers from the facility level up to health information management (HIM) information lifecycle of capturing, processing, storing, and dissemination of various HIV/AIDS reports

Health Information Systems is one of the six building blocks of a Health System [3]. While the other 5 building blocks (health workforce; health services; health financing; governance and leadership; medical products, vaccines,) are vital to any health system the Health Information System building block provides vital information for effective decision making for the other building blocks [4]. An information system refers to the "structures and processes dedicated to the collection, storage, retrieval and use of information usually within the context of an organization" [5], thus a health information systems consists of the "data collection, processing, archiving and use of the information required for the specific aim of improving health service efficiency and health systems" [6]

In a health information system there are different types of information based on the frequency of Information generation: routine and non-routine information. Routine health information provide. Information at regular intervals to meet predictable information needs [7], whereas non-routine health information like population censuses, demographic health surveys provide information on an ad hoc basis and over longer intervals usually to complement what is collected via routine health information [6]. Even though decision making are largely based on surveys and ad hoc reviews, these methods are more expensive and provide information intermittently [8].

In a health system, the measurement of success is determined by the health system's performance which depends on the generation and use of quality routine health data and information extracted from the health information systems [9].Unfortunately, though routine

health information is important the poor quality of the routine health information impedes the effective use of information for decision making in health systems. Despite the pivotal importance of good quality health data, it has been found that “in practice, HMIS data have a number of limitations and quality problems, such as missing values, bias, and computation errors” [10].

The effects of poor data quality in terms of validity, precision, reliability, timelines, integrity, completeness, impact several aspects of the health system including planning, resource financing and management [11]. Thus, to ensure high quality (in terms of validity, precision, reliability, timelines, integrity and completeness) data in routine health information systems the root causes of poor data quality and the factors that affect data quality has to be identified. The challenges poor data quality (in terms of validity, precision, reliability, timelines, integrity and completeness) has been noted in many developing countries. Those challenges includes producing data of sufficient quality (in terms of validity, precision, reliability, timelines, integrity and completeness) to permit the regular tracking of progress in scaling-up health interventions and strengthening health systems. Data gaps span the range of input, process, output, outcome and impact indicators [12].

Several reasons have been advanced to explain the problem of poor data quality (in terms of validity, precision, reliability, timelines, integrity and completeness) in developing countries including failure of health workers to appreciate the importance of information and shortage of medical recorders. [13-14]. Other reasons included failure to respond to data received and sometimes responding only when report has not been received. The collection of enormous amount of data tends to put an unnecessary burden to data collectors [15]. Since most health workers lack of knowledge and skills for analyses. However, most of the reports are based on experiences accrued by experts in the course of implementing various strategies for improvement of HMIS. This study will therefore carried out to assess factors influencing the quality of HIV/AIDS data on ART in Njombe Region, in order to propose new strategies for improving the quality of HIV/AIDS data

1.2 Problem Statement

Many developing countries including, Tanzania face challenges in producing quality data for regular tracking of progress in scaling-up health interventions and strengthening health systems. Data gaps span the range of input, process, output, outcome and impact indicators [13].

Data that are accurate complete as information are an important aspect in health planning, management and decision making. Evidence-based plans and decisions must be based on accurate, complete and timely data. Good planning and management depends on the availability of reliable, accurate and timely information.

Obtaining the highly accuracy data remains to be the problem not only in Tanzania but also around the world. For developing countries, the situation is worst compared to other developed nations.

The monthly or quarterly DQA reports from the CHMTs in the country show that there is an increasing discrepancy, for example in the number of current ARV recipients it may appear that one patient is described as LTF or dead while in reality the patient is alive only the HCW did not update his/her status.

Poor quality of data or reports can mislead the decision making processes and cause various problems such as treatment complication. Failure to provide proper treatment and unnecessary treatment and diagnostic cost in health care system. In health care system it is important to ensure that we have clean and quality data and reports which can match exactly with the sources of those information as well as the services given.

Despite concerns about the poor quality of data collected routinely through health facilities, the extent of quality has not been well researched. This study, was therefore aimed at assessing the quality of routine health information as well as to investigate the factors that influence data quality in Njombe health facilities in order to generate good quality data in routine health information systems for the use of information for decision making and planning especially for HIV/AIDS interventions, Specifically, the study sought to determine data completeness, reliability, integrity, precision, accuracy and timeliness in reporting to

assess the impact on the provision of health services and to ultimately give recommendations for improvement.

1.3 Rationale of the study

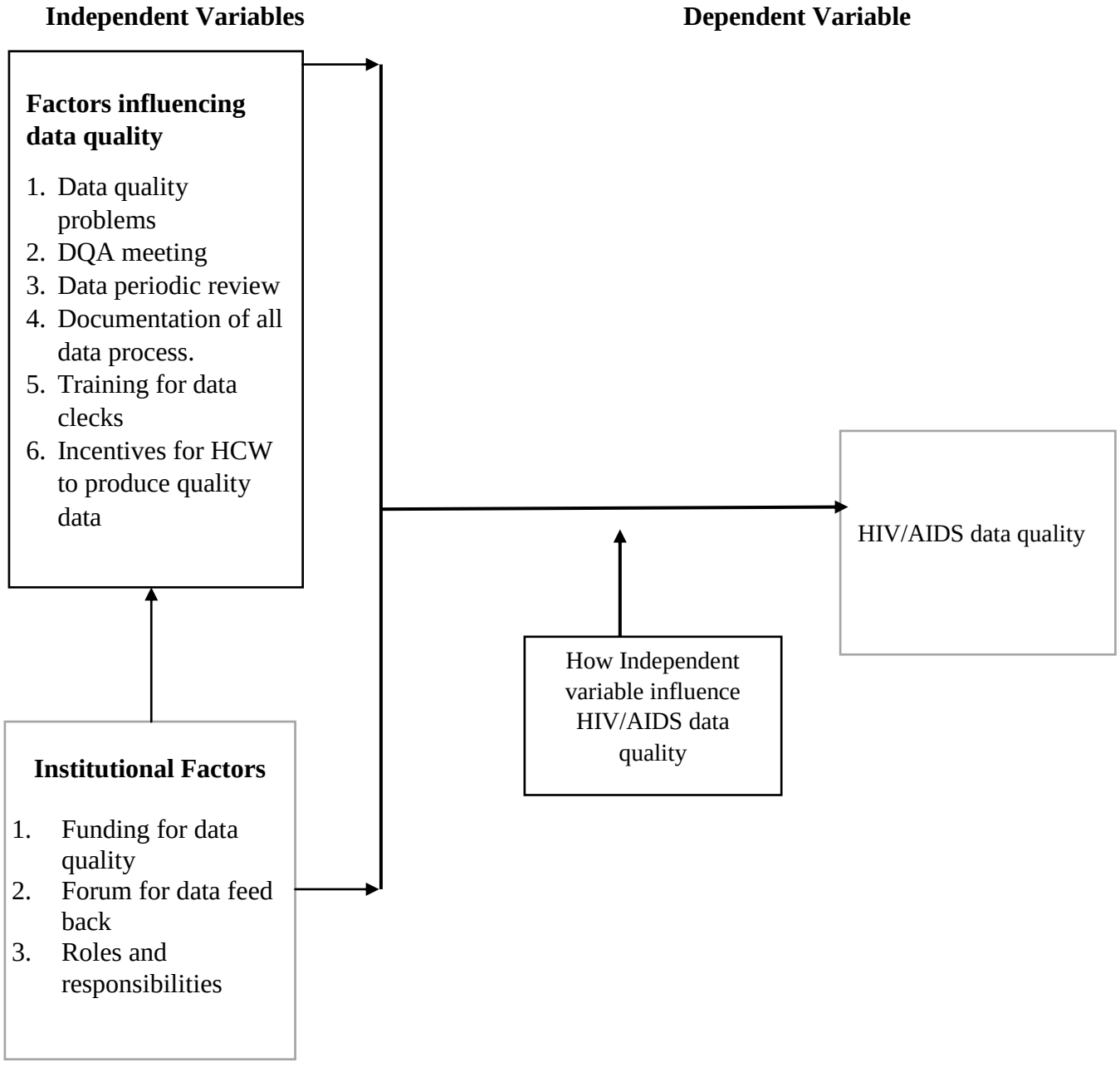
The proposed study will to uncover different factors influencing the quality of HIV/AIDS Data on ART in health management system at Njombe, District Council, in Njombe region. This study will generate baseline information that will be used to understand in detail more of what is needed to be done for future improvement of data management so as ensure the health management system is strengthened and promoted through evidence health planning.

The finding from this study will act as a source of information for future researcher who will in future want to do research on the related topic.

The study will also strengthen the health information systems functioning by suggesting to health care managers and health care workers the best ways to ensure the quality and improvement of HIV/AIDS data in evidence based decision making.

1.4 Conceptual Framework

This conceptual framework illustrates how the independent variables such as factors influencing HIV/AIDS data quality and the dependent variable which is the quality of HIV/AIDS data on ART in Njombe.



1.5 Main Research Questions

What are the level of accuracy and factors influencing the quality of HIV/AIDS Data on ART in Njombe, District Council, in Njombe region?

1.5.1 Specific Research Questions

1 What are the level of accuracy and factors influencing the quality of HIV/AIDS Data on ART in Njombe, District Council, in Njombe region?
2 What are the factors influencing the quality of HIV/AIDS Data on ART in Njombe, District Council, in Njombe region?
3 What are the Institutional factors affecting the quality of HIV/AIDS data on ART at CTCs in Njombe, District Council, in Njombe region?

1.6 Objectives

1.6.1 Broad Objective

To determine level of accuracy and factors influencing the quality of HIV/AIDS Data on ART in Njombe, District Council, in Njombe region.

1.6.2 Specific Objectives

1 To assess the level of accuracy and factors influencing the quality of HIV/AIDS Data on ART in Njombe, District Council, in Njombe region.
2 To assess factors influencing the quality of HIV/AIDS Data on ART in Njombe, District Council, in Njombe region.
3 To assess Institutional factors affecting the quality of HIV/AIDS data on ART at CTCs in Njombe, District Council, in Njombe region.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

Although there are no many studies in the country concerning data use and data quality issues, the study shall try to expose the various strategies which can help the country attain the 90-90-90 goals by 2020. This chapter shall begin with definitions of various terms as used in in data and data quality issues, especially on HIV/AIDS contexts. It will also in briefly elaborate the characterisitics or dimensions of high quality data and the importance of data use in HIV/AIDS manner. The chapter shall explain the challenges and other issues affecting the attainment of the high quality data in the country.

Accurate, timely and accessible health care data play a vital role in the planning, development and maintenance of health services. Quality improvement and the timely dissemi nation of quality data are essential if the health care authorities wish to maintain health care at an optimal level In the recent past, data quality has become an important issue not only becaus e of its importance in promoting high standards of patient care but also because of its impact o n government budgets for maintenance of health services[16].Sound policy, resource allocatio n and day
today management decisions in the health sector require timely information from routine healt h information systems (RHIS).

In most low- and middle-
income countries, the RHIS is viewed as being inadequate in providing quality data and contin uous information that can be used to help improve health system performance. In addition, the re is limited evidence on the effectiveness of RHIS strengthening interventions in improving d ata quality.

Quality as defined by Donabedium is the ability to achieve the desirable objectives using legitimate means. Quality data represents what was intended or defined by their official source, are objective, unbiased with known standards. Data quality includes; accuracy and

validity of the original source data, reliability data are consistent and information generated is understandable, completeness all required data are present, currency/timeliness data are recorded at the time of observation among others (16).

Whether collected data are going to be stored in paper (medical/health record) or in a computer based, but electronic patient record for statistics, data must be accurate, reliable and organized in such a way that they are understood and the information can be retrieved. Some causes of poor data are poorly designed data collection forms, inefficient clerical staff, lack of training in interviewing patients and recording details, lack of time caused by pressure of work. Poorly trained and insufficient staff, lack of understanding the need for accurate data and lack of understanding of the requirements are also the contributing factors to poor quality data (16). Use of technology oriented data quality improvement efforts are commendable and definitely a step forward in the right direction, however, technology alone cannot eradicate the root causes of poor quality data because poor quality of data is not as much as an IT problem but rather a business problem. Other enterprise disciplines must be developed, taught, implemented and enforced to improve the quality in a holistic, cross organization way. Therefore, because data quality improvement is a process not an event, the following enterprises wide disciplines be phased in and improved upon over time, stronger personal involvement of management, high level leadership for data quality, new incentives, new performance evaluation measures, data quality enforcement policies, data quality audits, additional training for data owners and data stewards about their responsibilities (17).

Research has also shown that the causes of data inaccuracy are double counting, counting in eligible patients, poor record keeping, incorrect data compilation procedures, and staff rotation and lack of teamwork. Other problems identified are with reporting data in a timely manner.

However systems for management of HIV/AIDS services data and reporting and QI indicators at the health facilities are partially developed, providing data which could effectively be used for improvement purposes, although significant gaps have remained for improvement.

2.2 Levels of country's HIV/AIDS data flow and Management

National Guidelines on HIV and AIDS data Management (NACP) describe the Levels of country's HIV/AIDS data flow starts from health facility level moving up to District level controlled by District Medical Officer (DMO), Regional level controlled by Regional Medical Officer (RMO) and finally the data ends at the national level where it is controlled by National Aids Control Programs (NAPC) which is under Tanzania National Aids Control Program (TACAIDS).

The facility aggregate report is categorized into District Summary Aggregate and facility aggregate report. The District Summary Aggregate is further categorized into District Summary Aggregates and Regional Summary Aggregates. From the District Summary Aggregate data are aggregated and stored in the District Health Information System (DHIS) and from Regional Summary Aggregates, HIV/AIDS data are verified at the regional level and stored in the Regional Health Information System (RHIS) which form into Regional Summary Aggregate and finally, they are approved and sent to National Aids Control Programs (NAPC) and summarized into National Summary Aggregate by TACAIDS [18].

2.3HIV/AIDS Data management responsibilities at each level, reporting flow, timing and feedback

The HIV/AIDS Data management responsibilities at each level, reporting flow, timing and feedback can be explained as follows, from the health facilities , the responsibility of Responsible personnel's is to Collect, aggregate data, discuss locally then submit monthly/quarterly report to district level by 7^{th} of the following month/quarter. At district level data are controlled by District Medical Officer. From district level data are Collected, aggregated data, and discussed locally then submitted monthly/quarterly report by 14^{th} of the following month/quarter and then sent to regional level. From the regional level data are Collected, aggregated , discussed locally and then submitted monthly/quarterly report by 21^{st} of the following month/quarter and finally data are sent at National Level which is the higher level of reporting and where the ministry of health get the data and use for informed decision making.

From the National Aids Control Program, data the data feedback are provided Feedback to lower ends by end of the following month/quarter to the regional level. From the regional level data feedback is provided to lower levels by 21st of the following month/quarter to the District level. From the district level data feedback is provided to lower levels by 14th of the following month/quarter to the health facilities where community get access of the data and informed decision making about their results. [18].

Accurate data are considered correct if the data measure what they are intended to measure accurate data minimize error (e.g., recording or interviewer bias, transcription error, sampling error) to a point of being negligible [19]. Data accuracy dimension is concerned with the conformity of the recorded value with the actual value. It is a widely accepted dimension of data quality [20]. Accuracy implies that data is correct, flawless, precise, reliable and certified free of error. The original data must be accurate in order to be useful. If data are not accurate, then wrong impressions and information are being conveyed to the user. Documentation should reflect the event as it actually happened. Recording data is subject to human error and steps must be taken to ensure that errors do not occur or, if they do occur, are picked up immediately [21].

2.4 The Challenges in producing data quality

It has been noted that many developing countries face challenges in producing data of sufficient quality to permit the regular tracking of progress in scaling-up health interventions and strengthening health systems. Data gaps span the range of input, process, output, outcome and impact indicators [22].

Poor data quality limits stakeholders' ability to use data for evidence-based decision making and has a negative impact on facilities' strategic planning activities and their efforts to advocate for resources. Inaccurate and incomplete data along with delayed reporting affects demand for data. Stakeholders who have had negative experiences with poor data quality are less likely to seek it for future decision making [23].

Inaccurate data may also result in improper follow-up of patients, inadequate resources (e.g., funding, staff, facilities, drugs, and supplies), inaccurate evaluation and policy development, misrepresentation of the public health burden of TB, and inability to measure TB program indicators based on surveillance data. To address all the above data accuracy challenged, this study is done to determine level of accuracy and factors influencing the quality of HIV/AIDS Data on ART in Njombe, District Council, in Njombe region.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Study design and settings

A cross sectional descriptive design, using quantitative approach was used to investigating factors influencing the quality of HIV/AIDS Data on ART at Njombe, District.

3.2. Study Area

The study was conducted in Njombe Town Council in Njombe Region. Njombe Region is located in the Southern Highlands of Tanzania. The region was established in July 2007. It has a population of 130,223 people. It lie between latitude: -9, 3333 (919’59.988″S) and longitude: 34,7667 (3446’0.120″E) and altitude: 1 581 m. The topography range from l 000m to 2000m above sea level and covers an area of 3212 km² which is equivalent to30% of the total district area. The region has six four District and two town. The four district are Ludewa, Makete, Njombe Rural and Wanging'ombe and the two Town are Makambako and Njombe town. Njombe Town Council borders, are Ludewa District and Ruvuma Region in the south; in the east it borders with Ruvuma Region; in the west it borders with Makete District and Njombe District Council. Administratively, Njombe Town Council is divided into, an urban and a rural area. The urban area is about 10 percent and the rural area is about 90 per cent of the total area of 3,212 km².The Council population is about 130,223 of whom 69,111 are males and 61,112 are females, [24].

The main economic activities in Njombe Town Council are Agriculture, Livestock development, forestation and small businesses. The average GDP of Council residents is TZS 753, 102/= per year. Njombe Town Council is a Potential Areas for Investment. The Region is becoming an increasingly attractive hub for investors in light of various economic, political and social reforms that are sweeping through the country, resulting in a much improved business environment conducive to direct investment. Njombe has been selected as the study area because it is among the regions with highest HIV prevalence rate [20].

3.3 Study population

The population for this study comprised of the Council Health Management Team such as DHMIS/MTUHA focal persons of Njombe Municipal Council town who are responsible in either compiling, using or reporting HIV/AIDS data. But also health care workers (facility in-charges, departmental heads in departments and Health records information officers) participating in data collection, management, compiling and editing were involved in this study.

3.5 Inclusion and exclusion criteria

Inclusion criteria:

- All participants who were responsible in handling HIV/AIDS data.
- Participants who had their consent form signed to participate in the study
- Participants who were involved in health planning and data management processes,
- Health care workers, who had worked for more than six months prior study and were willing to be interviewed.

Exclusion criteria:

- Members who fulfilled the inclusion criteria but had difficulties to communicate
- Those who did not wish to take part in the study.
- Members who fulfilled, the inclusion criteria and responsible for handling HIV/AIDS data in Njombe DC but not available during the data collection due to various reasons.

3.6 Sampling technique and samples size

Purposive sampling technique were used for this study. The study participants were selected conveniently because they were are at the right place in the data management section at the right time during data collection. The selection of the sampling technique based on the fact that, only health care workers dealing with data collection, management analysis and interpretation were required for this study, therefore purposively they were selected for this study. During data collection, some of the health care providers were missed because of being in the annual leave, official duties and official trip in other regions. Health care workers with basic knowledge in basic knowledge of Health Information management system were selected until the final sample size of 42 health care workers reached.

The multistage sampling technique were used to select the healthy facilities from where study participants were drawn. Participants were purposively followed from the respective health facility for the interview until the sample size of 42 were reached.

3.7 Pretesting of the tool

Before data collection, the tools (Checklist) were pretested to ensure captured information is relevant and aligned with the objectives of the study. The pretesting was conducted in Njombe Municipal Hospital to five health care workers which were not included in the study. The checklist were frequently revised accordingly based on the pre-tested results. The pretesting was done by the principal researcher and research assistants.

3.8 Data collection methods and tools

Quantitative data collection methods were used to collect information on the factors influencing the quality of HIV/AIDS Data on ART at Njombe, District Council, in Njombe region. The Checklist as data collection tool were used, where there, the list of independent variables influencing the quality of HIV/AIDS data were categorized as independent variables and the responses due to the influence of independent variable were grouped as dependent variable. The respondents were supposed to respond to all questions

3.9 Data Validity and Reliability

Validity and reliability of the checklist were ensured through pretesting of the tool to five participants before commencement of the data collection in order to test and ensure if the components of the tool is relevant to the research questions and objective of the study. Data reliability were also ensured through a verification of a tool where the researcher compared the current and new PLHIV at each facility with the data that have been entered into DHIS and those at the respective facility summary forms (Tally sheet/Mtuha registers) for the October-December, 2017 reporting period.

3.10 Data management and analysis

The information on the HIV/AIDS data were collected, entered/coded, cleaned up and analyzed using SPSS. Descriptive statistics were used to summarize characteristics of the respondents by calculating the mean, media, mode and standard deviation for continuous variables. The summary tables on variables were produced to show responses and number accordingly.

The Likert scale were used to calculate data accuracy level by adding the scores for agree which were coded as 1 and scores for disagree which were coded as 0.The total scores were added for each question and divided by the total number of questions times 100% to get the percentage of accuracy in terms of validity, timelines, completeness, reliability and precision. The Likert score were graded as 70%-100% as high accuracy 51%-69% as moderate accuracy and below 50% as low accuracy validity, timelines, completeness, reliability and precision

3.11 Data collection procedure

3.11.1 Responsible person for data collection:

In this study, the HIV/AIDS data on quality aspects were collected in the field by the researcher alone.

3.11.2 Field data collection

The checklist were administered to the respective CTC in charges or their subordinates; where as the data verification form were administered to the data clerks or those responsible for preparing and producing the ART reports or HIV/AIDS data at the respective health facility in the District.

3.12 Ethical Consideration

This study was conducted in line with the existing written standard ethical guidelines as per attachment. The ethical clearance was obtained from the directory of Research and Publications Committee (Institution Review Board) of Muhimbili University of Health and Allied Sciences. The permission to conduct the study were obtained from Njombe Regional Administrative Secretary and District Administrative Secretary and then to the health facilities where data were collected. Privacy and confidentiality of any information collected and shared were assured. Only unique identifier were used for anonymity.

CHAPTER FOUR

4.0 RESULTS

4.1 Overview

This section presents the findings of the research. The findings are divided into a number of areas namely demographic characteristics of respondents and factors influencing the quality of HIV/AIDS Data in Routine Health Information System. More details of the chapter will follow in the next discussion chapter.

4.2 Background Information of the respondents

The demographic characteristics of the respondents were first sought to understand the general demographic features of the respondents. The respondents were asked to choose their Age, professional background, highest level of education, sex and whether the member were CHMT member or not.

From table 1 below; A total respondents of 42 health care professionals were included in this study., The mean a (±SD) age of the participants were 31.07 (5.5) with majority of participants 54.8% being in the age group 18-29 years old, 35.7% were in the age group of 30-39years old, 9.5% in the age group of 40 years old and above. The highest percent of 40.5% of the respondents were in the age group of 25-29 years old compared to other age group because of the effect of new employment done by the government in the health sector. Again, of 100% of the total respondents, 61.9% were female and 38.1% were male.

The higher percent of female respondents is probably due more number of nurses than any others cadre from the results seen because female nurses are more than male nurses. Again, of 100% of the total respondents, 76.2% had certificate and diploma level of education and 23.8% had had degree level of education. The higher percent of the respondents being in the certificate level is due to the Government policy of employing Health care workers of low level of education especially in the dispensaries, health facilities and health centers the purpose of retention. Again, of 100% of the total respondents, 59.5% were Nurses, 11.9%

were doctors and clinical officers and 11.9% were HIMS data collectors and managers. The higher percent of nurses is because of the government priority of employing more nurses than any other health carder. Finally 64.7% of the respondents were not CHMT members while 35.7% were CHMT members Demographic Characteristics of the respondents

Table 1: Demographic Characteristics of the Respondents (N=42)

Variable	**Variable Response**	**Number (Frequency)**
Age of the respondents	18-29 years	23 (54.8%)
	30-39years	15 (35.7%)
	40 years and above	4 (9.5%)
Sex of the respondents	Male	16 (38.1%)
	Female	26 (61.9)
Education status of the respondents	Certificate and Diploma	32 (76.2%)
	Degree and above	10 (23.8%)
Cadre of the participants	Nurses	25 (59.5%)
	Doctors	12 (28.5%)
	HIMS data collectors and managers	5(11.9%)
CHMT member	Yes	15 (35.7%)
	No	27 (64.7%)

Table 2: Validity factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N (Percent)
Sound methods being used to collect data.	Agree	25 (59.5%)
	Dis agree	17 (40.5%)
There are reasonable assurance that the data collection methods being used do not produce systematically biased data.	Agree	9 (21.4%)
	Dis agree	33 (78.6%)
Results collected fall within a plausible range.	Agree	9 (21.4%)
	Dis agree	33 (78.6%)

4.3 Validity factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council

Table 2; Shows that majority of the respondent 59.5% agreed that, sound methods being used to collect data, 21.4% agreed that, there is reasonable assurance that, data collection methods being used do not produce systematically biased data and 21.4% agreed that, results collected always fall within a plausible range. On the others side, majority of the respondent 78.6% dis agreed that, there is reasonable assurance that, data collection methods being used do not produce systematically biased data and 78.6% disagreed that, results collected fall within a plausible range and 40.5% disagreed that, sound methods being used to collect data.

The overall validity percent of 34.1% were calculated from this study. The overall validity were calculated using Likert scale. The agreed response were coded as 1 and disagreed were coded as 0.The number of questions constituting validity were added for each respondents. For each questions the coded 1 as agreed response were added. The total number of agreed response were divided by the number of questions constituting validity times 100 percent in order to get the average validity percent for all 42 respondents and for all questions constituting validity.

Table 3: Timeliness factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N(Percent)
The data are reported as soon as possible after collection.	Agree	31 (73.8%)
	Disagree	11 (26.2%)
The data reported the most current practically available at this health facility.	Agree	9 (21.4%)
	Disagree	33 (78.6%)
The data are available frequently enough to inform the Government or Program management decisions?	Agree	19 (45.2%)
	Disagree	23 (54.8%)

4.4 Timeliness factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Table 3; Shows that majority of the respondent 73.8% agreed that, data are reported as soon as possible after collection, 21.4% agreed that, data reported are practically available at health facility and 45.2% agreed that, data available frequently enough to inform the Government or Program management decisions. On the other side 26.2% disagreed that, data are reported as soon as possible after collection, 78.6% disagreed that, data reported are practically available at health facility and 54.8% disagreed that, data available frequently enough to inform the Government or Program management decisions. The overall timeliness percent of 46.8% were calculated from this study. The overall timelines were calculated using Likert scale. The agreed response were coded as 1 and disagreed response were coded as 0.The number of questions constituting timelines were added for each respondents. For each questions the coded 1 as agreed response were added. The total number of agreed response were divided by the number of questions constituting timelines times 100 percent in order to get the average timelines percent for all 42 respondents and for all questions constituting timelines

Table 4: Precision factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N(Percent)
The margin of error are reported along with the data.	Agree	4 (9.5%)
	Disagree	38 (90.5%)
The data collection method/tool being used to collect the data fine-tuned or exact enough to register the expected change.	Agree	2 (4.8%)
	Disagree	40 (95.2%)
The margin of error less than the expected change being measured	Agree	9 (21.4%)
	Disagree	33 (78.6%)

4.5 Precision factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Table 4; Shows that, 9.5% of the respondents agreed that, the margin of error been reported along with the data, 4.8% agreed that, the data collection method used to collect the data are enough to register the expected change and 21.4% agreed that, the margin of error are less than the expected change being measured. On the other side 90.5% of the respondents disagreed that, the margin of error been reported along with the data, 95.2% disagreed that, the data collection method used to collect the data are enough to register the expected change and 78.6% disagreed that, the margin of error are less than the expected change being measured. The overall precision percent of 11.9% were calculated from this study.

The overall precision were calculated using Likert scale. The agreed response were coded as 1 and disagree response were coded as 0. The number of questions constituting precision section were added for each respondents. For each questions the responses coded 1 were added. The total number of agreed response were divided by the number of questions constituting precision times 100 percent in order to get the average precision percent for all 42 respondents and for all questions constituting precision.

Table 5: Integrity factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N(Percent)
There are mechanisms in place to prevent unauthorized changes to the data.	Agree	23 (54.8%)
	Disagree	19 (45.2%)
There are procedures or safeguards in place to minimize data transcription errors.	Agree	18 (42.9%)
	Disagree	24 (57.1%)
There are independence in key data collection, management, and assessment procedures	Agree	29 (69.0%)
	Disagree	13 (31.0%)

4.6 Integrity factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council

Table 5; Shows that, majority of the respondents, 69% agreed that, there is independence in key data collection, Management, and assessment procedures, 54.8% agreed that, there is mechanisms in place to prevent unauthorized changes to the data, 42.9% agreed that, there are procedures or safeguards in place to minimize data transcription errors. On the other side, 57.1% disagreed that, there are procedures or safeguards in place to minimize data transcription errors, 45.2% disagreed that, there is mechanisms in place to prevent unauthorized changes to the data and 31.0% disagreed that, there is independence in key data collection, Management, and assessment procedures.

The overall integrity percent of 55.6% were obtained from this study. The overall integrity were calculated using Likert scale. The agreed response were coded as 1 and disagreed response were coded as 0. The number of questions constituting integrity section were added for each respondents. For each questions the responses coded 1 were added together. The added total number of 1 were divided by the number of questions constituting integrity times 100 percent in order to get the average integrity percent for all 42 respondents and for all questions constituting integrity.

Table 6: Reliability factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N(Percent)
The same data collection method is used to measure/observe the same thing multiple times	Agree	32 (76.2%)
	Disagree	10 (23.8%)
The same results are produced each time.	Agree	38 (69.0%)
	Disagree	13 (31.0%)
Data collection and analysis methods documented in writing are being used to ensure the same procedures are followed each time?	Agree	29 (69.0%)
	Disagree	13 (31.0%)

4.7 Reliability factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council

Table 6; Shows that, majority of the respondents, 76.2% agreed that, the same data collection method is used to measure/observe the same thing multiple times, 69.0% agreed that, the same results are produced each time and 69.0% agreed that, the data collection and analysis methods documented in writing are being used to ensure the same procedures are followed each time. On the other side, 23.8% disagreed that, the same data collection method is used to measure/observe the same thing multiple times,31% disagreed that, the same results are produced each time and 31% disagreed that, the data collection and analysis methods documented in writing are being used to ensure the same procedures are followed each time. The overall reliability percent of 71.4% were from this study. The overall reliability percent were obtained by calculating the mean by adding the total of agreed responses divided by the number of questions on reliability section.

The overall reliability were calculated using Likert scale. The agreed response were coded as 1 and disagreed response were coded as 0. The number of questions constituting reliability section were added for each respondents. For each questions the responses coded 1 were added together. The added total number of 1 were divided by the number of questions

constituting reliability times 100 percent in order to get the average reliability percent for all 42 respondents and for all questions in the reliability section.

Table 7: Completeness factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N (Percent)
HCWs crosscheck data input for completeness every month/quarter before submission to DAC.	Agree	27 (64.3%)
	Disagree	15 (35.7%)
Computers, servers, and files securely locked away from unauthorized people.	Agree	21 (50.0%)
	Disagree	21 (50.0%)
There are consent forms for other people to sign during visits.	Agree	21 (50.0%)
	Disagree	21(50.0%)
Data collection meetings is held in each month/quarter.	Agree	15 (35.7%)
	Disagree	27 (64.3%)
There are reports on DQA feedback meetings.	Agree	3 (7.1%)
	Disagree	39 (92.9%)

4.8 Completeness factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Table 7; Shows that, majority of the respondents, 64.3% agreed that, health care workers cross-check data input for completeness every month/quarter before submission to DAC, 50% agreed that, computers, servers, and files are securely locked away from unauthorized people, 50% agreed that, there are Consent forms for other people to sign during visits, 35.7% agreed that, there is data collection meetings in each month/quarter, 7.1% agreed that, there are reports on DQA feedback meetings. On the other side, 35.7% disagreed that, health care workers cross-check data input for completeness every month/quarter before submission to DAC, 50% disagreed that, computers, servers, and files are securely locked away from unauthorized people, 50% disagreed that, there are Consent forms for other people to sign

during visits, 64.3% disagreed that, there is data collection meetings in each month/quarter and 92.9% disagreed that, there are reports on DQA feedback meetings. The overall Completeness percent of 41.4% were from this study. The overall Completeness percent were obtained by calculating the mean by adding the total of agreed responses divided by the number of questions on Completeness section.

The overall completeness were calculated using Likert scale. The agreed response were coded as 1 and disagreed response were coded as 0. The numbers of questions constituting completeness section were added for each respondents. For each questions the responses coded 1 were added together. The added total number of 1 were divided by the number of questions constituting completeness times 100 percent in order to get the average completeness percent for all 42 respondents and for all questions in the completeness section.

Table 8: General factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N (Percent)
Data quality problems are clearly described in final reports?	Agree	7 (16.7%)
	Disagree	35 (83.3%)
DQA meetings is held in each reporting month/quarter.	Agree	7 (16.7%)
	Disagree	35 (83.3%)
There are procedures in place for periodic review of data collection, maintenance, and processing.	Agree	12 (28.6%)
	Disagree	30 (71.4%)
Data collection, cleaning, analyses, reporting, and quality assessment procedures are documented in writing.	Agree	12 (28.6%)
	Disagree	30 (71.4%)
The data clerks are updated with trainings on CTC regularly.	Agree	2 (4.8%)
	Disagree	40 (95.2%)
There are incentives to encourage HCWs to produce high quality data.	Agree	3 (7.1%)
	Disagree	39 (92.9%)
The data collected at this health facility, are being used effectively at this facility.	Agree	8 (19.0%)
	Disagree	34 (81.0%)

4.9 General factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Table 8; Shows that, 16.7% of the respondents agreed that, data quality problems to be clearly described in final reports, 16.7% agreed that, DQA meetings to be held in each reporting month/quarter, 28.6% agreed that, there are procedures in place for periodic review of data collection, maintenance, and processing, 28.6% agreed that, there are data collection, cleaning, analyses, reporting, and quality assessment procedures documented in writing, 4.8% agreed that, the data clerks are updated with trainings on CTC regularly, 7.1% agreed that, there are incentives to encourage HCWs to produce high quality data and 19% agreed that, the data collected at health facility are being used effectively at health facilities. On the other side 83.3% of the respondents disagreed that, data quality problems to be clearly described in final reports, 83.3% disagreed that, DQA meetings to be held in each reporting month/quarter, 71.4% disagreed that, there are procedures in place for periodic review of data collection, maintenance, and processing, 71.4% disagreed that, there are data collection, cleaning, analyses, reporting, and quality assessment procedures documented in writing, 95.2% disagreed that, the data clerks are updated with trainings on CTC regularly, 92.9% disagreed that, there are incentives to encourage HCWs to produce high quality data and 81% agreed that, the data collected at health facility are being used effectively at health facilities

Table 9: Institution factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Variable	Response	N (Percent)
There enough fund for data quality.	Agree	1(2.4%)
	Disagree	41(97.6%)
There is always data quality forums for data feedback	Agree	2 (4.8%)
	Disagree	40 (95.2%)
There is enough people employed in data management sections.	Agree	4 (9.5%)
	Disagree	38 (90.5%)

4.10 Institution factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council (N=42)

Table 9; Shows that, 2.4% agreed that, there are enough fund for data quality,4.8% agreed that, the data quality forums to be held for data feedback, 9.5% agreed that, there are enough people employed in data management sections. On the other side, majority of respondents, 97.6% disagreed that, there are enough fund for data quality, 95.2% disagreed that, the data quality forums are held for data feedback and 90.5% disagree that, there are enough people employed in data management sections. The results from the table above show that, there is poor institution support for HIV/AIDS Data quality in Routine Health Information System in Njombe, District Council.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This discussion chapter summarizes the main findings of this study. The objective of the study was to assess factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council, and Tanzania. In its assessment the study focused on six dimensions of the data quality, data validity, Timelines, Reliability. Precision, Integrity and completeness using quantitative methods. Additional analysis was done on the effect of other factors that may influence the quality of data. These factors includeData quality problems, DQA meeting, Data periodic review, Documentation of all data process, Training for data clecks and Incentives for HCW to produce quality data. These are discussed in this chapter. The chapter also discusses the Institutional factors affecting the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council, and Tanzania.

5.2 Data management processes

The finding from this study show that routine data are collected in health facilities through the use of register, tally sheets and summary forms. Also this study found that, data are collected and filled manually. At district level, data is monthly compiled, after the health facilities send data to the district to be aggregated in District Health Information System (DHIF)

The finding from this study is similar with the study conducted in Ethiopia that, indicated that, data or information were generated at the health institution and district level from routine reports and vertical programs/activities and were manually filled [35]. Another study also found similar finding to the present study found that health facilities were primary producers of data [36].

Despite the above finding, the other observation found was that, health facilities are facing difficulties in data management due to various reasons such as shortage of staffs, inadequate tools for data collections and too much workload. The challenges mentioned above contribute to poor data management from the bottom of facility level to the regional and national level

hence leads to poor data quality in terms of validity, timeliness, precision, completeness and reliability.

5.3 Data Validity

Data validity is also among the important dimension of data quality. The study found an overall average timeliness of 34.1%. Poor data validity of HIV/AIDS data was due to the fact that, In Njombe Health Information System, sound methods are not used to collect data, also there is no reasonable assurance that the data collection methods being used do not produce systematically biased data. Also results collected do not fall within a plausible range. The overall data validity was 34.1% also indicates that, HIV/AIDS data collected do not measure that which it is intended to measure. Therefore, data collection processes and methods must be validated to ensure data collect what is was intended to collect to improve data validity. The average validity found from this study was lower than 81% average validity found in the study done in Mozambique[37].

5.4 Data Timelines

Data timelines also is among the important dimension of data quality. The study found an overall average timeliness of 46.8% %. Poor data timeliness was due to the fact that, In Njombe Health Information System, the data are reported as soon as possible after collection. Despite data being reported as soon after being collected there is a challenge of many data reported are not available on time at health facilities (Collection zones). Also available data are not enough to inform the Government or Program management decisions. The average timelines found in this study was also lower/contrasting with the 90% of the average completeness set by MoH[26].

5.5 Precision

Data precision is also the most important dimensions of data quality. The study found an overall average precision of 11.9%. The poor data precision In Njombe Health Information System is due to the reasons that, the margin of errors are not reported along with the data,

also, the data collection method being used to collect the data are not enough to register the expected change and the margin of error are less than the expected change being measured.. The overall average precision of 11.9% from this study is an indicator that, there is a need to improve data precision towards improving HIV/AIDS data quality in Njombe Municipal by improving those parameters disagreed by the participants.

5.6Integrity

Data integrity is also the most important dimensions of data quality. The study found an overall average integrity of 55.64%. In Njombe Health Information System**,** the available mechanisms in place to prevent unauthorized changes to the data has shown to improve the quality of HIV/AIDS data, this was agreed by 54.8% of the respondents. Also, the availability of procedures in place to minimize data transcription errors have been reported to improve HIV/AIDS data quality in Njombe. This was agreed by 57.1% of health care workers. Finally, the availability of independence in key data collection, Management, and assessment procedures in health facilities reported to improve HIV/AIDS data quality. This was agreed by 69% of the health care works involved in this study. Therefore, the overall average reliability of 55.6% from this study is an indicator that, the process and procedure for data collection are not truth and transparent enough towards improvement of HIV/AIDS data quality. The average integrity found in this study of 55.64% is almost similar with the finding reported by study done in Nigeria which reported average integrity of 57%[27].

5.7Data Reliability

Data reliability is one of the most important dimensions of data quality. The study found an overall average reliability of 71.4%. From the statistical results obtained, specifically from the parameters used to measure reliability. In Njombe**,** the same data collection methods are used to measure the same thing multiple times, this has shown to improve the quality of HIV/AIDS data, this was agreed by 76.2% of the respondents. Also, same results being produced each time found to improve HIV/AIDS data quality in Njombe.

This was agreed by 69% of health care workers and the data collection and analysis methods documented in writing are being used to ensure the same procedures are followed each time in order to improve HIV/AIDS data quality in Njombe. This was agreed by 69% of the health care works involved in this study.

Therefore, the overall average reliability of 71.4% from this study is an indicator that, the Njombe Health Information system of HIV/AIDS data collect same results being produced each time despite of being collected differently by multiple collector, the same data collection methods are used to measure the same thing multiple times and the data collection and analysis methods documented in writing are being used to ensure the same procedures are followed each time.

The average reliability found from this study was almost similar with 81% average reliability found in the study done in Mozambique[28].

5.8 Data completeness

Data completeness refers to whether there are any gaps in the data from what was expected to be collected and what was actually collected. Is one of the most important dimensions of data quality. The study found an overall average completeness of 41.4%. The completeness values in this study were found to be generally lower compared to similar countries. The overall 41.4% of the completeness is caused by percent of HCWs do not cross-check data input for completeness every month/quarter before submission to DAC, Computers, servers, and files are not securely locked away from unauthorized people probably there might be data manipulation and trembling, consent forms are not enough for other people to sign during visits, data collection meetings are not held in each month/quarter and there are no reports on DQA feedback meetings. Therefore in order to improve data quality the above mentioned weakness of implementation of some of the aspects has to be addressed.

The average completeness found from this study is lower than the average completeness of 77.3% reported by the study done in Nigeria [29].Lower than the study done in Ghana which found completeness to be estimated at 99.1 % for routine maternal health data in aggregate forms and 100% in the DHIS [30]. Also the average completeness found from this study was lower than the average found in Tanzania with a value of 64.2% for paper records [31].

5.9Other General factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council, and Tanzania

From the general questions, only 16.7% of the respondents agreed that, the data quality problems are clearly described in final reports. 16.7% agreed that, DQA meetings are held in each reporting month/quarter, 28.6% agreed that, there are procedures in place for periodic review of data collection, maintenance, and processing, 28.6% that, there are data collection, cleaning, analyses, reporting, and quality assessment procedures documented in writing, 4.8% of the respondents agreed that, data clerks are updated with trainings on CTC regularly, 7.1% agreed that, there are incentives to encourage HCWs to produce high quality data and 19% agreed that, the data collected at this health facility are they being used effectively health facilities. Therefore in order to improve HIV/AIDS quality in Njombe, the data quality problems need to be clearly described in final reports, DQA meetings need to be held in each reporting month/quarter, there should be procedures in place for periodic review of data collection, maintenance and processing, there should be data collection, cleaning, analyses, reporting, and quality assessment procedures documented in writing, data clerks need to be updated with trainings on CTC regularly, there should be incentives to encourage HCWs to produce high quality data and the data collected are to be used effectively in health facilities.

5.10 Institution factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council.

From the institution factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, District Council, and Tanzania the results shows that, there is poor institution support for HIV/AIDS Data quality in Routine Health Information System in Njombe, District Council. This statement is revealed by the results from health care workers responses of the institution support for data use. For stance, 97.6% of the health care workers revealed that, there is no enough fund for data quality. This finding are also supported by other studies which identified inadequate financial resources as a hindrance to implementation of Health Information Management System [32, 33].Not only that, but also 95.25% of the health care workers responded that, there is always no data quality forum for data feedback and 90.5% of the total health care workers participated in this study agreed that, there are no enough people employed in data management section.

These finding are similar with the study done in Zanzibar workshop that reported that, data use in district health planning is still a problem despite being reported [34].

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study revealed poor data quality in HIV/AIDS data collection routine systems in Njombe district with gaps in precision, timelines and validity of health information. Therefore poor precision, timelines and validity of HIV/AIDS revealed to be affecting the quality other/AIDS Data in Routine Health Information System in Njombe, District Council. Therefore, problem of data quality can be easily mitigated by recognizing the factors that will affect or influence the quality of data. Therefore, working on those factors such as improving precision, timelines and validity will automatically lead to improved overall HIV/AIDS data quality.

6.2 Recommendations

For routine HIV/AIDS data to truly attain the goal of providing good quality data for decision making, the business of ensuring good HIV/AIDS quality data must be considered effectively. From the findings of this study, the following are suggested.

For routine health information systems to truly attain the goal of providing good quality data for decision making, the business of ensuring good quality data must be paid attention to. Based on the findings of this study, the following recommendations are suggested;

1. There should be the development of appropriate human resources for routine health information
2. There should be updated and frequency staff capacity especially for data management training to ensure dedicated trained staffs are available in health facilities to manage routine health information systems.
3. A data quality system should be in place that ensures that there is routine data quality checks and assessments facilities, districts and Regional repositories of data within the health information system. External
4. Also internal processes for data quality checks at the health facility should be instituted within each health.

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APPENDECES

Appendix I: Checklist

A Checklist to Assess factors influencing the quality of HIV/AIDS Data in Routine Health Information System in Njombe, among Health Workers in Njombe District Council.

Code No:…….

General Instructions

Kindly take your time to help me answer all the questions in this checklist with your best capability. However, you are advised not to hesitate to seek more clarifications from me in case you face any difficulties. TRY NOT TO ANSWER ANY QUESTION THAT YOU DON'T UNDERSTAND.

PART: 1 BACKGROUND INFORMATION

S/N	Background Information	Coding of the response
1	Sex	1=Male; 2=Female
2	Age	1=18-24; 2=25-29; 3=30-34; 4=35-39; 5=40+
3	Marital Status	1=Single; 2=Married; 3=Divorced
4	Education level	1=Certificate; 2=Diploma; 3=Degree
5	Cadre	1=EN; 2=CO; 3=MD; 4=ANO; 5=AMO,
6	CHMT membership	1=Yes; 2=No

PART: 2 QUESTIONS

S/N	Validity	Response		Any comment/Observation
		Agree	**Dis agree**	
	Coding of the responses	**1**	**0**	
1	The sound methods are being used to collect the data.			
2	There is a reasonable assurance that the data collection methods being used do not produce systematically biased data.			
3	Results collected fall within a plausible range.			
	Timeliness			
4	Data are reported as soon as possible after collection.			
5	Data are reported the most current practically available at health facility.			
6	Data available are frequently enough to inform the Government or Program management decisions.			

	Precision			
7	The margin of errors are reported along with the data.			
8	The data collection method/tool being used to collect the data fine-tuned or exact enough to register the expected change.			
	The margins of errors less than the expected change being measured.			
	Integrity			
9	There are mechanisms in place to prevent unauthorized changes to the data.			
10	There are procedures or safeguards in place to minimize data transcription errors			
11	There is independence in key data collection, management, and assessment procedures.			
	Reliability			
12	The data collection method is used to measure/observe the same thing multiple times and the same result			

	produced each time.			
13	The data collection and analysis methods documented in writing and being used to ensure the same procedures are followed each time.			
	Completeness/Confidentiality/Security			
14	HCWs cross-check data input for completeness every month/quarter before submission to DAC.			
15	Computers, servers, and files securely locked away from unauthorized people.			
16	There are consent forms for other people to sign during visits.			
17	Data collection meetings are held in each month/quarter.			
18	There are reports on DQA feedback meetings.			
	General Questions			
19	Data quality problems are clearly described in final reports.			
20	DQA meetings are held in each reporting month/quarter.			

21	There are procedures in place for periodic review of data collection, maintenance and processing			
22	Data collection, cleaning, analyses, reporting and quality assessment procedures documented in writing			
23	Data clerks are updated with trainings on CTC regularly.			
24	There are incentives to encourage HCWs to produce high quality data.			
25	The data collected at health facility, are being used effectively at health facility.			
	Institutional support for data use			
26	There are enough fund for data use			
27	There are always data quality forums for data feedback.			
28	There are enough people employed in data management sections.			

Appendix II: Consent Form

A Consent to participate in a study titled '' Assessment of the importance of HIV/AIDS data use and Data Quality Issues among Health Care Workers ''

Greetings! My name is **Ferdinand F. Nachenga** from Muhimbili University of Health and Allied Sciences (MUHAS). I am involved in the above mentioned study for the Health care workers at this facility.

Purpose of the Study

42 HCWs and other staffs who are directly involved in the HIV/AIDS data will be used in this study to assess the importance of HIV/AIDS data and data quality issues as the basis for determining and understanding factors contributing to low quality HIV/AIDS data in Njombe region and therefore finding the mechanisms to enhance HIV/AIDS data quality and increase more attention on HIV/AIDS data reporting.

Participation

If you agree to join into this study, you will be required to answer and fill all the questions in the questionnaire, which will be provided to you.

Confidentiality

All information that I shall collect from you, will be treated confidentially and will not be used for any other purpose other than this study.

Risks

We do not expect that any harm will happen to you because of joining in this study.

Rights to Withdraw and Alternatives

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will continue to be treated normally. You can stop participating in this study at any time, even if you have already given your consent and if for any reason you would wish to come back into the study after withdrawal, I will be ready to accept you to continue with the study. Refusal to participate or

withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled from me.

Study Benefits

If you agree to take part in this study, you will be among those who will contribute towards strengthening high quality HIV/AIDS data reporting in the region. Your information and others participating in the study may be collectively be used by HIV/AIDS stakeholders/partners such as USAID in an effort to strengthening the HIV/AIDS data quality system which would benefit many other Tanzanians.

Whom to Contact

If you have any questions relating to this study, you should contact the following:

Mr. Ferdinand Francis Nachenga (Investigator)

Student,

Muhimbili University of Health and Allied Sciences,

P.O. Box 65013, Dar es salaam,

Mobile phone: 0767-143040/0714143040-WhatsApp.

OR

Prof. David Urassa (study supervisor),

Deputy Vice Chancellor – Planning, Finance and Administration,

Muhimbili University of Health and Allied Sciences,

P.O. Box 65013, Dar es salaam,

Mobile Phone: 0754279553,

Tel: 0222150748

Do you agree to participate? Write the word ‘yes’ if you agree……..

I, _____ have read the contents in this form.

My questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of investigator _____

Date of signed consent_____

Appendix III: Ethical Clearance

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES

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Ref. No. DA.287/298/01A/

25th September, 2018

Mr.Ferdinand Nachenga
MPH-Distance Learning
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: "ASSESSMENT OF FACTORS INFLUENCING THE QUALITY OF HIV/AIDS DATA IN ROUTINE HEALTH INFORMATION SYSTEM IN NJOMBE, DISTRICT COUNCIL, AND TANZANIA"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 19th September, 2018 to 18th September, 2019. In case you do not complete data analysis and dissertation report writing by 18th September, 2019, you will have to apply for renewal of ethical clearance prior to the expiry date.

Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences, MUHAS