



**COLLEGE OF MEDICINE AND HEALTH  
SCIENCES OF HEALTH SCIENCES**

**MASTER OF HOSPITAL AND HEALTH CARE ADMINISTRATION**

**REDUCING WAITING TIME IN OUTPATIENT DEPARTMENT OF KADUHA  
DISTRICT HOSPITAL**

**A capstone submitted in partial fulfillment of the requirements for award of A  
Master of Hospital and Healthcare Administration**

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**Kigali, November 2022**

**STUDENT’S DECLARATION**

I, MUTWARASIBO Norbert hereby declare to the best of my knowledge that this research project and all its contents is my original work and has never been submitted elsewhere for examination, award of a degree publication. Where other people’s work or my own work has been used, this has properly been acknowledged and referenced in accordance with the University of Rwanda.

**MUTWARASIBO Norbert**

**Signature.....Date.....**

**SUPERVISORS’S DECLARATION**

I confirm that, to the best of my knowledge:

- The study was carried out and the dissertation was prepared under our direct supervision;
- The study was conducted in accordance with the degree regulations;
- The capstone dissertation represents the original work of the candidate;
- The contribution we made to the study by other members of the supervisory team, by other members of staff of the University and by others was consistent with normal supervisory practice;
- External contributions in the research are acknowledged.

**Assoc. Prof. Jean Baptiste SAGAHUTU**

**Supervisor:..... Date:.....**

**Mr. RUBEGA Lauben.....**

## **DEDICATION**

To the Almighty God for his love and blessings

To my beloved Wife

To my Brothers and Sisters

To my Family members

To my Supervisors

To my relatives, Classmates and Friends

## **ACKNOWLEDGEMENTS**

In the first place, I wish to extend my thanks to the Government of Rwanda through the Ministry of Education in collaboration with the University of Rwanda for their effort establish MHA-Program.

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Special thanks go to Kaduha District Hospital staff for their support during baseline data collection, implementation of the best solution and entire research project. Without their support, it would not be possible to accomplish this research project. Finally, I thank all MHA students for their unity, cooperation and moral support rendered to me throughout the whole process of writing this dissertation.

**May God bless you all abundantly**

## ABSTRACT

**Background:** The long waiting time in Outpatient Department (OPD) of Rwandan Public Hospitals is a common challenge for patients and to the healthcare providers. Prolonged waiting time is the common complaint for the patients and the source of dissatisfaction emanating from the delay of Hospital ambulatory services. The length of time a patient spends in a healthcare facility at each stage of admission to a healthcare provider and the total OPD time from arrival to departure influences satisfaction and quality of healthcare services provided. The aim of this study is to reduce patients waiting time at Outpatient Department of Kaduha District Hospital from four hundred fortyone minutes to two hundred and forty minutes by Mach 2022.

**Methods:** A research project team was formed in October 2019 to investigate the causes of long waiting time and come up with a solution. A time study tool has been used to collect pre and post interventions data. A sample of 50 patients was selected using systematic simple random sampling before and after with the help of Kaduha DH Outpatient Department Staff. We measured the magnitude of the problem by calculating the process time and waiting time at each step where the patients could move seeking for the services in OPD. We conducted a root cause analysis using a fishbone diagram and the retained real root cause of long waiting time were the delay of outdated Humalyser machine to process the tests and insufficient medical doctors. This outdated machine could process results in two hours and thirty minutes per patient on average which caused the delay. For the insufficient number of Medical Doctors during second consultation, there was one Doctor instead of two. He could serve about fifty patients on average per day which is a huge workload for one Doctor according to the standards of the World Health Organization which stipulates that one Doctor should receive not later than 25 clients per day. In as far as the intervention was concerned, a modern machine known as COBAS which performs 106 lab exams in 30 minutes at once was bought and installed. Another medical staff was recruited in OPD to occupy the second consultation room which was also initiated. The interventions started in September 2021 and lasted for a period of five months and the evaluation was conducted in March 2022.

**Results:** The results show that the total time in Kaduha DH OPD has been significantly reduced from four hundred and forty-one minutes (7 Hours and 21 Minutes) in pre-intervention to three hundred and eleven minutes (5Hours and 11 Minutes) after intervention. Total waiting time for a patient was 6 hours and 06 minutes per day in pre interventions and this reduced to 3hours and 42 minutes in post interventions. Finally, process time for the patient increased from one hour and 16 minutes to one hour and 29 minutes per day.

**Conclusion:** The problem of long waiting time in Kaduha District Hospital OPD can be addressed and patients attending OPD services can be satisfied with the services delivered if the problems of under-staffing, inadequate equipment, patient flow and respect of working hours and turnaround time (both process and Wait time) long waiting time can be managed. Hospital staff are recommended to start providing health services from morning at 7h : 00 am. Two medical consultations rooms should remain open and receive patients

regular, the turn around time in Laboratory should be effectively managed. Finally, proper prescription procedures of laboratory exams and medications should be enhanced on time.

Key words: Waiting Time, Out-Patient Department

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

<b>ARV:</b>	Antiretroviral
<b>DH:</b>	District Hospital
<b>FP:</b>	Family Planning
<b>HC:</b>	Health Center
<b>IM:</b>	Internal Medicine
<b>IP:</b>	Inpatient
<b>MOH:</b>	Ministry of Health
<b>NCDs:</b>	Non Communicable Disease
<b>OPD:</b>	Out Patients Department
<b>PT:</b>	Process Time
<b>QI:</b>	Quality Improvement
<b>TAT:</b>	Turn Around Time
<b>USA:</b>	United State of America
<b>WT:</b>	Waiting Time

## **DEFINITIONS OF KEY TERMS**

**Waiting time:** It is the amount of time a patient must wait in the clinic before a member of the clinic's medical staff sees them. The length of time patients must wait in the health facility is an indicator of how hospitals provide quality services (1).

**Process time:** It's a period a patient or client spends when he or she is being given a service

**Overall waiting time:** It is all time a patient or a client has to wait at each service (2)

**Out Patient Department:** It means, preventive, diagnostic, therapeutic, observation, rehabilitation, or palliative services provided to a patient by or under the direction of a physician, dentist, or other practitioner where services are rendered to persons who have not had an overnight stay and are not charged for room and board(3)

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

Kaduha District Hospital is a Public Hospital that was built by Algerian cooperation in 1987. It is located in Southern Province in Nyamagabe District with a catchment area covering nine Health Centers with a population of 187380. The hospital offers complementary activities package and has got the capacity of 153 beds. The hospital has two departments of clinical and non-clinical units. Clinical Department is composed of Internal Medicine, Gynecology and Pediatrics, Surgery, Neonatology, Emergency, Ambulance, Pharmacy, Operating Room, ARV, Family Planning, Dentistry, Medical Imaging, Mental Health, Physical Therapy, Laboratory, Nutrition and Social Services. The non-clinical department has the following services: Administration, Accounting, Procurement, Logistics, Inventory, Collections, Billing, Information and Technology Management, Public Relations and Customer Care,, Laundry, Kitchen, incinerator and mortuary. The facility has a Director General, five Medical Doctors, twenty-seven Nurses, three Midwives and six Lab technicians among others.

#### The Outpatient Department

Outpatient Department approximately receives 19,247 patients annually. Table 1 illustrates the services offered and number of Staff.

**Table 1: Kaduha District Hospital Out-Patient Department, services offered and assigned staff**

Service/Unit	Number of Staff assigned
Reception	2 Staff
Vital signs	1 Nurse
Consultation(curative)	1 Medical Doctor
Dental services	2 Technicians
Non communicable diseases	1 Nurse
Ophthalmology	1 Technician
Mental Health and clinical psychology	1 Staff
Family Planning	1 Nurse
Medical imaging (Radiography and Ultrasound)	1 Technician
Laboratory	6 Laboratory Technicians
Cashier	1 Cashier
Pharmacy (Drugs distribution)	3 Nurses dispensers of medicines
Recovery	1Staff

**Source:** Kaduha District Hospital-HMIS

In Kaduha, the patients receive healthcare services in outpatient department and basically on minor disease conditions which could be managed without hospitalization.

### **1.2. Problem statement**

There is a long waiting time in Out-Patient Department of Kaduha District Hospital. The patients were spending long hours of waiting during the day in OPD and this was presented by the Head Nurse and Quality Improvement Officer of the health facility in the regular staff meetings. Long waiting time in OPD was also among the priority problems to address that was listed on the quality improvement plan 2019-2020. The report conducted by ENABEL indicated that patients in OPD spend eight hours on average waiting for treatment.

According to quality improvement committee, the problem of long waiting time was also a regular complaint by patients attending OPD seeking for consultation and treatment services. Other problems noted on the quality improvement plan were low incident reporting, surgical site infections, high neonatal mortality among others.

### **1.3. Objective**

To reduce Patients' waiting time at Outpatient Department in Kaduha District Hospital from four hundred forty one minutes (7 hours and 41 minutes) to two hundred and forty minutes (4 hours) by March 2022.

### **1.4. Hypothesis of the study**

The study is guided by the following hypothesis;

**H0:** It is hypothesized that by availing the automated equipment in Laboratory, the waiting time for patients in OPD will not be reduced.

**H1:** It is hypothesized that by availing the automated equipment in Laboratory, the waiting time for patients in OPD will be reduced.

### **1.5. Justification**

OPD is called the fore front of every hospital and it is one of the first points of contact between patients and healthcare facilities. The hospital's perception of her OPD often influences the patient's perception of medical services (3). Since there is an increased number of patients in OPD, this results into increased waiting time. Several studies have indicated that long waiting time as a barrier to actually obtaining health services (4–6). Therefore, reducing waiting time and making sure that patients receive the right care at the right time will have a significant beneficial effects on the quality of care patients receive. It is in this respect that reducing long waiting time will improve Kaduha DH outpatient outcomes and reduce the cost of care (3).

### **1.6. Organization of the study**

The dissertation is divided into six main chapters which are organized as follows: Chapter one introduces the hospital setting and background, chapter two contains the relevant literature on patient waiting time.

Chapter three presents the methodology used during data collection; methods and techniques used to collect and analyze data. The chapter further identified the root causes, the intervention strategies, data analysis procedure and ethical consideration. Chapter four presented and interpreted the results of the study implementation basing on various statistical tests for each indicator. Chapter five discussed the results and lastly is chapter six which came up with conclusion and recommendations.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1. Causes of Long Waiting Time**

**Long waiting time is defined as the time between a patient's arrival at a healthcare facility and their last service and departure** (2). The reported causes of long waiting time were heavy workload levels, insufficient work procedures, employees- supervisor interaction problems. More so, adequate facilities, crowded waiting lounge, lack of suitable and sufficient space, insufficient consultation rooms, modern and advanced medical equipment, too many forms to be filled, staff having the same hour for resting among others (7). Other causes of long waiting time in OPD are routine practice in various units of a health facility. For example, in one of Nigerian outpatient Pharmacy, delay was associated with waiting time and process time; delay to get services accounted for 73% of overall patients waiting time while process time was observed during collection of money, issuing of receipts and recording by cashier and it contributed to 51% of overall waiting time. In general, over 20% of patients were not satisfied with waiting time(8)

### **2.2. Impact of long waiting time**

Long waiting time frustrates, leads to depression and patient's health conditions deteriorates. It also results to patients' dissatisfaction and increased direct and indirect expenses. Patients also lose trust in the facility where they spend long hours of waiting the services(5,6,9). The amount of time a patient wait is one of the factors which affects utilization of healthcare services. Patients perceive long waiting times as a barrier to actually obtain services and keep waiting unnecessarily can cause stress for both patient and doctors (1). In sub-Saharan Africa, long waits are often a symptom of a low provider-to-patient ratio that causes health workers to fail to provide adequate care to all patients. Time is occurring. In a study examining the moral burden of caregivers in a busy institution in Malawi, one participant found that the daily burden of caring for as many patients as possible could overwhelm everyone waiting in line for treatment. Reported unable to care. and lonely (5). A part from causing frustration to patients and staff, long waiting time may cause reduction of adherence to health services, psychological impact to entire family.

A study done in Kenya on determinants of client's satisfaction elucidated that long waiting time has negative impact on patient's satisfaction. In a broader sense, the long waiting time is associated with low levels of patient satisfaction(10).

### **2.3. Factors influencing waiting time**

The study done in Ethiopia by Biya M, Gezahagn M, Birhanu B, Yitbarek K, Getachew N, Beyene W reported that Patients who arrive early in the morning at the health facility spend long hours waiting for health services compared to those who attend in afternoon, patients who attended Monday spend longer hours waiting than those who attended on Friday. Patients with low level of education waited for a longer time compared to those with tertiary education(2).



Waiting time is also influenced by sex, age where women take long time compared to men, this largely depend on the type care that women seek in health facility. This was reported by Shyamkumar Sriram and Rakchanok Noochpoung where men were six minutes lower than women, young patients take long waiting time compare to elderly. On contrary, A study conducted in OPD of Kibungo referral Hospital in Rwanda by Ukizentaburuwe.B, Mukarwego. J , Kagimbangabo et al. found that women were 48% less likely than men to endure long waiting times, and at the same time patients were more likely to see an OB/GYN, surgical, pediatric, or ENT specialist. I added that it is four times more expensive. compared to related departments in dentistry, mental health, ophthalmology, and physiotherapy. It was also advanced that patients from private health facilities spend a short time compared to public(11,12) .

Long waiting time is associated with inadequate staff where Doctor to patient ratio is imbalance, few doctors are obliged to attend a large number of patients on the queue (13). Lack of commitment, motivation, expertise, cooperation among employees, poor work attitude from colleagues like conflicts, un responsive by employee to patient needs, poor inter communication system between various levels of employees, long patient journey process, lack of timely presence of medical staff, physician's schedule conflicts and patients' non adherence to appointment (7).

It has been also noted that the nature of the disease and socio-economic status are also contributing for long waiting time. The patients with chronic diseases were reported to spend long hours with providers when compared to other diseases. Socio-economically advantaged experience more time of waiting at health facilities in comparison with patients with higher social status and income in developing world(14). This is however, not the case in most developing countries, as several studies have shown that patients spend two to four hours in the Out-Patient Department before seeing the Doctor. It was advanced that waiting for a long period is one of the sources of dissatisfaction to patients (15,16). Several studies have also documented the negative association between increased waiting time and patient satisfaction with primary care and measures must be taken by both healthcare institutions and healthcare providers (15,17).

Furthermore, long waiting times in health facilities have been reported in both developed and developing countries as an issue of concern. In the USA, an average waiting time of about 60 minutes was found in Atlanta and an average of 188 minutes in Michigan (18,19). In Nigeria, an average waiting time of about 173 minutes was found in Benin, while in University College Hospital Ibadan, a mean waiting time of one hour and thirteen minutes was observed(20).

A study done in two Arab nations postulated five main problems of long waiting time in OPD which are appointment type, ticket numbering, doctor late arrival, early arriving patients and patient distribution list (21).

## **2.4. Various interventions made to reduce long waiting time**

There is global consensus that well-designed healthcare systems provide timely and convenient access to healthcare services for all patients or clients. A number of interventions aimed at reducing waiting times have been implemented in public tertiary hospitals in China to improve patient satisfaction. However, few have been well documented and impacts have rarely been measured using robust methods (4). The Institute of Medicine (IOM) recommends that at least 90% of patients should be seen by the healthcare provider within thirty minutes of their scheduled appointment time.

Regular updating of online booking was also believed to be one of the response to long waiting time, it was designed to clear all appointments received within forty-eight hours and address the issues of overbooking. It also involved sending short messages to patients as a reminder to patients and as well as provision of appointment confirmation services. Additionally, dedicated telephone calls for follow up consultations, presence of nurse practitioner on staff, nurse and general practitioner triage and email consultations were effective in reducing waiting time. All these mechanisms help the patients to avoid coming to the hospital when the services are unavailable (21,22).

A study done in India using Lean Six Sigma approach has facilitated healthcare workers and hospital administration to find out gaps in the whole process of care so as to reduce waiting time. This study mainly focused on enhancing a solution by analyzing the history of past treatments and medications of patients by doctors (9).

According to the study done in Ear, Nose and Throat (ENT) Clinic of Johann-Wolfgang Goethe University from Germany, the most important remedial actions for long waiting times were establishing a telephone hotline, standardizing all patient appointments, improving telephone advice, switching to flexible scheduling with daily appointment book updates, and improving overall patients satisfaction. It was an overall improvement (23). Long waiting time was reduced after integration of OPD and ART clinics in two urban Lusaka sites. The exercise harmonized the flow of OPD and ART patients so that patients were treated on a first-come, first-served basis regardless of medical condition, with the exception of medical emergencies (24).

## **CHAPTER THREE: METHODOLOGY**

### **3.1 Research design**

This study used a pre and post intervention design. A time study tool was used to collect information on waiting and process time before and after implementation. During the pre-intervention, a baseline study was conducted in June 2021 and the baseline data was analyzed to obtain the magnitude. After identification of Root Causes with help of a fishbone diagram, alternative solutions were brainstormed and final one was agreed upon with the multi-disciplinary team. Implementation and analysis of all processes were done by a multidisciplinary team composed of a receptionist, Nurses, Doctors, Lab-Technicians, cashiers and other allied health professionals.

### **3.2 Magnitude of the problem**

The problem was witnessed by the Quality Improvement Officer during day to day activities in OPD. It was observed that patients and their caretakers had to spend long hours waiting the services at the health facility. Other evidences were obtained on waiting time were also gathered from the suggestion box and patient satisfaction and monitoring survey rated the hospital waiting at 64%. Other hospital concerns were depicted and ranked by accreditation performance progress assessments as follows;

Long waiting time (8 hours), post- surgical infection rate (9.4%), birth asphyxia (5.7%) and increased neonatal deaths (10.8%). The hospital administration team argued that there are always a long line of patients waiting for health services at OPD and this has resulted into endless complaints of patients. It is from this context that the researcher had to conduct a study that will reduce patients waiting time in OPD.

### **3.3. Root causes analysis**

We identified the root causes of long waiting time based on fishbone analysis in OPD of Kaduha District Hospital. Researcher together with the hospital management (Director and Quality Improvement Officer and Physicians in OPD) brainstormed on the various causes of long waiting time.

The suggested causes were then plotted on the fishbone diagram according to people, process or procedures or policies, equipment or materials and environment.

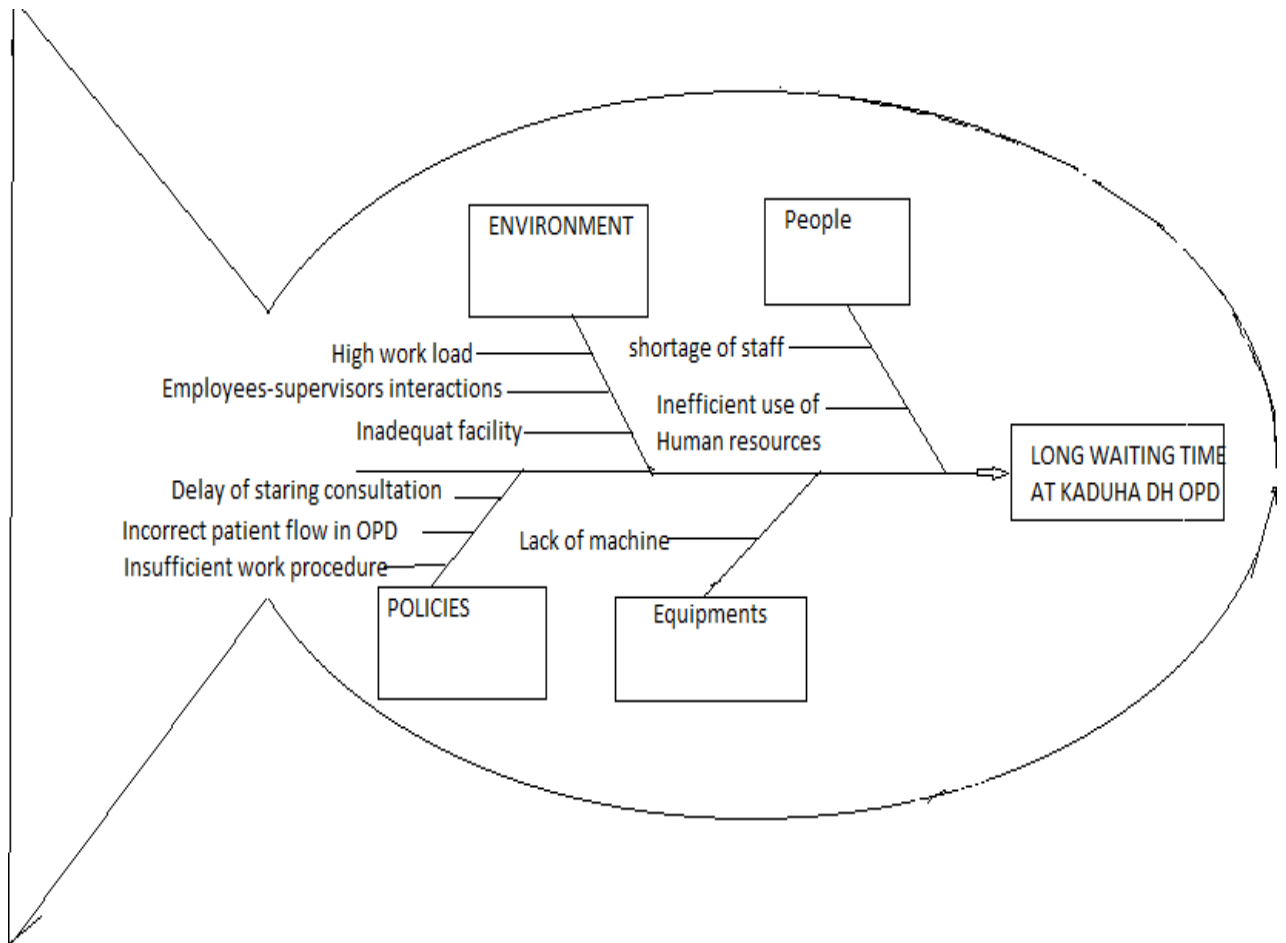


Figure 1: Fishbone Diagram presenting suggested causes of long waiting time

### 3.4. Verification of possible causes

In order to verify the real causes of long waiting time, evidences were gathered on people, equipment, policies (procedures and process) and environment and then presented on fishbone diagram. The suggested causes were categorized as follows;

#### 3.4.1. People

Shortage of Human The time study illustrated that Patients spent more than 150 minutes in waiting results from Laboratory. The time study demonstrated also that this Department receives 55 clients per day on average and are served by one Medical Doctor and others allied health professionals. The Patients spent 37 minutes in waiting for Medical Doctor in Consultation room for seeking for care and Medical Doctor spends 10 minutes of consultation per client on average and this not comply with the National workload Policy from the Ministry of Health Rwanda which stipulates that a medical Doctor should spend between 15 to 20 Minutes with the client and the clients do not wait for more than 30 minutes before being consulted .However Basing on this evidence, high workload is not

the cause of long waiting time. Humana resources are not managed efficiently even if the number of Medical Doctors (five) is not sufficient, there is a need to perform some staff reallocation

### 3.4.2. Equipment

Another suggested cause of long waiting time is slow performance of **Humalyzer 3500**. It is a semi-automated machine and requires preparation and mixing, does not offer consolidated results, it is also Mechanical where it performs one test after another. The machine does not contribute to improvement of sample TAT and avails results after 150 minutes (three hours). According to the results of time study done in five days, the total waiting time for patients from laboratory was 159 minutes. It was discovered that slow performance of Laboratory machine (COBAS C 311) is the real cause of the long waiting time.

### 3.4.3. Policies and procedures or process

**Delay to starting consultation:** Normally the consultation in OPD should start at seven O'clock in the morning but it is not the situation because it starts at 9 hours often after finishing the morning presentations or the ward round in Hospitalization and has a negative impact on OPD delivered services.

Incorrect Patient flow in OPD, at cashier desk where Patients pass two times, firstly for paying laboratory exams, secondly for paying medication and average waiting time spent at cashiers desk was 23 minutes only. Basing on these results, it was reported this was not the real cause of long waiting time.

### 3.4.4. Environment

**High workload:** big number of clients with small number of providers.

**Employees-supervisors interactions:** There is no problem influencing the long waiting time.

**Inadequate facility,** OPD is located at the entrance of the Hospital and has enough space so it is not a problem.

**Table 2: Data from Out Patient Department for a period of three months**

Service	Jun-20	Jul-20	Aug-20
OPD	460	478	451
Ophthalmology	90	81	101
Dental	570	335	426
NCD	442	484	526
Mental Health	133	107	124
FP New Acceptors total	83	62	66
<b>Total</b>	<b>1778</b>	<b>1547</b>	<b>1694</b>

### 3.5. Sample size

The study population included all the patients seeking care in Kaduha DH OPD. In this quality improvement project. We used Sloven formula to determine the sample to be used:

$$n=N/(1+Ne^2).$$

$$\text{Average: } 1778+1547+1694=5019/3=1673/30=55,76$$

$$N=55,76$$

$$n=55,76/(1+55,76*0.05^2)$$

$$n=49.019. \text{ Therefore, our sample size was 50 participants;}$$

This research project used time study tool was conducted on 50 Patients as sample size since May, 2021. Data was collected using the same sample size in February 2022 as post intervention phase

#### 3.5.1. Sample technique

We used a systematic random sampling and a certain number of participants were chosen after their consent in this activity. We excluded patients who finally have been hospitalized due to the severity of illness.

#### 3.5.2. Data collection methods

Data was collected in two different periods. We distributed a time study sheet to every participant and to every phase and thereafter, we transferred them in another excel sheet which helped in the data recording. Hospital performance measurements policy makers' major opportunity to secure healthcare system improvement and accountability. In other words, measurement is central to the concept of quality improvement (7). Literature review and brainstorming have helped and contributed to identify the possible causes of the problem of long waiting time in OPD of Kaduha DH. With the use of Ishikawa diagram and literature review, here are some of the possible causes of long waiting time in Out-patient Department of Kaduha District Hospital.

#### Possible Causes

1. No appropriate and update machine for laboratory tests
2. Shortage of staff: Medical Doctors, cashiers and Laboratory technicians
3. No orientation mechanisms for staff
4. Delay of starting consultation and ward rounds: the rounds and consultation start after the Doctors' meeting which ends around 8 :00AM
5. Inappropriate Patient flow at OPD

**Table 3: Collected data to prove or disapprove the suggested root causes**

<b>SUGGESTED ROOT CAUSE</b>	<b>INFORMATION NEEDED TO PROVE/DISPROVE</b>	<b>ACCEPTED/REJECTED</b>
Old fashioned Laboratory clinical chemistry analyzer machine	Laboratory Analyzers' machine specifications comparison	Accepted
Shortage of Medical Doctors and support staff	Staff New structure	Accepted
High patient workload	Cases Received per day	Rejected
Employees-Supervisor interactions problems	Supervision done at OPD	Rejected
Inappropriate Patient flow	Patient flow analysis	Accepted
Delay of starting ward round and consultation	Respect of starting time	Accepted
Inadequate facilities	OPD area dimensions	Rejected

### **3.5.6. Identification of the real root causes**

We found out that the old fashion Humalyser machine in the Laboratory contributes to the delay of the laboratory results. Medical Doctor has to wait the results processed by the machine in order to prescribe drugs to the patients. The main delay results were biochemistry includes: ALAT, ASAT, UREA, CREATININE, CRP, RPR, ASLO, RHUMATOID TEST, IONOGRAM. The retained final root causes of long waiting time in OPD at Kaduha District hospital were: Old fashion and outdated Laboratory machine to analyzing the samples and shortage of staff: Medical Doctors (only one Doctor appointed in OPD consultation), cashier.

**Figure 2. Kaduha DH OPD patient waiting time in pre – intervention data collection in 2020 – 2021**

The figure 2. Illustration of the time patients wait before receiving the service

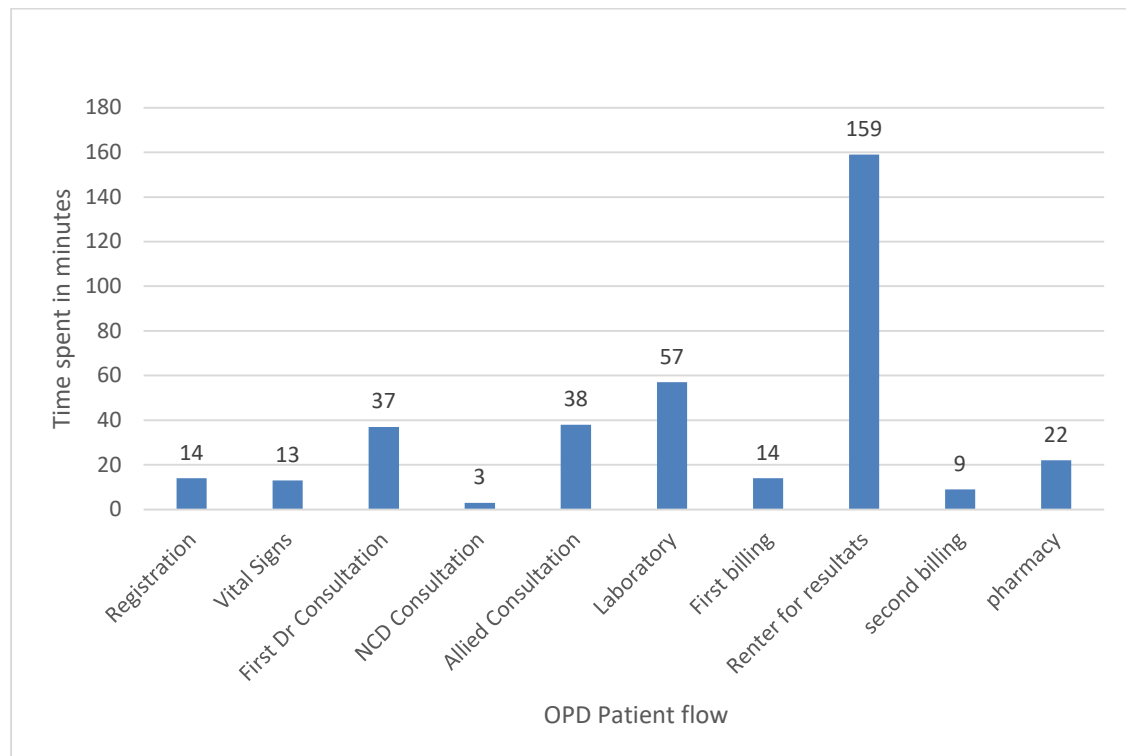
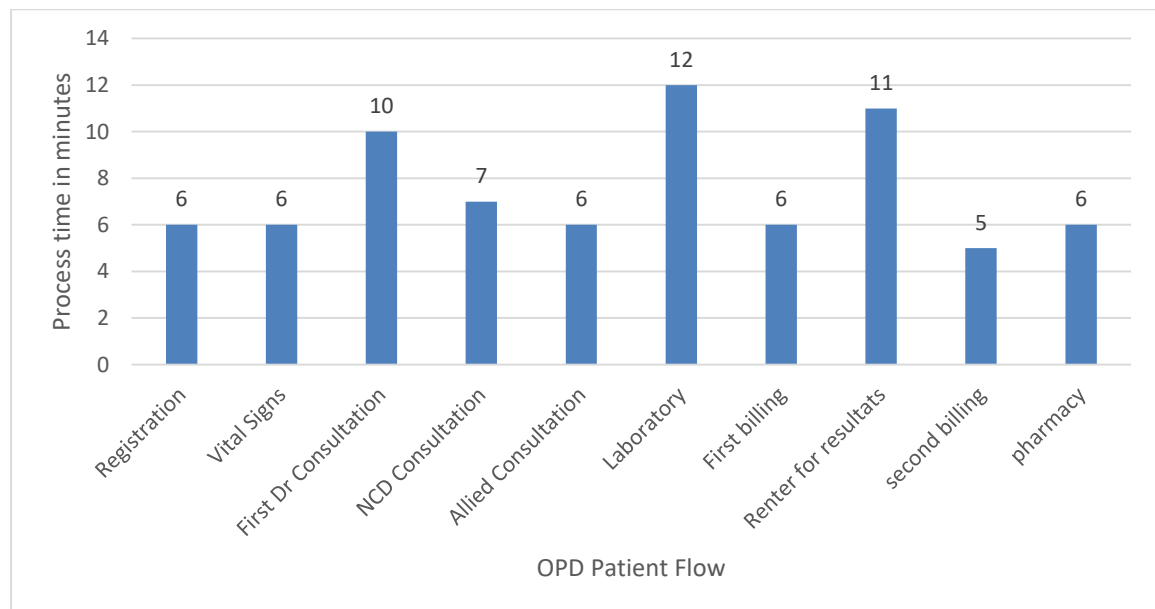


Figure 3. OPD of Kaduha DH Patient Process time from pre-Intervention Data 2020-2021



In pre-intervention, the total waiting time in Kaduha DH OPD was 7h 21minutes, with an average waiting time of 6h 06 minutes 14sec and an average Process time of 01h15 minutes. Within the total waiting time of seven hours and twenty one minute (7h21min) ; 2H 39 Min of this time is spent by waiting the results from Laboratory, while the average process time to reviewing results is eleven minutes (11min).Therefore most of the possible causes were



in concern second doctor’s consultation although they are applicable to other OPD services like Laboratory(phlebotomy), Allied providers consultation and the first doctor’s consultation which also have a considerable number of waiting time.

### 3.6. Interventions

After conducting the data collection in pre-implementation phase, a meeting was held on 16th December 2021 with all persons involved in the research projects and we found that the time spent by our clients is too long. We tried to find the possible and feasible interventions to address these problems of long waiting time in OPD of Kaduha DH : we concluded that the problem of long waiting time in the OPD of Kaduha District Hospital will be solved if we take into consideration some of the following elements :

**Equipment:** we have done an advocacy in Laboratory, Cobas machine has been availed and is functioning every day and it must be filled with reagents.

**Staffing:** We have Conducted a staff need assessment in OPD and in collaboration with Clinical Director we re-allocated another Medical staff and opened the second consultation room.

**Patient Flow:** we have reviewed the old patient flow and set a new one in order to reduce unnecessary ways. We have improved the orientation system by adding others signals.

The old-fashioned machine which was slow to analyze and process the sample results in the Laboratory was replaced by the new one. Table 4 illustrates the performance of the old Lab machine (HUMALYZER 3500) in comparison with the new one (COBAS 311) .

**Table 4: COBAS C 311 VS Humalyzer 3500 Clinical Chemistry Lab Machines Comparison Regarding Performance**

<b>HUMALYZER 3500</b>	<b>COBAS C 311</b>
Semi-automated machine	Automated machine
Requires preparation and mixing	No preparation or mixing required
Do not offer consolidated results	Offers consolidated testing
Mechanical	Automated sample rerun and dilution
One test after another	Additional sample loading during operation
Low test throughput per hour and do not improve sample TAT	High test throughput per hour and improve sample turnaround time
Avail results in 3 hours	Avail results in 30 minutes

After this comparison the conclusion is that COBAS C 311 is better than Humalyzer machine. After comparing the specifications of those two machines, the Laboratory Manager in collaboration with the researcher have explained the importance of having COBAS machine and written a letter requesting the new one to the Management committee so that the problem of long TAT can be solved and long waiting time improved.

In order to measure the impact of those implementations data collection has been collected again with the same sample and at every step of different services of OPD of Kaduha DH.

### **3.7. Data analysis procedure**

We analyzed the data using Microsoft excel for compilation and SPSS v20. The level of significance was set at 0.05 ( $\alpha=0.05$ )

### **3.8. Ethical consideration**

Permission was obtained from Kaduha District Hospital and all participants first **agreed** to **participate** and identification numbers **were** used **in place** of names to protect confidentiality and privacy.

## CHAPTER FOUR: RESULTS

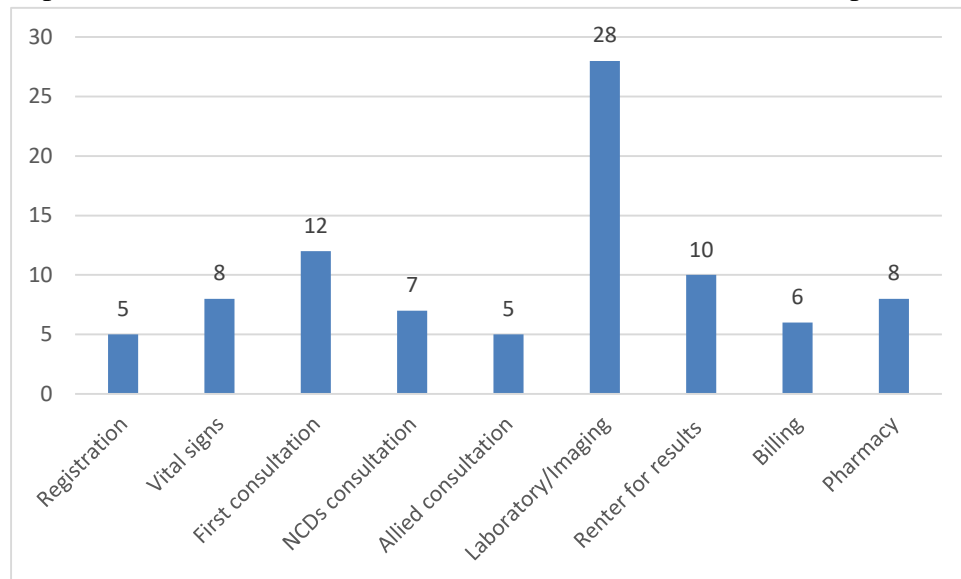
### 4.1. Socio-Demographic Characteristics of respondents

#### 4.1.1. Gender

All participants were fifty in both pre and post intervention. In preintervention, there were 19(38%) male participants and 31 (62%) females while in post intervention, 33 (66%) were males and 17(33%) were females.

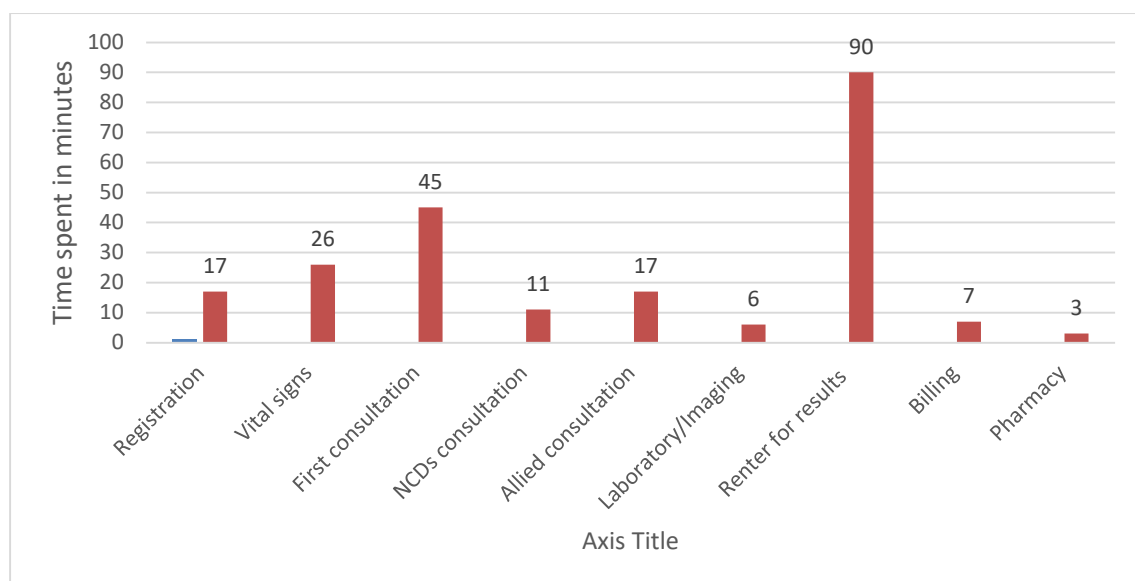
#### 4.1.1.2. Implementation

The baseline study was conducted in June 2021, implementation period covered the September 2021 to March 2022 and the evaluation was done in April 2022.



**Figure 4: Kaduha DH OPD Waiting Time post intervention data 2022**

Figure 4 illustrates the time patients wait while receiving the services from the provider in consultation during post intervention. The graph indicates that, although re-enter for results was still high with 90 minutes of waiting, it was reduced from 159 minutes.



**Figure 5: Kaduha D.H Process Time in Post – intervention 2022**

The results obtained after implementation of various interventions show that the total waiting time in Kaduha DH OPD has been significantly reduced from 357 minutes to 133 minutes. Although, waiting time increased on Registration (17 minutes), Vital signs (26 minutes), first consultation (46 minutes) NCDs consultation room (11minutes) increased after intervention three to thirteen minutes, there was a significant reduction of time in allied consultation (38 to 17 minutes), laboratory (57 to 6 minutes), billing counter 14 to 9 minutes), pharmacy (22 to 3 Minutes) and final reception of results (159 to 90 Minutes).

**Table 4: Pre and Post Intervention results of waiting time in OPD of Kaduha D.H**

OPD services	Pre-intervention/ Results in minutes	Post Intervention/ Results in minutes	Change	P-Values
Registration	14	17	-3	
Vital signs taking	13	26	-13	
First consultation	37	45	-8	
NCDs consultation	3	11	-8	
Allied consultation	38	17	21	
Laboratory	57	6	51	
Counter for Billing	14	9	5	
Re-enter for results	159	90	69	
Pharmacy	22	3	19	
<b>Total</b>	<b>357</b>	<b>224</b>	<b>133</b>	

**Table 5: Summary of pre and post intervention results**

<b>Waiting Time/service</b>	<b>Pre intervention</b>	<b>Post intervention</b>	<b>p-value</b>
Total WT	336 Min	222 Min	0.03
Total WT-PT	441 min	311 Min	0.07
enters for results	159min	90 Min	0.09
Laboratory	69 min	34 Min	0.02

Those results are showing that a significant reduction of long waiting time has been observed in laboratory service where the time of 159 minutes became 90 minutes, time spent in waiting the results from Laboratory. Another important waiting time reduction has been observed in allied consultation where it has been reduced from 38 to 17 Minutes.

## **CHAPTER FIVE: DISCUSSION**

The outcome from this study was that waiting time has considerably decreased from 357 to 244 minutes within a three months' period and this similar to other studies conducted in developing countries. A 2016-2019 survey of outpatient waiting times in 12 hospitals in Rwanda showed that the length of patient waiting times and process times with providers varied by facility and depended on several factors. These factors that brought change were based on policy regarding resource capacity, speed of the registration process, physical layout of facilities and payment for services. Average patient service time (contact time) for ambulances ranged from 18 minutes to one hour and the mean waiting times ranged from 3 hours 32 minutes to seven hours thirty-three minutes for all different services.

The total time patients spent in the various outpatient departments in Rwanda varied between 4 hours and 8 hours 30 minutes. Of the seven hospitals that conducted a baseline analysis of customer flows, Butaro, Kibungo, Masaka, Muhima and Rwamagana provincial hospital. The average consultation time was almost the same (39 minutes) for both antenatal care and internal medicine, but it was slightly shorter at 36 minutes for non-communicable disease clinics. However, latency was more variable, averaging 5 hours 37 minutes and 6 hours 7 minutes for ANC and NCD, respectively. This was significantly more than Internal Medicine (five hours and three minutes). These results indicate that the biggest bottlenecks are waiting to see the doctor for the second consultation. The Null Hypothesis was rejected because the interventions conducted reduced up to 133 minutes and fifty minutes from waiting time in Outpatient Department of Kaduha DH.

### **5.1. Lesson Learnt**

This QI research project has shown that WT reduction is a feasible and achievable activity if there is an appropriate equipment and a commitment of every staff involved in service delivered at OPD. Working as a team can lead to success for any organization especially in a healthcare setting like Kaduha District Hospital.

## **CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS**

This project has shown that with SPS approach, it is possible to define well the problem of waiting time in every Hospital, to set the objectives, to conduct a root cause analysis and to find the feasible and measurable solutions to reduce a long waiting time in all OPDs of Public Hospital. These findings highlighted the high opportunity costs of seeking care in KADUHA DH Outpatient department before interventions and I recommend to everyone who works in its services to keep the momentum in order to maintain this achievement or why not to more reduce this waiting time again.

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## APPENDICES

### Appendix I. WAITING TIME MEASUREMENT TOOL

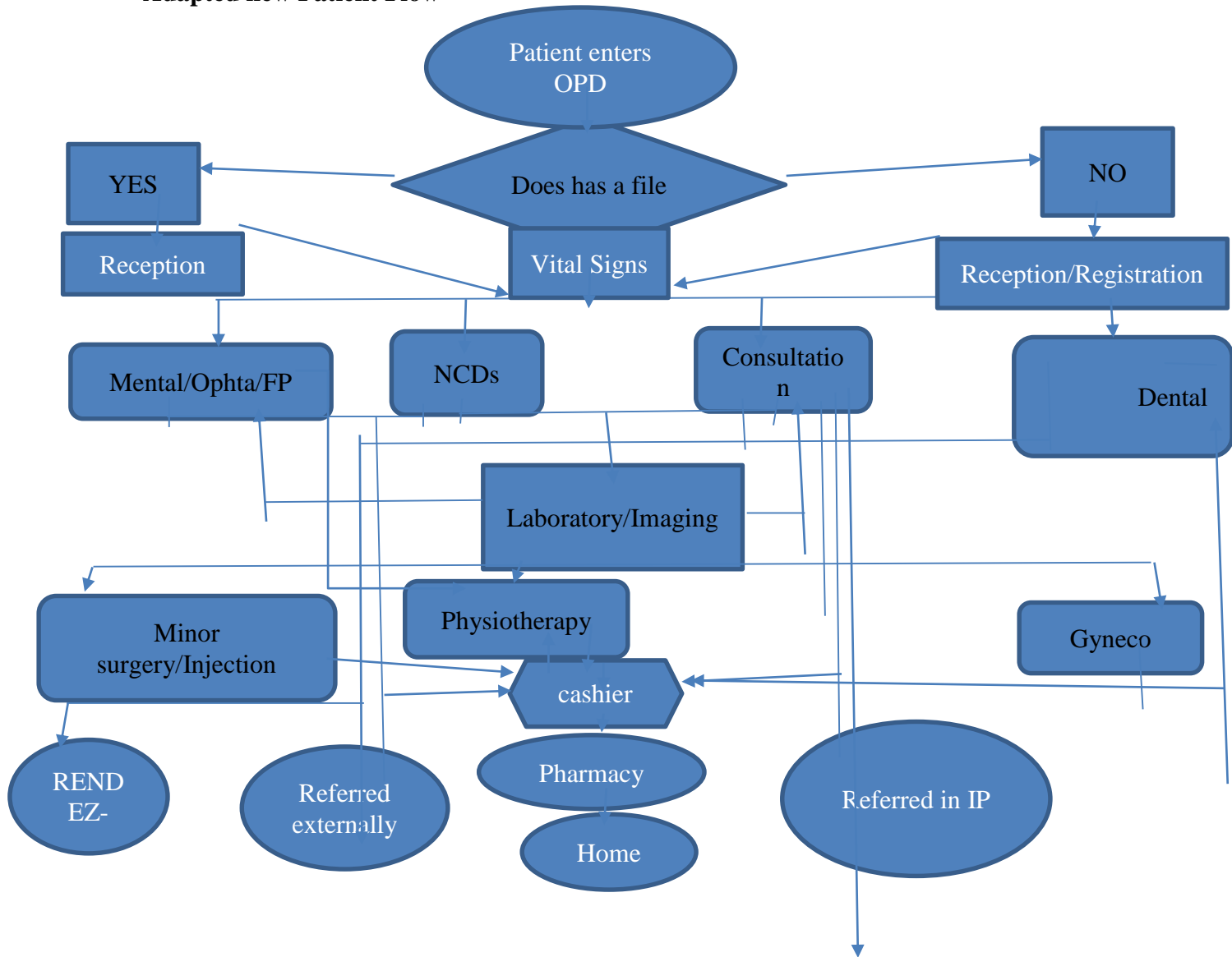
NAME OF FACILITY:KADUHA DH/OPD SERVICE							NO.....	
DATE OF SURVEY:...../...../2021								
Mark the condition for which patient is attending with an <X>								
<b>Acute</b>				<b>chronic</b>		Mother and child		
MINOR AILMENTS	ADULT	HIV	TB	NCD	MENTAL HEALTH	FAMILY PLANNING	ANC/PNC	
	children(IMCI)							
Area						TIME		
Time patient enters OPD								
Time patient registers at reception								
Time patient is allocated patient file								
Area	Type of Health care provider			Start time			End time	
Vital signs								
1st consultation								
Laboratory								
cashier								
Medical imaging								
2nd consultation								
cashier								
Pharmacy								
Time Patient departs OPD facility								
Patient waiting time monitoring tool for OPD facility : 9 hours service								

## APPENDIX II. GANT CHART

NUMBER	TASK ACTIVITY	RESPONSIBLE	PERIOD			
			January 2021	February 2021	March 2021	April 2022
1.	Hold a meeting with OPD department	Researcher	X			
2.	Explain to the administration the real causes of the problem.	Lab.Manager	X			
3.	Initialization of the best solutions				X	
4.	To conduct a post interventions data collection and evaluate the effect of interventions undertaken to decrease waiting time.	Researcher	x	x		x
5.	Monitoring of the implementation					X
6.	Comparison of the situation before and after implementation					X
7.	Recommendation to the Hospital					X

### Appendix III : Updated Patient flow diagram

#### Adapted new Patient Flow



## APPENDIX IV. Ethical Clearance



UNIVERSITY of  
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES  
DIRECTORATE OF RESEARCH & INNOVATION

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### CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 22/06/2020  
Ref: CMHS/IRB/197/2020

**MUTWARASIBO Norbert**

**Masters in Hospital and Healthcare Administration,  
School of Health Sciences, CMHS, UR**

Dear **MUTWARASIBO Norbert**,

**RE: ETHICAL CLEARANCE**

Reference is made to your application for ethical clearance for the study entitled ***"Reducing Patients' Long Waiting Time in Outpatient Department at Kaduha District Hospital."***

Having reviewed your application and been satisfied with your protocol, your study is hereby granted ethical clearance. The ethical clearance is valid for one year starting from the date it is issued and shall be renewed on request. You will be required to submit the progress report and any major changes made in the proposal during the implementation stage. In addition, at the end, the IRB shall need to be given the final report of your study.

We wish you success in this important study.

  
Professor **GAHUTU Jean Bosco**  
Chairperson Institutional Review Board,  
College of Medicine and Health Sciences, UR

**Cc:**

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate studies, UR

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## APPENDIX V. COBAS C311



This photo represents the updated machine available in Kaduha DH Laboratory department after the interventions

## APPENDIX VI. HUMALYZER 3500



This photo represents the Old Model of Biochemistry Laboratory Machine used by Kaduha DH Laboratory Department before the intervention study.

## APPENDIX VII. PLAGIARISM REPORT

Date:06/12/2022

### Note

The Study Entitled "REDUCING WAITING TIME IN OUTPATIENT DEPARTMENT OF KADUHA DISTRICT HOSPITAL" is approved by the Directorate of Research and Innovation for submission in UR\_CMHS Library. The plagiarism report is 13% with the following parameters:

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Sincerely



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Research and Innovation Officer, CMHS