Analyzing the TAT in the Department of Laboratory Services at The Mission Neighborhood, Advanced Diagnostics & Patient Care, Asansol

Dissertation Submitted to

The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree

of Master of Business Administration (MBA)

in

Hospital and Health Management

by

Deepali Kumari

Under the Supervision and Guidance of

Monika Chaudhary

2021

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THE MISSION HOSPITAL DURGAPUR
FUTURISTIC TECHNOLOGY BRILLIANT MINDS

Ref: TMH/HRD/OG/June -21/25

Date: 21.06.2021

To Whom It May Concern

This is to certify that **Ms. Deepali Kumari** has done her three months dissertation on "Analyzing the TAT in the department of Laboratory Services at The Mission Neighbourhood – Advanced Diagnostics & Patient Care, Asansol" from 22.03.2021 to 21.06.2021

During the period of dissertation she has been found sincere

We wish her a successful future and career ahead.

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Senior Manager - HR

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CERTIFICATE

This is to certify that dissertation titled..... is a record of the research.

work undertaken by Deepali Kumari in partial fulfillment of the requirements for the award of the degree of MBA Hospital and Health Management from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide	School Dean
IIHMR University, Jaipur	IIHMR University, Jaipur
Date	Date

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Receiving my Dissertation at The Mission Neighborhood, Advanced Diagnostics and Patient Care, Asansol branch of The Mission Hospital Durgapur, West Bengal, has been a joy. My dissertation has helped me obtain considerable information during the last three months.

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Table of Contents

ABBREVIATIONS 7

ABSTRACT 9

INTRODUCTION 11

REVIEW OF LITERATURE 13

METHODOLOGY 17

SAMPLE FLOW CHART IN ASANSOL 17

DATA ANALYSIS 19

ANALYSIS OF THE ROOT CAUSES OF TAT EXCESS 13

SUGGESTIONS 14

CONCLUSION 14

REFERENCES 15

Table of Graphs

FIGURE:1 Total Sample 19
FIGURE:2 Sample Process TAT 20
FIGURE:3 Average Pre & Post Analytical Sample Process TAT 21
FIGURE:4 Total Average TAT 22

Extra Table &Graphs

FIGURE:1 Time Relevance in Clinical Pathology TAT 26
FIGURE:2 Time Relevance in Special Biochemistry TAT 27
FIGURE:3 Time Relevance in Serology TAT 27
FIGURE:4 Time Relevance in Biochemistry TAT 28
FIGURE:5 Time Relevance in Hematology TAT 29
TABLE:1 Main TAT Sheet 30
TABLE:2 TAT Sheet for Reception 31
TABLE:3 TAT Sheet for Collection Room 32
TABLE:4 TAT Sheet for Laboratory Department 33

ABBREVIATIONS

TAT	Turnaround Time
OPD	Out-patient Department
Dept.	Department
HIS	Hospital Information System
LIS	Laboratory Information System

ABSTRACT

Title:

Analyzing the TAT in the Department of Laboratory Services at The Mission Neighborhood, Advanced Diagnostics & Patient Care, Asansol.

Introduction

A laboratory is a place where clinical investigations are performed on clinical specimens in order to gain information about a patient's health in order to aid in illness diagnosis, treatment, and prevention.

Laboratories are focusing more on providing services that are dependable, quick, and easy to access for patients, as well as at a reasonable cost. As a result, they prioritize time and quality. While laboratories place an overwhelming emphasis on dependability and error reduction, turnaround time is also important (TAT).

There has not been a precise definition of turnaround time (TAT) that can be used to determine TAT for a certain test. It could be from the time the test is received until the report is created for the laboratory. However, in certain organizations, it is from the time a patient requests a test until the patient or patient family receives the report.

TAT is influenced by a variety of circumstances, both inside and outside the laboratory.

Pre-analytical, analytical, and post-analytical phases are known for determining TAT in laboratories, and they all affect the laboratory's overall Turnaround time.

Objective

Analyze the reasons for delayed TAT in the laboratory services at the Diagnostic center Asansol and provide a further recommendation.

Methodology

An Observational cross-sectional study was conducted on this study. Where this study has some inclusion criteria which are Clinical Pathology, Special Biochemistry, Biochemistry, Hematology, & Serology between 7:00AM to 5:00PM and in exclusion criteria, Microbiology, Histopathology & Cytopathology, and test which are sent to Durgapur were kept in. A total of 219 population sample size was taken in which 966 samples were observed.

Result

TAT of Report type to Report send to Reception desk show higher turnaround. Also, the Higher Turnaround was noticed in Clinical pathology which is 20 hours 6 minutes followed by Hematology 17 hours and 59 minutes.

Conclusion

According to the study, there are numerous outliers that affect the Turnaround time (TAT) of the laboratory process, and in order to lower the Turnaround, all pre-analytical and post-analytical stages must be improved.

And it is important to realize that they're all connected, so keeping track of them will not only help to improve turnaround times but also ensure high-quality services.

The main reason for the TAT delay was a delay in the laboratory consultants' verification of test findings, followed by staff shortages, system or equipment breakdowns, and a lack of management involvement in policymaking and monitoring to smooth the workflow.

INTRODUCTION

A laboratory is a place where medical tests are performed to gain information about a patient's health in order to aid in illness diagnosis, treatment, and prevention.

Laboratories are focusing more on providing services that are dependable, quick, and easy to access for patients, as well as at a reasonable cost. As a result, they prioritize time and quality. While some laboratories place an inordinate emphasis on dependability and error reduction, other priorities turnaround time (TAT).

The importance of laboratory investigations for patient satisfaction is highlighted, as are the characteristics of the test reports. But there is another facet of quality that is frequently overlooked: timeliness, which is measured in turnaround time (TAT).
The turnaround time (TAT) is an important factor that determines throughput, revenue cycles, and the patient and physician experience with the lab.

Even yet, there is no precise definition of Turnaround Time (TAT) or which period should be considered when calculating TAT for a certain test. From the time the sample is received at the laboratory until the report is generated, it can be claimed that time is spent in the laboratory. However, it would be appropriate for a physician from the time a patient requests a test until the report reaches the patient or patient family.

For routine tests, the TAT would be different. However, hospital computerization with a log of time from test request to sample collection to report generation and clinical reception of the report would aid in the generation of TAT.

In a lab, analyzing outliers in TAT provides insight into the causes of turnaround time (TAT) delays and areas for improvement.

The goal of this research is to improve laboratory workflow by examining the laboratory's process flow and TAT.

RESEARCH QUESTIONS

What causes the laboratory services at The Mission Neighborhood, Advanced Diagnostics and Patient Care, Asansol, to have a longer TAT?

OBJECTIVES

- To determine the TAT of laboratory services in Diagnostic Center
- To determine the major factors that contribute to TAT delays.

REVIEW OF LITERATURE

Sr. No.	Author	Study Location	Sample technique	Salient features
1	Hara P. Pati & Gurmeet Singh 2012 Nov 8.	Hawkins RC	Observational Study	noted that most laboratories place an unnecessary emphasis on reliability, whereas clinicians place a greater emphasis on how quickly (TAT) a report is accessible to them. There is no precise definition of TAT for a specific test for laboratory employees, however it would be from the time the material is received in the laboratory until the result is generated. For a clinician, however, it would be suitable from the time he or she requests a test until the report is received.
2	Rajendra Dev Bhatt, Chandani Shrestha & Prabodh Risal 2019 Mar.	Kathmandu University Hospital, Nepal	observational descriptive study	Quality service cannot be achieved in hospital-affiliated laboratories without identifying the variables that cause extended TAT and prompt improvement by hospital administration. TAT in clinical laboratories is affected by a variety of factors, including institutional infrastructure, their own setup, policy, system, and the characteristics of staff working in various departments of the hospital.
3	J H Howanitz & P J Howanitz 2001 Sep		Observational Study	According to "Timeliness as a Quality Attribute and Strategy," timely reporting of laboratory findings has a significant impact on clinician and patient satisfaction, as well as the length of hospital stay.

4	Xavier Bossuyt, Kurt Verweire, Norbert Blanckaert		Observational Study	Current advancements may have an impact on the future of laboratory medicine and how to deal with these changes, according to "Challenges and Opportunities." We argue that, in order to be prepared for the future, clinical laboratories should build alliances and networks, consolidate, integrate, or outsource, and, most significantly, provide knowledge services linked to in vitro diagnostics to increase efficiency and minimise costs.
5	AACC (American Association for Clinical Chemistry) JUN.15.2017	Halifax, Nova Scotia	Lean approaches	The use of auto-verification of results improves test processing and saves turnaround time (TAT)
6	Cakirca G	Dept. of Biochemistry, Sanliurfa Mehmet Akif Inan Training and Research Hospital, Sanliurfa, Turkey.	retrospectively	Continuous training for hospital staff on sample collection techniques (proper venepuncture techniques, tube selection, etc.) and specimen transit time should be planned.
7	Pamela G Manor		Observational Study	Laboratory turnaround times. According to a review of the literature, more than 80% of laboratories receive complaints about test TAT. It was discovered that not only does delayed TAT increase patient unhappiness, but it also increases the length of stay in hospitals.

8	Nitin Kaushik, Victor S Khangulov, Mat thew O'Hara, Ramy Arnaout 2018 Apr	US	Retrospective analysis	indicated that quick turnaround of laboratory testing can help the ED run more smoothly by reducing LOS and improving patient outcomes.
9	Robert C Hawkins	Department of Pathology & Laboratory Medicine, Tan Tock Seng Hospital,		The laboratory's TAT continues to be a source of consumer concern. When the impacts of improvements in intra-laboratory TAT are diluted by pre-analytical and post-analytical circumstances that appear to be beyond their control, laboratory workers can become upset. All routine laboratory tests should ideally be reported as quickly as feasible using methods that produce high-quality findings, with 60 minutes or fewer from sample registration to reporting being ideal.
10	Kiran P Chauhan, Amit P Trivedi, Dharmi k Patel, Bhakti Gami, N Haridas 2014 Oct	Department of Biochemistry , Shree Krishna Hospital & Pramukh Swami Medical College	Root cause analysis	Though monitoring TAT with the use of a laboratory information system is a challenging work, real-time documentation and authentic data retrievable, as well as the identification of causes for delays and their remedial measures, all help to enhance laboratory TAT and hence patient satisfaction.
11	Bruce A. Jones et al 2016 Oct	A College of American Pathologists	comparison Study	While the majority of physicians are satisfied with the reliability and correctness of laboratory test findings, but the turnaround time is an area of dissatisfaction and shows need for improvement.

12	Pati, H.P., Singh, G. November 2012	Indian J Hematol Blood Transfus		the speed with which laboratory results are reported impacts the institution as well as the patient. When the result of routine laboratory tests is delayed, physicians show a tendency to reorder the same test which puts an extra cost on the hospital. In the study, it was stated that more than four-fifths of hospital-based laboratories receive complaints about test turnaround time Pressure to discharge inpatients as quickly as possible, and intense competition in the outpatient testing marketplace is likely to heighten clinicians demands for more rapid laboratory turnaround time in the future.
13	Steven J. Steindel, David A. Novis	College of American Pathologists	descriptive	many laboratories analyzing multiple time intervals help in locating areas where the delay occur and needs improvement. During the study, three phases of laboratory workflow were studied which were pre-analytical, analytical, and post-analytical and outliers were noticed in all phases which can affect the overall TAT of the laboratory.

METHODOLOGY

Research Design: Cross-sectional Observation Study

Duration of the Study: 22 March-19 June 2021

Sample Size: 966 samples were collected from 219 outpatients.

Study Population:

Inclusion Criteria: Clinical Pathology, Special Biochemistry, Serology, Biochemistry, and Hematology reports that were analysed in Asansol Diagnostic Center from 7:00 AM to 5:00 PM.

Exclusion Criteria: All the samples send outside for analysis.

Study Tools

The data for the study was collected.

- HIS
- LIS
- Department TAT Sheet

Data Analysis Tool: Microsoft Excel

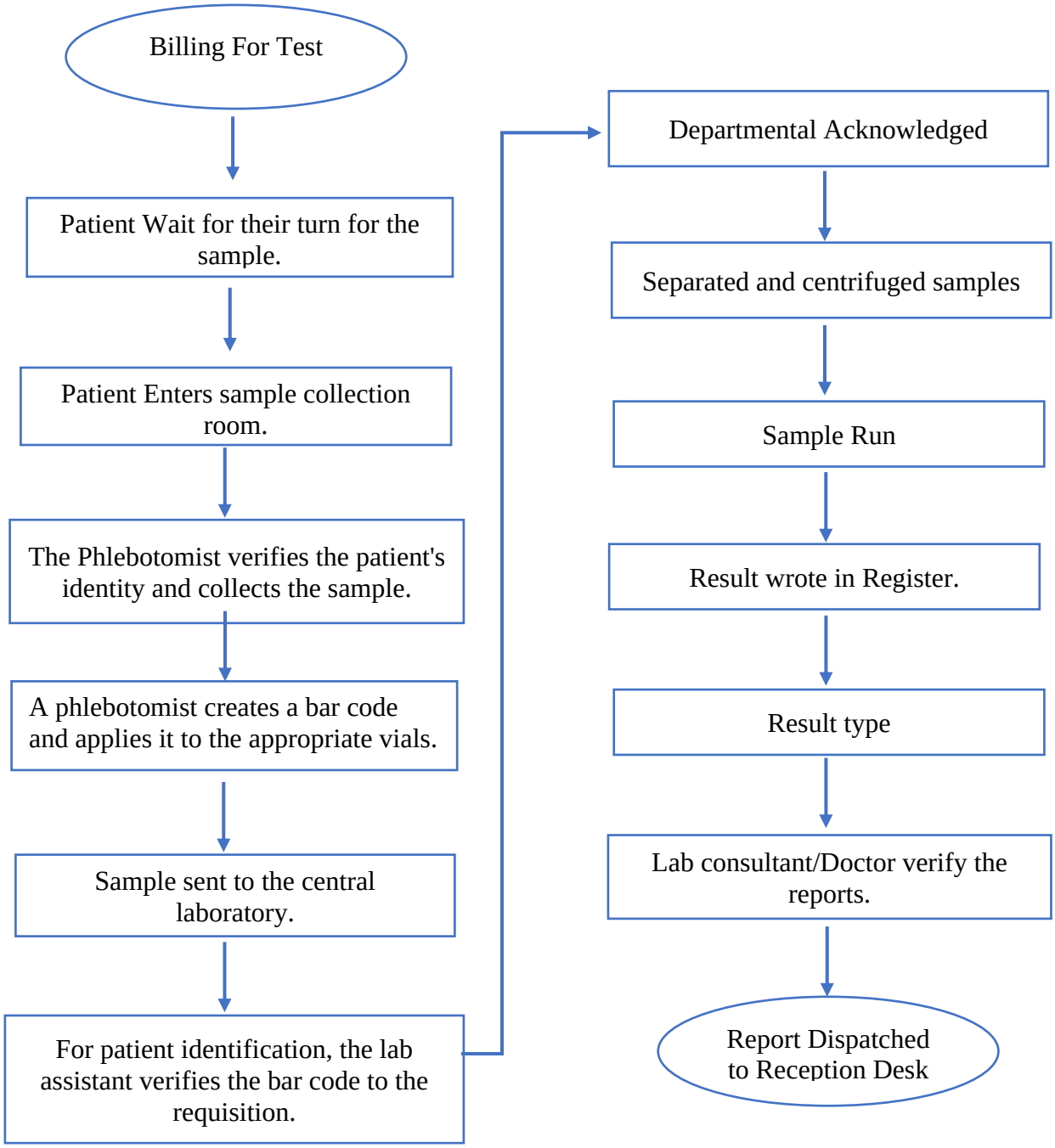
Sampling Technique: Convenient Sampling Technique

LIMITATION OF STUDY:

1. Restricting access to the target person.

2. There are only a few days.

SAMPLE FLOW CHART IN ASANSOL



DATA ANALYSIS

The study included a total of 219 outpatients/diagnostic patients. Haematology, biochemistry, special biochemistry, clinical pathology, and serology were among the 966 samples collected.

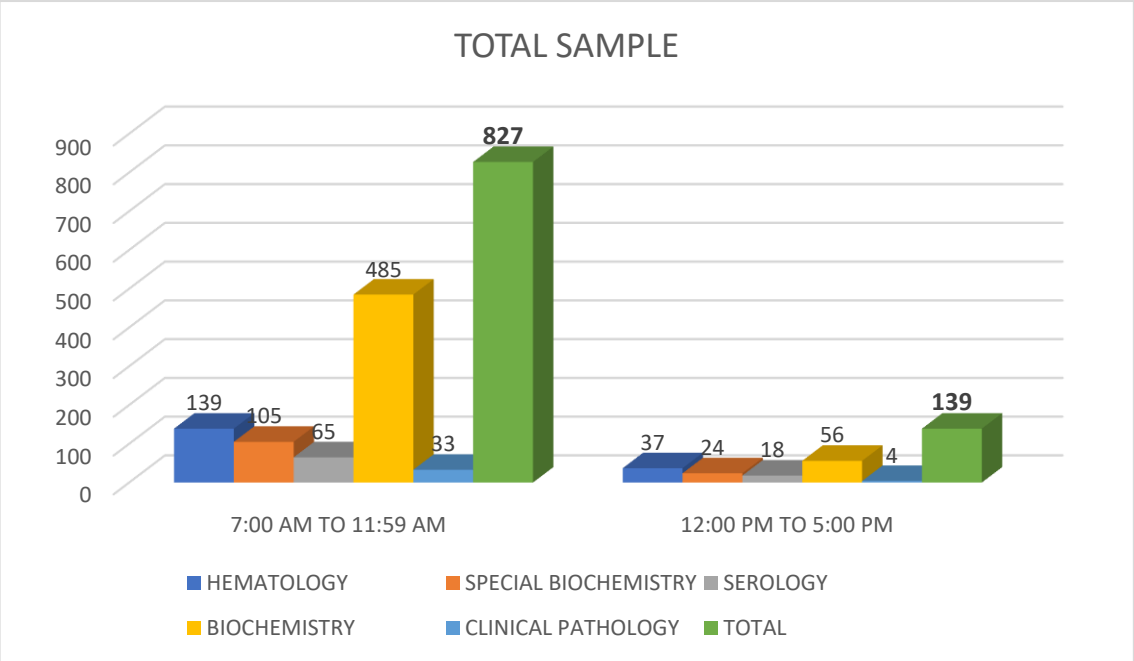


FIGURE: 1

Interpretation: The Total sample graph above shows that 827 samples went through the process in the first half and 139 samples in the second half.

In addition, 139 samples of haematology, 105 samples of special biochemistry, 65 samples of serology, 485 samples of biochemistry, and 33 samples of clinical pathology were found in the first half.

In the second half, there were 37 haematology samples, 24 special biochemistry samples, 18 serology samples, 56 biochemistry samples, and four clinical pathology samples.

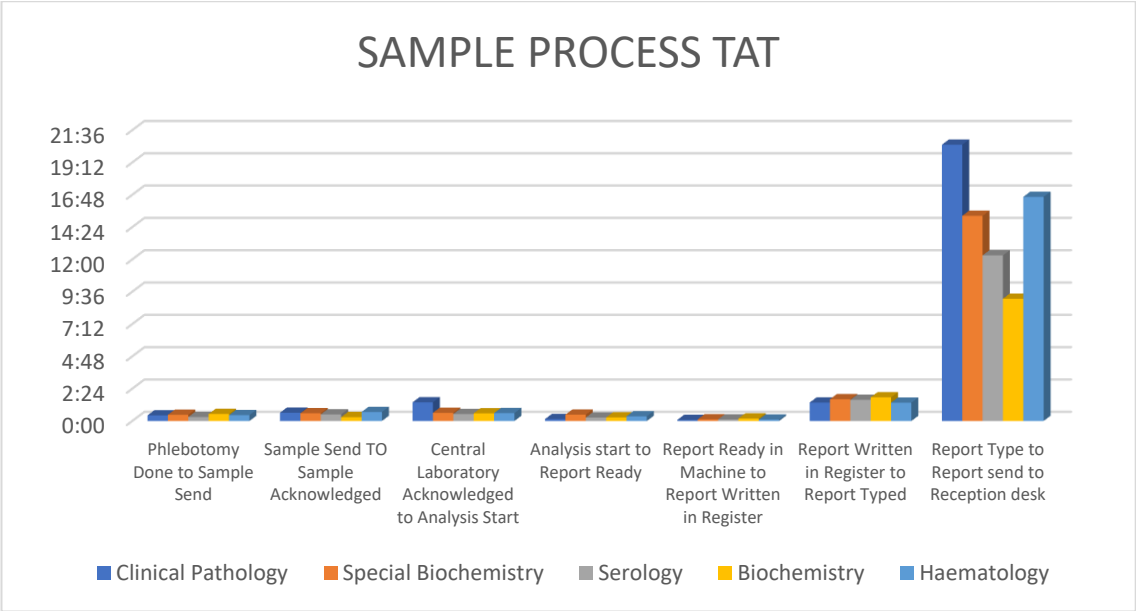


FIGURE: 2

Interpretation: The graph above demonstrates an increase in turnaround time from Report Type to Reception Desk Report, followed by Report Written in Register to Report Typed.

Various TATs were estimated in the following fashion to discover the primary factors for increased OPD/Diagnostic TAT.

- **TAT for Sample Acknowledged** (time difference between sample collection & sample acknowledged)

- **TAT for Result Generation** (time difference between Report Ready in Machine of tests and Analysis Starts)

- **TAT for Report Ready** (time difference between Report Written in Register to report send to the reception desk)

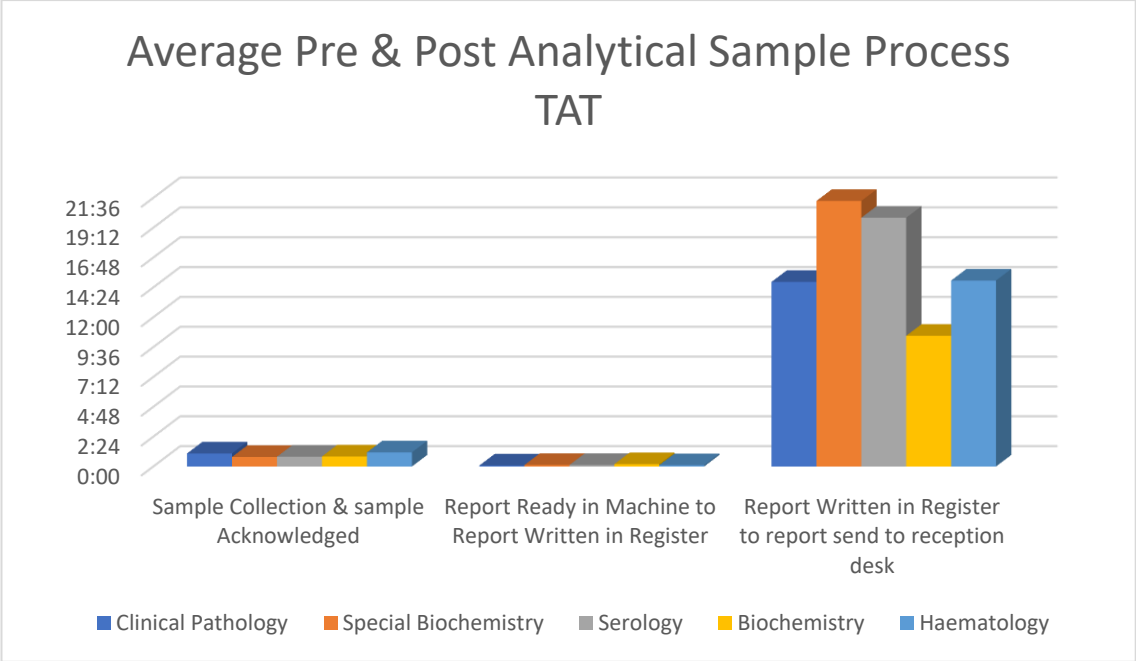


FIGURE: 3

Interpretation: The graph below depicts the rise in turnaround time from Report Ready to Sample Acknowledged to Result Generation.

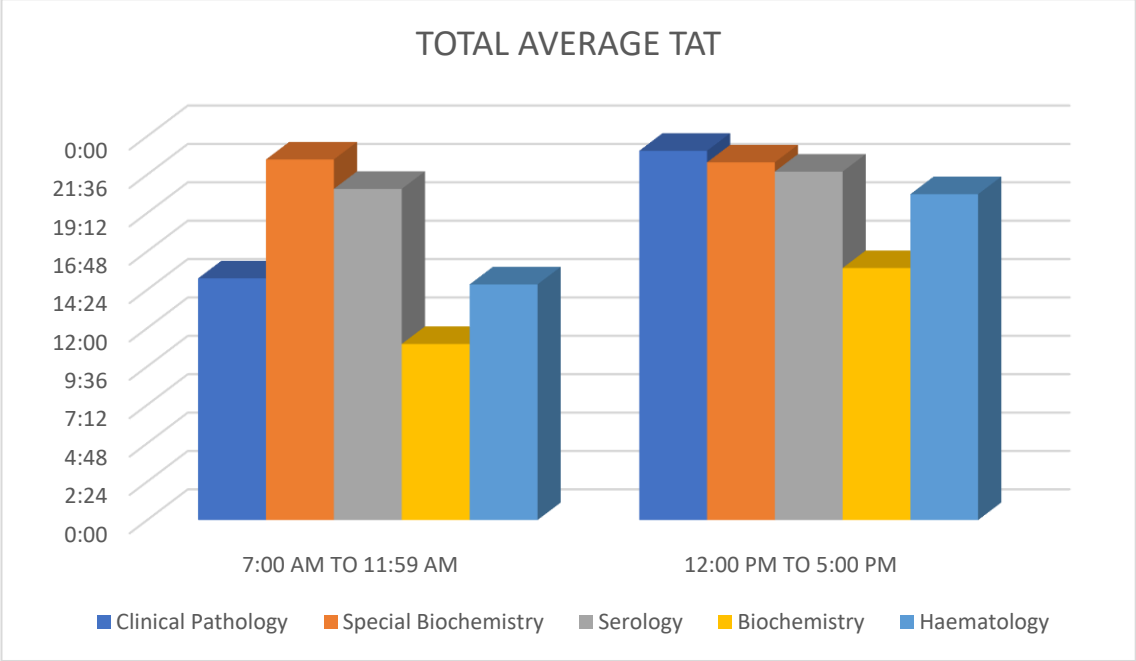
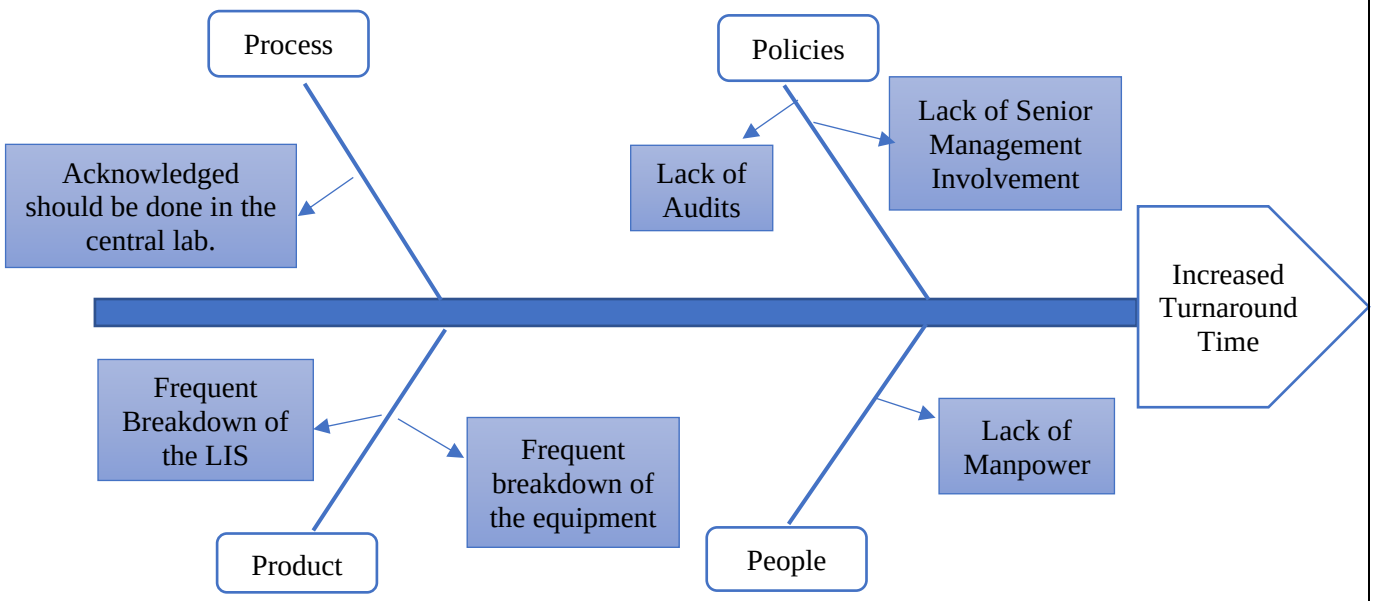


FIGURE: 4

Interpretation: The graph above depicts the Clinical Pathology, special Biochemistry, serology, Biochemistry, and Hematology OPD TAT by department. Clinical pathology had the fastest turnaround at 23 hours 5 minutes, followed by Special Biochemistry at 22 hours and 22 minutes.

ANALYSIS OF THE ROOT CAUSES OF TAT EXCESS



SUGGESTIONS

- To improve TAT regular audits needs to be conducted under the supervision of management person for a monitoring of TAT.
- All phases, including pre-analytical and post-analytical, must be worked on because they are interrelated, and monitoring them will help to improve TAT and ensure quality control.
- Need of authorized person involvement in process also in monitoring and policymaking to smoothen the workflow.

CONCLUSION

According to the study, many outliers affect the laboratory's Turnaround Time (TAT), and to reduce TAT, it is necessary to work on all phases of TAT, including pre-analytical and post-analytical, as these are interrelated, and monitoring these will aid in improving overall TAT as well as ensuring quality services and quality control.

It was discovered that the main cause of Turnaround time was a delay in the laboratory consultants' verification of test reports, which was followed by frequent equipment breakdown and staff shortages during the analytical phase, which increased the TAT of the result, and inefficient use in some places increased the TAT of sample acceptance, as transportation took longer than expected.

To enhance the TAT, policies must be developed and implemented, and audits should be undertaken at regular intervals to ensure patient satisfaction.

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EXTRA GRAPHS & TABLES:

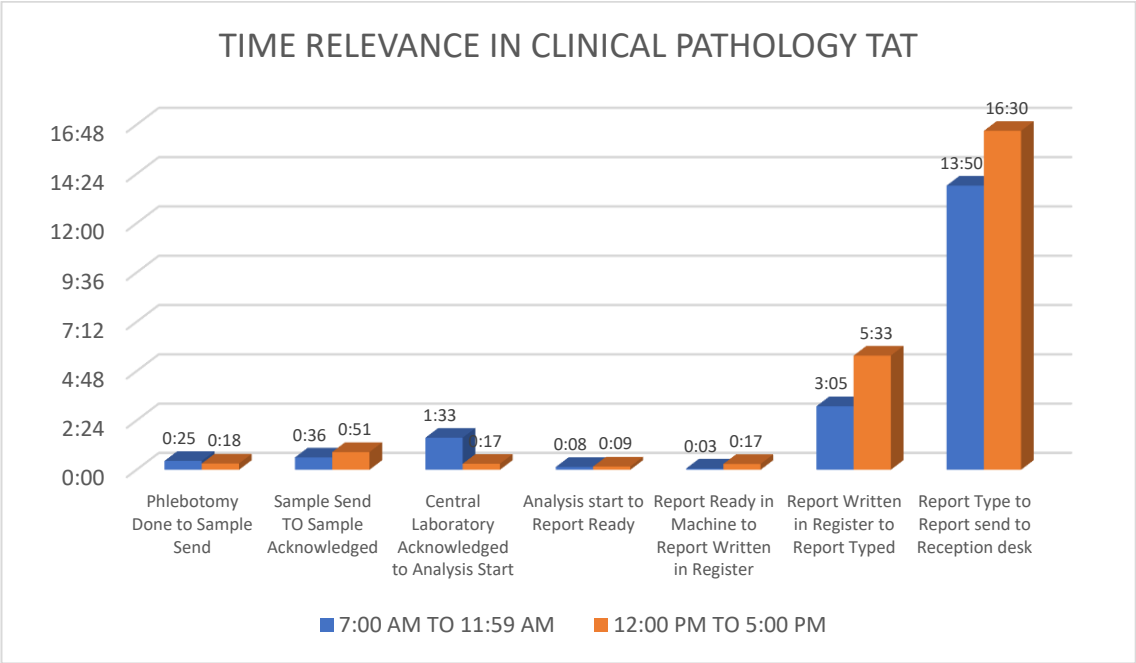

FIGURE: 1

Interpretation: In the Time Relevance in Clinical Pathology TAT, it was discovered that greater time was spent on phlebotomy before the sample was transmitted in the first half. In addition, greater time was spent in the central laboratory, which was acknowledged when analysis began in the first half.

In the second half of the project, more effort was spent on Report Type to Report Send to Reception Desk, followed by a report prepared in Register to Report Typed, and then sample send to sample Acknowledged.

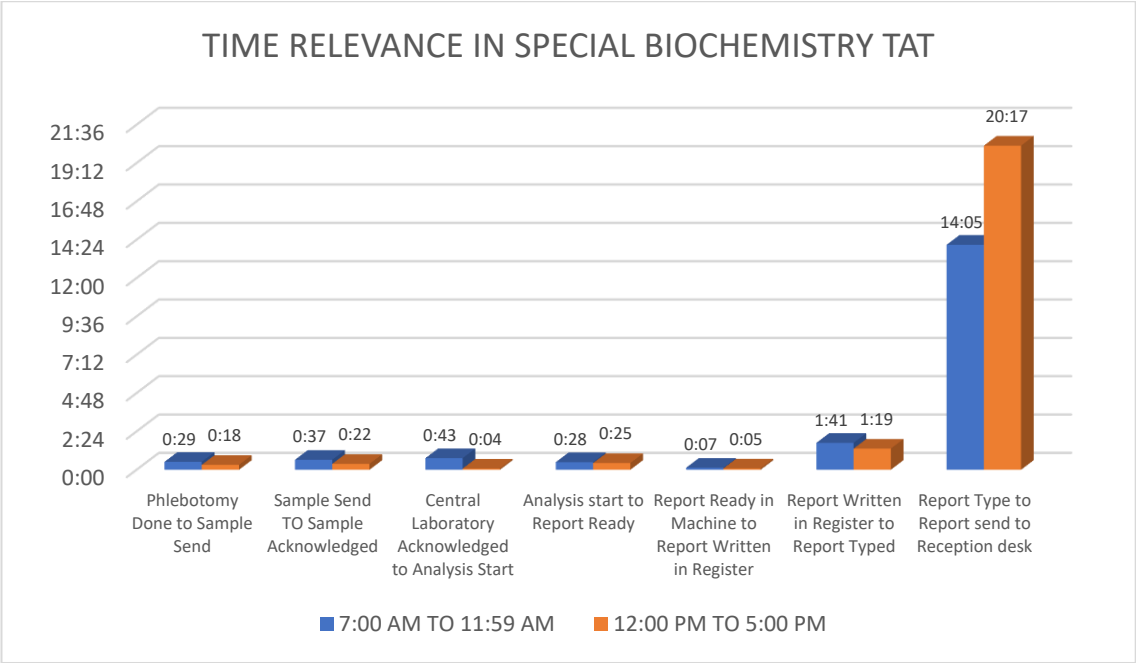

FIGURE: 2

Interpretation: It was discovered that in the first half of Time Relevance in Special Biochemistry TAT, less time is required to transmit a report to the reception desk than in the second half.

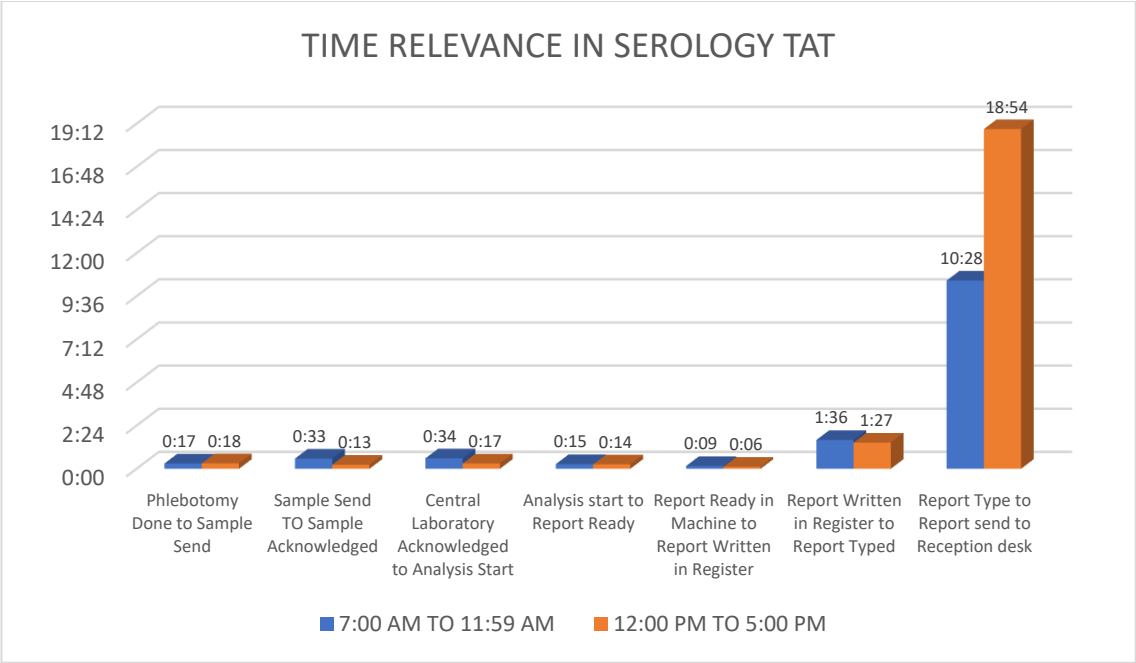

FIGURE: 3

Interpretation: It was discovered that in the first half of the Serology TAT, less time is required in the second half of the Report type to submit the report to the reception desk. In addition, it has been observed that in the first half, greater time is necessary for sample send to sample acknowledgement.

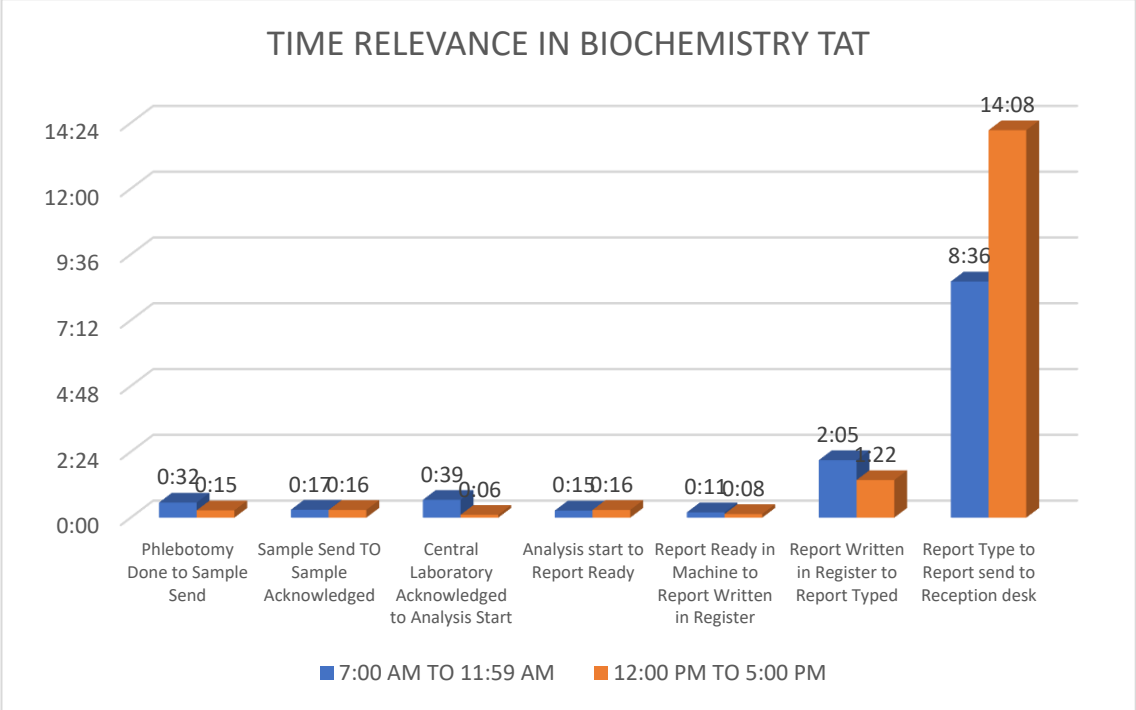

FIGURE: 4

Interpretation:

It was discovered that in the first half of Time Relevance in Biochemistry TAT, less time is required to transmit a report to the reception desk than in the second half.

In addition, it has been discovered that in the second half, more time is necessary for the analysis to begin and for the report to be completed.

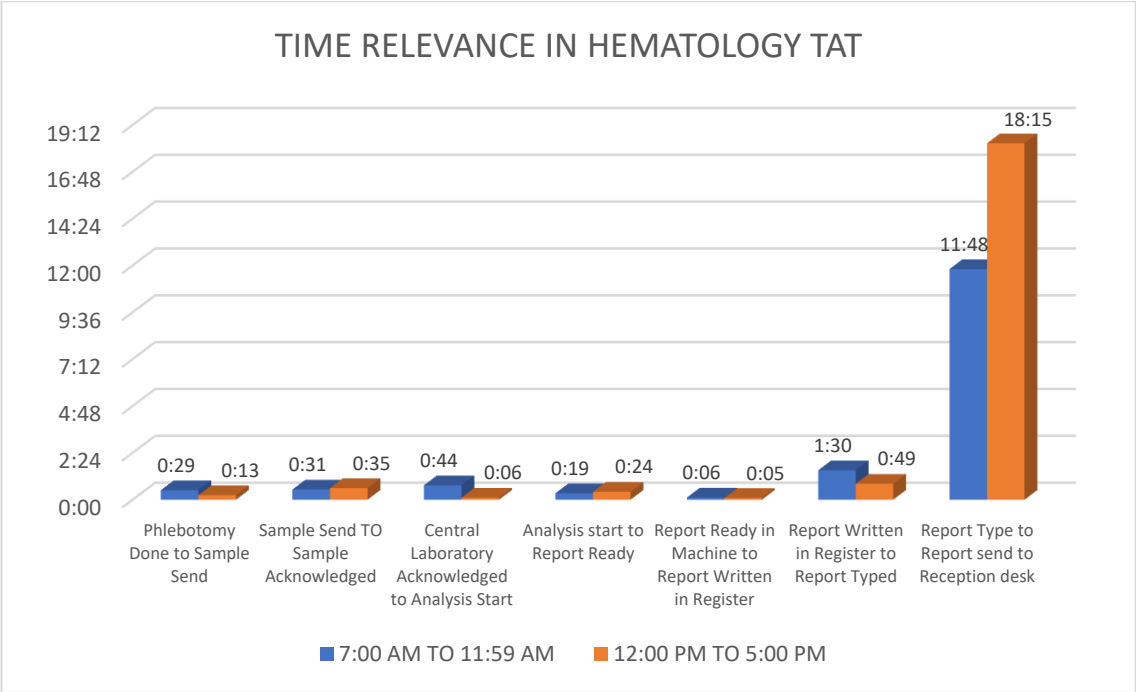

FIGURE: 5

Interpretation: In the first half of the Time Relevance in Hematology TAT, it was discovered that transmitting a report to the reception desk takes less time than in the second half.

Furthermore, it has been established that in the second half, more time is required to begin the analysis and complete the report.

MAIN TAT SHEET

Sr. No.	Date	UHID/ MRN No.	Phlebotomy done	Sample Send for Analysis / Testing	Predetermining of sample/ Name	Analysis Start	Report Ready in Machine	Report written in Register	Report Typed	Report sends to Reception desk

TAT Sheet for Reception

Sr. No.	Date	UHID/ MRN No.	Report Received from which Department	Report Received (Time)	Report Received by Patient (Time)

TAT Sheet for Collection Room

Sr. No.	Date	UHID/ MRN No.	Phlebotomy done	Sample Send for Analysis / Testing in Asansol	Predetermining of sample done in Asansol

TAT Sheet for Laboratory Department

Sr. No.	Date	UHID / MRN No.	Sample Received for Analysis / Testing	Predetermining of sample/ Name	Analysis Start	Report Ready in Machine	Report written in Register	Report Typed	Report sends to Reception desk