

Study on Process Mapping and Turnaround Time (TAT) For
Diagnostic Service Delivery in Home Health Care

By

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*Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management*

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Kingshuk Kar**, student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone dissertation training at Portea Medical, Bangalore from 1st March to 25th May, 2016.

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific & analytical.

The Internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.



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The certificate is awarded to

Dr. Kingshuk Kar

In recognition of having successfully completed his
Internship in the department of

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He has successfully completed his Dissertation on

**Study on the process mapping and TAT in delivery of diagnostic Services in
Home Health care with the scope of refinement**

25th May, 2016

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He comes across as a committed, sincere & diligent person who has a
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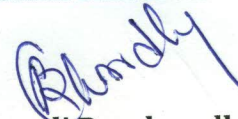
We wish him all the best for future endeavors

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CERTIFICATE BY SCHOLAR

This is to certify that that dissertation titled **“A study on the process mapping and turnaround time (TAT) for diagnostic service delivery in home health care”** and submitted by **Kingshuk Kar**, Enrollment no. **IIHMR-U/MBA-HM/2014-2016/19-0160** under the supervision of **Dr. Barun Kanjilal** for award of MBA in Hospital and Health management of the University carried out during the period from **1st March, 2016 to 24th May, 2016** embodies my original work and has not formed the basis for the award of any degree, diploma associateship, fellowship, titles in this or any other institute or other similar institution of higher learning.



Signature

Date: 31.05.2016.

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DISSERTATION REPORT:

2.1 INTRODUCTION:

Home Healthcare services are provided by healthcare professionals to patients at their own homes, also called formal or skilled care services. Growing at a rate of 15 per cent current estimates put the global value of the home healthcare market at \$140 billion. The Indian home-healthcare market, which stands at \$ 1.5 billion, is also waking up to the market opportunities with MNCs foraying into the nascent market.

The Diagnostic market:

Diagnosis is always the first step to disease management as without accurate identification; there is no chance for accurate treatment. The **“Indian Diagnostic Market Outlook to 2015”** says that the Indian diagnostic market is broadly divided into equipment and services. The service sector is largely unorganized, with a large presence of players located at the regional or city level. However, a clear and structured format is being established to have better regulations and proper definition for the market. The industry is comprised of more than 100,000 labs across the country and only 10 per cent of the market is consolidated by three major players. The major segments which need services of diagnostic players are the doctors who prescribe tests to patients, corporate clients for wellness programmes and clinical trial lab support as well as routine laboratories and hospitals who need a referral centre for specialised tests. With the rising awareness for healthcare, demand for good quality diagnostics has grown as well, and customers prefer to partner with laboratories demonstrating high levels of accuracy and service. The other major change has come through advances in technology and automation of equipment, resulting in reducing the turnaround time for reports and providing quicker diagnosis. The focus is on convenience to customers, be it through all varieties of tests processed in India, home health services, using technology for result communication or providing a network of collection centres for easier access.

New Trends:

The bigger diagnostic players like SRL, Metropolis and Dr. Lal Path including big multispecialty hospitals like Apollo coming up with its own home care lab services and Manipal partnering with Portea to provide its customers the option of a home sample collection. We are witnessing many trends that will create substantial changes in the

landscape of the industry in the coming years. With more information and awareness, preventive healthcare and self monitoring are becoming more popular. There is a conflict between increasing lifestyle diseases in the population and increase in levels of awareness about mortality ratio of these diseases. We now see young adults between ages of 30-45 years suffering from heart attacks and severe diabetes. Using tools like health checks and regular testing, these deadly diseases can be curbed and a healthy life can be enjoyed by taking necessary precautions. The business model has expanded beyond diagnostic tests to offering wellness solutions including services like dentistry and nutritional guidance under one roof. This trend however, is yet to reach Tier-II, Tier-III cities, small towns and rural areas where health awareness is minimal. Various government bodies and NGOs are engaged in improving the awareness level of people living in smaller townships. However, lack of sufficient manpower as well as infrastructure limits the success of these programmes. Currently, leading chains like Metropolis are reaching even small towns with the message of keeping good health by providing customers access to regular blood monitoring. The focus of the government should be to initiate public-private partnerships (PPP) that reach large number of patients and provide easy access to diagnostic facilities at their doorstep using the existing public facilities and expertise of private labs. Improvement in test facilities at government hospitals must be done by introducing automation in equipments, keeping costs low without compromising quality, training of personnel or using information technology to store health records. Hence, on this background we will see the diagnostics industry get more regulated in the coming years which will result in improvement in standards for the entire industry and accreditations, local and global, will play an important role in differentiating an average laboratory from a good quality laboratory.

The Future:

The deeper penetration of the health insurance industry in India will lead to closer integration of the health insurance industry with diagnostic centres. As the number of people holding health insurance policies expands and outpatient diagnostics gets covered, we will see health insurance companies partnering with diagnostic centres for standardised services. The focus will be to partner with good quality labs as health insurance companies would want to ensure the pre-existing diseases are correctly identified so their monetary outgoing for claims are kept low. Diagnostic partners will play a very important role in identifying and monitoring disease trends in health insurance policy holders. Some insurance schemes even motivate

patients to keep disease levels low by offering lower premiums, and labs will be the key third party partner for monitoring the same.

2.2 REVIEW OF LITERATURE:

Home health care industry- Global Scenario

Home healthcare, also referred to as formal or skilled care, is the support and care services that healthcare professionals provide at the patient's own home.[2] These care services include respiratory therapy, home infusion therapy, rehabilitation services, telehealth, unskilled home care, and other services. The global home care and self care market has grown at a CAGR of 8.4% between 2009 and 2014. [7] During the past five years, industry growth in the US has been fostered by an aging population, the prevalence of chronic disease, growing physician acceptance of home care, medical advancements and a movement toward cost-efficient treatment options from public and private payers. [8] However, despite strong past growth, industry funding from government sources has come under intense pressure in recent year. In the next five years, Medicare and Medicaid reimbursement cuts will continue to seriously threaten the industry. Nevertheless, strong and steady revenue growth seems likely for the Home Care Providers industry in the next five years, as a result of an aging population and increasing interest in home healthcare. [8]

According to the Bureau of Labour Statistics US, approximately 1.3 million additional jobs within the homecare field will be added through 2020. In fact, they report that those working in home health positions will see a 69 percent growth through 2020, while those in personal care aide positions will see a 70 percent growth. Compared to the 14 percent growth rate that all jobs on average are expected to have, the home care industry is expected to have a substantial increase in the coming years.

There are numerous reasons why the home care industry is seeing such accelerating growth, including:

Increase in need- Millions of people are reaching an age where they will need some sort of homecare, increasing the expanse of the industry. With so many people in need, the industry will respond by growing to accommodate the demand.

Affordability- Many people are realizing that home care is a much more affordable route to providing people with the assistance they need. This is especially true when compared with such things as assisted living facilities and nursing homes.

Aging in place- People are beginning to understand the importance of helping the elderly be able to age in place, or stay in their own home. This helps them maintain some independence, be happier, and be able to stay in their familiar surroundings. Home care is the option that allows them to do this.

Convenience- Rather than taking the elderly or sick out of the home for appointments the homecare industry can bring many of those to the person. This provides a convenient route to getting people the assistance they need.

Home health care industry – Indian market

India has the second largest geriatric population in the world. According to a United Nations Population Fund report, the number of people age 60 and over in India will increase from 100 million in 2011 to 300 million by 2050 [4]; this means one in five Indians will be above the age of 60. Of the 300 million over-60s, 200 million are likely to be suffering from chronic ailments. Already, non-communicable diseases including cardiovascular diseases, diabetes, chronic obstructive pulmonary disease and cancer cause around 50% of all deaths in India

According to Accel Partners report, the home health care market in India, currently estimated to be a \$2 billion to \$4 billion-a-year opportunity, is driven by an aging population, the increasing prevalence of chronic diseases and the need for better quality post-operative and primary care.[4]

In India, Portea medical, a pioneer in home health care provides doctors, nurses and physiotherapists who have passed rigorous hiring standards along with trained attendants for the old and sick who have difficulty moving around. [10] Portea works with hospitals, insurance companies and individuals. The company has five tiers-I corporate hospitals as partners, a network of referring physicians and handles around 2,000 home visits a month. Portea's procedures were developed in consultation with professionals in the US. Portea gets revenue from two streams – direct-to-consumer and business to business (B2B). In the former, it charges patients either for each visit or a flat annual fee. In the latter, mainly for geriatric and chronic patients, it charges an annual fee for customized services. B2B partners comprise hospitals and insurers. [11]

Diagnostic Overview

Diagnosis is always the first step to disease management as without accurate identification; there is no chance for accurate treatment. Hence, on this background we will see the diagnostics industry get more regulated in the coming years which will result in improvement in standards for the entire industry and accreditations, local and global, will play an important role in differentiating an average laboratory from a good quality laboratory. The diagnostic market as of now is more price regulated but quality and efficiency would be a major differentiating factor for any organization giving them a huge competitive advantage.

2.3 RATIONALE:

Most of patients who require diagnostics require quick and reliable diagnosis for early prognosis or an early start of treatment; hence price would be a major factor once a patient gets service comprehension and value. A process mapping and turnaround time becomes very important to deliver the services to the customer within the stipulated time and maintain the quality of the service.

2.4 RESEARCH QUESTION:

What is the current process structure in diagnostic home care delivery and how do you bridge the gaps associated with it?

2.5 OBJECTIVES OF THE STUDY:

1. To assess the present process structure in diagnostic home care delivery and the barriers associated with it, in accordance with consumers and providers.
2. To recommend changes in the current process structure.

2.6 DATA COLLECTION AND METHODOLOGY:

Data collection is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes.

The procedure followed is enumerated below:

2.7 RESEARCH METHODOLOGY:

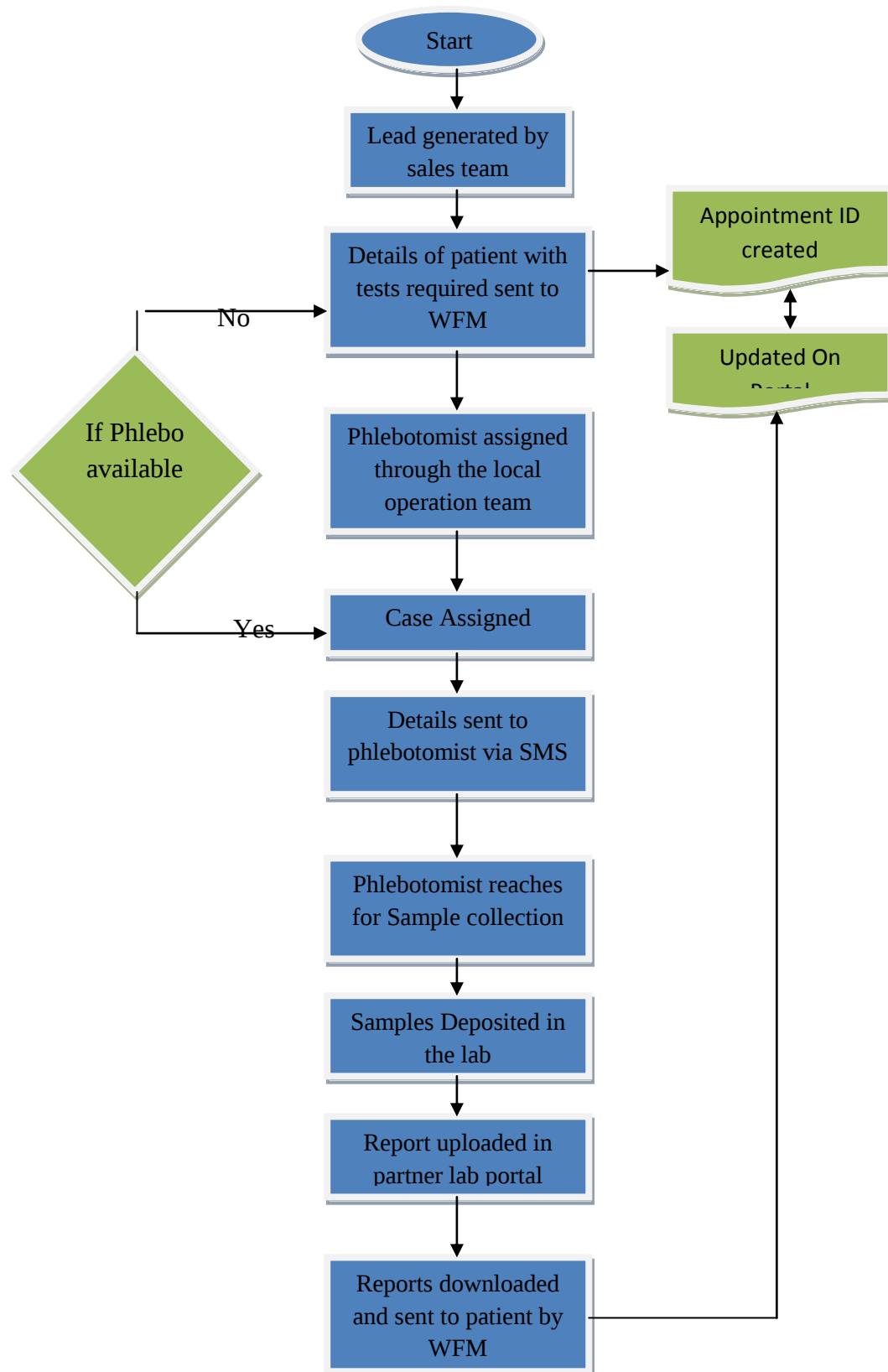
1. **Study Type** – The study is a Descriptive study.
2. **Sampling Method** – Convenience sampling was used to select the cases for the research.
3. **Sample Size** – A sample size of 151 patients was selected from Bangalore.
4. **Study Period** – The study period was from 1st April to 20th May 2016
5. **Study Technique** – Primary data and Secondary data from the organization MIS was collected.
6. **Data Analysis** – The tool used for process mapping was- Process flowcharting. The data collected was arranged and analyzed with the help of MS-Excel.
7. **Ethical Considerations**- The confidentiality of the data given by respondents was maintained.

2.8 ETHICAL CONSIDERATION:

- Rights of the respondents and informed consent were ensured.
- Rights of the institution where the study is conducted was ensured
- Scientific Honesty was maintained.
- No sensitive issues were explored before building a good relationship with the informant and making him/ her comfortable
- Privacy & confidentiality of data obtained was ensured.

2.9 PROCESS MAPPING FOR DIAGNOSTIC HOME CARE DELIVERY

The current process which is being followed right now in Portea Medical for the diagnostic service delivery at home, it depicts the various operational steps and the stake holders involved within the process.



Abbreviations used: Phlebo – Phlebotomist, WFM-work force management (the operations team), Lead generated - patient acquired.

2.10 RESULTS: The process flow for diagnostic service delivery was broken down to 4 key steps:

- Case assignment
- Sample collection
- Sample processing
- Report delivery

Turnaround time was defined for each step by the internal quality department as there is no regulatory body to define the standard turnaround time (TAT) in diagnostic service delivery at home.

➤ The Standard TAT set for each step are:

- Case assignment - 2 Hrs
- Sample collection- 0.5 Hrs
- Sample processing- 6 Hrs
- Report delivery- 1 Hr

Turnaround time (TAT) for each step was noted and the percentage of cases falling within the stipulated TAT and percentage of cases falling beyond were represented in the form of pie charts and the reasons behind the extended TAT was also noted and based on the their frequency they were analyzed using the Pareto chart.

Step1. Case Assignment: It is the time between the patient's call to the sales team and assignment of a clinician by the operations team for the patient. The standard TAT set up by the quality team within Portea for case assignment is 2Hrs.

Inference: The total no of patients included in the survey was 151 out of which in 61 (40%) patients the TAT was more than 2hrs as shown in Fig. 1.1

Fig 1.1 Percentage of TAT with respect to Case assignment

■ No of cases with increased TAT
■ No of cases in accordance to the TAT

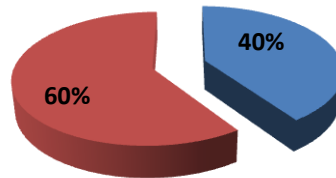


Fig: 1.1

Fig. 1.2 Reasons for delay in TAT

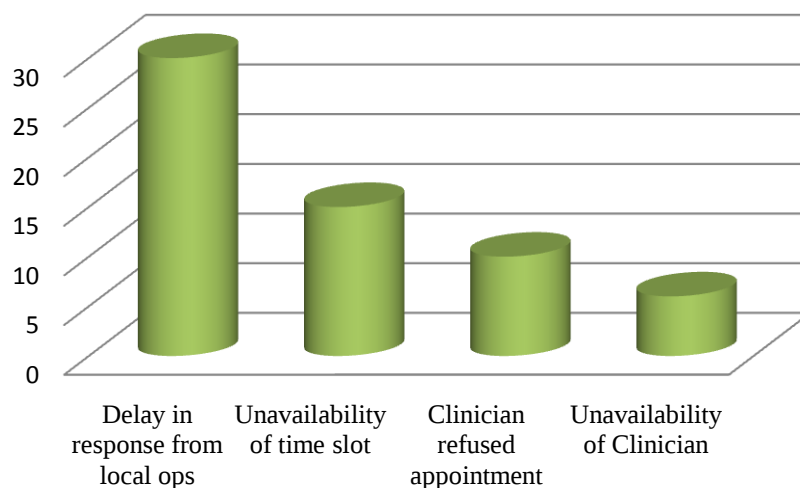


Fig: 1.2

Inference: According to Fig.1.2 in 61 cases where the TAT was beyond the standard time the reasons for delay are

- 49.18% of cases happened due to delay in response from the local operations team.
- 24% of cases delay was due to unavailability of time slot.
- 16% cases the delay was due to clinician refusing service.

- 9.8%cases the delay was due to clinician unavailability.

Step2. Sample collection: It is the time between the actual times of appointment scheduled and the time the phlebotomist/clinician reached the patients house for sample collection.

Inference: The total no of patients included in the survey was 151 out of which in 30 (20%) patients the TAT was more than 30minutes which is set by the quality team within Portea as shown in Fig. 2.1.

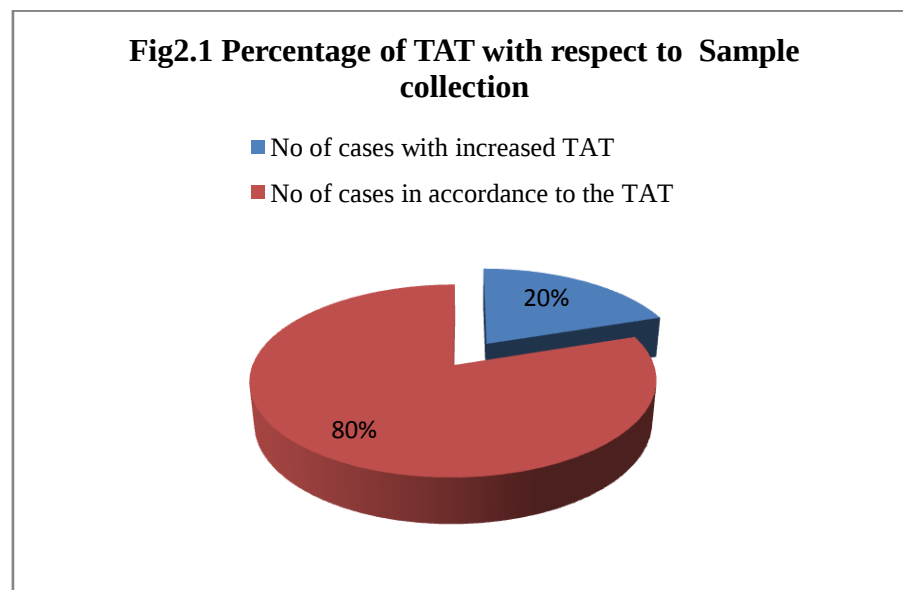


Fig: 2.1

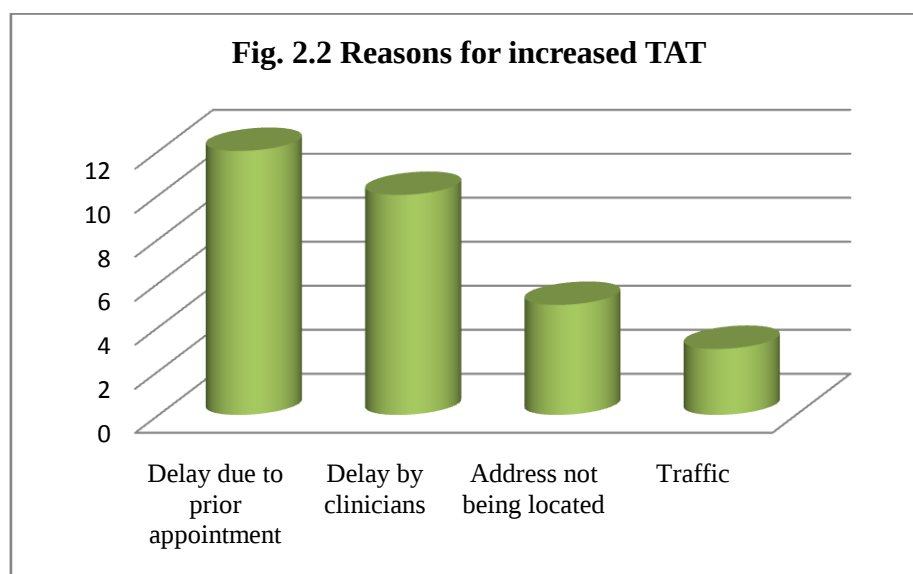


Fig: 2.2

Inference: As shown in Fig.2.2 out of 30 cases where the TAT was beyond the standard time of 30minutes and the reasons for delay are

40% of cases TAT was increased due to prior appointment of the clinician.

33% of cases TAT was increased due to the delay by the clinician.

16% of cases TAT was increased due to address not being located by the clinician.

10% of cases TAT was increased due to traffic which causes a delay to reach the customers place.

Step3. Report processing: It is the time taken by the partner lab in processing the samples from the time it is deposited in the lab.

Inference: The total no of patients included in the survey was 151 out of which in 116 (77%) patients the TAT was more than 6hrs as shown in Fig. 3.1.

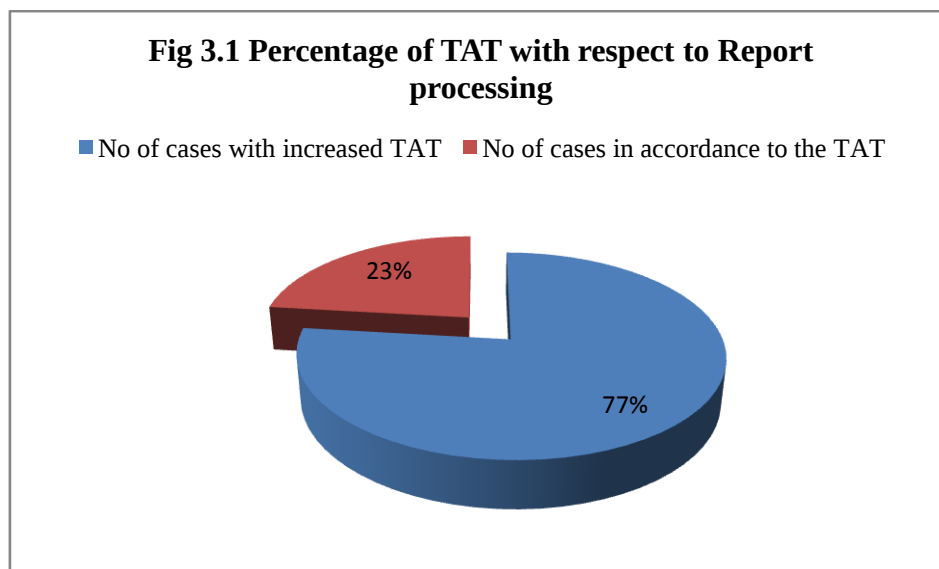


Fig. 3.1

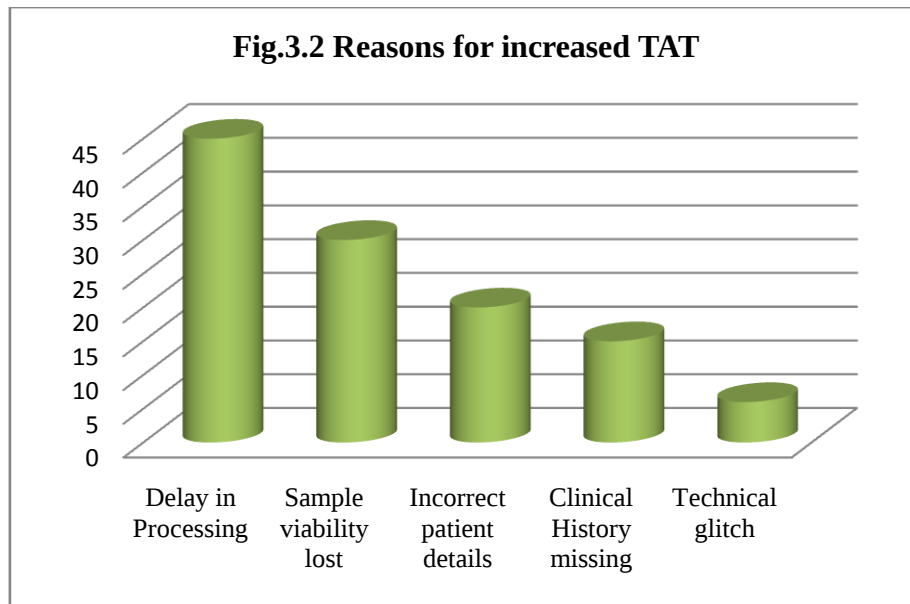


Fig. 3.2

Inference: As shown in Fig. 3.2 out of 116 cases where the TAT was beyond the standard time of 6hrs and the reasons for delay are

39% of cases TAT was increased due to delay due to reports being received post the working hours.

26% of cases TAT was increased due to sample viability being lost.

17% of cases TAT was increased due to incorrect patient details entered in the system

13% of cases TAT was increased due to Clinical history missing for the patient.

5% of cases TAT was increased due to a technical glitch in the system due to which reports are not being downloaded and sent to the patient.

Step4.Report delivery: It is the time taken by the operation team to upload the reports on the portal after receiving from the partner lab.

Inference: The total no of patients included in the survey was 151 out of which in 39 (26%) patients the TAT was more than 1hr as shown in Fig. 4.1.

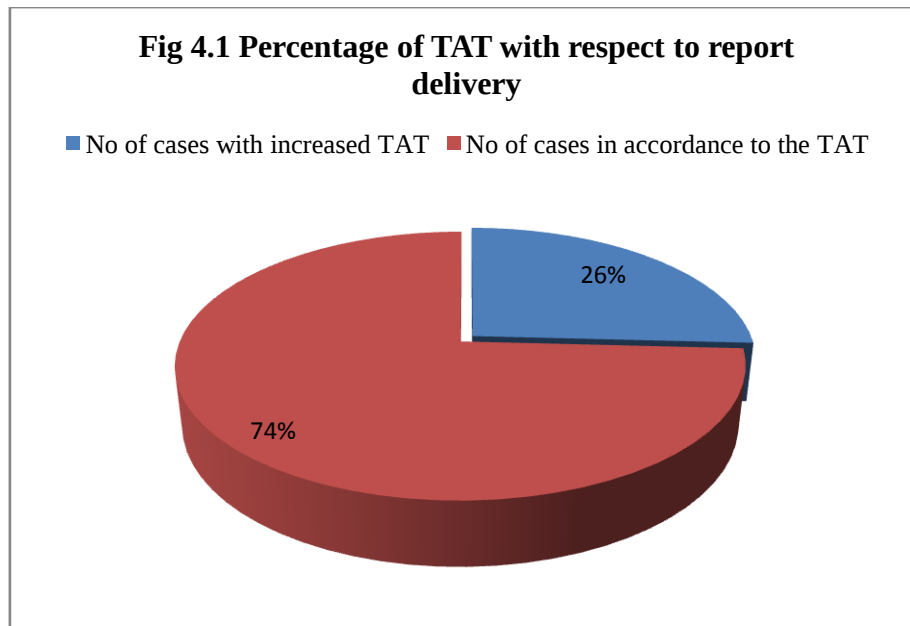


Fig. 4.1

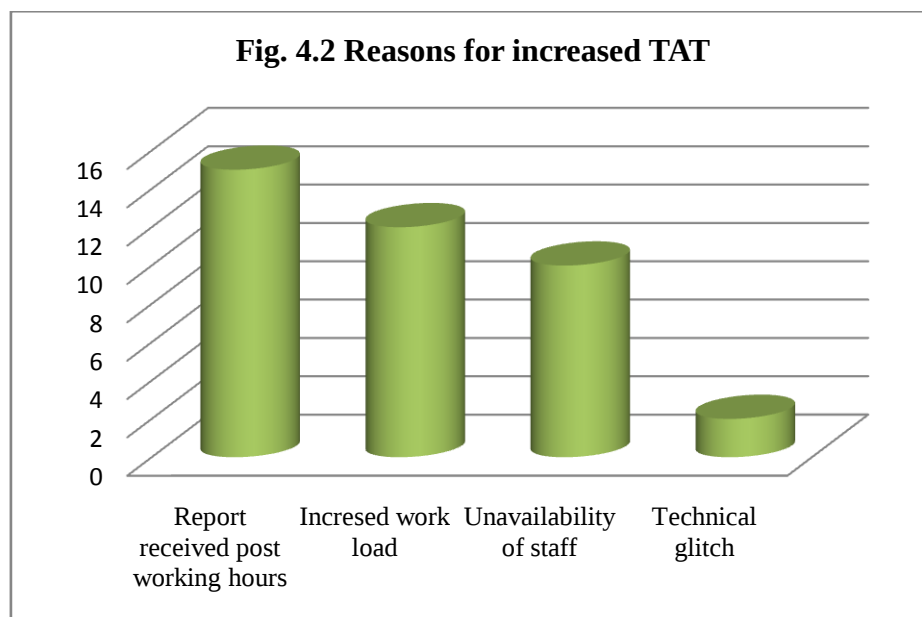


Fig. 4.2

Inference: As shown in Fig.4.2 out of 39 cases where the TAT was beyond the standard time of 1hr, and the reasons for delay are

39% of cases TAT was increased due to reports being sent post working hours of the operations team

31% of cases TAT was increased due to increased work load of the operations team thereby causing a delay in the updating of the reports on the portal.

25% of cases TAT was increased due to unavailability of staff

5% of cases TAT was increased due to a technical glitch in the system.

2.11 CONCLUSION:

Process mapping and turnaround time (TAT) are one of the key ways to maintain and monitor the quality of service delivery and bridge the gaps within the process flow, since the no of stake holders involved are many in the delivery of diagnostic services, it is essential as to what corrective and sustainable steps are taken to improve the overall experience of the customer.

According to the study done, it can be concluded that TAT for diagnostic delivery in home health care is reasonably high as compared to the standard TAT that has been set as parameters for each step. The market being still in the nascent stage, and the diagnostic market mostly governed by prices and reliability, service comprehension and timely delivery of service is something that has been ignored by majority of all the diagnostic chains but with increasing competition this could serve as a differentiating factor for all organizations and add value to the service thereby increasing the customer experience and better retention.

2.12 RECOMMENDATIONS:

- **Case Assignment:** The assignment of cases as of now happened with the assistance of local ops which need to be replaced with geographical mapping of Phlebotomists thereby creating a centralized assigning system which would project the availability of a particular Phlebotomist at a specified location and a specified time to the WFM thereby assisting in clinician assignment faster and more efficiently.
- **Service Delivery Time:** A real time update on the app or via sms to the customer detailing about the location of the phlebotomist and updating the current status or delay to the client.
- **Sample Processing:** Prescribing a standard TAT for sample processing to all partner labs based on tests and penalizing them based on any delay in adhering to that TAT.

- Report delivery: Creating /Providing an API login to all partner labs where a partner lab can directly upload all reports to our Portal instead of us going and downloading it manually from their portal and then uploading it in our portal.

2.13 References:

1. John TJ, Dandona L, Sharma VP, Kakkar M. Continuing challenge of infectious diseases in India. *Lancet* 2011; published online Jan 12.DOI:10.1016/S0140-6736(10)61265-2
2. Dales RE, Burnett R, Zwanenburg H. Adverse health effects among adults exposed to home dampness and molds. *Am Rev Respir Dis* 1991; 143: 505-509.
3. Dales RE, Zwanenburg H, Burnett R, et al. Respiratory health effects of home dampness and molds among Canadian children. *Am J Epidemiol* 1991; 134: 196-203.
4. The healthy homes initiative: A preliminary plan. Washington, DC: Department of Housing and Urban Development, Office of Lead Hazard Control; 1999. Available at: www.hud.gov/offices/lead/library/hhi/HHIFull.pdf. Accessed April 18, 2008.
5. Dowd MD. Childhood injury prevention at home and play. *Curr Opin Pediatr* 1999; 11: 578-582.
6. Jacob B, Ritz B, Gehring U, et al. Indoor exposure to molds and allergic sensitization. *Environ Health Perspect* 2002; 110: 647-653.
7. Leaderer BP, Belanger K, Triche E, et al. Dust mite, cockroach, cat, and dog allergen concentrations in homes of asthmatic children in the northeastern United States: Impact of socioeconomic factors and population density. *Environ Health Perspect* 2002; 110: 419-425.
8. Litonjua AA, Carey VJ, Burge HA, et al. Exposure to cockroach allergen in the home is associated with incident doctor-diagnosed asthma and recurrent wheezing. *J Allergy Clin Immunol* 2001; 107: 41-47.
9. Matte TD, Jacobs DE. Housing and health: Current issues and implications for research and programs. *J Urban Health* 2000; 77: 7-25.
10. Klitzman S, Caravanos J, Deitcher D, et al. Prevalence and predictors of residential health hazards: A Pilot Study. *J Occup Environ Hyg* 2005; 2: 293-301.
11. Danzig LE, Short LJ, Collins K, et al. Bloodstream infections associated with a needleless intravenous infusion system in patients receiving home infusion therapy. *JAMA* 1995; 273: 1862-1864.