STUDY OF DRUG DISPENSING PROCESS AND TURNAROUND TIME IN OUTPATIENT PHARMACY IN CKB HOSPITAL, JAIPUR

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Project Overview

Research Question

How drug dispensing is related to turnaround time in OP pharmacy?

Approach

Primary Research

- Visit to OP Pharmacy - 2 months*
- Interactions with Pharmacy staff
- Turnaround time of OP pharmacy clients
- Audit of prescriptions
- Visits to 6 pharmacies outside hospital**

Secondary Research

- Analysis on data from HMIS - 1 month*
- Relevant project reports from IIHMR repository, Internet sources

Insights were drawn from the analysis done post research & suggestions were given

*1/March/2019-03/May/2019 [observation period]
** 3 outside pharmacies, 3 hospital pharmacies

Objectives of the study

1. To capture turnaround time in OP pharmacy
2. To carry out prescriptions audit arriving at OP pharmacy
3. Identification of the bottleneck responsible for delay (if any) in prescription processing
4. To suggest measures to minimize drug dispensing time

Material and methods

Study design: observational descriptive design

Setting: out-patient pharmacy, Rukmani Birla Hospital, Jaipur

Total population: 6038 clients who have visited OP pharmacy in March 2019

Inclusion criteria: clients arriving at the OP pharmacy counter in OPD hours

Exclusion criteria: clients arriving after OPD hours, Sundays, clients arriving before 9:00 A.M.

Duration of study: 2 months (1st March 2019- 3rd May 2019)

Sample size:

a) 357 for turnaround time

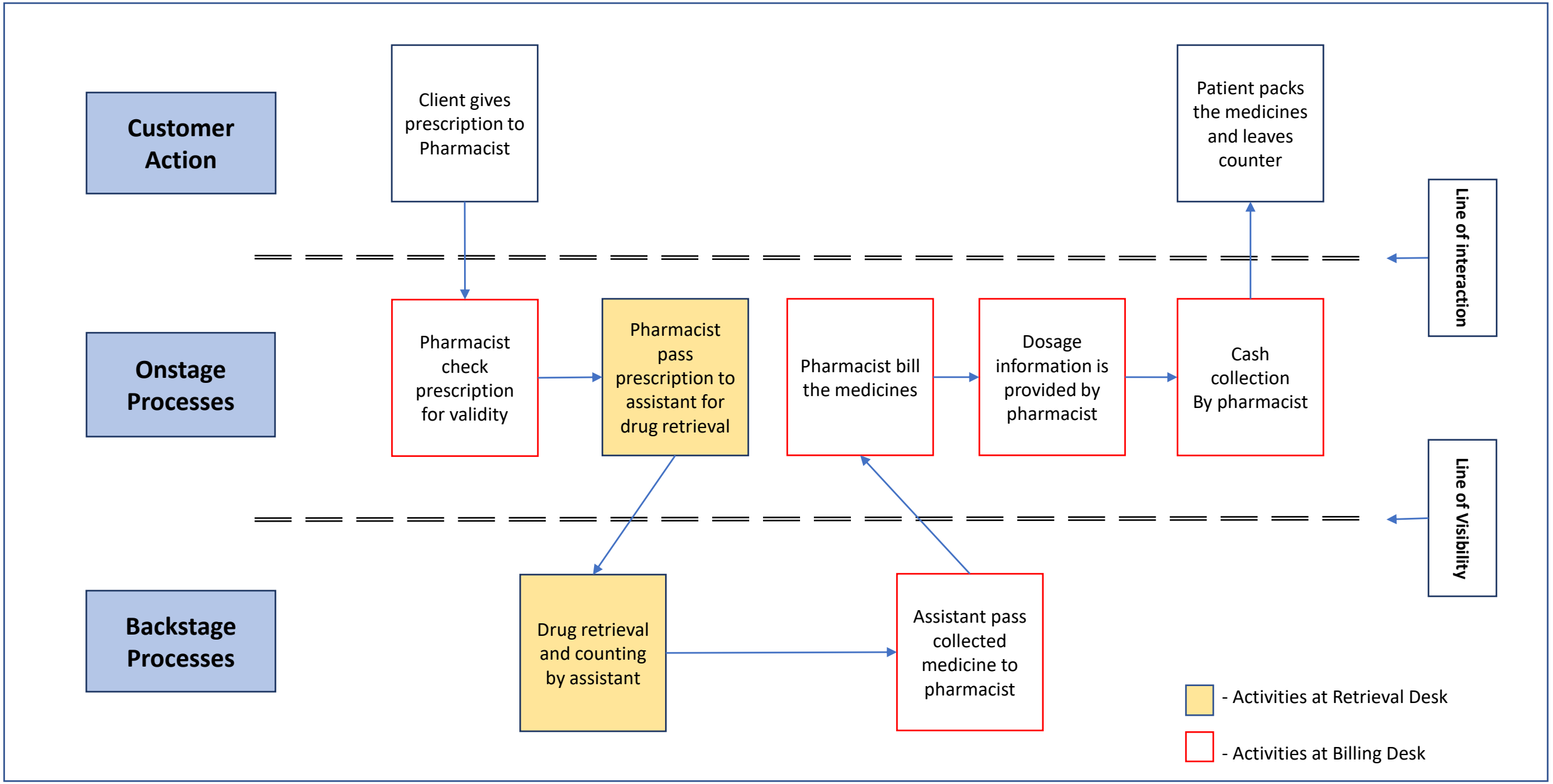
b) 457 prescription audits

Sampling technique:

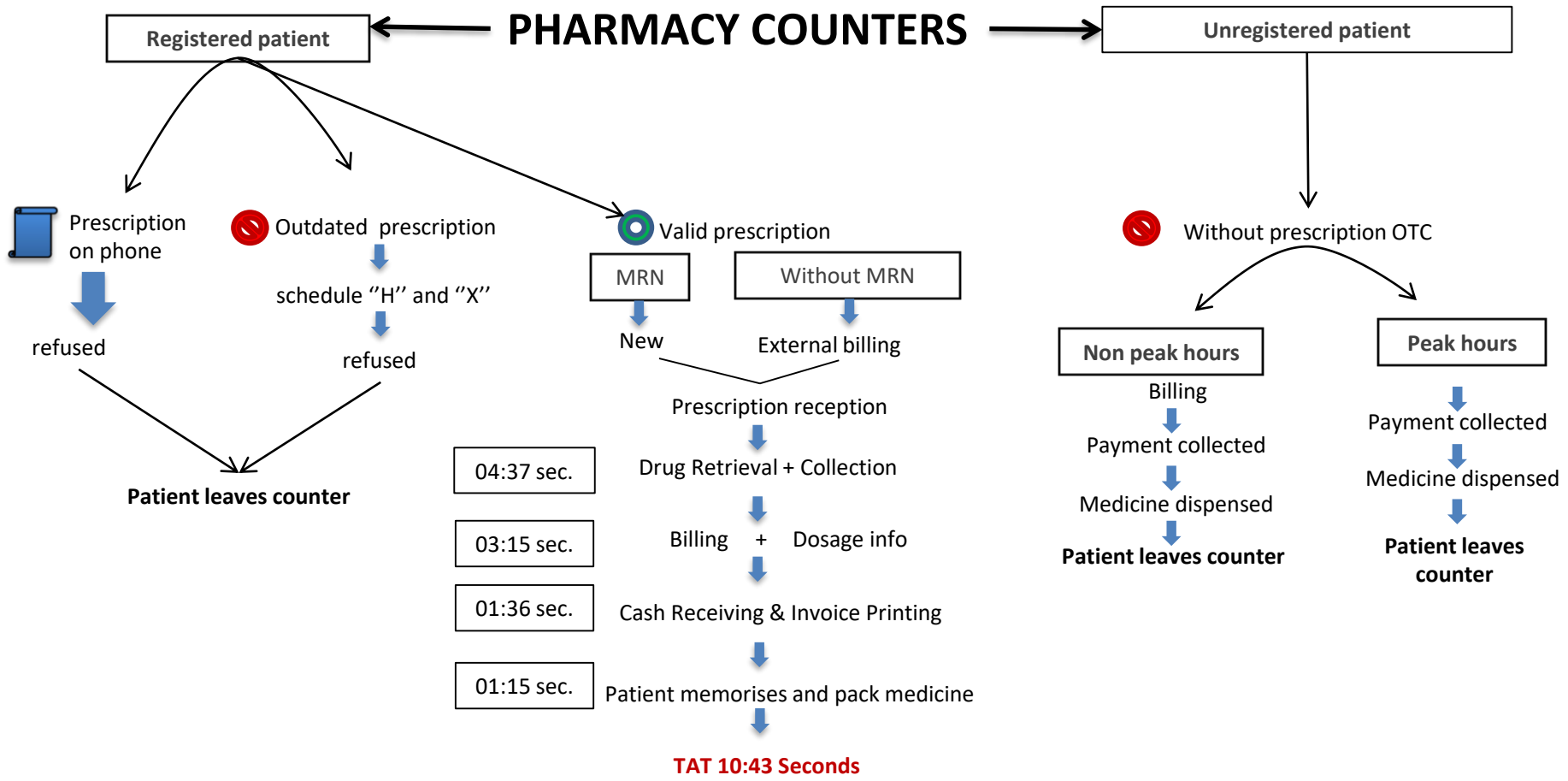
- Simple random sampling (2 samples from every counter)
- Simple random sampling (Every 4th Prescription arriving at retrieval desk)

(population-5074 excluding outliers)

Service Blueprint



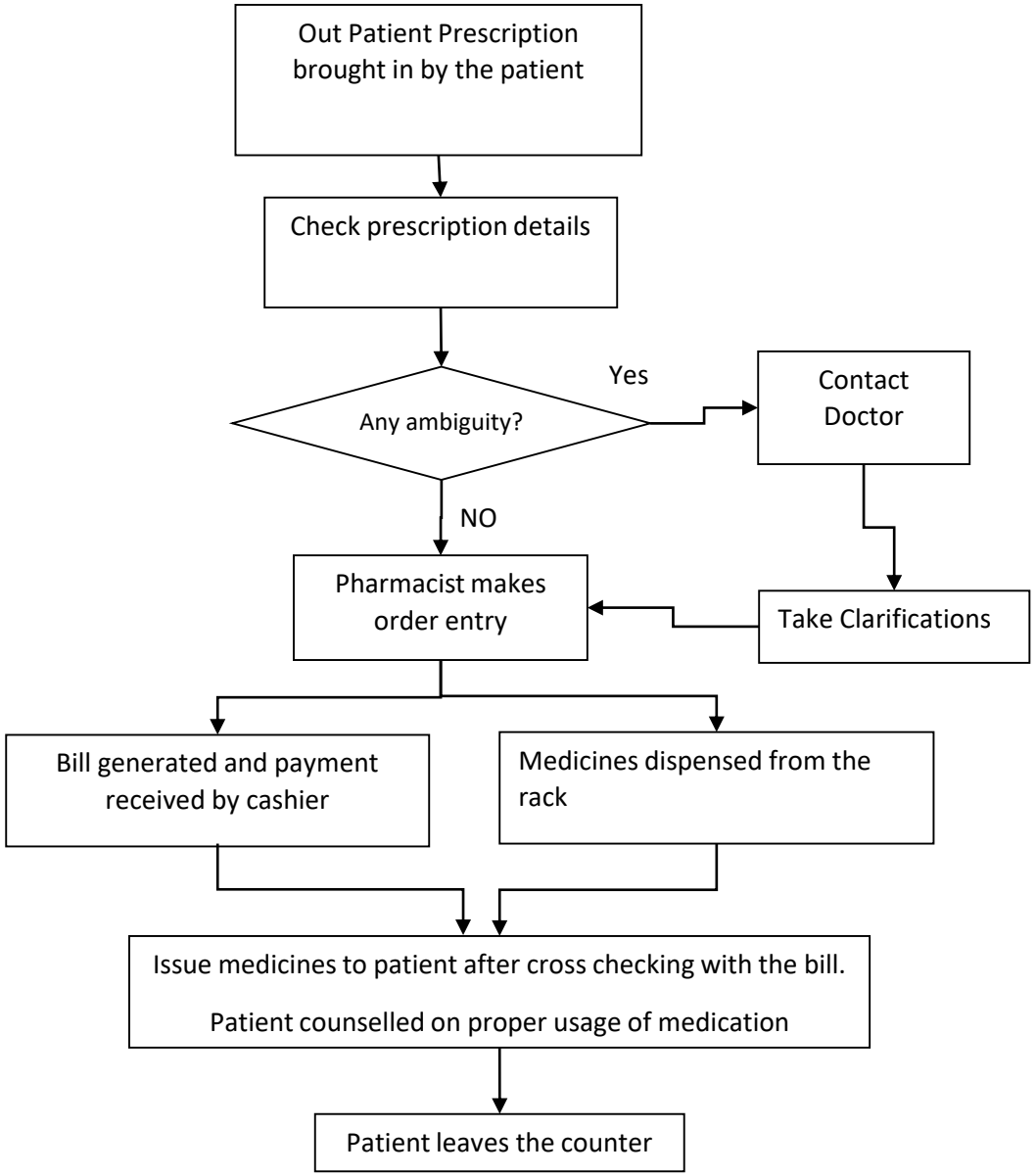
Types of prescription received in OP pharmacy



Average med. Per prescription 3.75

Sample size- 357

Flow chart of dispensing process in OP pharmacy



Drug dispensing prerequisite-

The pharmacy shall dispense the medications with the appropriate label indicating:

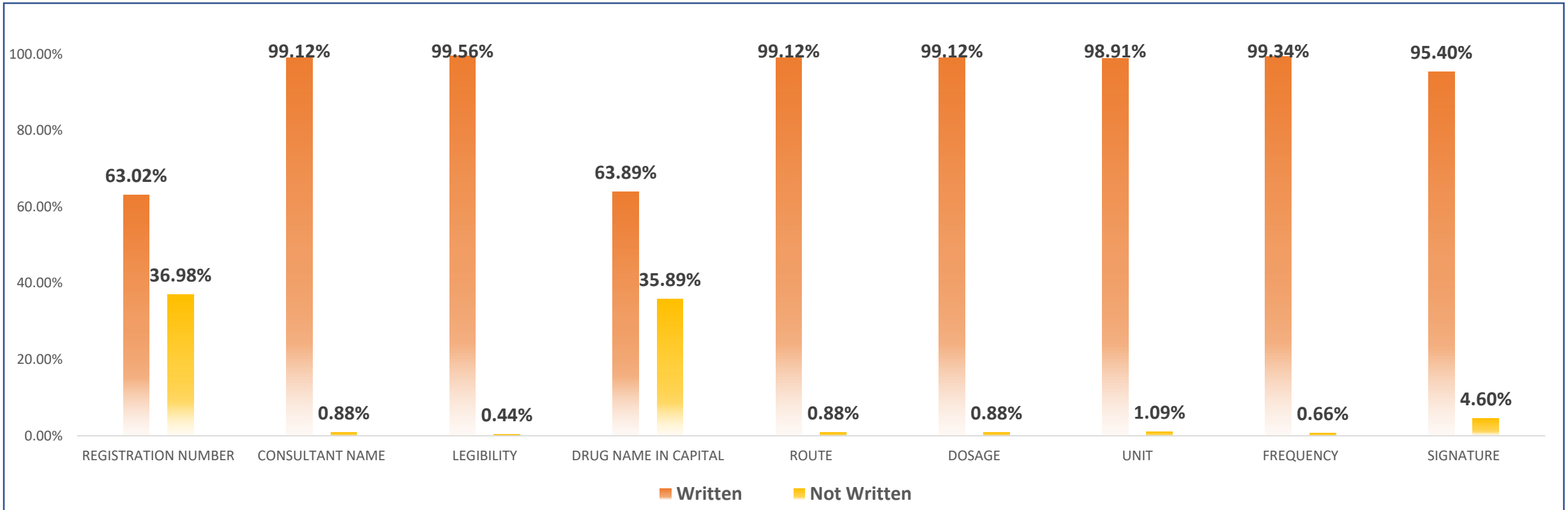
1) Patient name and MRN
2) Name of the drug & strength
3) Expiry date
4) Batch number

Turn-around time

Desk category	Activity	Minimum time	Maximum time	AVERAGE waiting time	% contribution in TAT	
Retrieval	DRUG COLLECTION + SORTING + COUNTING	0:00:03	0:09:12	0:04:37		**43%**
Billing	BILLING + DOSAGE INFORMATION	0:00:10	0:06:19	0:03:15	30%	
	CASH RECEIVING + INVOICE PRINTING	0:00:05	0:03:07	0:01:36	15%	**45%**
	PATIENT PACKS MEDICINES	0:00:00	0:02:30	0:01:15		**12%**
		Total average overall		**0:10:43**		

Observations:	**Potential Impact:**	**Recommendation:**
• Retrieval desk has only one activity which contributes 43% in overall TAT. • Billing desk has several activities adding 45% of the contribution thus becoming bottleneck of the dispensing process. • After dispensing patient packs medicine by own, blocking counter space for next patient thus creating crowd at the counter • Placement of slow moving general items in front shelves	• Increase in overall turn-around time and chaos in peak hours • Decrease in server utilization	• To decrease the TAT activities at the billing desk can be shared • Start usage of baskets for drug collection • Dosage information, cash receiving and invoice printing are some can be assign to separate nursing staff during peak hours • Replace slow moving general items in front shelves with fast moving items

Prescription Audit



Observations:	Potential Impact:	Recommendation:
• 37% prescription are without MRN • In 36% prescription drugs name was not written in capitals	• Potential increase in TAT • In case of prescription without MRN, entry of patient data takes an additional 10-15 seconds. Solution can lead to savings of billing time. [~12.5*3465=12 man hours ca be saved]* • Exact average revenue per OPD patient cannot be determined • Patient dissatisfaction due to probable wrong dispensing of medicines *HMIS data analysis March	• Mandate writing MRN • Attach patient details sticker in OPD files, similar to that of IPD • Electronic prescription can be introduced

Queue Management

Waiting Lines

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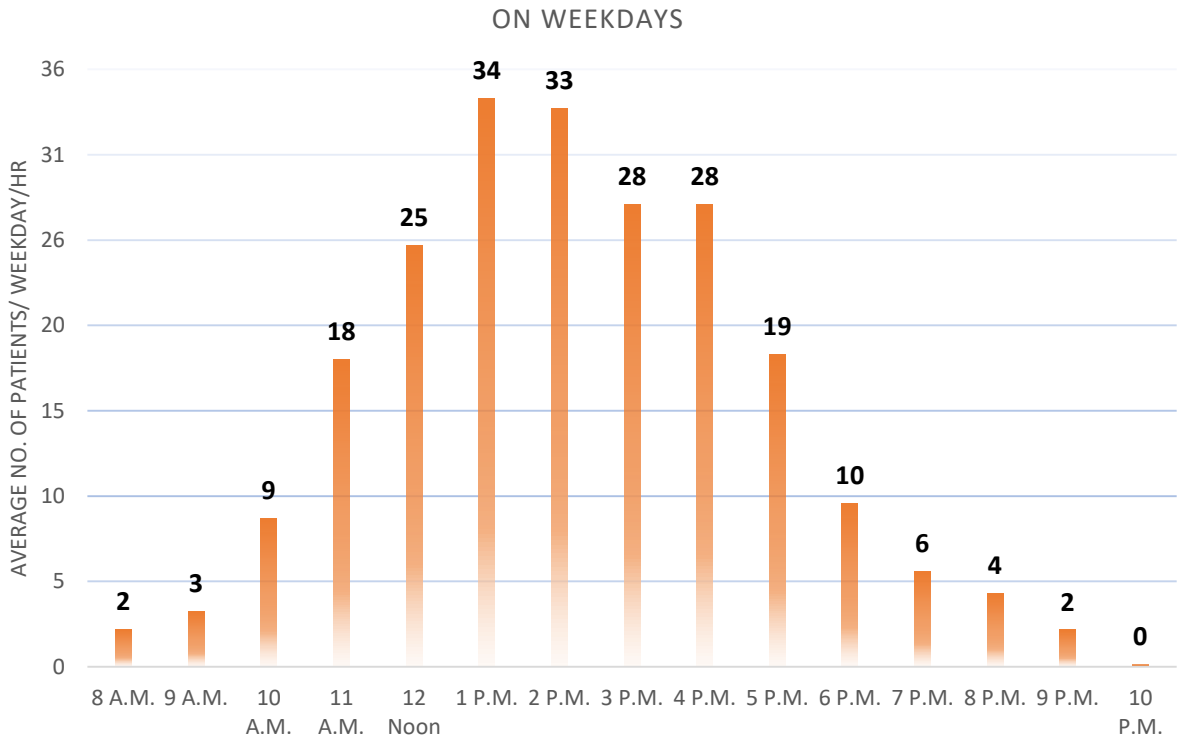
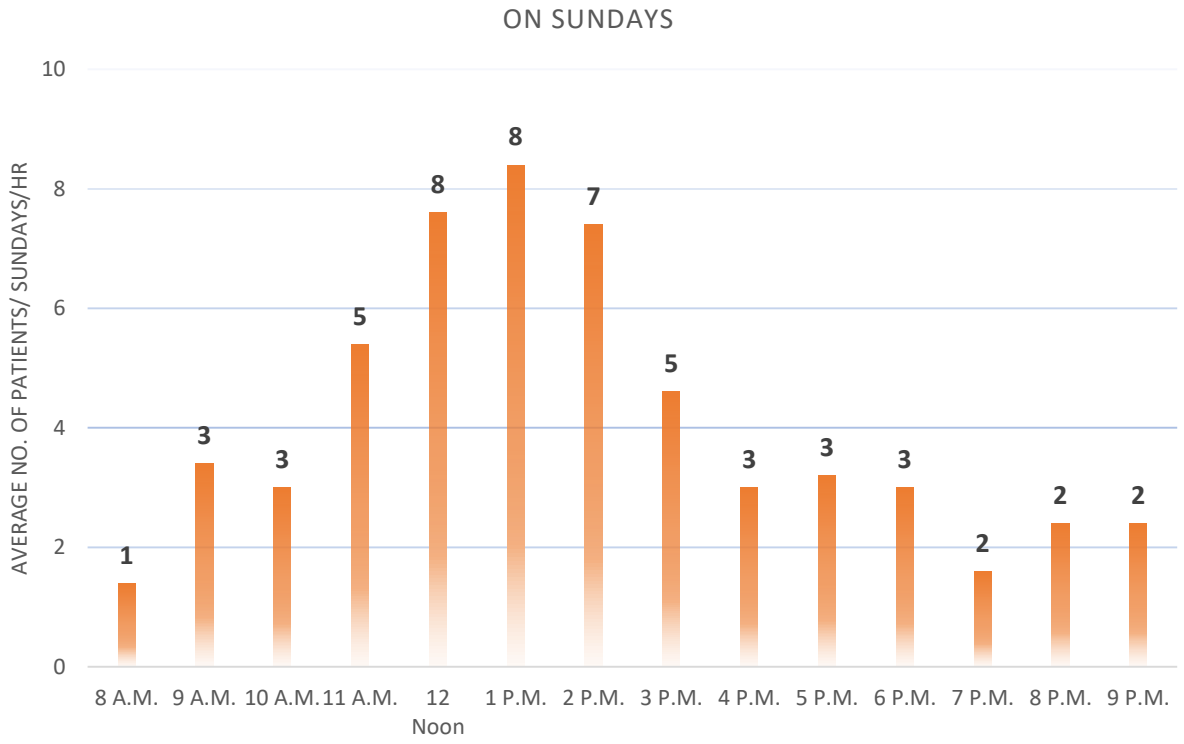
Parameter	Value	Parameter	Value	Minutes	Seconds
M/M/s		Average server utilization	.08		
Arrival rate(lambda)	6	Average number in the queue(Lq)	0		
Service rate(mu)	24	Average number in the system(Ls)	.25		
Number of servers	3	Average time in the queue(Wq)	0	0	.12
		Average time in the system(Ws)	.04	2.5	150.12

Observations:	Potential Impact:	Recommendations:
• According to the calculations done by POM-QM, average utilization of server in the OP pharmacy is 8% arrival rate service rate.xlsx • OP pharmacy has infinite source model which assume steady state conditions, Poisson arrival rate and exponential service time **M/M/s>1** • Arrival of average of 2 clients per prescription creating chaos	• Increase in chances of error in dispensing and explaining of dosage to client	• Token system can be incorporated • Display that only one person per prescription should be in the queue (or) • Additional attendants can be handled by deploying a security guard during peak hours • Make an express counter for prescriptions with 3 or less medicines

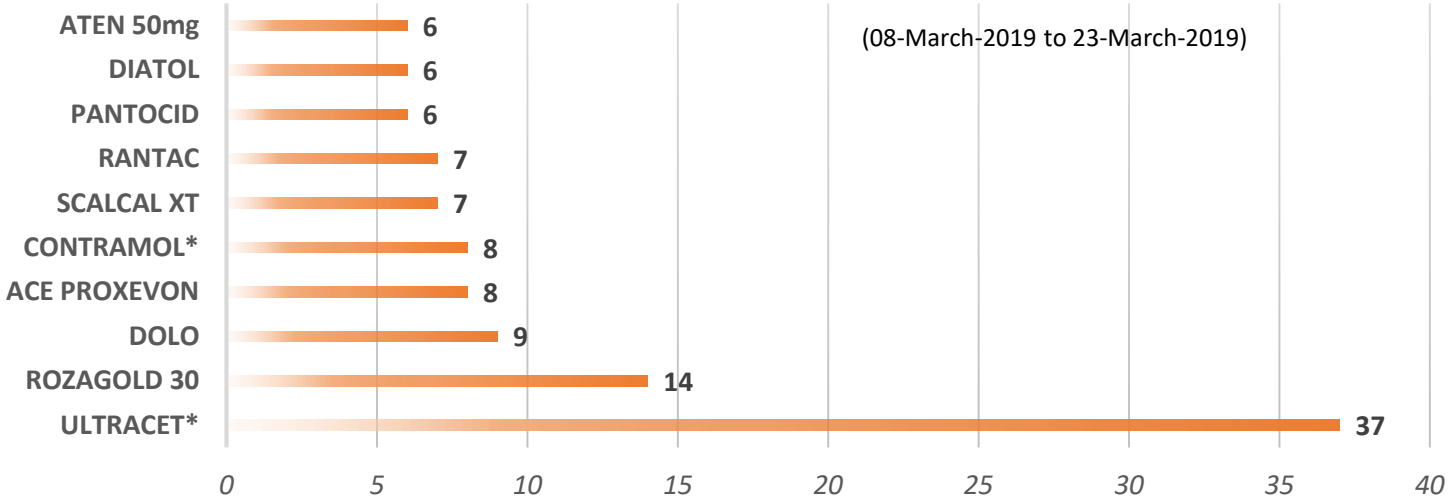
Queue Management

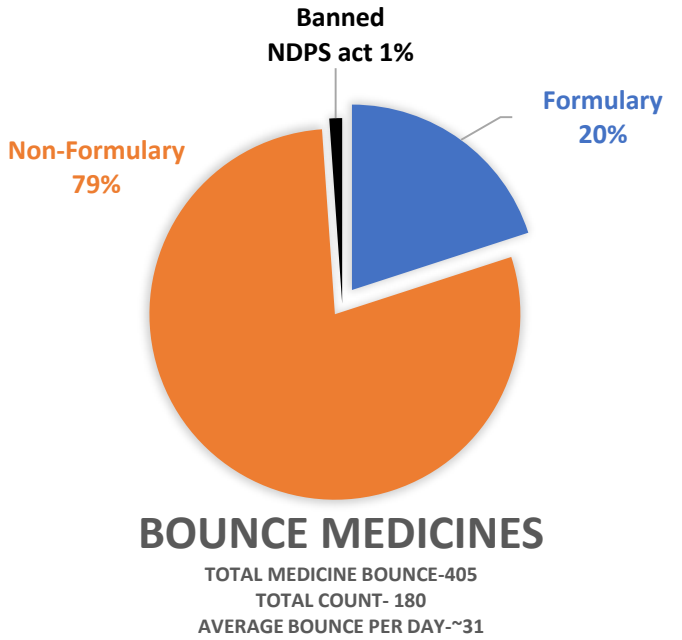




Observations:	Potential Impact:	Recommendations:
• Arrival of average of 2 clients per prescription creating chaos	• Chaos can lead to patient dissatisfaction • Increase in chances of error in dispensing and explaining of dosage to client	• Token system can be incorporated • Display that only one person per prescription should be in the queue (or) • Additional attendants can be handled by deploying a security guard during peak hours • Make an express counter for prescriptions with 3 or less medicines

Bounce Medicines



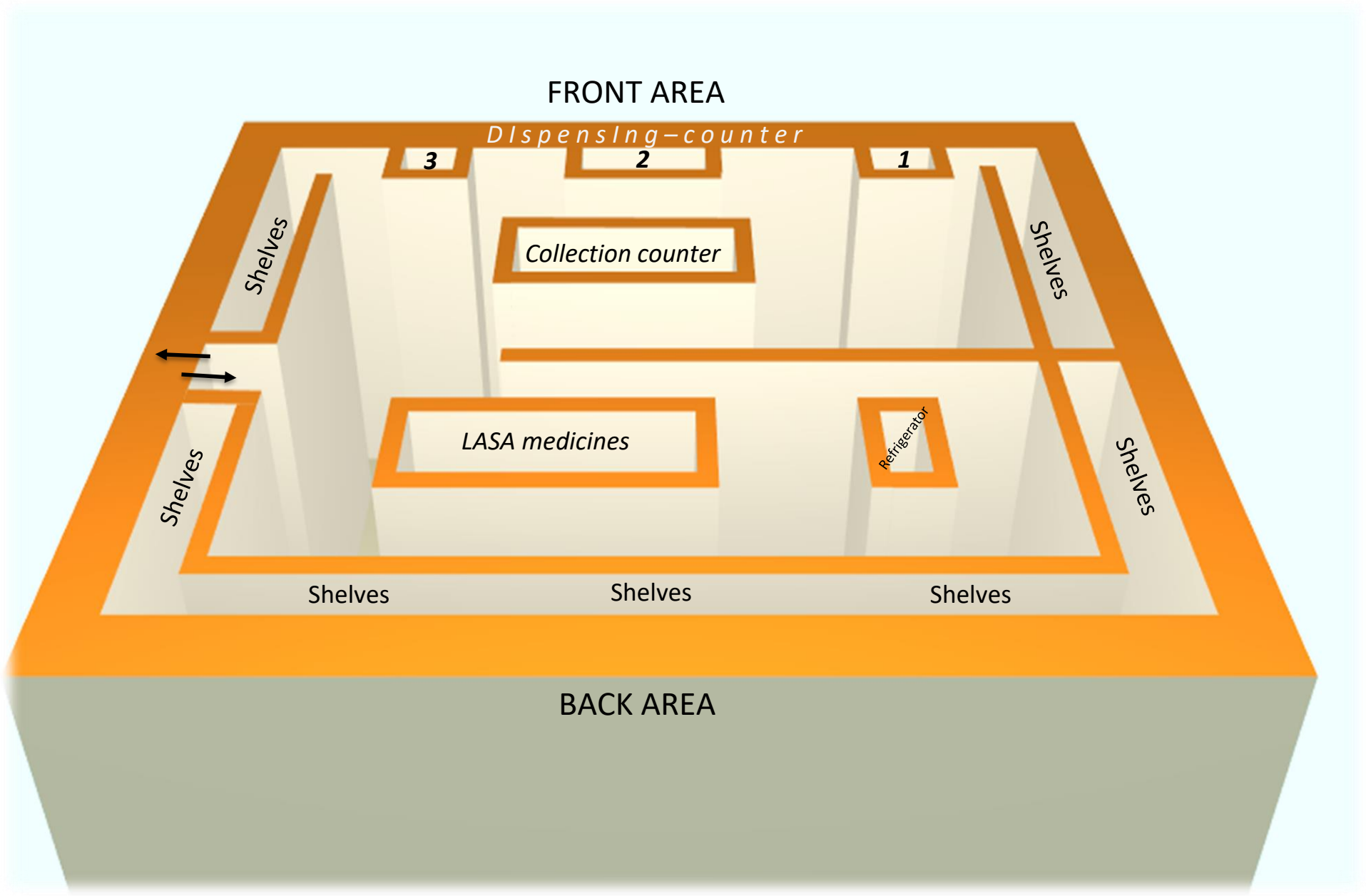


Observations:	Potential Impact:	Recommendation:
• Time consumed to substitute non available or non-formulary medicine increase TAT • Stock out due to inadequate re-order level • Bounce medicine data is improperly captured • Stocking of frequently prescribed NF drugs can lead to increased inventory cost	• Potential revenue loss • Bounce medicine noted at the end of the day, possible chances of error	• Adherence to hospital provided formulary drugs • Online automated re-order indicator on home screen according to past consumption • For outstation patients medicine mail facility can be started inclusive of delivery charges, Can be delivered to home locally *(Formulary medicines-38, Non-formulary medicines-142)

Conclusion

- This study intended to improve the dispensing process ,identification of bottleneck and measures to improve the overall turnaround time which can be addressed by-
  - Incorporating token system
  - Activities at the billing desk can be shared by additional nursing staff deployment [dosage information, cash receiving and invoice printing are some can be assign to separate nursing staff]
  - Start usage of baskets for drug collection to reduce chances of error while billing thus reducing billing time
  - Replace slow moving general items in front shelves with fast moving items reducing retrieval time
  - Extra 3% discount on MRN prescriptions Operant conditioning theory, skinner 1938
  - Attach patient details sticker in OPD files, similar to that of IPD
  - Electronic prescription can be introduced
  - Adherence to hospital provided formulary drugs to reduce potential revenue loss
  - Online automated re-order indicator on home screen according to past consumption
  - For outstation patients medicine mail facility can be started inclusive of delivery charges, Can be delivered to home locally

[3D-layout]


FRONT AREA
Dispensing–counter
3
2
1
Shelves
Collection counter
Shelves
LASA medicines
Refrigerator
Shelves
Shelves
Shelves
Shelves
BACK AREA

Thank you