

Predicting the turn-around-time of the pre-consultation blood tests for patients at the Diabetes Centre



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Introduction: The Diabetes Centre (DBC)

The Diabetes Centre

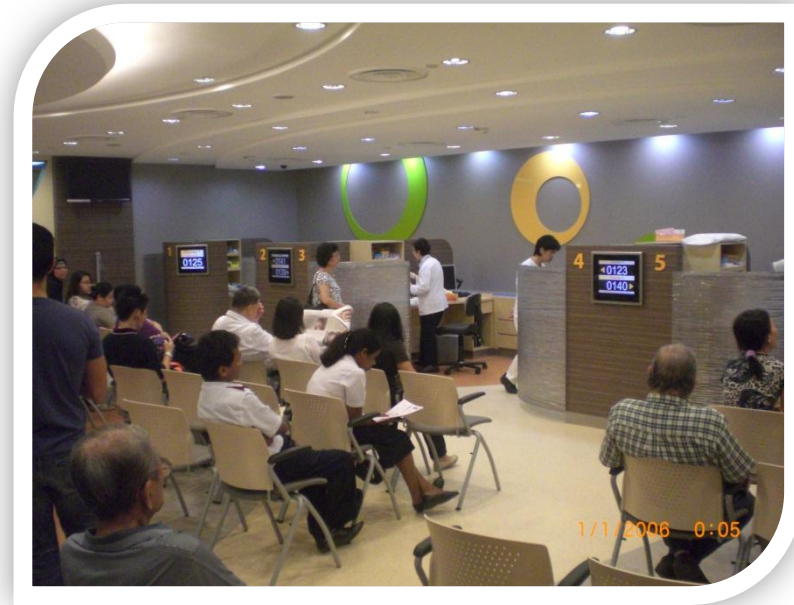
- One-stop centre for diabetic patients to see:
 - A doctor
 - A podiatrist
 - A dietician
 - A nurse educator
 - A foot-screening nurse
- Majority of the patients (including new cases) requires blood results before seeing the doctor



Introduction: A centralized phlebotomy facility services DBC and other SOC

The Clinical Laboratory at Blk 3

- Provides phlebotomy services for DBC and SOC
- Consist of **8** phlebotomy stations & a backroom lab
- Has **2** counters to for patients to make payment before blood-taking
- DBC patients make up **5%** of the Clinical Laboratory's workload



Introduction: A typical patient with diabetes that requires a blood test before seeing a doctor

Patients with non-complex tests are told to come **2 hrs** before the doctors consultation but....

**≥ 2 hrs before
Doctor's
consultation**

**Patient tends to
wait a long time
before seeing the
doctor**

**< 2 hrs before
Doctor's
consultation**

**Patient's blood results
may not be ready in
time for consultation**



Scenario One: Patient needing to wait long to see the doctor

**Patient arriving ≥ 2 hrs
before doctor's consultation**



TAT time for blood-
taking

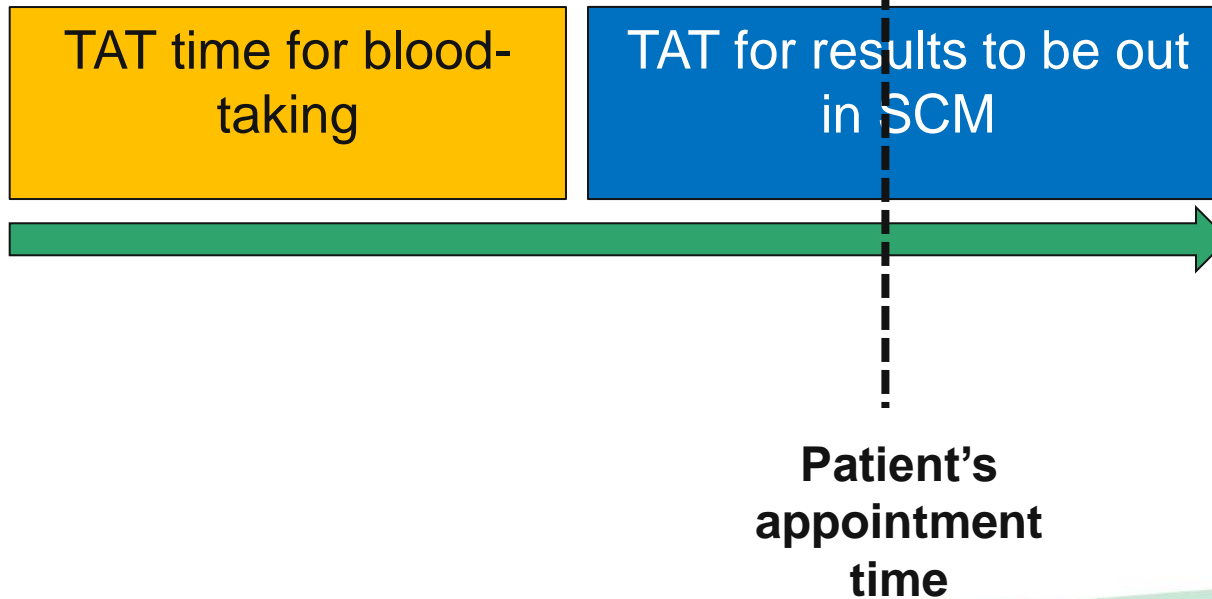
TAT for results to be out
in SCM

Waiting time
to see the
doctor

**Patient's
appointment
time**

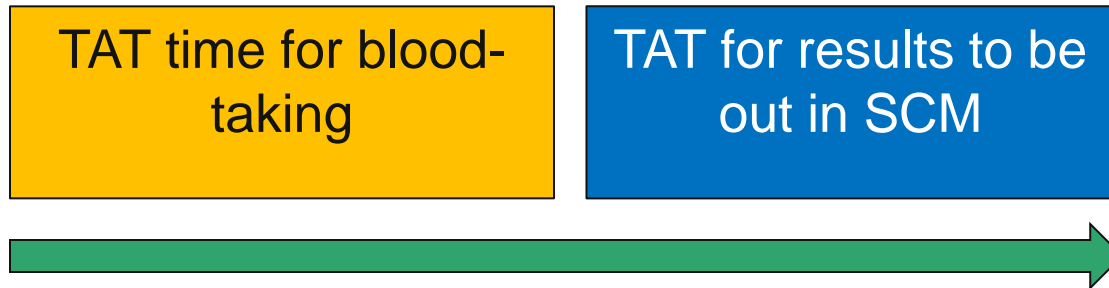
Scenario Two: Results not ready when it is the patient's turn to see the doctor

Patient arriving <2hrs before doctor's consultation

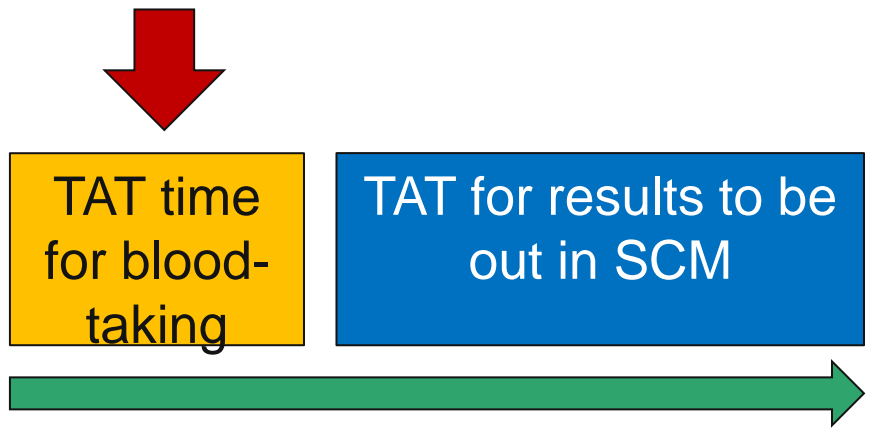


The ideal for us to achieve: Reduce waiting time for both blood-taking and to see the doctor

Same day blood-taking (for patients with standard tests only) with minimal waiting to see the doctor



Even better if we can reduce the TAT for blood-taking!



What we discovered after conducting a in-depth time-motion study

With the recommended 2 hrs...

Percentile	Total TAT
10 th	51 min
50 th	72 min
75 th	90 min
90 th	108 min

50% of our patients wait around **50** minutes or more for the doctor



It seems 1.5 hrs would be the best

Instead of just recommending **1.5 hrs** as the 'best' estimation, we decided to explore improving the TAT for blood-taking

Three ways
to shorten
the TAT for
blood
taking



Increase the no. of phlebotomy stations?



Encourage patients to make pre-payment for bloods to avoid the queue?

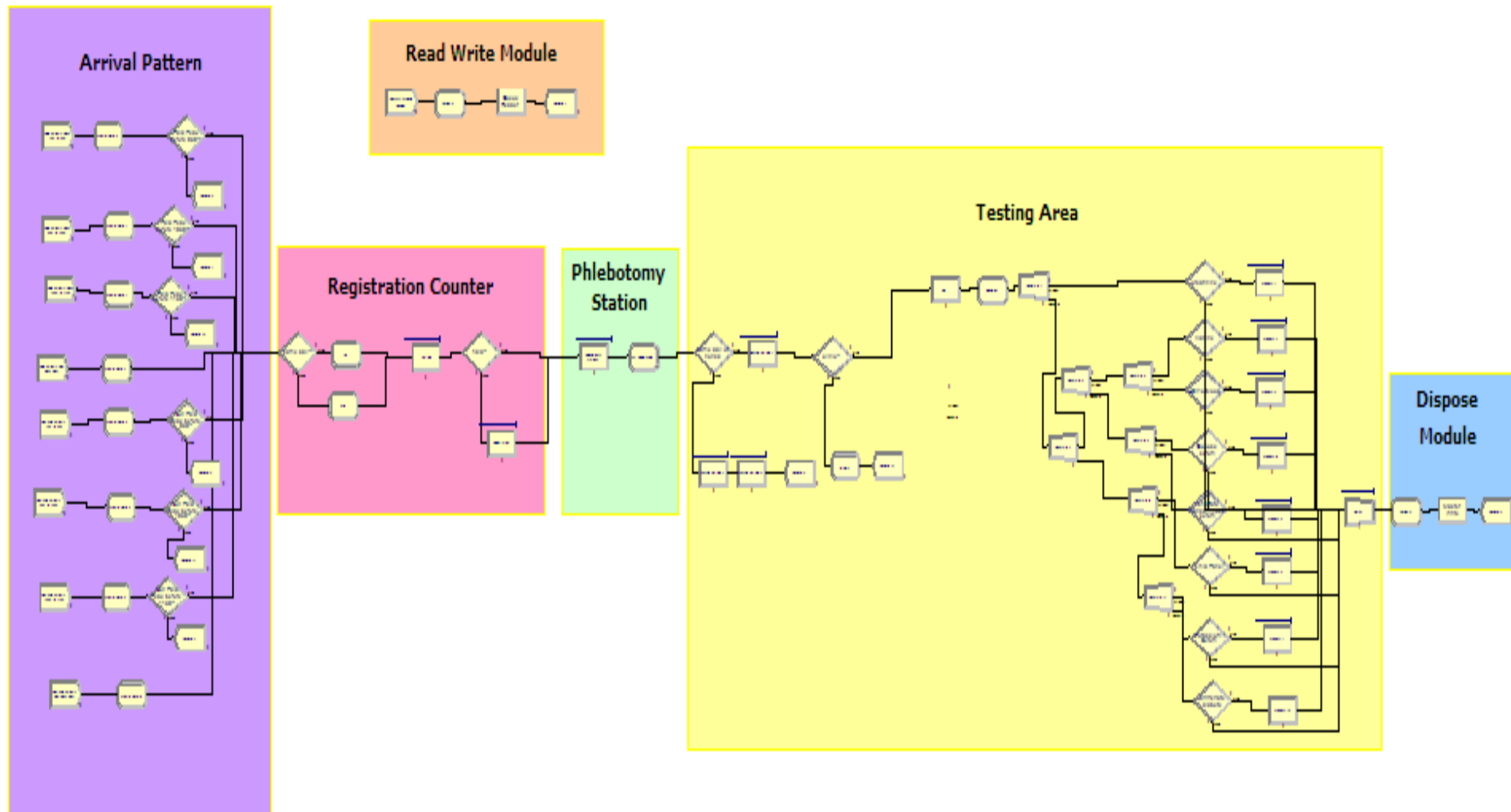


Encourage non-fasting or patients with no doctor's consultation to draw blood during the off peak hours (afternoon)?

We decided to use a simulation model to determine which permutation yields the best outcome

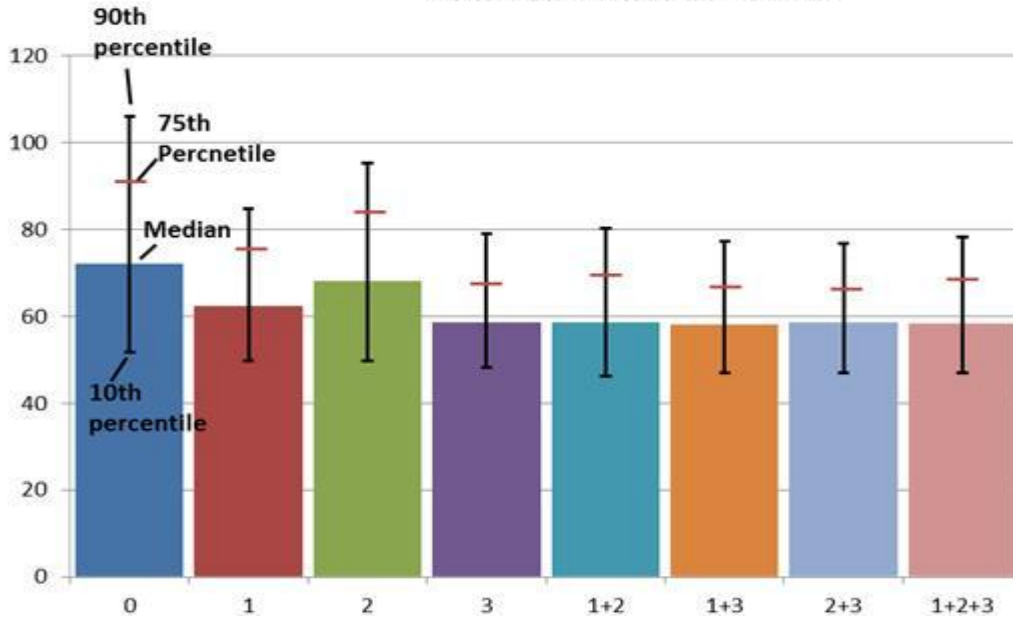
Permutation	Scenarios played out on the simulation model
0	Current
1	Increase the number of phlebotomy stations from 6 to 8
2	All patients with doctor's consultation on the same day to make pre-payment
3	Shift 30% of non-same-day patients in the morning to the afternoon
1+2	Implement 1 and 2 together
1+3	Implement 1 and 3 together
2+3	Implement 2 and 3 together
1+2+3	Implement 1, 2, and 3 together

How our simulation model looked like



The results after running the simulation over **50** replications

Total turn-around-time



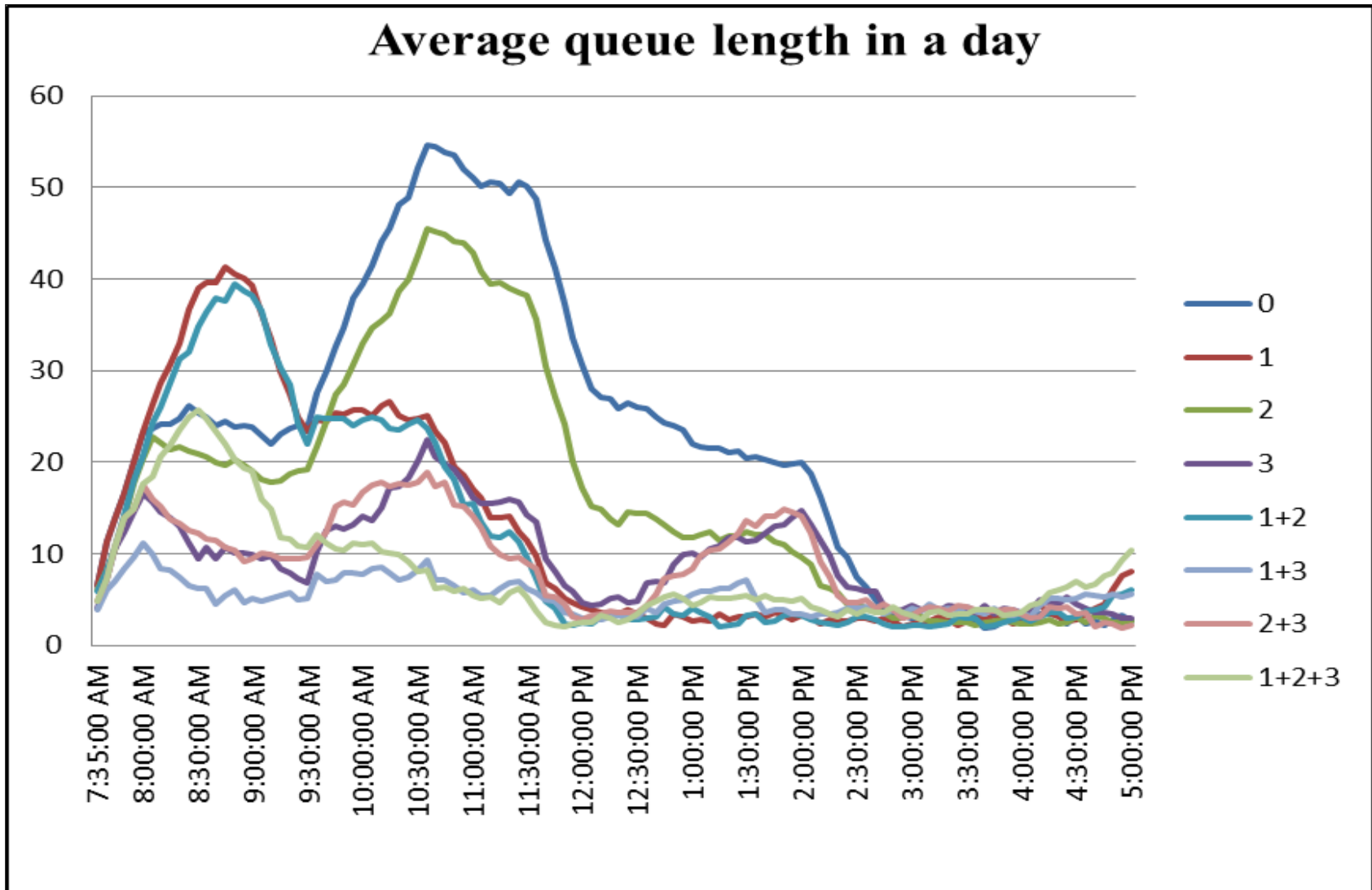
Option 1: Increase phlebotomy stations from 6 to 8

Option 2: All patients with doctor's consultation on the same day to make pre-payment

Option 3: Shift 30% of non-same-day patients in the morning to the afternoon

(mins)	0	1	2	3	1+2	1+3	2+3	1+2+3
10th percentile	52	50	50	48	48	47	47	47
Median	72	62	68	59	60	58	58	58
75th percentile	89	74	81	68	70	67	67	67
90th percentile	106	85	95	79	83	77	77	77

We also determined the average number of patients that will be queuing at the Clinical Laboratory



A Priority Matrix was used to determine which option has the best yield per effort

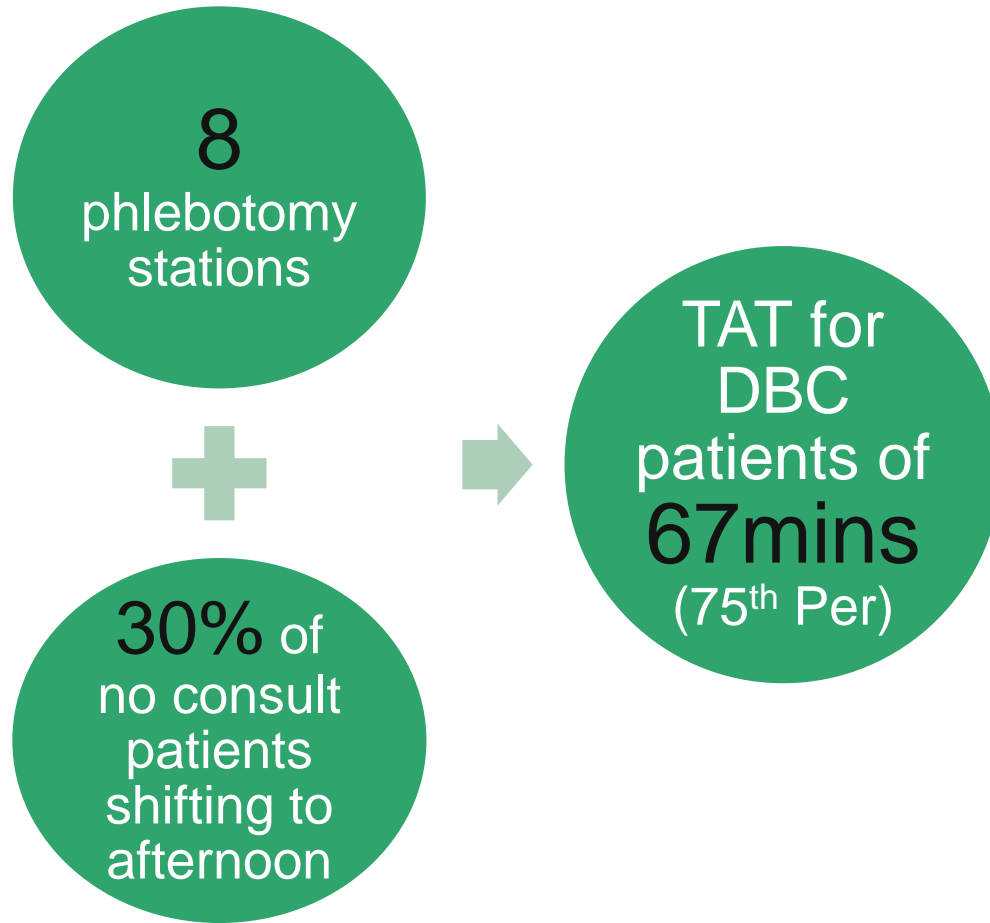
Options	Ease of implementation (qualitative)	Impact (quantitative)	Total Score
1+3	5	8	40
2+3	4	8	32
1+2+3	3	8	24

Option 1: Increase phlebotomy stations from 6 to 8

Option 2: All patients with doctor's consultation on the same day to make pre-payment

Option 3: Shift 30% of non-same-day patients in the morning to the afternoon

Conclusion



That's a potential
reduction of 120mins
– 67mins =
53mins of waiting

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Thank You.

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BACK-UP SLIDES

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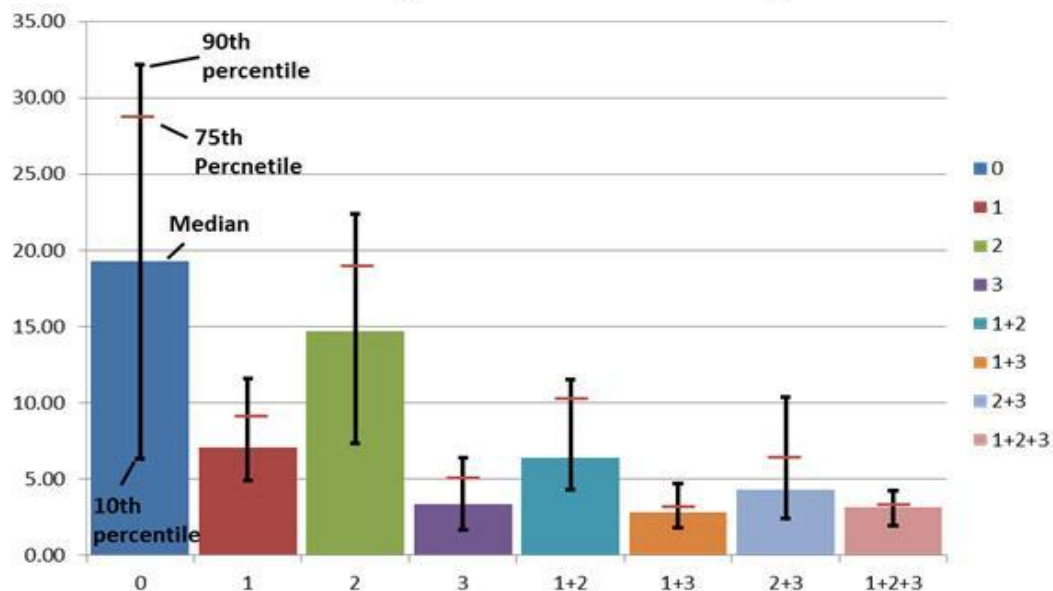


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Waiting time for blood-taking



	0	1	2	3	1+2	1+3	2+3	1+2+3
10th percentile	6.35	4.93	7.36	1.69	4.29	1.83	2.45	1.97
Median	19.32	7.06	14.70	3.34	6.42	2.86	4.30	3.19
75th percentile	29.04	9.50	19.54	5.33	10.13	3.63	6.40	3.84
90th percentile	32.19	11.60	22.37	6.39	11.53	4.73	10.37	4.26

Total Queue

