PREDICTIONS AND FACTS…….
A PATH TOWARDS
QUALITY BY TECHNOLOGY

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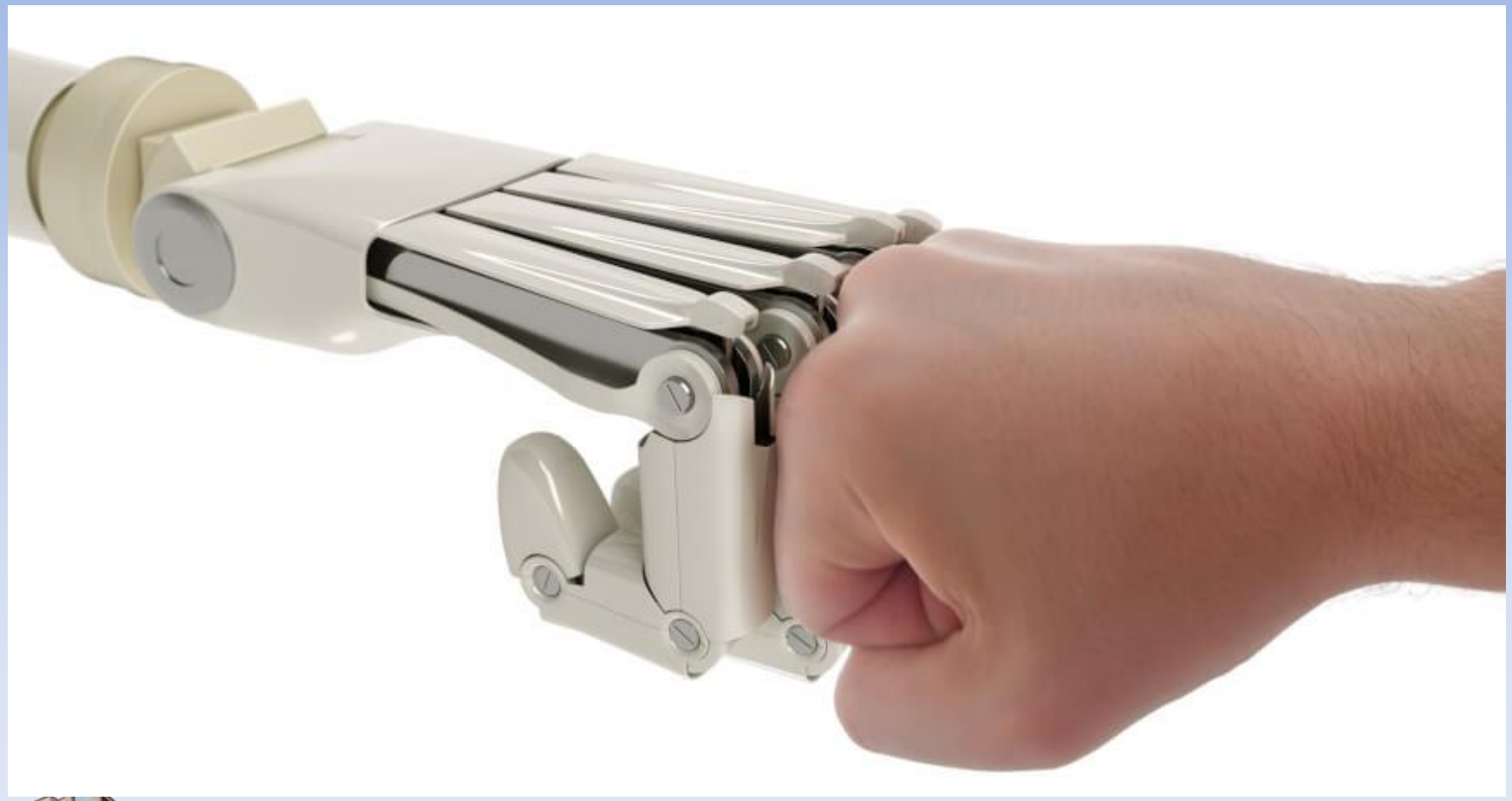
KNOWLEDGE IS TELLING THE PAST……

WISDOM IS PREDICTING THE FUTURE……

JOINING HANDS OF TECHNOLOGY AND QUALITY HEALTHCARE BY PREDICTION



INTRODUCTION

I
- **Crude Mortality rates vs. Standardizing & Benchmarking Mortality Rate for Quality check**

II
- **Simplified Acute Physiology Score (SAPS II) calculator** -Health Information technology

III
- **E-PREDICT" software.**

IV
- **Staff trained for quality data collection**

CRUDE MORTALITY RATE

"Crude mortality is not a sensitive parameter"

Mortality Rate in ICU

- Standardizing & benchmarking mortality rate with severity score is **a sensitive tool for measuring quality & performance of that particular unit.**

SAPS Scoring

- The **worst physiological** variables, corresponding to the highest number of points, should be collected within the **first 24 hours** of ICU admission

THE SAPS SCORE INVOLVES 15 VARIABLES

Parameter	Value (score)						
HR			<40 (11)	40-69 (2)	70-119 (0)	120-159 (4)	>160 (7)
SBP			<70 (13)	70-99 (5)	100-199 (0)	>200 (2)	
Temp					<39°C (0)	>39°C (3)	
PaO2/FiO2	<100(11)	100-199 (9)	>200 (6)				
UO (ml)		<500 (11)	>500(4)		>1000 (0)		
S.Urea					<28 (0)	28-83(6)	>84(10)
TLC(10^3/cc)				<1(12)	1-20 (0)	>20 (3)	
K*				<3(3)	3-4.9 (0)	>5(3)	
Na*				<125 (5)	125-144 (0)	>145 (1)	
Bicarb			<15(6)	15-19 (3)	>20 (0)		
bilirubin					< 4(0)	4-5.9 (4)	>6 (9)
GCS	<6 (26)	6-8 (13)	9-10 (7)	11-13 (5)	14-15 (0)		

Age - score
<40- 0
40-59- 7
60-69- 12
70-74- 15
75-79- 16
>80- 18

Chronic disease:
Metastatic cancer- 9
Hematological.cancer
AIDS- 17

Type Of Admission
Sched Surgery - 0
Medical - 6
Emr Surgery -8

“E-PREDICT”

- IT in healthcare improves the quality of healthcare delivery, increases patient safety, decreases medical errors, and strengthens the interaction between patients and healthcare providers.

- Software designed in-house to calculate the Mortality rate based on the Routine Physiological Measurement.

- The form is designed to make data entry and the data is stored in database

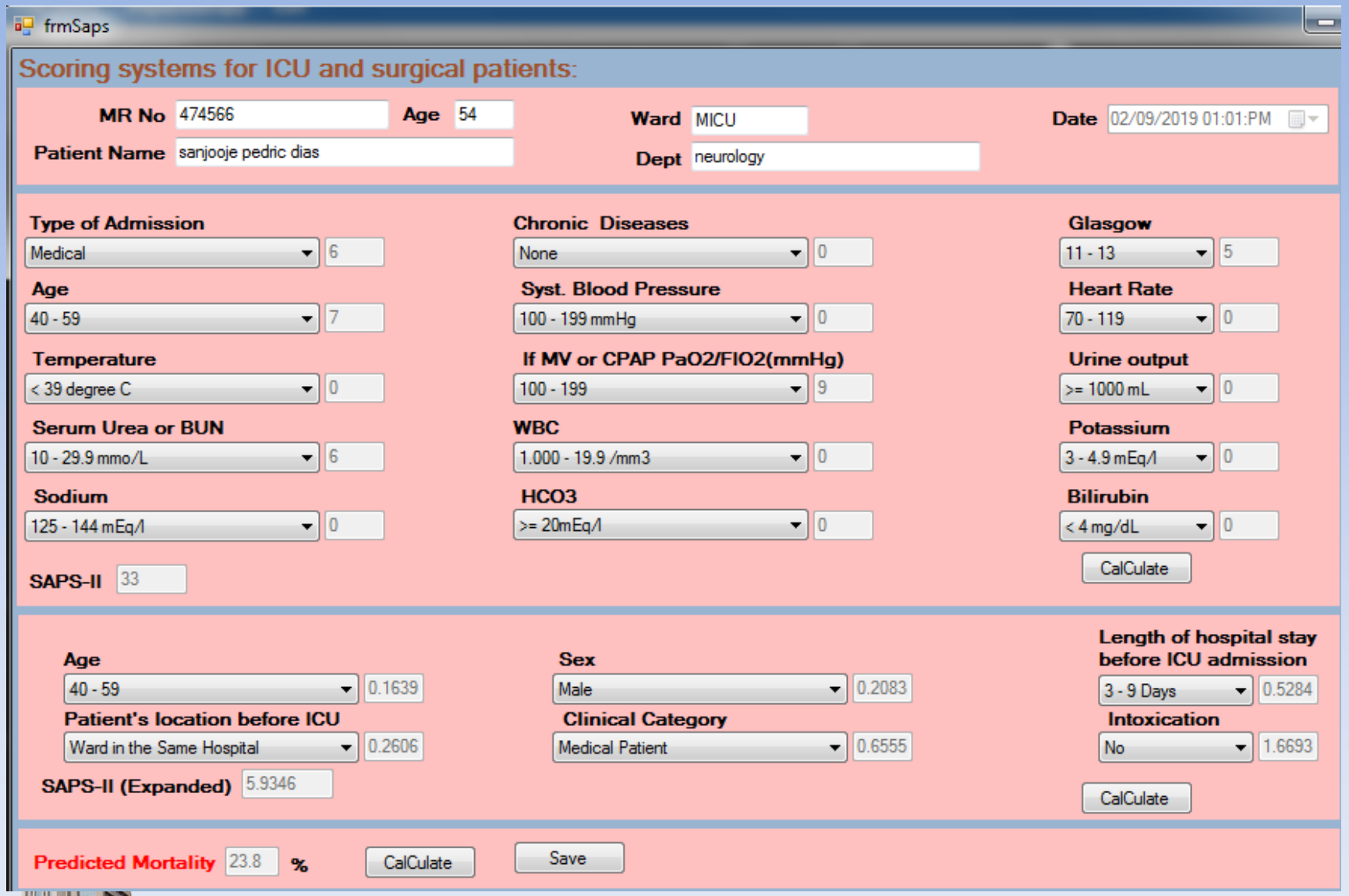
“E-PREDICT”

- Software Queries are used to generate report from the database.
- Data input and data retrieval is Login based, so there is security and privacy of data.
- Data stored in database instead of maintaining hardcopy of the same.
- Database is maintained by internal IT team. Monthly reports are generated for statistical analysis

“E-PREDICT”

- Patient data is stored based on the episode of admission. Comparison of data is possible if required.
- Low-cost implementation
- Audit log for data editing is enabled. So tampering of data is monitored
- If there are any changes required in the form or formula, it can be made as per requirement
- Policy is maintained for storage and retrieval of data

SAPS ASSESSMENT SCREEN



DATA WITH SEVERITY SCORE

STRUCTURED QUERY LANGUAGE (SQL) ARE USED TO GENERATE REPORT FROM THE DATABASE.

MR No | Patient Name | Refresh

From Date 01/09/2019 | To Date 26/09/2019

SL NO	MRNO	Patient Name	Dept	Age	SAPSII	SAPSExtended	Mortality	SRNC
10	475436	mr. murthappa		55	56	6.1967	28.99	59605
84	477630	shalini	gen med	46	33	4.9373	9.32	63660
42	476578	kamrunissa	cardiology	67	76	8.2379	71.67	62624
37	476491	naveena krishna ...	critical care	29	57	5.0932	11	62619
8	474852	abdulla c	gastro	62	35	4.1897	3.81	58611
12	417579	suresh shetty	gastro	49	33	3.9313	2.69	59607
14	362049	laxman b	gastro	57	57	6.45	34.4	59609
15	474846	manjunath rama ...	gastro	54	61	6.3429	32.07	59610
18	475620	semanth	gastro	35	26	2.793	0.44	59613

STANDARD MORTALITY RATIO (S.M.R)

$$SMR = \frac{\text{Actual Death}}{\text{Expected Death}}$$

Actual Death : Total number Of death occurred in MICU

Expected Death : Sum of probability Of Deaths

SMR INTERPRETATION IN QUALITY CARE

SMR for an ICU is <1

Then the outcomes for that unit are interpreted to be better than the overall outcomes of the reference set used to develop the scoring system.

SMR of >1

- Alternatively, signifies that the observed mortality rate is higher than the expected mortality rate, suggesting that the quality of care needs to be improved.

PREDICTED Vs ACTUAL

>1– hospitals' mortality rate is higher than the expected average mortality rate

<1 – hospitals mortality rate is lower than the expected average mortality rate

Equal to 1– hospital's mortality rate and the expected average rate are the same

STATISTICAL INTERPRETATION OF EXPECTED DEATH

- Hospital mortality is calculated using the following equation
- **Formula**
  - SAPS Score is sum of all 15 parameters

$$\text{Probability Of Death} = \frac{e^{(logit)}}{e^{(logit)} + 1}$$

Where

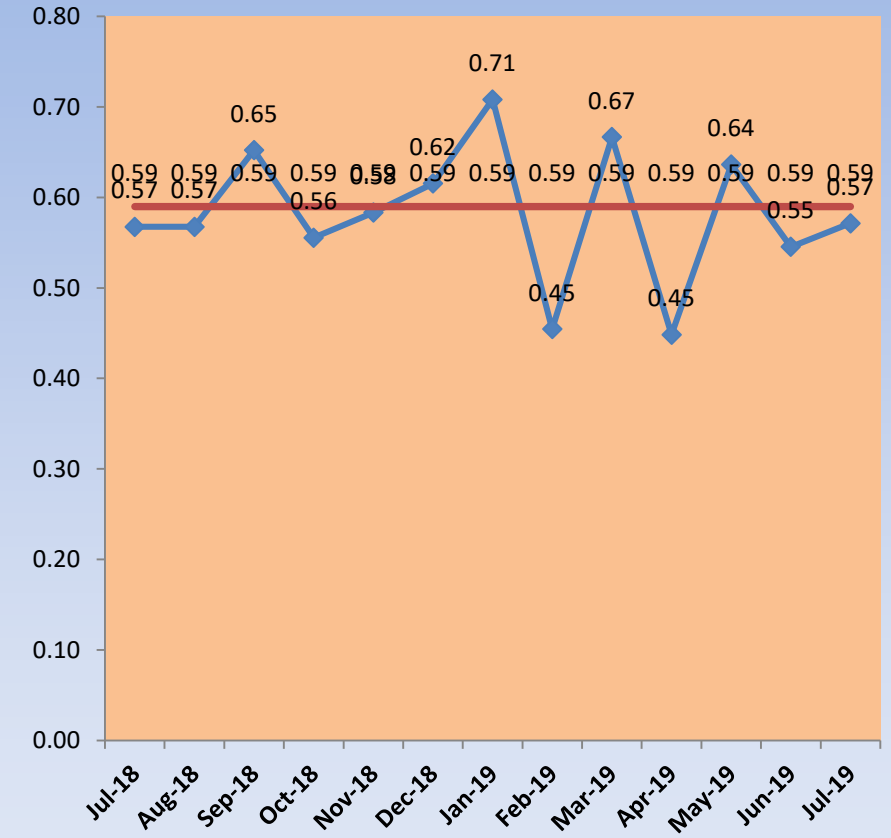
logit = -7.76+ 0.07 *SAPS Score+ 0.99*ln(SAPS Score+ 1)

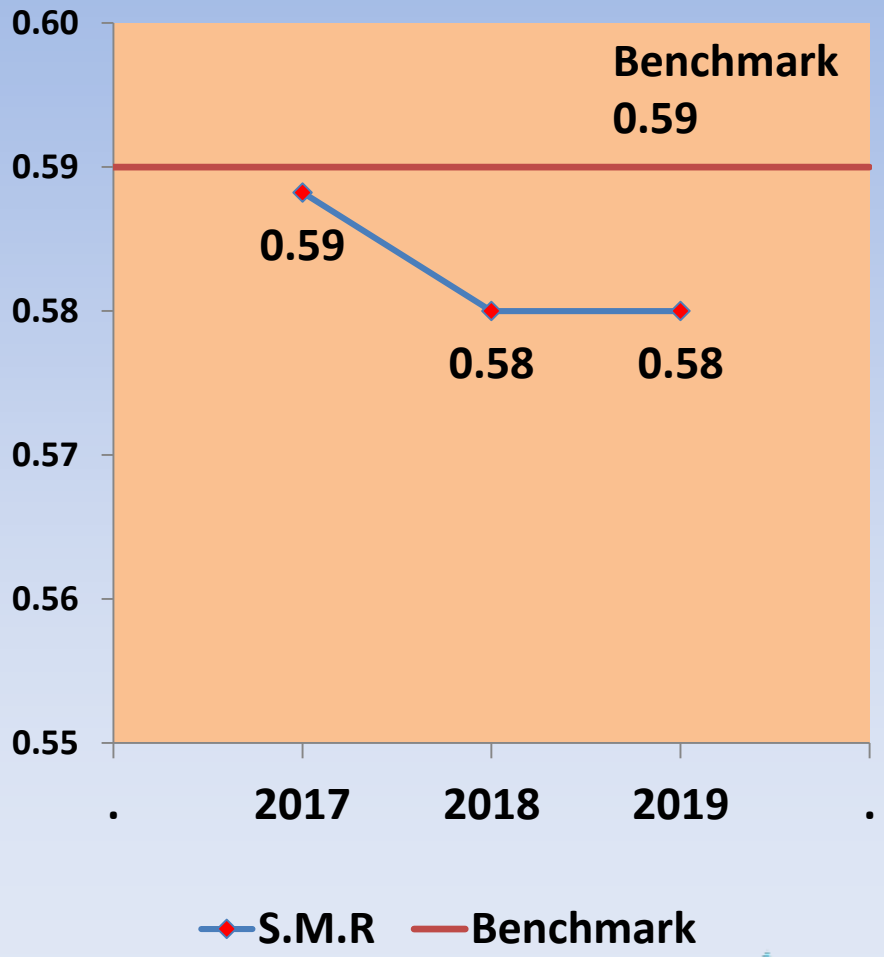
Total sum of Probability of Death = Expected Death

RESULT

STUDY DURATION	from July-17 to July 19.
SAMPLE SIZE	2495
BENCHMARK	0.59

MONTHLY /YEARLY SMR FROM JULY-18-JULY-19





TECHNOLOGY BASED BENCHMARK IN QUALITY HEALTH CARE

- Compare the performance level with the national standard or international bench marks.

- It gives the individual institution an opportunity to improve its quality of care through standardization of processes, procedures and treatment protocols.

- SAPS scoring is better with technology support

BENIFITS AND LEARNING

- Early prediction.
- Quality assurance for patient safety
- Decision making & Treatment plan
- Availability of beds for critical cases & Manpower planning
- Better ICU administration. Strengthening patient counselling and decision making for the family
- Documentation based on prognosis
- Planning for Advanced Life Support Systems
- Irreversibility of primary condition and planning for palliative care

E PREDICT SAPS A RETROSPECTIVE ANALYTICAL TOOL

Mortality can be reviewed retrospectively in those cases which had better scoring but poor outcome because it reflects wide performance of the system

REFERENCE

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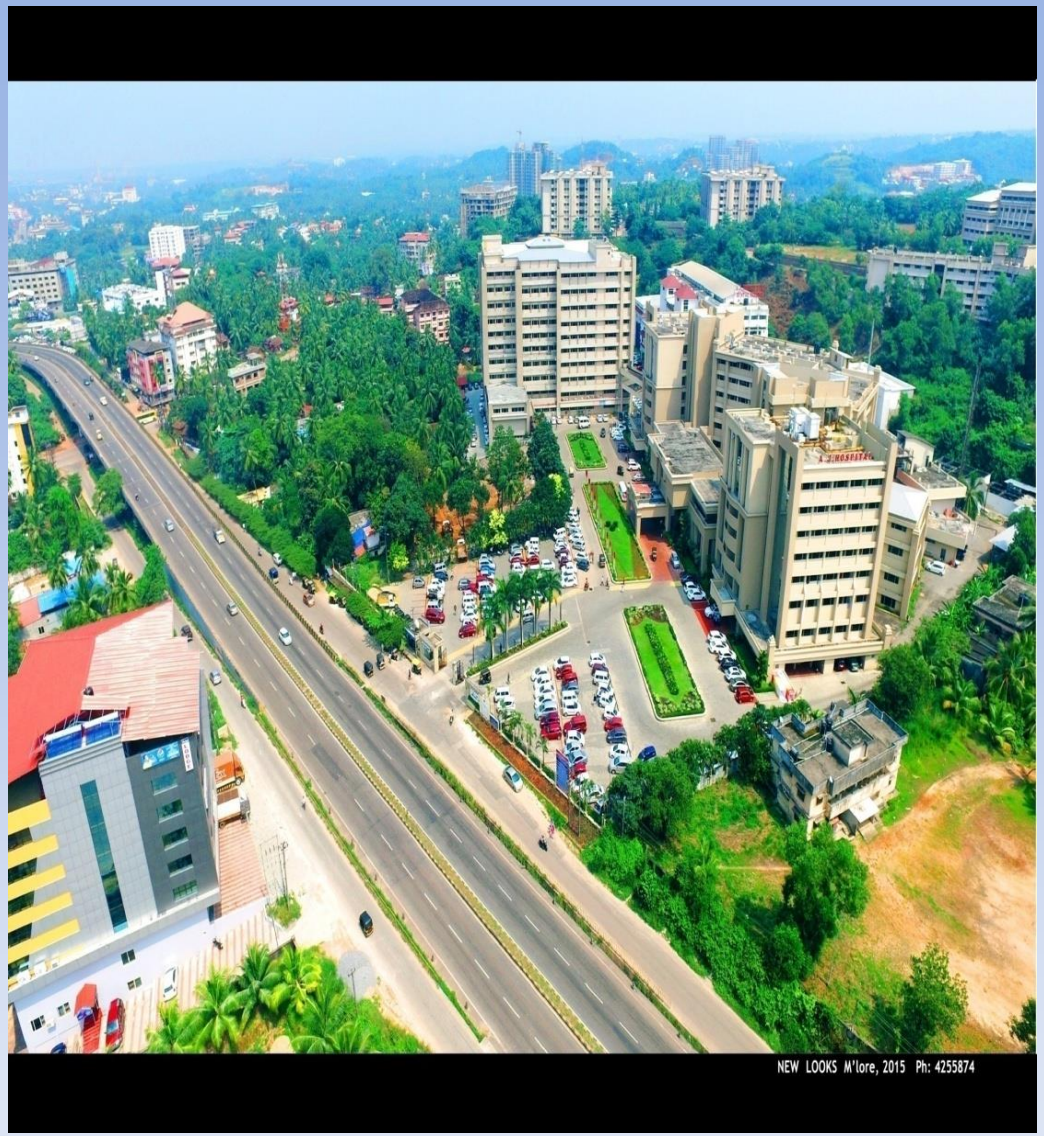

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