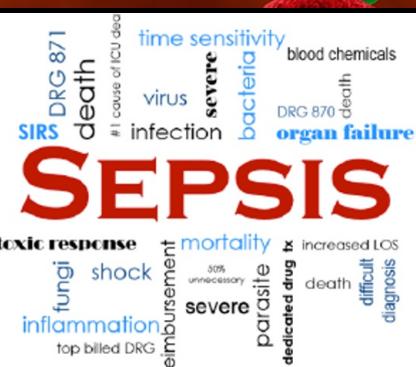


SEPSIS

Sepsis is a life-threatening condition that occurs when the body's immune system has an extreme response to infection or injury.



OCTOBER 2024
OUR CO-ORDINATORS

Team Members

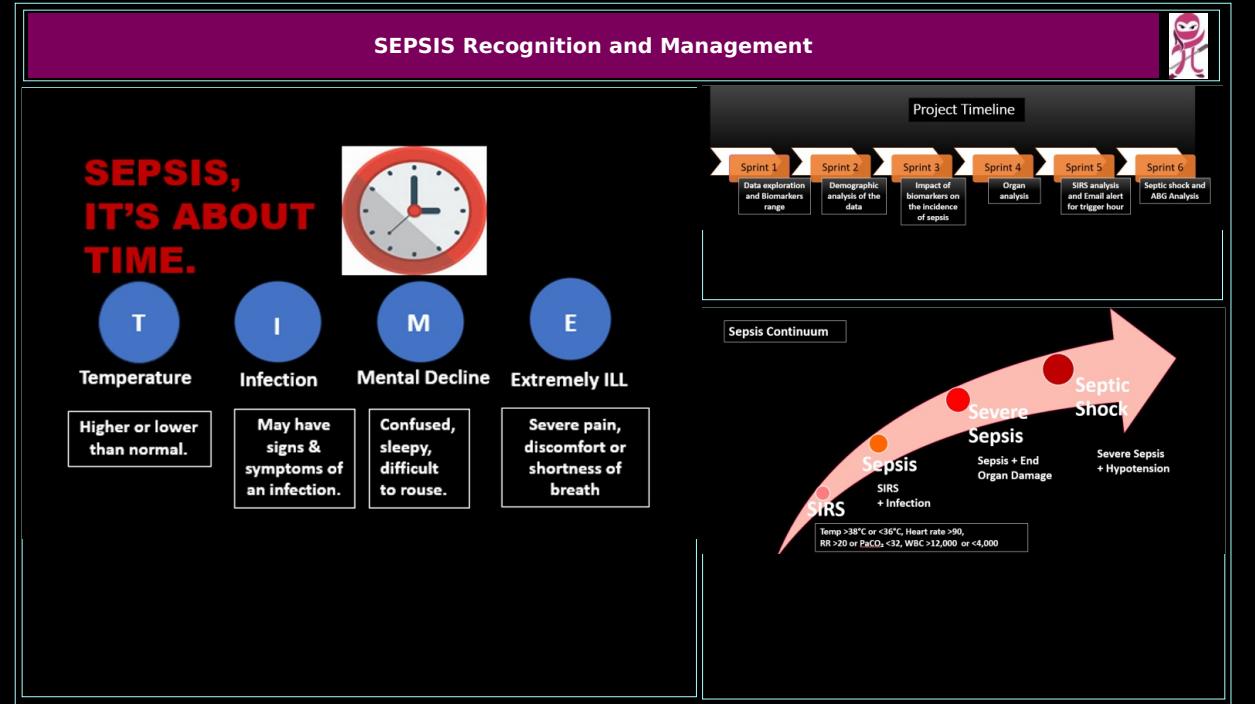
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Jalpa Patel
Sheeba Priya

Vinay Hemmadi
Simantini Nalawade
Remya Kadri
Neelima Vasilepalli



SYMPTOMS OF SEPSIS

S E P S I S



Shiver,
Fever or
Very Cold



Extreme
Pain or
General
Discomfort



Pale or
Discolored
Skin



Sleepy, Difficulty to
Rouse & Confused



I Feel Like
I Might
"DIE"



Short of Breath

Who is at risk for sepsis?



Adults 65 or older



People with weakened immune systems



People with chronic medical conditions



People with recent severe illness or hospitalization



Sepsis survivors



Children younger than one

September is Sepsis Awareness Month

How Sepsis Affects the Body

Vomiting

Fever

Fast, Shallow Breathing

Confusion or Disorientation

Increased Heart Rate

Chills or Shivering

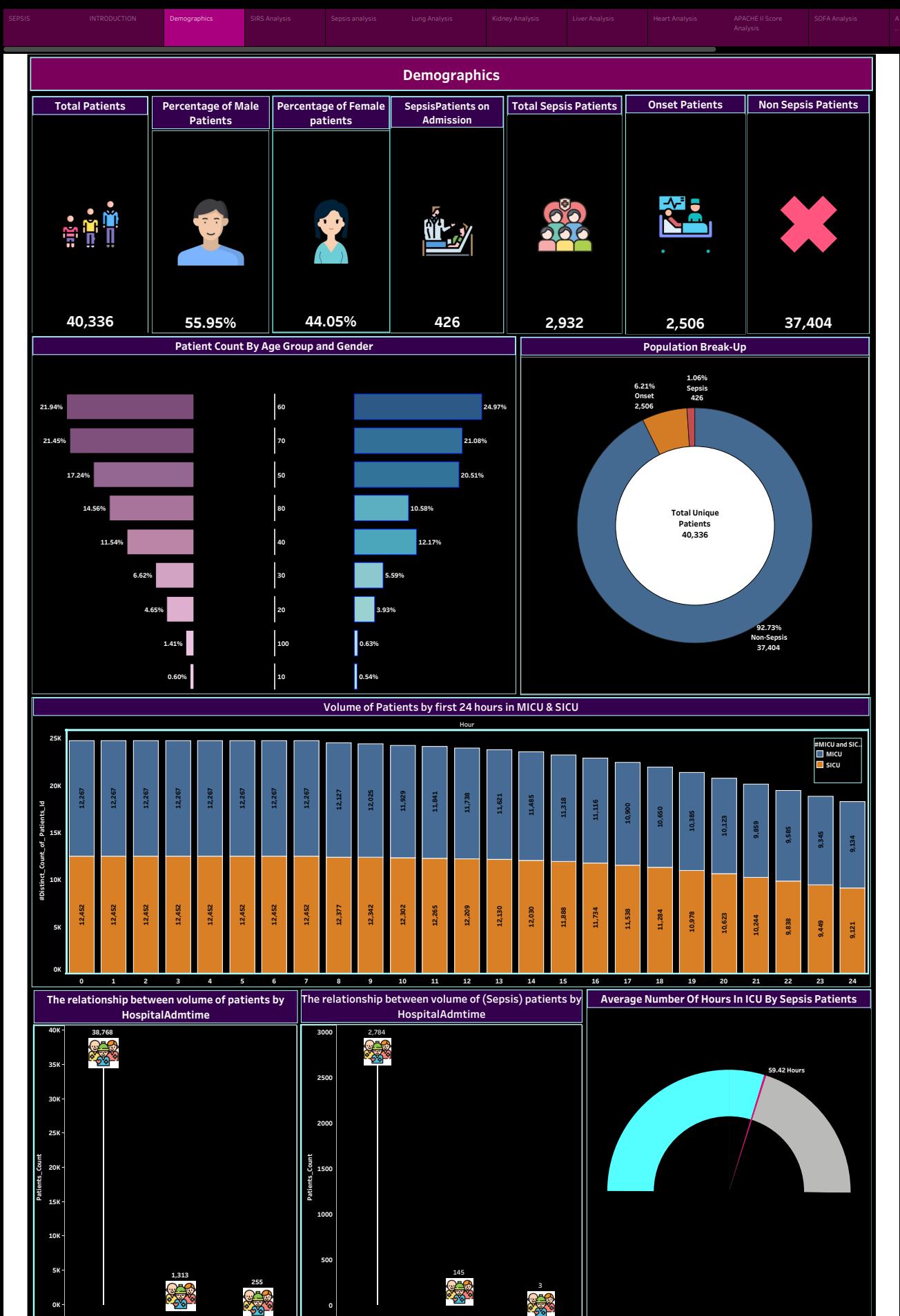
Low Urine Output

Lethargy

Low Body Temperature

Refusing to Eat



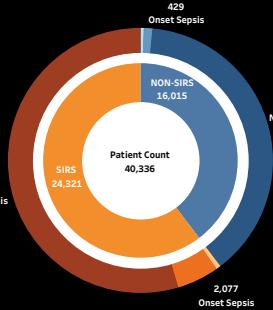


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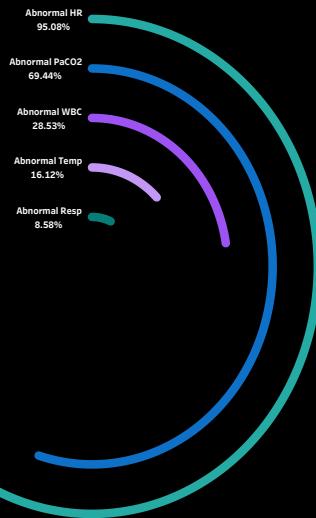
Systemic Inflammatory Response Syndrome (SIRS)

SIRS Criteria	
Temperature	>38°C or <36°C
Tachycardia	HR >90 beats/min
Tachypnea	>20 breaths/min or PaCO ₂ <32 mmHg
WBC	>12,000 cells/mm ³ or <4,000 cells/mm ³ or >10% immature (band) forms

SIRS Patient Analysis



Analysis of Abnormal Biomarker in SIRS

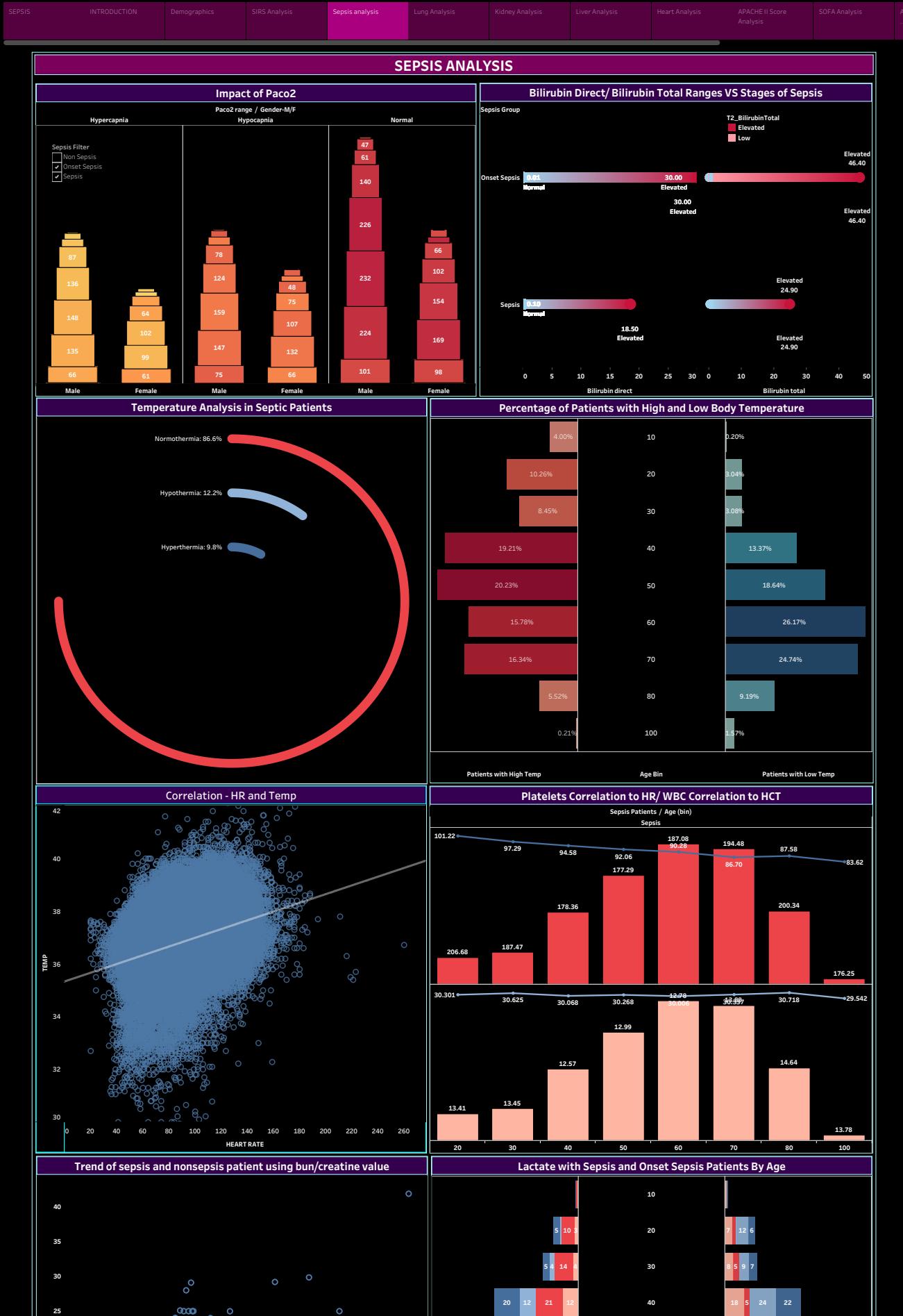


SIRS - Trigger Alert

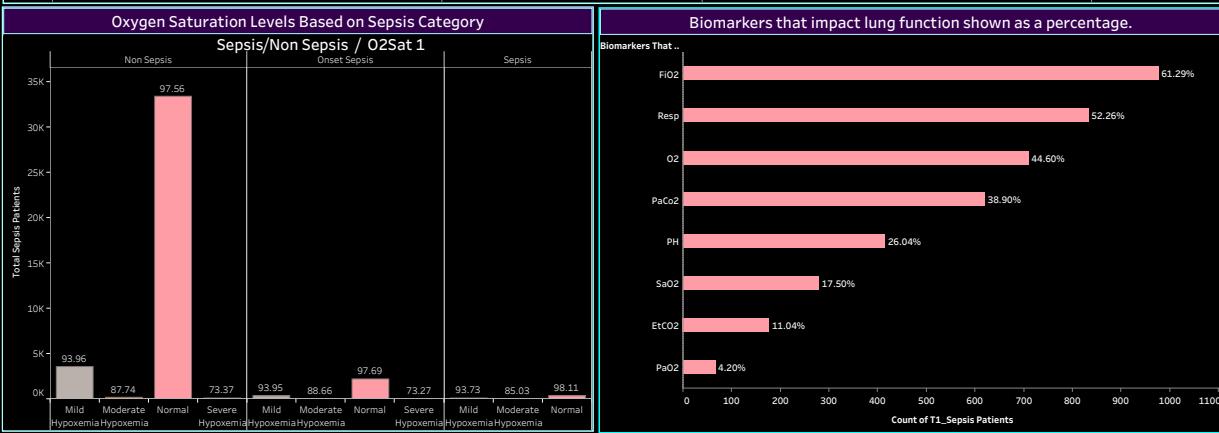
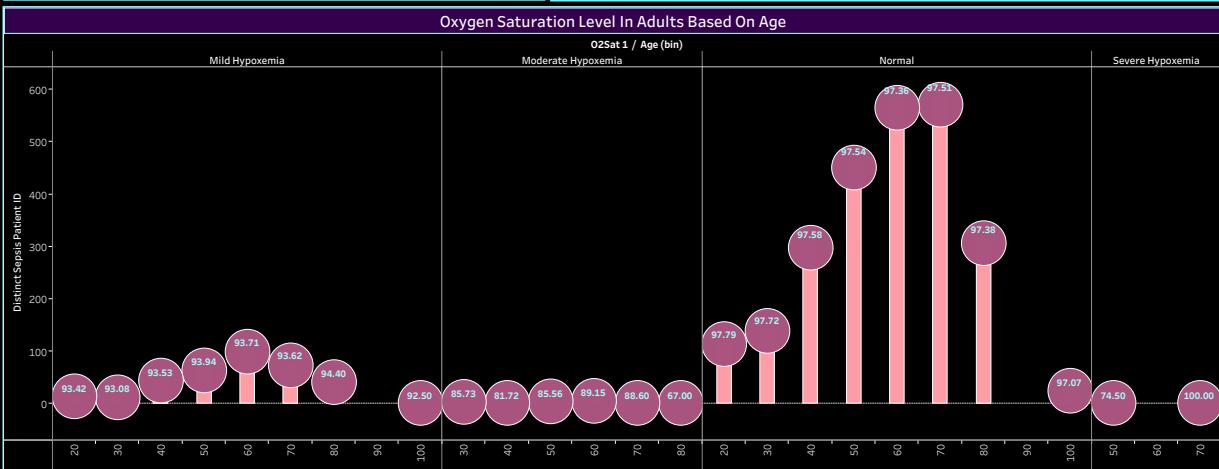
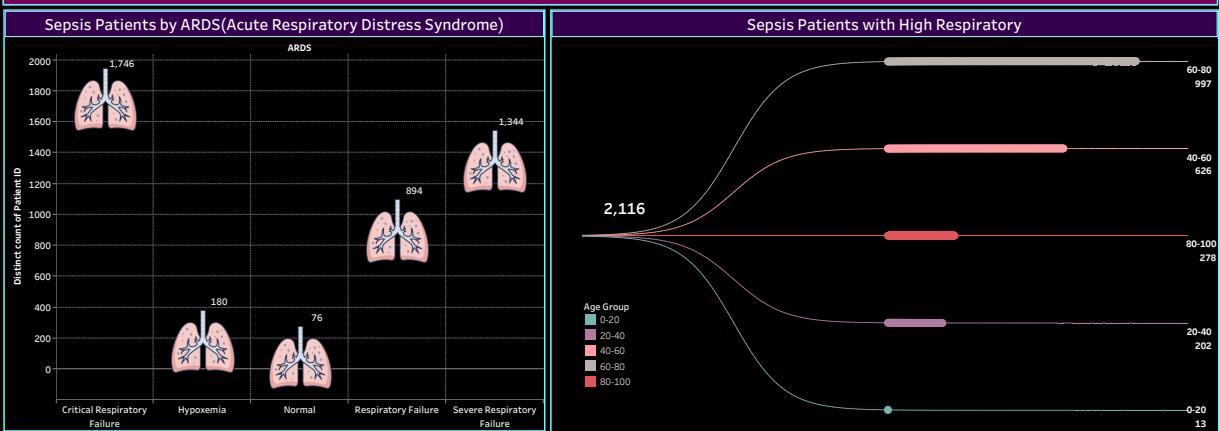
Patient ID	S5_Hour...	Hour	SIRS Trigger Alert	HR	Resp	Temp	PaCO2	WBC
9	Transition	5					42.00	
	Trigger	6	☒	120.00	30.00	36.000	54.00	4.300
11	Transition	19		93.00	17.00			
	Trigger	20	☒	101.00	21.00		37.00	
18	Transition	1		104.00	16.00			
	Trigger	2	☒	102.00	24.00	38.560		
28	Transition	0						
	Trigger	1	☒	117.00	32.00			
34	Transition	5		88.00	27.00	36.500	59.00	
	Trigger	6	☒	91.00	24.00			
42	Transition	0						
	Trigger	1	☒	97.00	23.00			
63	Transition	10		113.00	19.00			
	Trigger	11	☒	107.50	20.50	39.000		

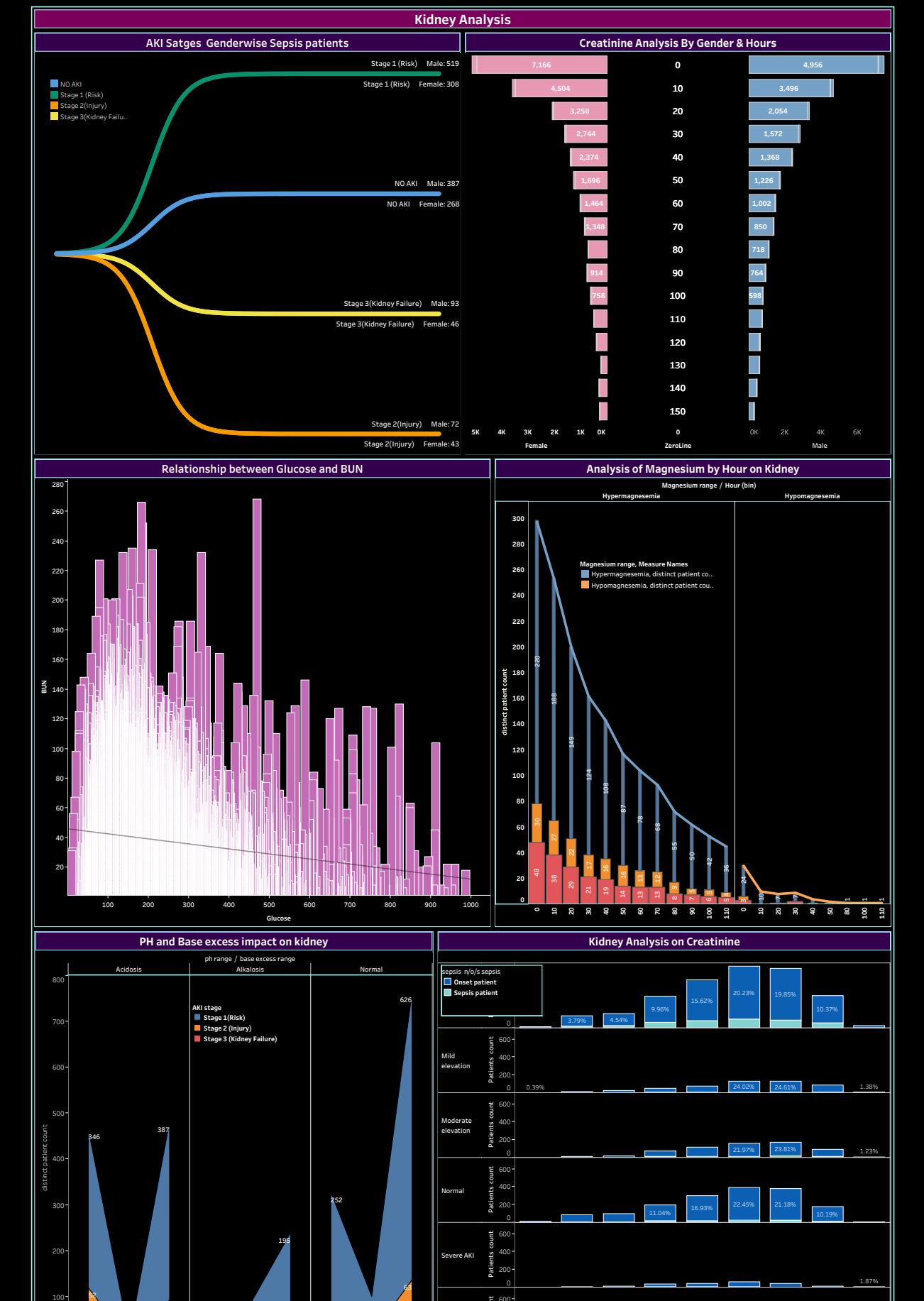
Trigger Hour in SIRS Patients

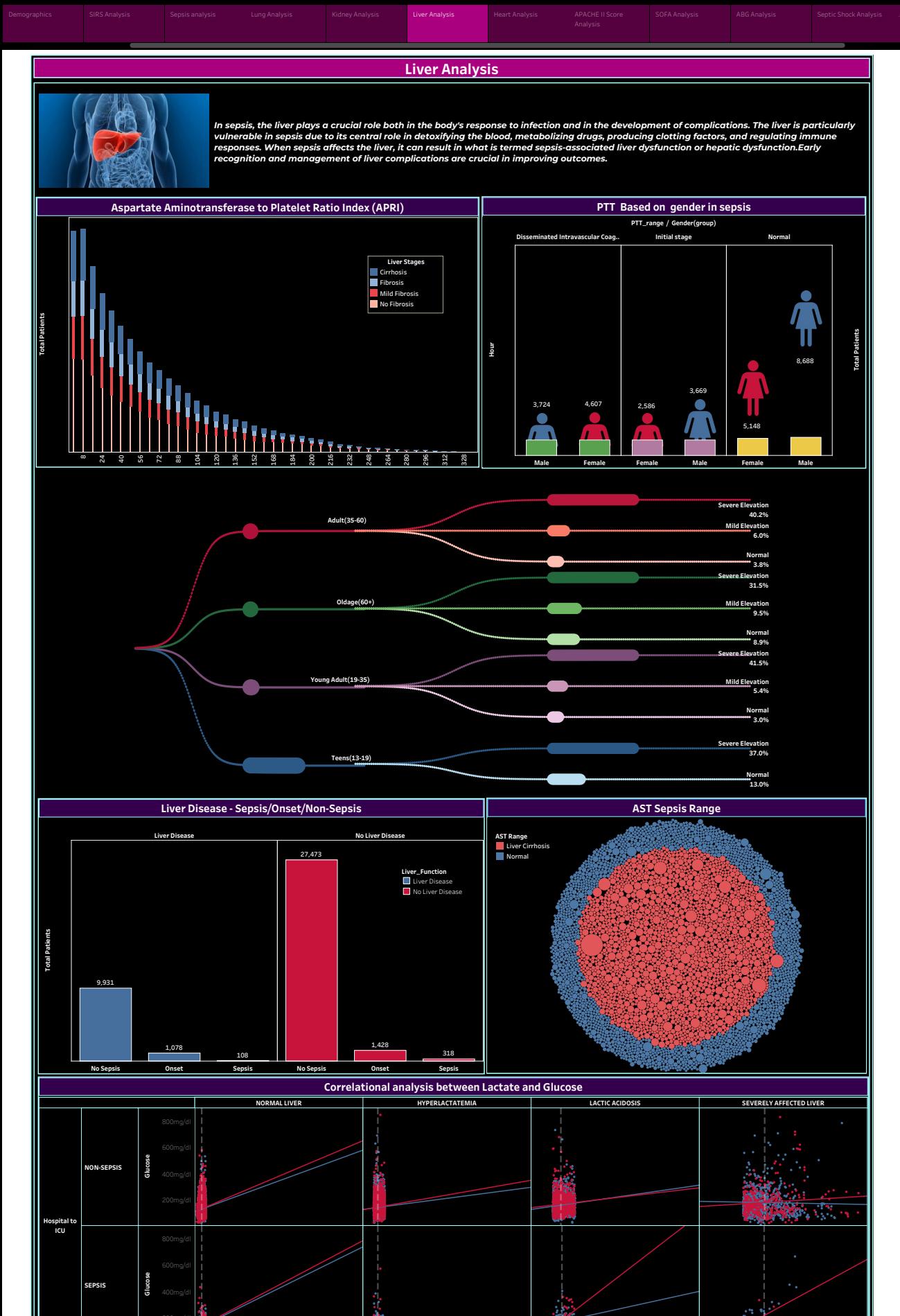
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Lung Analysis







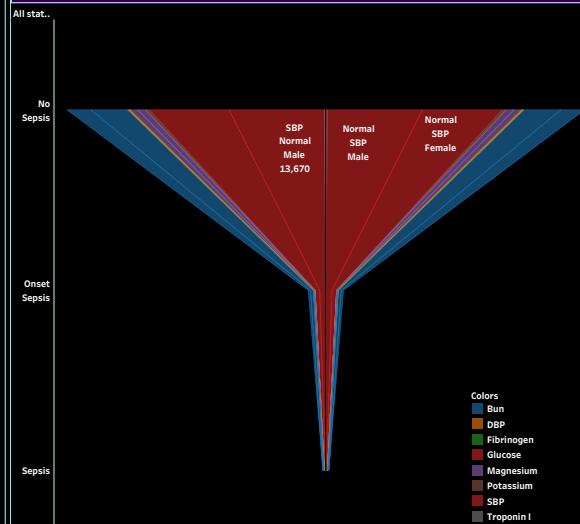
HEART ANALYSIS



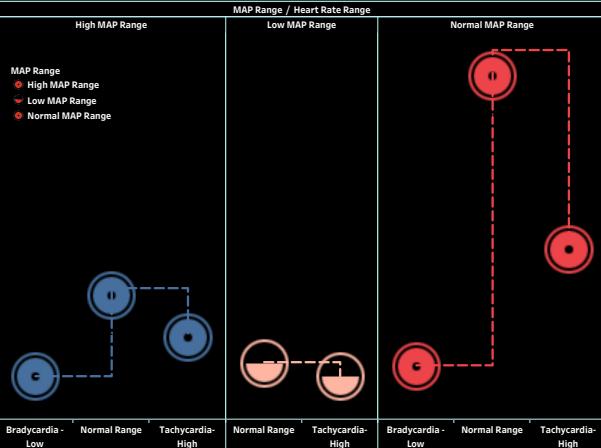
Heart rate is a vital sign that can indicate a patient's response to infection. A Heart Rate of more than 90 beats per minute is one of the crucial bio markers for sepsis in adults. Heart rate analysis involves evaluating the heart's rhythm, rate, and patterns to assess cardiovascular health. Factors Influencing Heart Rate are physical activity, emotions, medications, health conditions -> Fever, infections, and other medical issues can affect heart rate and for patients with known heart conditions. In conditions like sepsis, heart rate is a vital sign that helps guide diagnosis and treatment decisions.



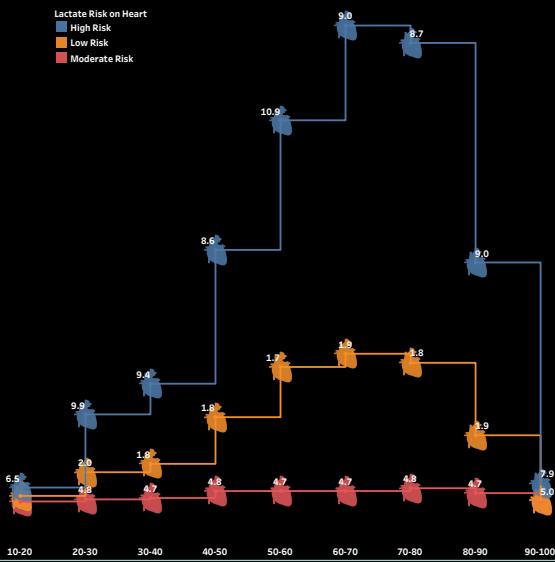
Biomarkers impacting Heart



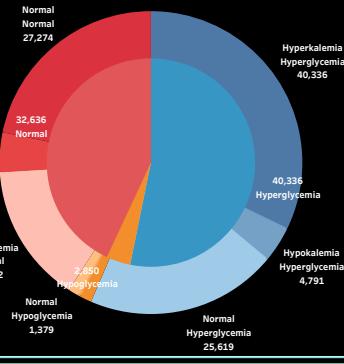
MAP Range Vs Heart Rate



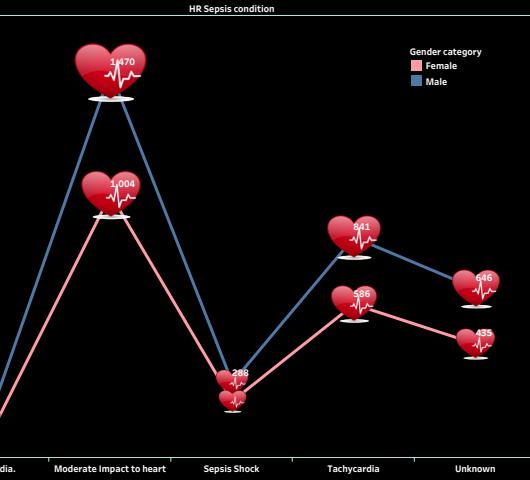
Lactate Levels and Cardiac Risk



Glucose Potassium Level Distribution Among Patients



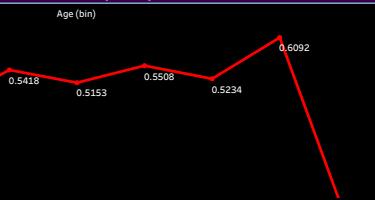
HR Risk in SICU and MICU with Gender



Potassium Level and Length of Stay



Correlation of Bicarbonate(HCO3) with PACO2



Apache II Score Analysis



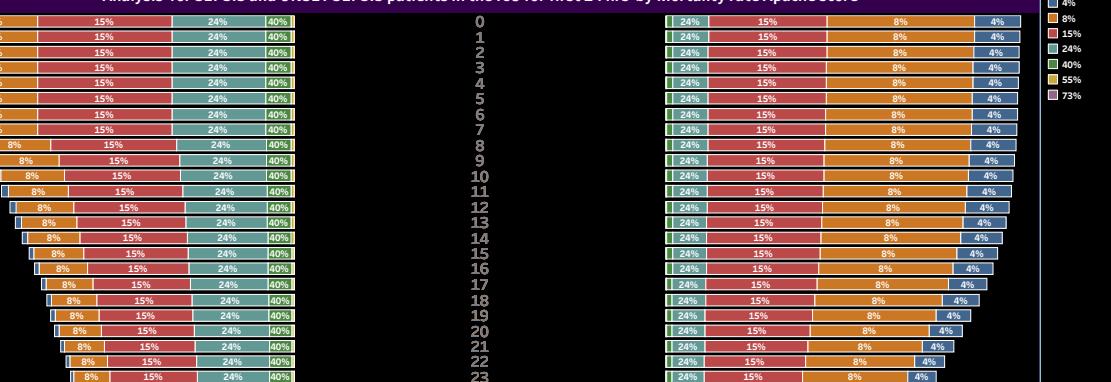
The Acute Physiology and Chronic Health Evaluation II (APACHE II) score is a prognostic stratification system for sepsis that can help assess a patient's disease severity and the level of care they need.

Organ dysfunction mode refers to a state where one or more organs in the body fail to function properly, often due to underlying conditions such as sepsis, trauma, or chronic disease. This can lead to a cascade of complications, affecting overall health and requiring immediate medical intervention to restore function and prevent progression to organ failure. Key indicators may include changes in vital signs, laboratory values, and organ-specific symptoms. Early detection and treatment are crucial for improving outcomes.

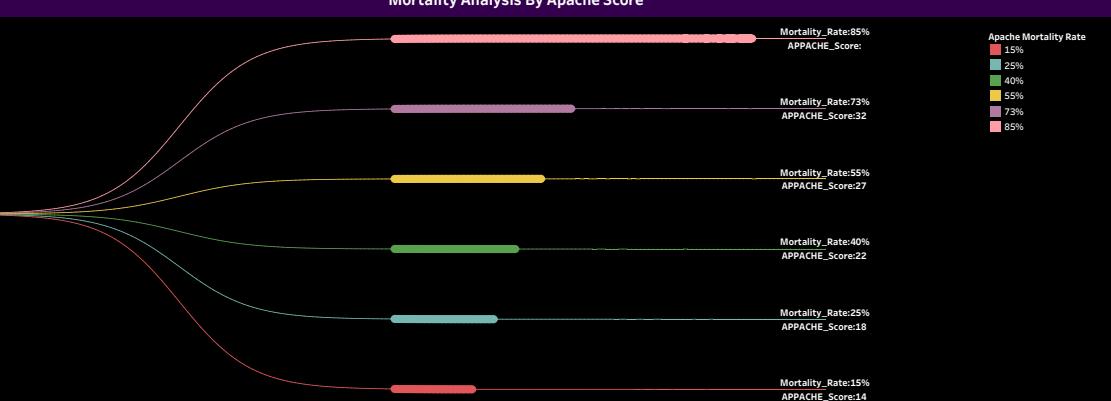
APACHE SCORE TABLE

Patient..	MORT..	AGE_APII	APACHE II S..	Creatinine_..	HCT_APII	HR_APII	MAP_APII	PH_APII	Potassium_..	RESP_APII	TEMP_APII	WBC_APII
114	75%	6.00	30.00	2.00	2.00	4.00	4.00	4.00	1.00	3.00	0.00	4.00
852	75%	6.00	30.00	2.00	2.00	2.00	4.00	4.00	4.00	4.00	0.00	2.00
1242	75%	6.00	34.00	2.00	2.00	4.00	4.00	4.00	4.00	3.00	1.00	4.00
4556	75%	6.00	31.00	2.00	2.00	2.00	4.00	4.00	4.00	3.00	0.00	4.00
11882	75%	6.00	30.00	2.00	4.00	3.00	4.00	4.00	3.00	3.00	0.00	1.00
19254	75%	5.00	31.00	2.00	4.00	2.00	4.00	4.00	3.00	3.00	0.00	4.00
101141	75%	6.00	30.00	2.00	2.00	4.00	4.00	4.00	3.00	3.00	0.00	2.00
101215	75%	6.00	32.00	2.00	2.00	4.00	4.00	4.00	3.00	3.00	2.00	2.00
105597	75%	6.00	31.00	2.00	2.00	2.00	4.00	4.00	4.00	3.00	0.00	4.00
111882	75%	6.00	31.00	2.00	4.00	4.00	4.00	4.00	3.00	3.00	1.00	1.00

Analysis for SEPSIS and ONSET SEPSIS patients in the ICU for first 24 hrs by Mortality rate Apache score

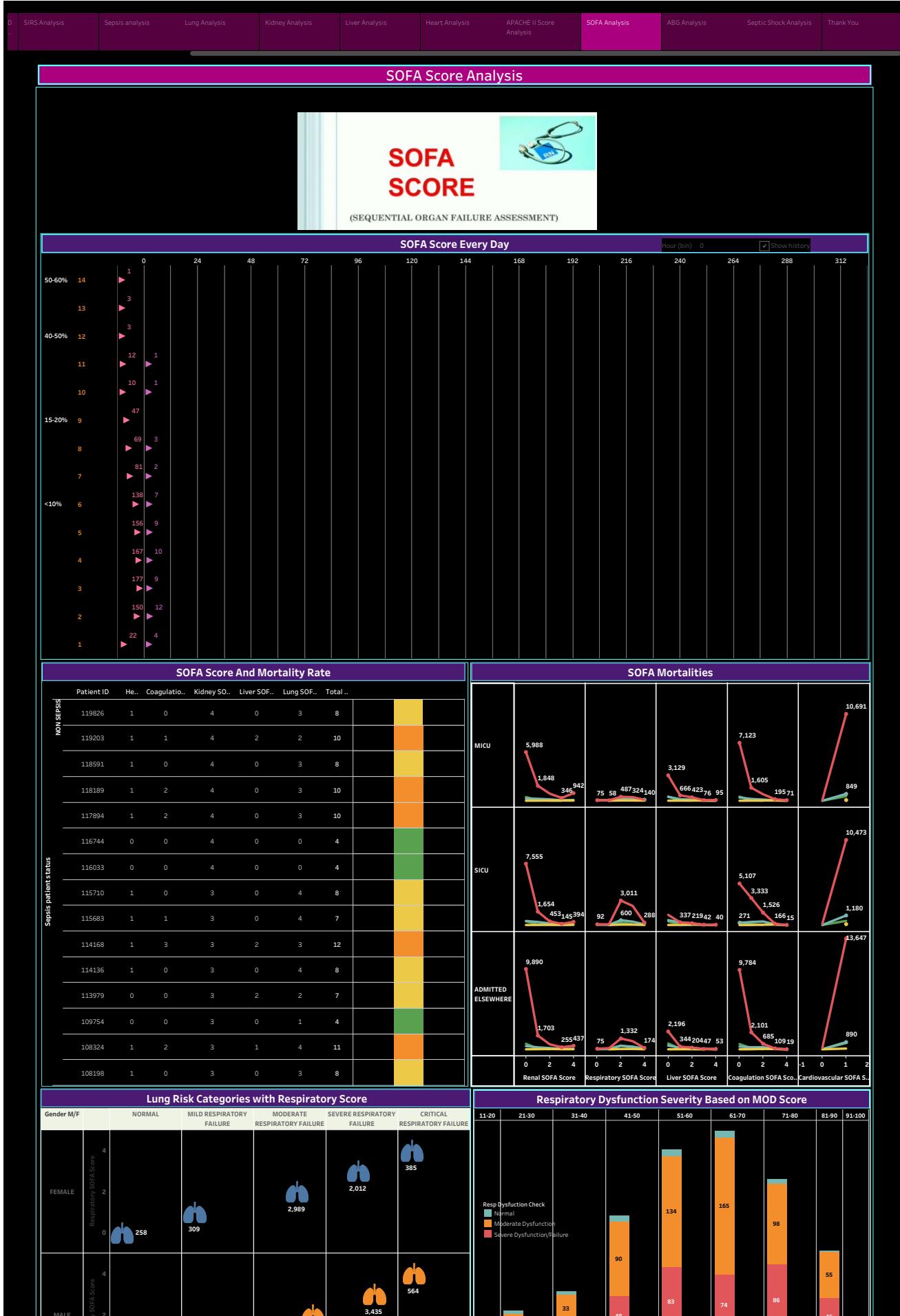


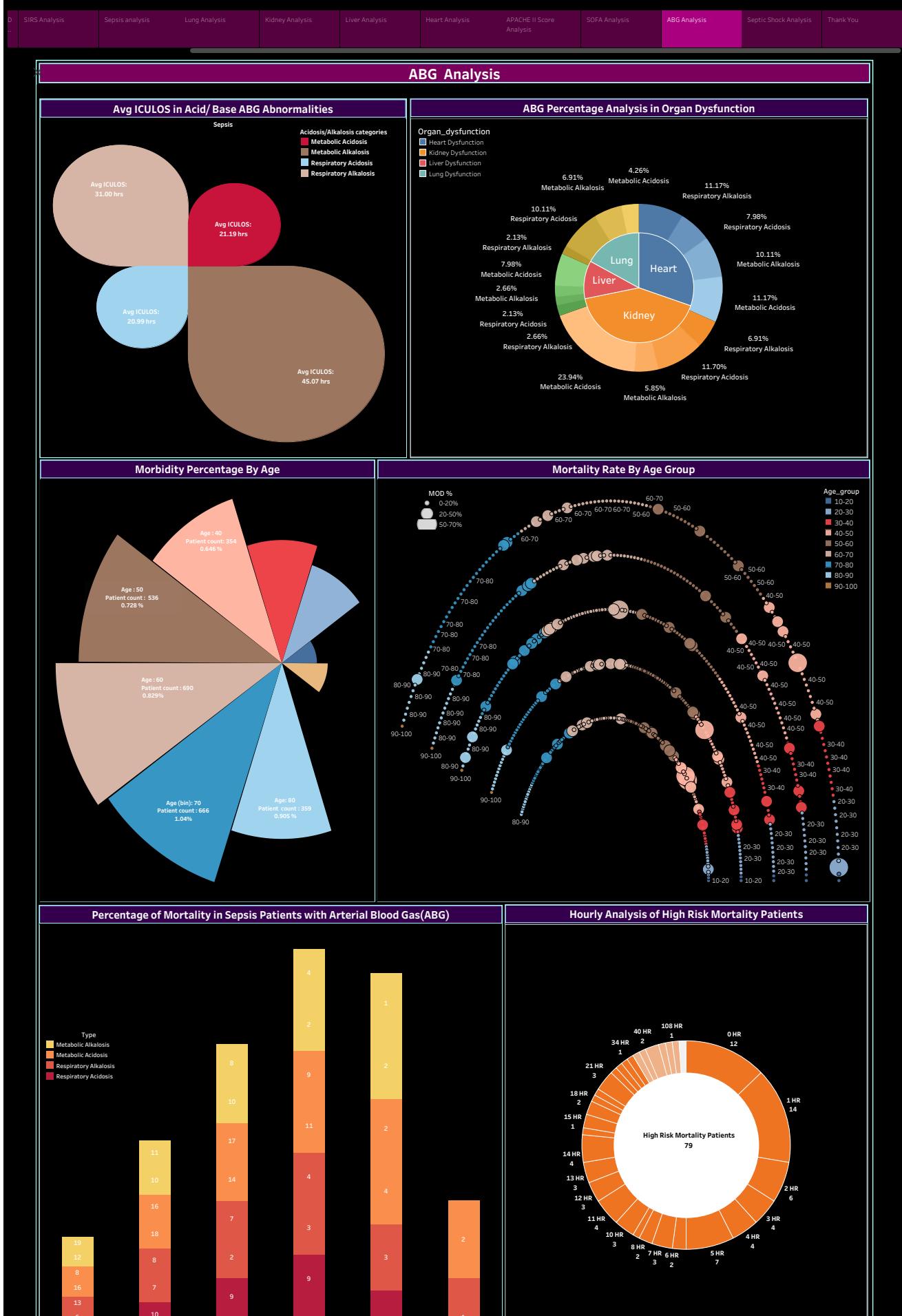
Mortality Analysis By Apache Score



Apache II score vs Organ Dysfunction







SIRS Analysis | Sepsis analysis | Lung Analysis | Kidney Analysis | Liver Analysis | Heart Analysis | APACHE II Score Analysis | SOFA Analysis | ABG Analysis | Septic Shock Analysis | Thank You

Septic Shock Analysis



Septic shock is a severe and life-threatening condition that occurs when sepsis leads to dangerously Low Blood Pressure and Organ Dysfunction. It is characterized by an overwhelming immune response to widespread inflammation and tissue damage, impairing blood flow and oxygen delivery to vital organs.



infection, which causes SBP < 90mmHg / SBP > 40mmHg SBP leads to Hypotension in Septic Shock patients



MAP < 60 mmHg
Low MAP leads to Hypoperfusion



LACTATE > 2 mmol/L
High lactate levels lead to Hyperlactatemia in Septic Shock patients



RESP >= 22 bpm
Both Elevated and Decreased levels of Respiratory Rate can lead to potential Respiratory Failure.



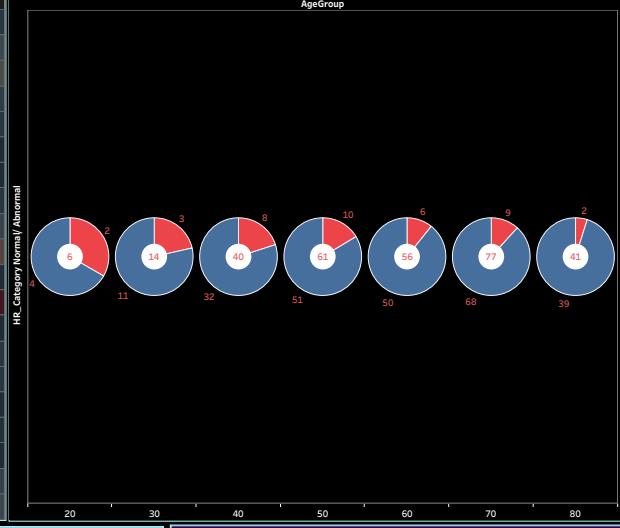
Elevated and Low Temperature can indicate severe sepsis, leading to Septic Shock.

Septic Shock Biomarker Analysis

Septic S..	S ..Hour	SepticShock..	Email	Lactate >2	MAP<60	Resp >= 22	SBP<90
403	4	Septic Shock	Email	3.20	51.00	43.50	79.75
107511	1	Septic Shock	Email	4.64	58.00	32.00	66.00
5987	3	Septic Shock	Email	2.60	57.50	31.00	61.50
8506	1	Septic Shock	Email	5.40	46.00	30.00	74.00
1384	2	Septic Shock	Email	3.20	58.00	30.00	80.00
5391	2	Septic Shock	Email	2.30	55.33	29.00	88.00
18760	1	Septic Shock	Email	4.80	58.00	28.00	87.00
14518	3	Septic Shock	Email	10.00	56.00	28.00	80.00
11090	34	Septic Shock	Email	3.10	57.67	28.00	69.00
1917	0	Septic Shock	Email	6.60	33.00	28.00	59.00
106246	74	Septic Shock	Email	4.44	56.00	27.50	87.00
110106	15	Septic Shock	Email	6.41	32.00	27.00	34.00
10957	11	Septic Shock	Email	6.20	59.00	27.00	88.00
2425	12	Septic Shock	Email	4.30	52.00	27.00	79.25
19481	8	Septic Shock	Email	11.30	56.50	26.00	80.00
13985	1	Septic Shock	Email	2.50	47.83	24.50	87.50
16051	5	Septic Shock	Email	3.00	46.33	24.00	85.00
2700	206	Septic Shock	Email	8.40	55.00	24.00	87.50
19311	100	Septic Shock	Email	3.90	44.00	23.00	71.00
4749	8	Septic Shock	Email	2.20	48.00	22.00	66.50

HR Analysis in Septic Shock Patients

AgeGroup

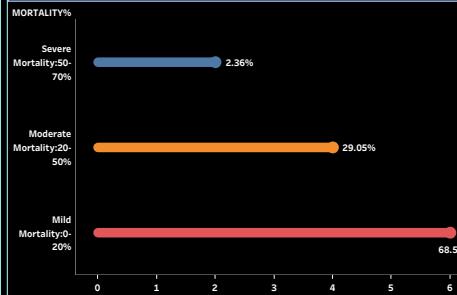


AgeGroup	HR - Category Normal/Abnormal
20-30	11
30-40	32
40-50	32
50-60	51
60-70	68
70-80	39
80+	41

Organ Failure Analysis

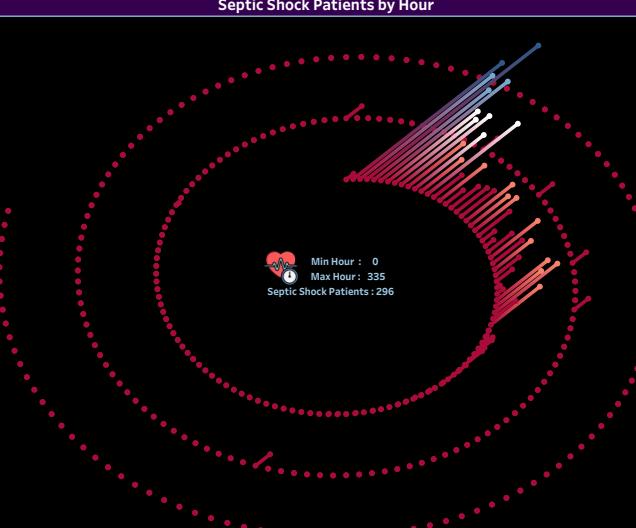
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Mortality rate Based On MOD Score



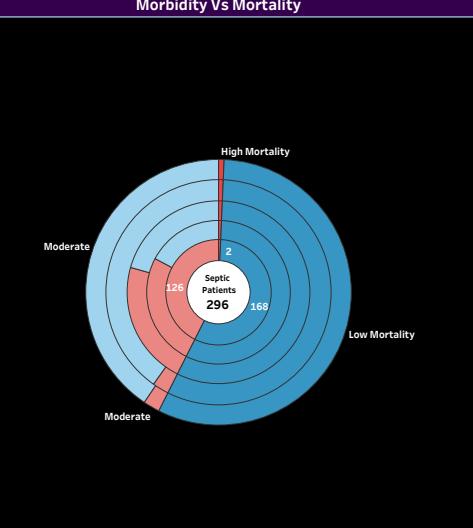
MORTALITY%	MOD Score Category	Mortality Rate (%)
Severe Mortality: 50-70%	Severe	2.36%
Moderate Mortality: 20-50%	Moderate	29.05%
Mild Mortality: 0-20%	Mild	68.58%

Septic Shock Patients by Hour



Min Hour : 0
Max Hour : 335
Septic Shock Patients : 296

Morbidity Vs Mortality



High Mortality
Moderate
Low Mortality
Septic Patients 296
168
126
2

CONCLUSION

- Sepsis remains a formidable adversary in healthcare, posing a significant threat to patient health and outcomes.
- Data analytics can inform more effective prevention, diagnosis and treatment strategies.
- Early detection and intervention are crucial in sepsis.
- Age, gender and underlying health conditions influence patient outcomes.
- Targeted protocols and advanced analytics can enhance decision-making.
- Continued research and collaboration are essential to combat sepsis.
- The future of sepsis management lies in data-driven insights and innovation.

