

Supplementary material 1. Scoring systems for predicting neonatal mortality

Clinical risk index for babies II (CRIB II): 5 parameters with a total score from 0 to 27

- Birthweight
- Gestational age
- Body temperature at admission
- Maximum base deficit in first 12 hours
- Sex

(Parry et al., 2003)

Birthweight (g)	Gestational age (weeks)																					
	22		23		24		25		26		27		28		29		30		31		32	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
251-500	15	14	14	13	13	12	12	11	11	10	10	10	10	10	–	–	–	–	–	–	–	–
501-750	14	13	13	12	12	11	11	10	10	9	9	8	8	8	8	7	8	7	8	7	–	–
751-1000	–	–	12	11	11	10	10	9	8	8	7	7	7	6	6	5	6	5	6	5	6	5
1001-1250	–	–	12	11	10	10	9	8	8	7	7	6	6	5	5	4	4	3	3	3	3	3
1251-1500	–	–	–	–	–	–	–	–	8	7	6	5	5	4	3	3	3	2	2	1	1	1
1501-1750	–	–	–	–	–	–	–	–	–	–	6	6	5	4	3	3	2	1	1	0	0	0
1751-2000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	3	1	1	0	0	0	0
2001-2250	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	1	0	0	0	0
2251-2500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	2	0	0	0	0
2501-2750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	0	0
2751-3000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0

F, female; M, male

Body temperature at admission (°C)	Score
≤29.6	5
29.7 – 31.2	4
31.3 – 32.8	3
32.9 – 34.4	2
34.5 – 36	1
36.1 – 37.5	0
37.6 – 39.1	1
39.2 – 40.7	2
≥40.8	3

Base excess (mmol/L)	Score
< –26	7
–26 to –23	6
–22 to –18	5
–17 to –13	4
–12 to –8	3
–7 to –3	2
–2 to 2	1
≥3	0

Score for Neonatal Acute Physiology II (SNAP-II): 6 parameters with a total score ranging from 0 to 115. (Richardson et al., 2001)

Variable	Values	Points
Mean blood pressure (mmHg)	>29	0
	20-29	9
	<20	19
Lowest body temperature (°C)	>35.6	0
	35 – 35.6	8
	<35	15
pO ₂ /FiO ₂	> 2.49	0
	1.0 – 2.49	5
	0.3 – 0.99	16
	<0.3	28
Lowest serum pH	>7.19	0
	7.1 – 7.19	7
	<7.1	16
Multiple seizures	No	0
	Yes	19
Urine output (ml/kg/hr)	>0.9	0
	0.1 – 0.9	5
	<0.1	18

FiO₂, fraction of inspired oxygen; pO₂, partial pressure of oxygen

Score for Neonatal Acute Physiology Perinatal Extension II (SNAPPE-II): 9 parameters with a total score ranging from 0 to 162. (Richardson et al., 2001)

Variable	Values	Points
Mean blood pressure (mmHg)	>29	0
	20-29	9
	<20	19
Lowest body temperature (°C)	>35.6	0
	35 – 35.6	8
	<35	15
pO ₂ /FiO ₂	> 2.49	0
	1.0 – 2.49	5
	0.3 – 0.99	16
	<0.3	28
Lowest serum pH	>7.19	0
	7.1 – 7.19	7
	<7.1	16
Multiple seizures	No	0
	Yes	19
Urine output (ml/kg/hr)	>0.9	0
	0.1 – 0.9	5
	<0.1	18
Birth weight (g)	>999	0
	750 – 999	10
	<750	17
Small for gestational age (<3rd percentile)	No	0
	Yes	12
Apgar score at 5 min <7	No	0
	Yes	18

FiO₂, fraction of inspired oxygen; pO₂, partial pressure of oxygen

Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar (STOPS):

6 parameters with a total score ranging from 0 to 10.

(Vardhelli et al., 2023)

Variable	Score 0	Score 1	Score 2
Sensorium	Spontaneous arousal, alert, demonstrates active movement and normal cry	Irritability, poor response to touch, reduced spontaneous movements, weak cry, or poor feeding	Lethargy or no response to touch or absence of spontaneous movements or no cry or not sucking well
Temperature	Normal temperature (36.5–37.5°C) with warm peripheries	Temperature instability (cold stress: < 36.5°C)—cold peripheries despite clothing or rewarming	Hypothermia with < 36°C or fever with > 38.5°C with cold extremities
Oxygenation	No respiratory distress and no need for oxygen	Persistence of tachypnea (RR 60–80/min) or mild grunting or minimal chest retractions or need for $\text{FiO}_2 \leq 30\%$	Persistence of tachypnea (RR > 80/min) or respiratory distress (persistent audible grunting or severe retractions) or apnea, requiring need for $\text{FiO}_2 > 30\%$ or requirement for CPAP or ventilatory support
Perfusion	Normal CRT, HR 100–160/min, normal blood pressure for age	CRT > 3 s or tachycardia (HR > 160/min) or bradycardia (HR < 100/min) AND normal blood pressure	Hypotension (MAP below the gestational age in weeks at the time of birth) and prolonged CRT with cool extremities or mottled skin or oliguria (urine output < 1 mL/kg/h)
Skin color	Normal pink extremities and body	Presence of pale or bluish extremities (in spite of rewarming) and body	
Blood sugar	Random blood sugar ≥ 45 mg/dL and ≤ 180 mg/dL, single value of abnormal blood sugar promptly corrected by feeds or intravenous fluids	Abnormal random blood sugar at least 2 times: hypoglycemia < 45 mg/dL or hyperglycemia > 180 mg/dL despite adequate treatment	

CPAP, continuous positive airway pressure; CRT, capillary refill time; FiO_2 , fraction of inspired oxygen; HR, heart rate; MAP, mean arterial pressure; RR, respiratory rate.

Modified Sick Neonatal Score (MSNS): 8 parameters with total score ranging from 0 to 16.

(Mansoor et al., 2019)

Parameter	Score 0	Score 1	Score 2
Respiratory effort	Apnea or grunt	Tachypnea (respiratory rate > 60/min) with or without retractions	Normal (respiratory rate 40–60/min)
Heart rate	Bradycardia or asystole	Tachycardia (>160/min)	Normal (100–160/min)
Axillary temperature (°C)	<36	36 – 36.5	36.5 – 37.5
Capillary refilling time (second)	>5	3-5	<3
Random blood sugar (mg/dl)	<40	40 – 60	>60
SpO ₂ (in room air)	<85	85 – 92	>92
Gestational age (week)	<32	32 to 36 +6/7 days	≥37
Birth weight (kg)	<1.5	1.5 – 2.49	≥2.5

SpO₂, saturation of peripheral oxygen

Neonatal Sequential Organ Failure Assessment (nSOFA): 3 subscore parameters with a total score ranging from 0 to 15. (Wynn & Polin, 2020)

Respiratory score criteria	Score 0	Score 2	Score 4	Score 6	Score 8
	Not intubated OR intubated, SpO ₂ /FiO ₂ ≥300	Intubated, SpO ₂ /FiO ₂ <300	Intubated, SpO ₂ /FiO ₂ <200	Intubated, SpO ₂ /FiO ₂ <150	Intubated, SpO ₂ /FiO ₂ <100
Cardiovascular score criteria	Score 0	Score 1	Score 2	Score 3	Score 4
	No inotropes AND no systemic steroids treatment	No inotropes AND systemic steroid treatment	One inotrope AND no systemic steroids	Two or more inotropes OR one inotrope AND systemic steroid treatment	Two or more inotropes AND systemic steroid treatment
Hematologic score	Score 0	Score 1	Score 2	Score 3	
	Platelet count ≥150 ×10 ³	Platelet count 100–149 ×10 ³	Platelet count <100 ×10 ³	Platelet count < 50 ×10 ³	

FiO₂, fraction of inspired oxygen; SpO₂, saturation of peripheral oxygen

References

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Supplementary material 2. Detailed performance of six neonatal mortality prediction scores

Table S1 Clinical Risk Index for Babies II (CRIB II) in study population

Subscore/total score	All (n=299)	Non-survivors (n=105)	Survivors (n=194)	<i>p</i> value
Birth weight/gestational age/sex*	0 (0-1)	1 (0-5)	0 (0-0)	<0.001
Body temperature at admission*	0 (0-1)	1 (0-1)	0 (0-0)	<0.001
Maximum base deficit in first 12 hours*	3 (3-4)	4 (3-5)	3 (2-4)	<0.001
Total score	4 (3-6)	6 (4-10)	3 (3-4)	<0.001
Total score categories†				<0.001
0 – 3	123 (41.1%)	12 (11.4%)	111 (57.2%)	
4 – 6	124 (41.5%)	52 (49.5%)	72 (37.1%)	
7 – 10	25 (8.36)	17 (16.2%)	8 (4.1%)	
≥11	27 (9.0%)	24 (22.9%)	3 (1.6%)	

*median (IQR), †number (%),

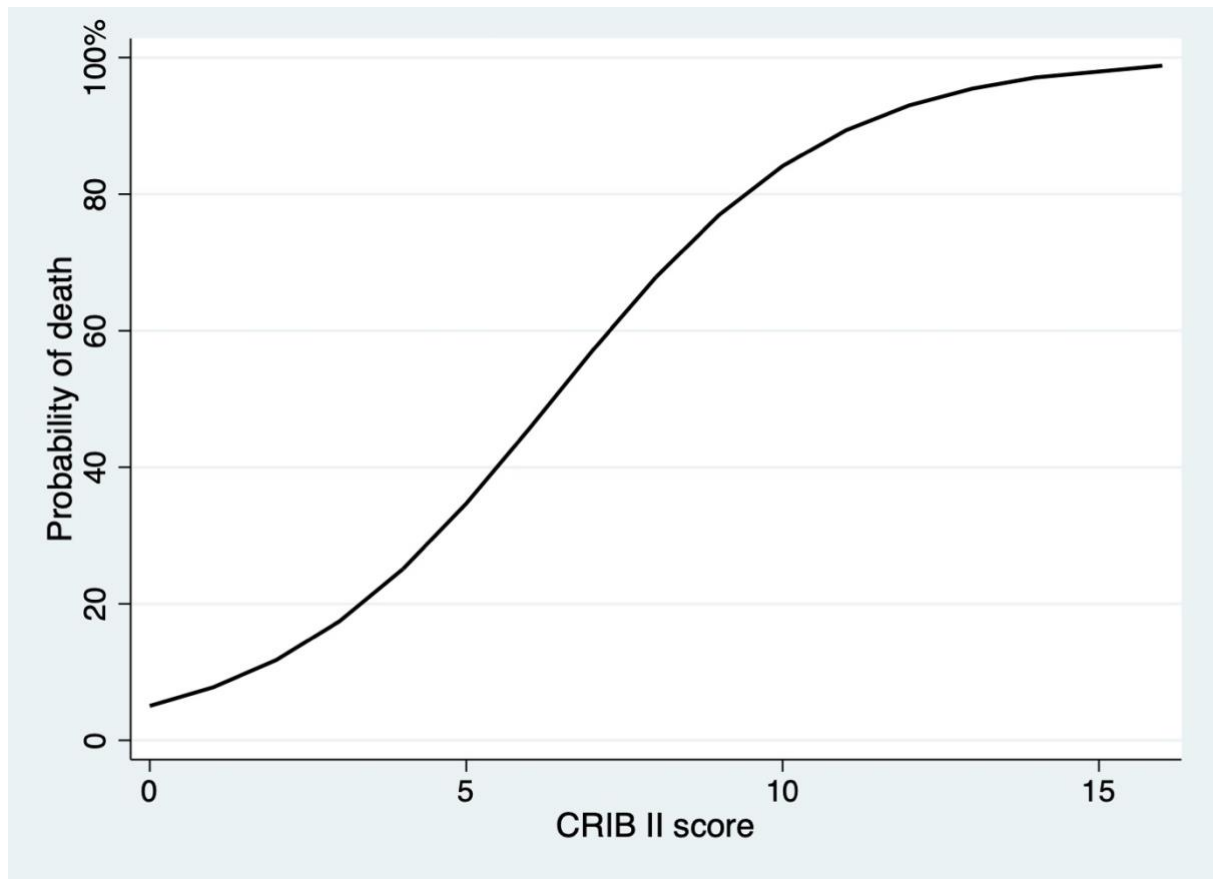


Fig. S1 Line graph of the relationship between CRIB II score and probability of neonatal death

CRIB II, Clinical Risk Index for Babies II

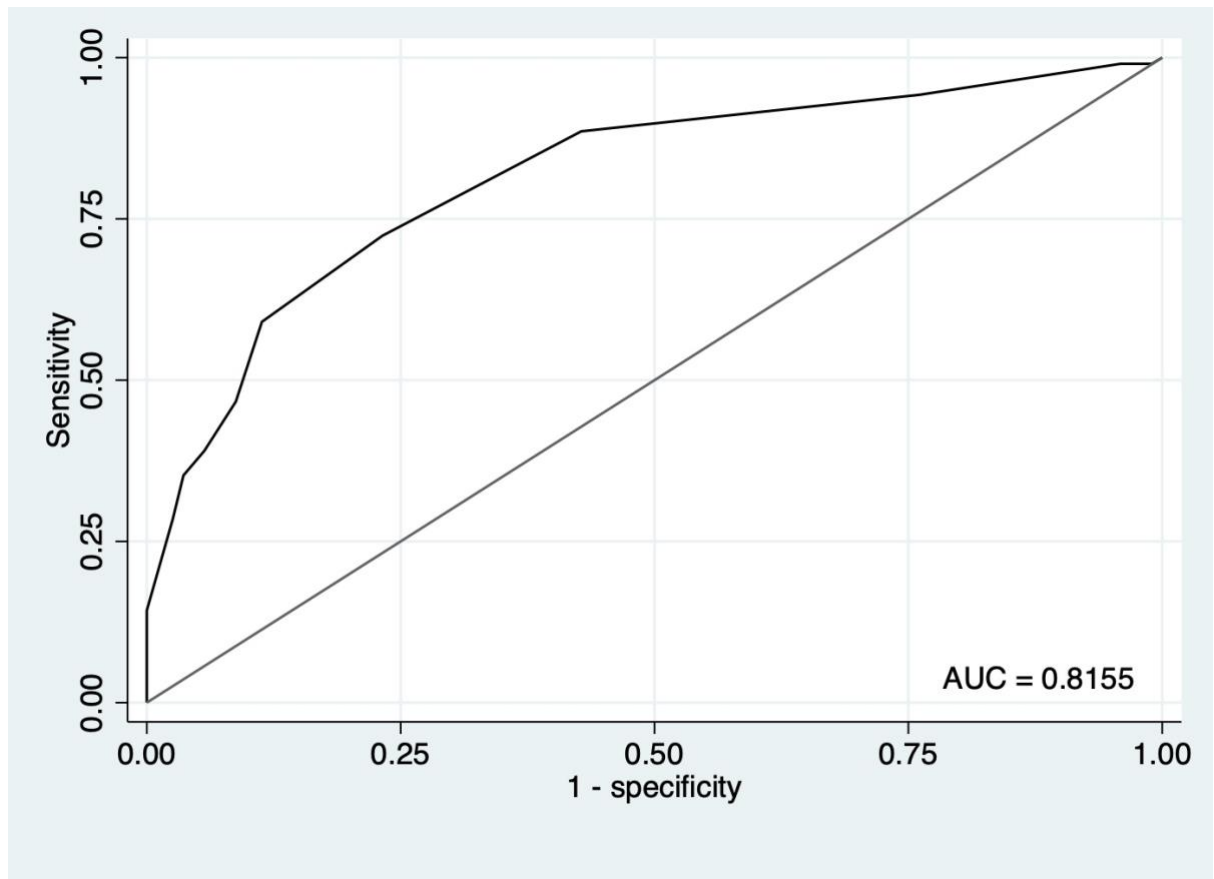


Fig. S2 Receiver operating characteristic (ROC) curve analysis of Clinical Risk Index for Babies II (CRIB II) for predicting neonatal mortality
AUC, area under the ROC curve

Table S2 Score for Neonatal Acute Physiology II (SNAP-II) in study population

Parameters	All (n=299)	Non-survivors (n=105)	Survivors (n=194)	<i>p</i> value
Mean blood pressure (mmHg) [†]				<0.001
>29 (score 0)	270 (90.3%)	77 (73.3%)	193 (99.5%)	
20 – 29 (score 9)	28 (9.4%)	27 (25.7%)	1 (0.5%)	
<20 (score 19)	1 (0.3%)	1 (0.95%)	0	
Lowest body temperature (°C) [†]				0.123
>35.6 (score 0)	297 (99.3%)	103 (98.1%)	194 (100%)	
35 – 35.6 (score 8)	2 (0.67%)	2 (1.9%)	0	
<35 (score 15)	0	0	0	
pO ₂ /FiO ₂ [†]				<0.001
>2.49 (score 0)	130 (43.5%)	7 (6.7%)	123 (63.4%)	
1.0 – 2.49 (score 5)	121 (40.5%)	51 (48.6%)	70 (36.1%)	
0.3 – 0.99 (score 16)	48 (16.1%)	47 (44.8%)	1 (0.5%)	
<0.3 (score 28)	0	0	0	
Lowest serum pH [†]				<0.001
>7.19 (score 0)	249 (83.3%)	62 (59.1%)	187 (96.4%)	
7.1 – 7.19 (score 7)	46 (15.4%)	40 (38.1%)	6 (3.1%)	
<7.1 (score 16)	4 (1.3%)	3 (2.9%)	1 (0.52%)	
Multiple seizures [†]				0.837
No (score 0)	283 (94.7%)	99 (94.3%)	184 (94.9%)	
Yes (score 19)	16 (5.4%)	6 (5.7%)	10 (5.2%)	
Urine output (ml/kg/hr) [†]				0.008
>0.9 (score 0)	282 (94.3%)	94 (89.5%)	188 (96.9%)	
0.1 – 0.9 (score 5)	17 (5.7%)	11 (10.5%)	6 (3.1%)	
<0.1 (score 18)	0	0	0	
Total score [*]	5 (0-12)	16 (5-24)	0 (0-5)	<0.001
Total score categories [†]				<0.001
0 – 9	210 (70.2%)	33 (31.4%)	177 (91.2%)	
10 – 19	42 (14.1%)	30 (28.6%)	12 (6.2%)	
20 – 29	27 (9.0%)	23 (21.9%)	4 (2.1%)	
30 – 39	16 (5.4%)	15 (14.3%)	1 (0.52%)	
≥ 40	4 (1.3%)	4 (3.8%)	0	

[†]number (%), ^{*}median (IQR)

FiO₂, fraction of inspired oxygen; pO₂, partial pressure of oxygen

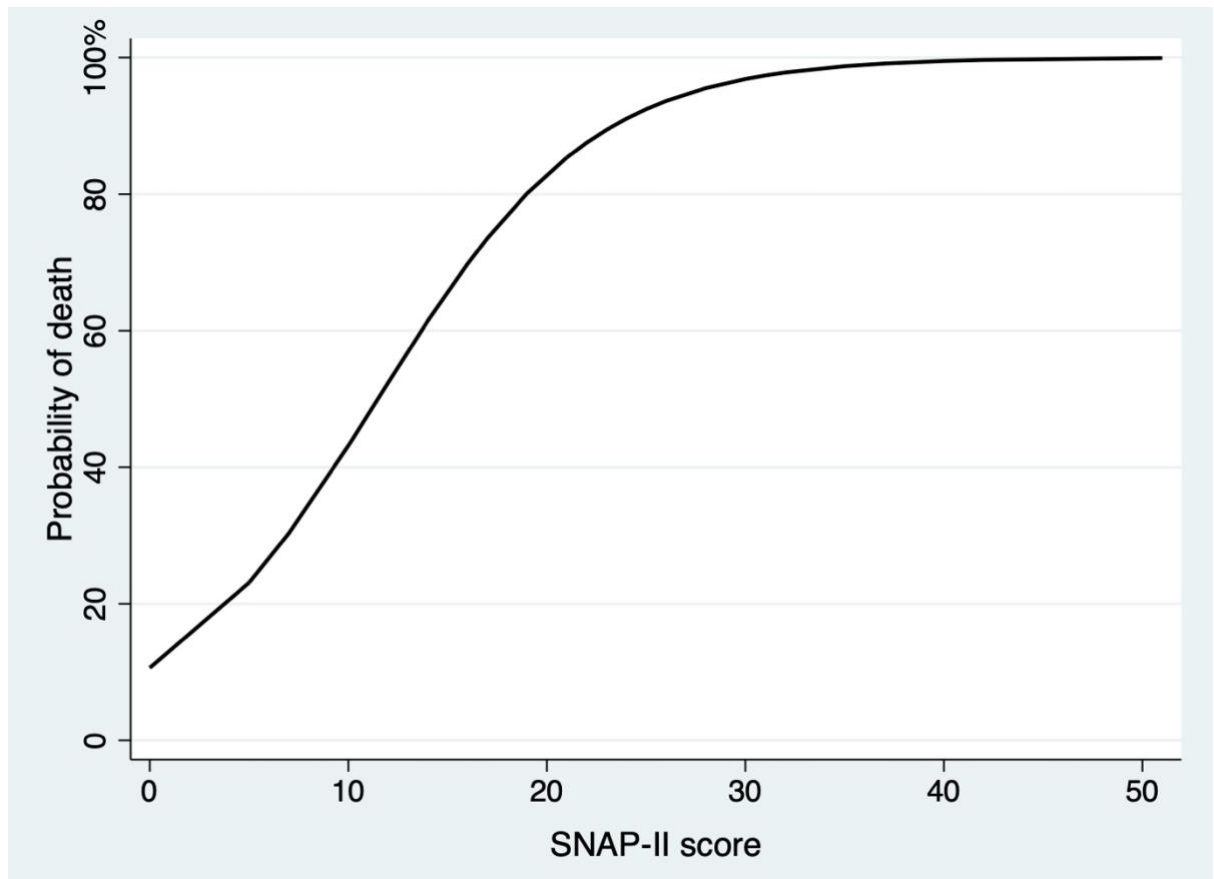


Fig. S3 Line graph of the relationship between SNAP-II score and probability of neonatal death

SNAP-II, Score for Neonatal Acute Physiology II

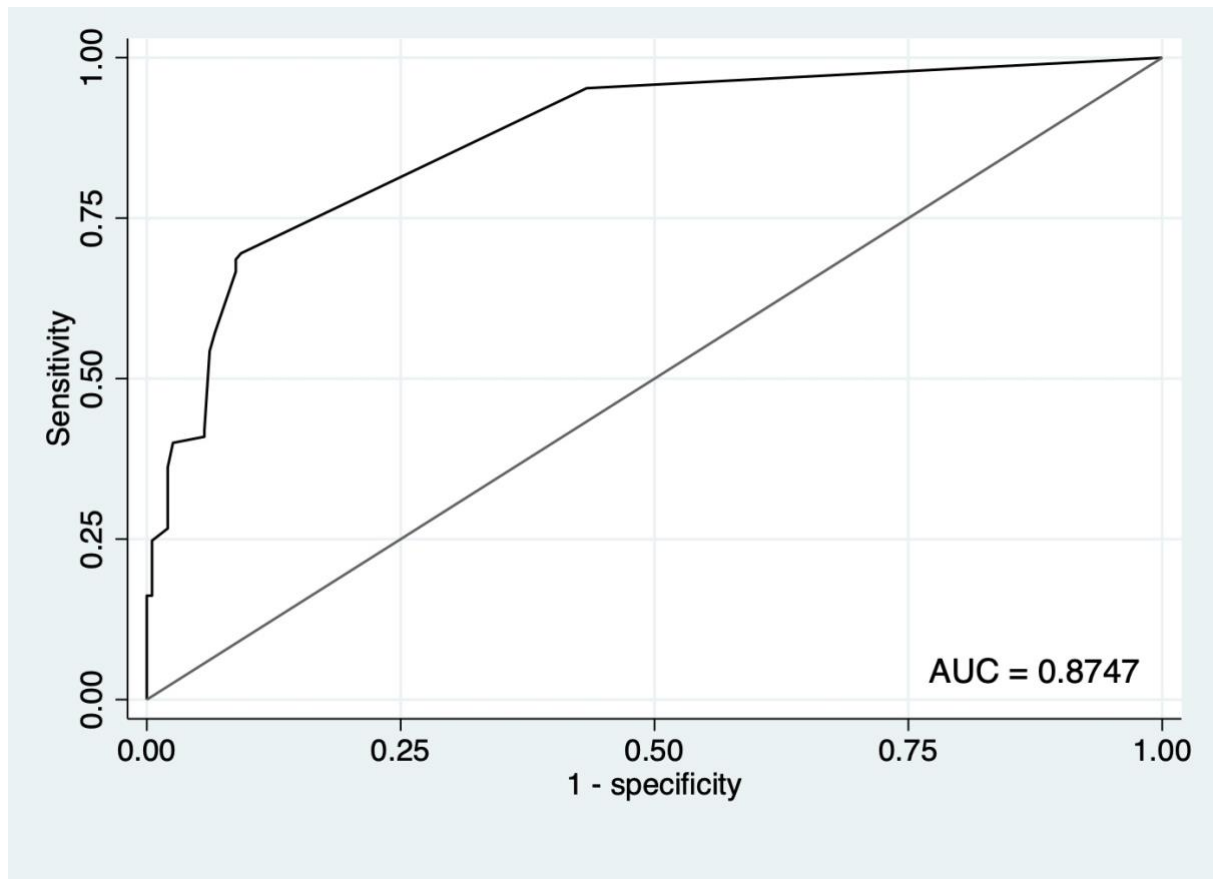


Fig. S4 Receiver operating characteristic (ROC) curve analysis of Score for Neonatal Acute Physiology II (SNAP-II) for predicting neonatal mortality
AUC, area under the ROC curve

Table S3 Score for Neonatal Acute Physiology Perinatal Extension II (SNAPPE-II) in study population

Parameters	All (n=299)	Non-survivors (n=105)	Survivors (n=194)	<i>p</i> value
Mean blood pressure (mmHg) [†]				<0.001
>29 (score 0)	270 (90.3%)	77 (73.3%)	193 (99.5%)	
20 – 29 (score 9)	28 (9.4%)	27 (25.7%)	1 (0.5%)	
<20 (score 19)	1 (0.3%)	1 (0.95%)	0	
Lowest body temperature (°C) [†]				0.123
>35.6 (score 0)	297 (99.3%)	103 (98.1%)	194 (100%)	
35 – 35.6 (score 8)	2 (0.67%)	2 (1.9%)	0	
<35 (score 15)	0	0	0	
pO ₂ /FiO ₂ [†]				<0.001
>2.49 (score 0)	130 (43.5%)	7 (6.7%)	123 (63.4%)	
1.0 – 2.49 (score 5)	121 (40.5%)	51 (48.6%)	70 (36.1%)	
0.3 – 0.99 (score 16)	48 (16.1%)	47 (44.8%)	1 (0.5%)	
< 0.3 (score 28)	0	0	0	
Lowest serum pH [†]				<0.001
> 7.19 (score 0)	249 (83.3%)	62 (59.1%)	187 (96.4%)	
7.1 – 7.19 (score 7)	46 (15.4%)	40 (38.1%)	6 (3.1%)	
< 7.1 (score 16)	4 (1.3%)	3 (2.9%)	1 (0.52%)	
Multiple seizures [†]				0.837
No (score 0)	283 (94.7%)	99 (94.3%)	184 (94.9%)	
Yes (score 19)	16 (5.4%)	6 (5.7%)	10 (5.2%)	
Urine output (ml/kg/hr) [†]				0.008
> 0.9 (score 0)	282 (94.3%)	94 (89.5%)	188 (96.9%)	
0.1 – 0.9 (score 5)	17 (5.7%)	11 (10.5%)	6 (3.1%)	
< 0.1 (score 18)	0	0	0	
Birth weight (g) [†]				<0.001
> 999 (score 0)	267 (89.3%)	81 (77.1%)	186 (95.9%)	
750 – 999 (score 10)	24 (8%)	17 (16.2%)	7 (3.6%)	
< 750 (score 17)	8 (2.7%)	7 (6.7%)	1 (0.5%)	
Small for gestational age (<3rd percentile) [†]				0.159

No (score 0)	225 (75.3%)	74 (70.5%)	151 (77.8%)	
Yes (score 12)	74 (24.7)	31 (29.5)	43 (22.2%)	
Apgar score at 5 min <7 [†]				<0.001
No (score 0)	272 (91%)	78 (74.3%)	194 (100%)	
Yes (score 18)	27 (9.0%)	27 (25.7%)	0	
Total score [*]	5 (0-16)	17 (7-26)	1 (0-5)	<0.001
Total score categories [†]				<0.001
0 – 9	197 (65.9%)	27 (25.7%)	170 (87.6%)	
10 – 19	43 (14.4%)	27 (25.7%)	16 (8.3%)	
20 – 29	31 (10.4%)	25 (23.8%)	6 (3.1%)	
30 – 39	17 (5.7%)	15 (14.3%)	2 (1.0%)	
≥40	11 (3.7%)	11 (10.5%)	0	

[†]number (%), ^{*}median (IQR)

FiO₂, fraction of inspired oxygen; pO₂, partial pressure of oxygen

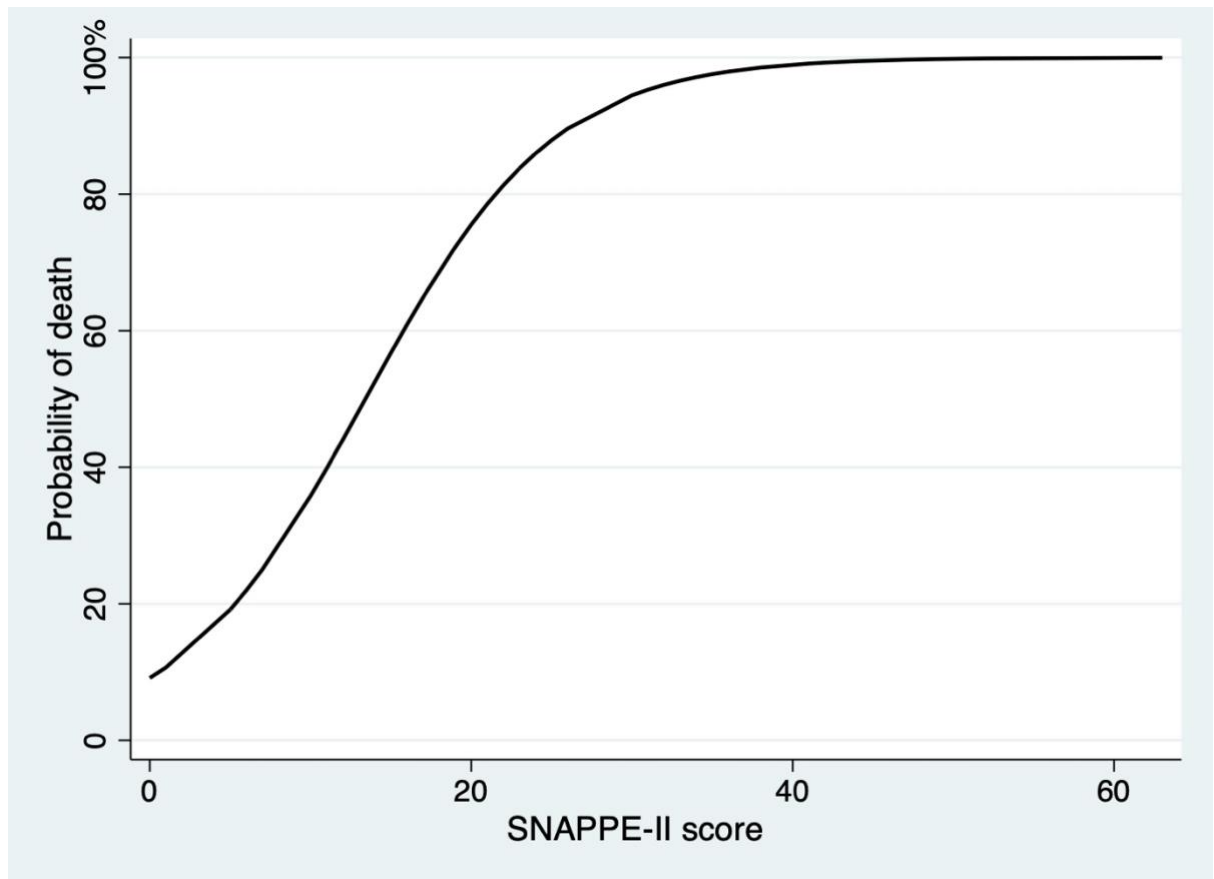


Fig. S5 Line graph of the relationship between SNAPPE-II score and probability of neonatal death

SNAPPE-II, Score for Neonatal Acute Physiology Perinatal Extension II

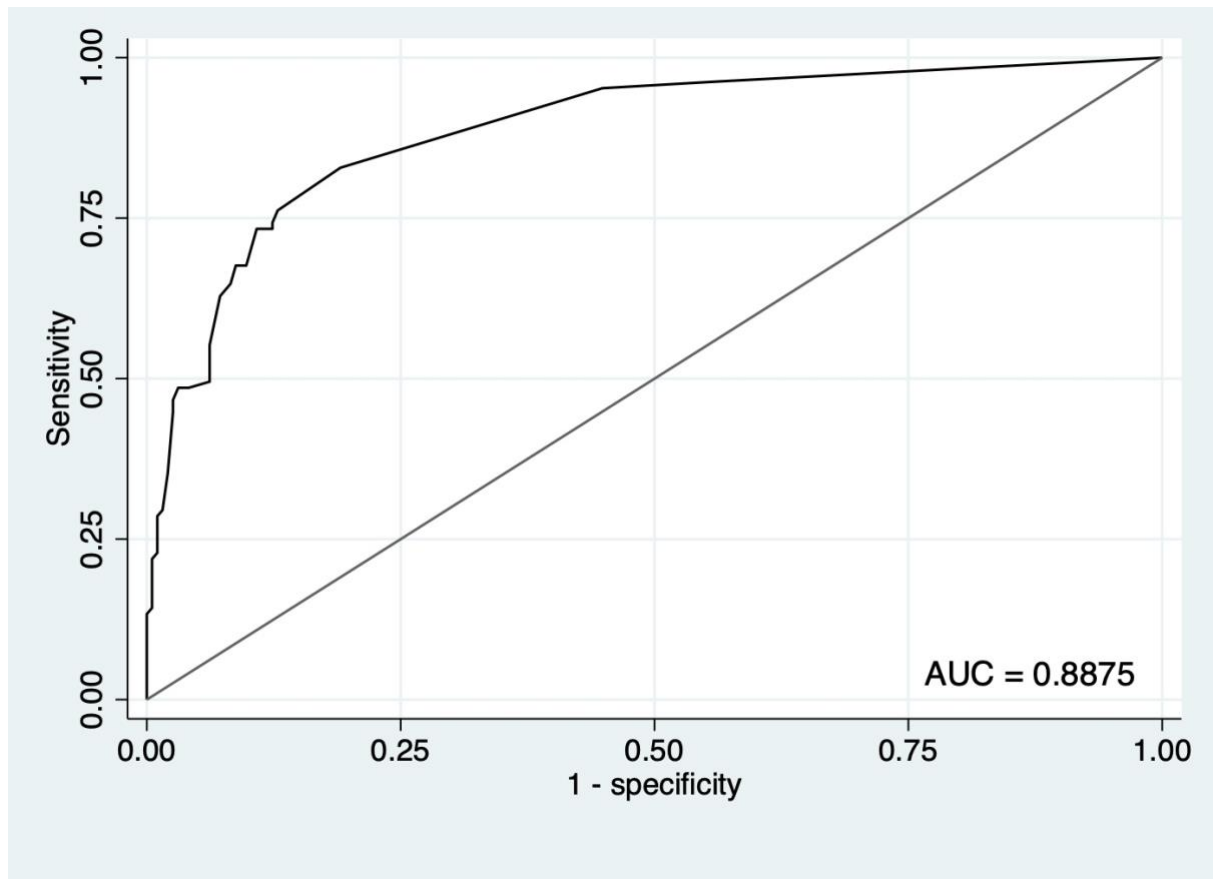


Fig. S6 Receiver operating characteristic (ROC) curve analysis of Score for Neonatal Acute Physiology Perinatal Extension II (SNAPPE-II) for predicting neonatal mortality
AUC, area under the ROC curve

Table S4 Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar (STOPS) score in study population

Parameters	All (n=299)	Non-survivors (n=105)	Survivors (n=194)	<i>p</i> value
Sensorium [†]				<0.001
Score 0	214 (71.6%)	30 (28.6%)	184 (94.9%)	
Score 1	51 (17.1%)	43 (41.0%)	8 (4.1%)	
Score 2	34 (11.4%)	32 (30.5%)	2 (1.0%)	
Temperature [†]				<0.001
Score 0	249 (83.3%)	58 (55.2%)	191 (98.5%)	
Score 1	47 (15.7%)	44 (41.9%)	3 (1.6%)	
Score 2	3 (1.0%)	3 (2.9%)	0	
Oxygenation [†]				<0.001
Score 0	19 (6.4%)	2 (1.9%)	17 (8.8%)	
Score 1	36 (12.0%)	2 (1.9%)	34 (17.5%)	
Score 2	244 (81.6%)	101 (96.2%)	143 (73.7%)	
Perfusion [†]				<0.001
Score 0	229 (76.6%)	57 (54.3%)	172 (88.7%)	
Score 1	37 (12.4%)	22 (21.0)	15 (7.7%)	
Score 2	33 (11.0%)	26 (24.8%)	7 (3.6%)	
Skin color [†]				<0.001
Score 0	256 (85.6%)	68 (64.8%)	188 (96.9%)	
Score 1	43 (14.4%)	37 (35.2%)	6 (3.1%)	
Blood sugar [†]				<0.001
Score 0	249 (83.3%)	69 (65.7%)	180 (92.8%)	
Score 1	50 (16.7%)	36 (34.3%)	14 (7.2%)	
Total score [*]	2 (2-4)	4 (3-7)	2 (2-2)	<0.001
Total score categories [†]				<0.001
0 – 3	221 (73.9%)	36 (34.3%)	185 (95.4%)	
4 – 6	60 (20.1%)	51 (48.6%)	9 (4.6%)	
7 – 10	18 (6.0%)	18 (17.1%)	0	

[†]number (%), ^{*}median (IQR)

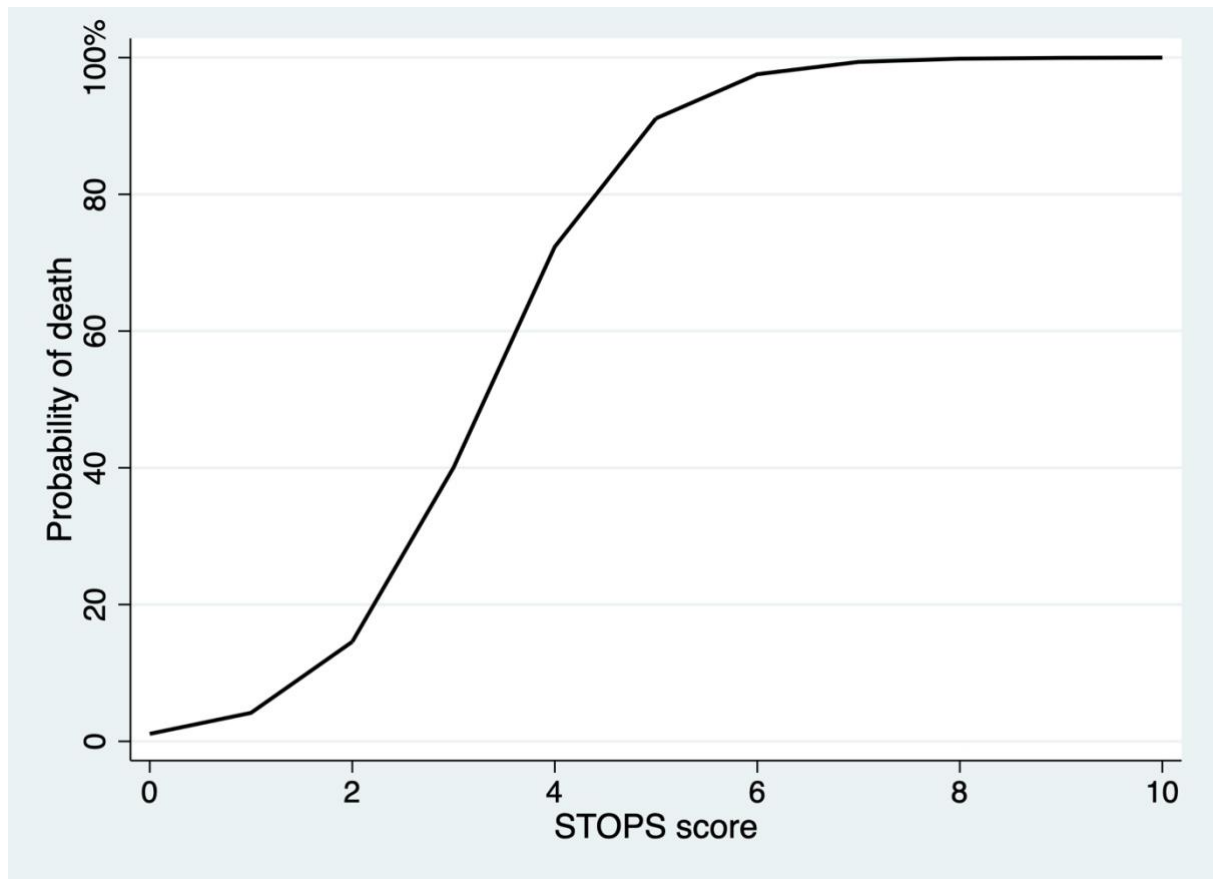


Fig. S7 Line graph of the relationship between STOPS score and probability of neonatal death
STOPS, Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar score

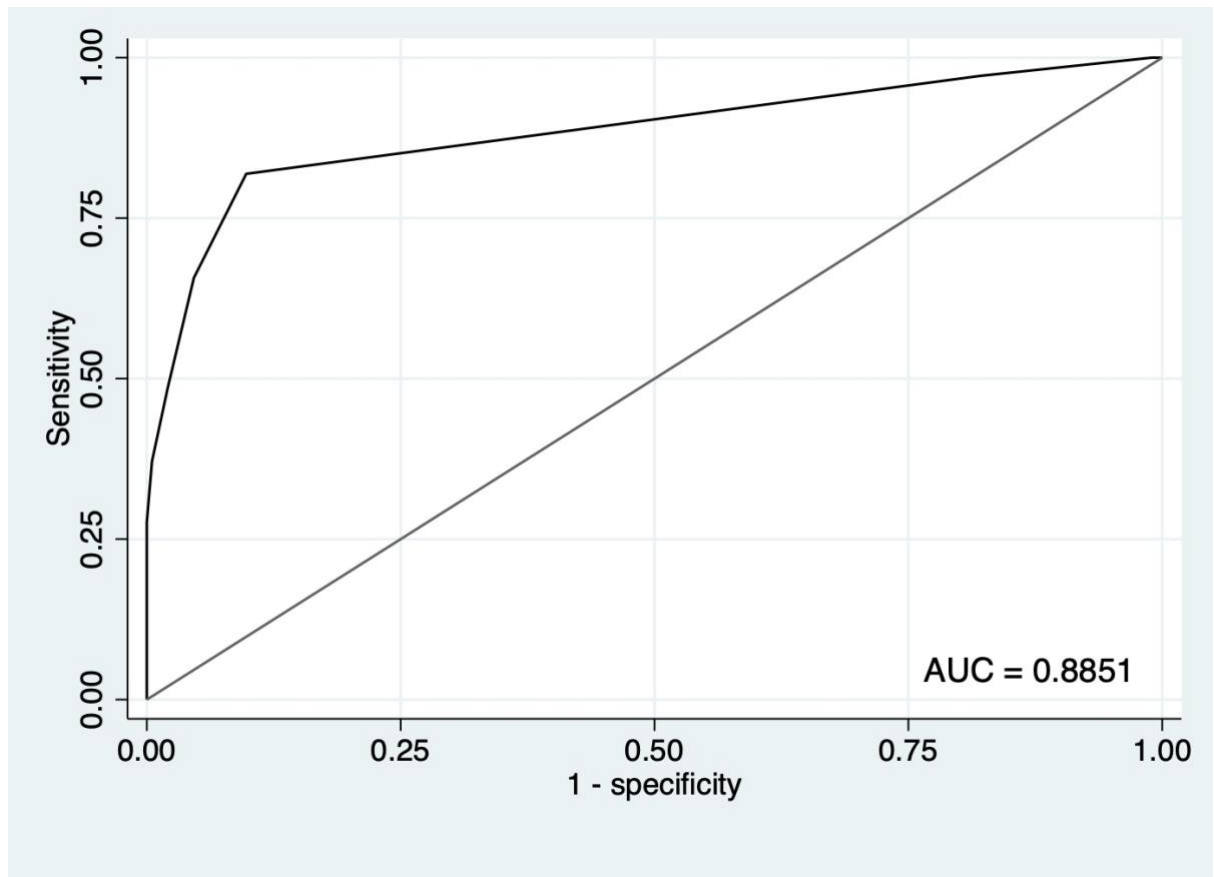


Fig. S8 Receiver operating characteristic (ROC) curve analysis of Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar score (STOPS) for predicting neonatal mortality

AUC, area under the ROC curve

Table S5 Modified Sick Neonatal Score (MSNS) in study population

Parameters	All (n=299)	Non-survivors (n=105)	Survivors (n=194)	<i>p</i> value
Respiratory effort [†]				<0.001
Apnea/grunt (score 0)	99 (33.1%)	74 (70.5%)	25 (12.9%)	
Tachypnea (score 1)	137 (45.8%)	9 (8.6%)	128 (66.0%)	
Respiratory rate 40-60/min (score 2)	63 (21.1%)	22 (21.0%)	41 (21.1%)	
Heart rate [†]				<0.001
Bradypnea/asystole (score 0)	24 (8.0%)	18 (17.1%)	6 (3.1%)	
Tachycardia (score 1)	24 (8.0%)	13 (12.4%)	11 (5.7%)	
Normal 100-160/min (score 2)	251 (84.0)	74 (70.5%)	177 (91.2%)	
Axillary temperature (°C) [†]				<0.001
<36 (score 0)	120 (40.1%)	71 (67.6%)	49 (25.3%)	
36 – 36.5 (score 1)	81 (27.1%)	24 (22.9%)	57 (29.4%)	
36.5 – 37.5 (score 2)	98 (32.8%)	10 (9.5%)	88 (45.4%)	
Capillary refill time (second) [†]				<0.001
>5 (score 0)	0	0	0	
3 – 5 (score 1)	56 (18.7%)	48 (45.7%)	8 (4.1%)	
<3 (score 2)	243 (81.3%)	57 (54.3%)	186 (95.9%)	
Random blood sugar (mg/dl) [†]				<0.001
<40 (score 0)	41 (13.7%)	28 (26.7%)	13 (6.7%)	
40 – 60 (score 1)	47 (15.7%)	31 (29.5%)	16 (8.3%)	
>60 (score 2)	211 (70.6%)	46 (43.8%)	165 (85.1%)	
SpO ₂ (in room air) (%) [†]				<0.001
<85 (score 0)	50 (16.7%)	43 (41.0%)	7 (3.6%)	
85 – 92 (score 1)	70 (23.4%)	50 (47.6%)	20 (10.3%)	
>92 (score 2)	179 (59.9%)	12 (11.4%)	167 (86.1%)	
Gestational age (weeks) [†]				<0.001
<32 (score 0)	74 (24.8%)	53 (50.5%)	21 (10.8%)	
32 – 36+6/7 days (score 1)	184 (61.5%)	47 (44.8%)	137 (70.6%)	
≥37 (score 2)	41 (13.7%)	5 (4.8%)	36 (18.6%)	
Birth weight (kg) [†]				<0.001
< 1.5 (score 0)	87 (29.1%)	54 (51.4%)	33 (17.0%)	
1.5 – 2.49 (score 1)	140 (46.8%)	37 (35.2%)	103 (53.1%)	
≥ 2.5 (score 2)	72 (24.1%)	14 (13.3%)	58 (29.9%)	
Total score [*]	11 (8-13)	7 (5-9)	12 (11-13)	<0.001
Total score categories [†]				<0.001
0 – 4	21 (7.0%)	21 (20.0%)	0	
5 – 8	65 (21.7%)	51 (48.6%)	14 (7.2%)	
9 – 12	134 (44.8%)	29 (27.6%)	105 (54.1%)	
13 – 16	79 (26.4%)	4 (3.8%)	75 (38.6%)	

[†]number (%), ^{*} median (IQR)

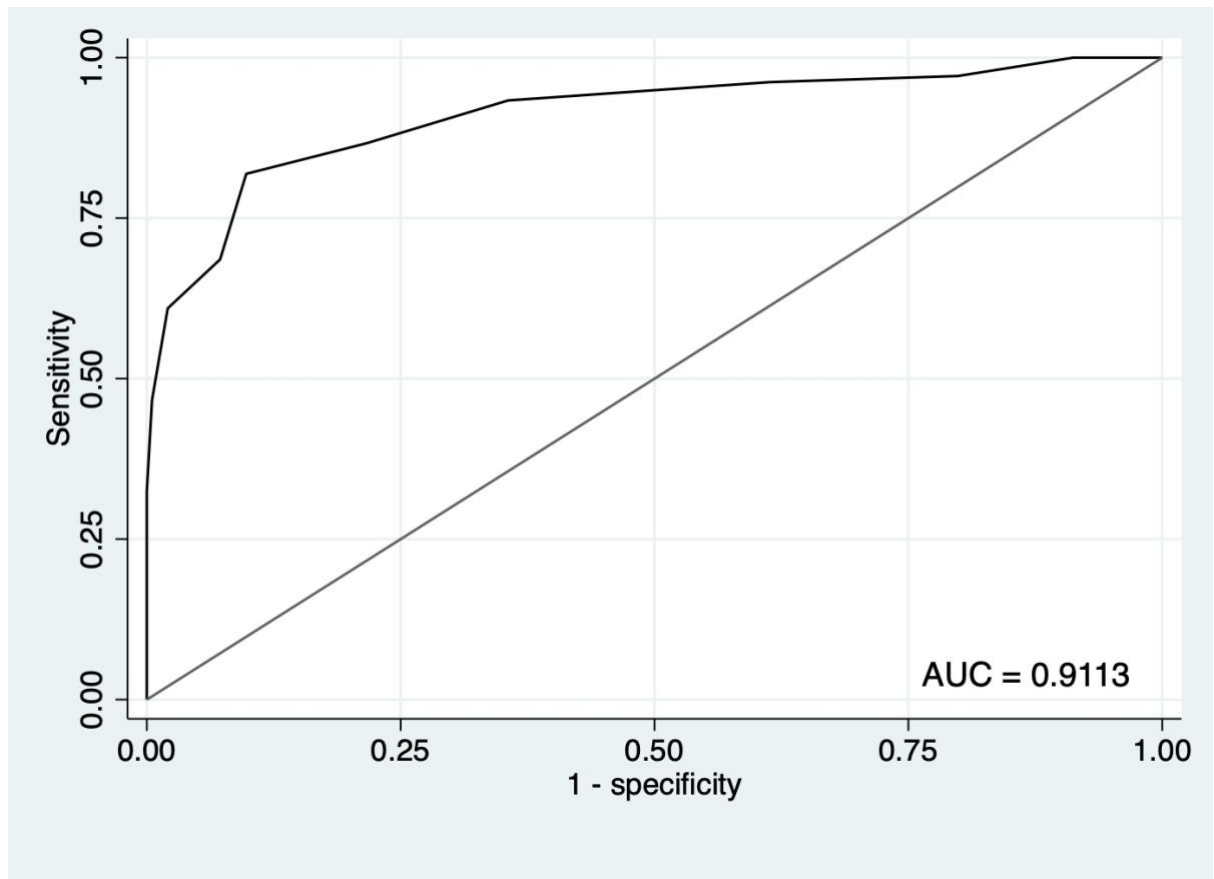


Fig. S9 Receiver operating characteristic (ROC) curve analysis of Modified Sick Neonatal Score (MSNS) for predicting neonatal mortality
AUC, area under the ROC curve

Table S6 Neonatal sequential organ failure assessment score (nSOFA) in study population

Parameters	All (n=299)	Non-survivors (n=105)	Survivors (n=194)	<i>p</i> value
Respiratory score criteria [†]				<0.001
SpO ₂ /FiO ₂ ≥ 300 (score 0)	134 (44.8%)	12 (11.4%)	122 (62.9%)	
Intubated, SpO ₂ /FiO ₂ < 300 (score 2)	89 (29.8%)	26 (24.8%)	63 (32.5%)	
Intubated, SpO ₂ /FiO ₂ < 200 (score 4)	57 (19.1%)	48 (45.7%)	9 (4.6%)	
Intubated, SpO ₂ /FiO ₂ < 150 (score 6)	18 (6.0%)	18 (17.1%)	0	
Intubated, SpO ₂ /FiO ₂ < 100 (score 8)	1 (0.33%)	1 (0.95%)	0	
Cardiovascular score criteria [†]				<0.001
Inotropes-&steroids- (score 0)	234 (78.3%)	44 (41.9%)	190 (97.9%)	
Inotropes-& steroids+ (score 1)	3 (1.0%)	1 (0.95%)	2 (1.0%)	
Inotropes=1& steroids- (score 2)	37 (12.4%)	36 (34.3%)	1 (0.52%)	
Inotropes=1&steroids+ OR	22 (7.4%)	21 (20.0%)	1 (0.52%)	
Inotropes≥2&steroids- (score 3)				
Inotropes≥2&steroids+ (score 4)	3 (1.0%)	3 (2.9%)	0	
Hematologic score [†]				0.205
Platelet ≥150 ×10 ³ (score 0)	232 (77.6%)	76 (72.4%)	156 (80.4%)	
Platelet 100 – 149 ×10 ³ (score 1)	40 (13.4%)	20 (19.1%)	20 (10.3%)	
Platelet <100 ×10 ³ (score 2)	20 (6.7%)	7 (6.7%)	13 (6.7%)	
Platelet <50 ×10 ³ (score 3)	7 (2.3%)	2 (1.9%)	5 (2.6%)	
Total score [*]	2 (0-4)	6 (4-8)	0 (0-2)	<0.001
Total score categories [†]				<0.001
0 – 4	234 (78.3%)	45 (42.9%)	189 (97.4%)	
5 – 8	52 (17.4%)	47 (44.8%)	5 (2.6%)	
≥9	13 (4.4%)	13 (12.4%)	0	

[†]number (%), ^{*}median (IQR)

FiO₂, fraction of inspired oxygen; SpO₂, saturation of peripheral oxygen

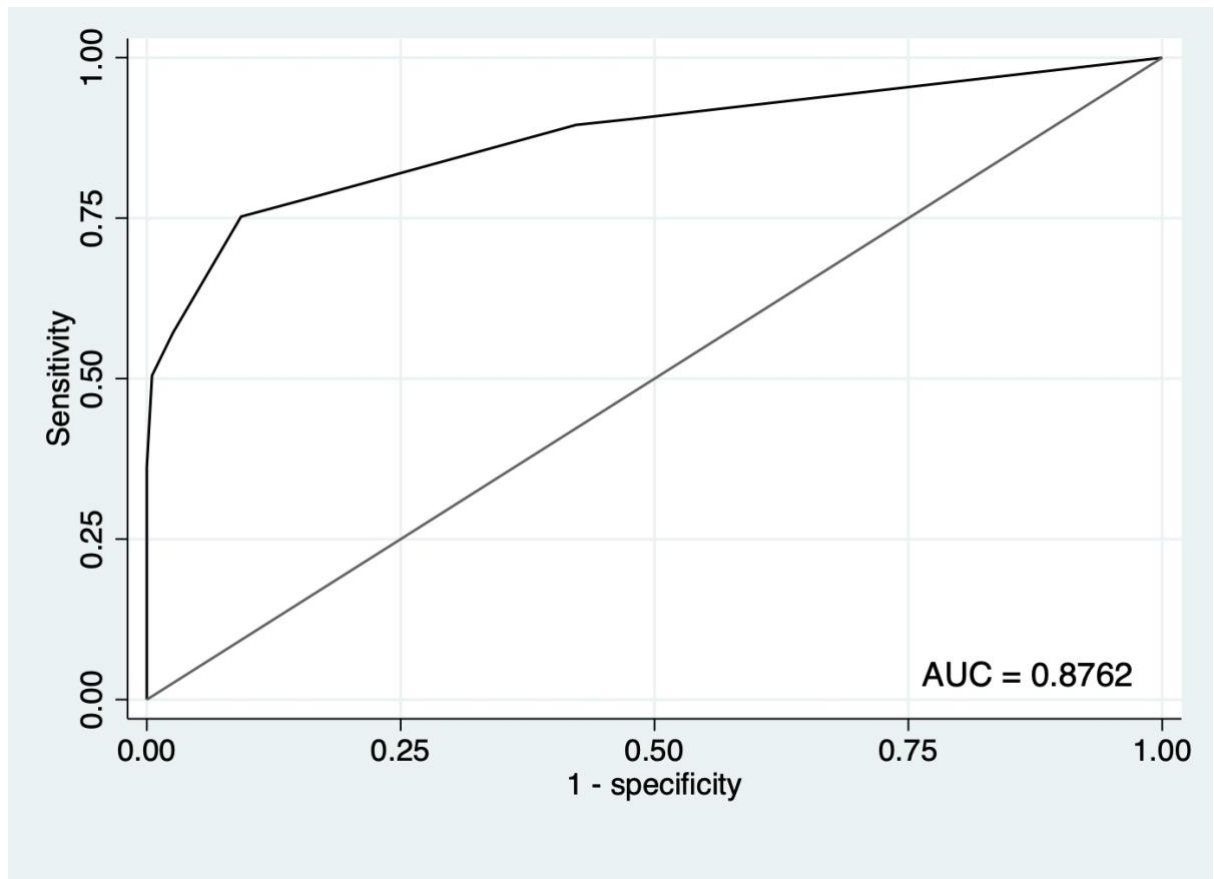


Fig. S10 Receiver operating characteristic (ROC) curve analysis of Neonatal Sequential Organ Failure Assessment (nSOFA) score for predicting neonatal mortality
AUC, area under the ROC curve

Supplementary material 3 Performance of neonatal mortality prediction scores stratified by gestational age

Table S7 Neonatal mortality prediction scores stratified by gestational age

Parameter	All (n=299)	Non-survivors (n=105)	Survivors (n=194)	<i>p</i> value
CRIB II				
Entire cohort	4 (3-6)	6 (4-10)	3 (3-4)	<0.001
<33 weeks	7 (4-10.5)	9 (6-11)	4 (3-7)	<0.001
≥33 weeks	3 (3-4)	4 (4-6)	3 (3-4)	<0.001
SNAP-II				
Entire cohort	5 (0-12)	16 (5-24)	0 (0-5)	<0.001
<33 weeks	5 (5-21)	16 (5-25)	5 (0-5)	<0.001
≥33 weeks	0 (0-5)	16 (5-24)	0 (0-5)	<0.001
SNAPPE-II				
Entire cohort	5 (0-16)	17 (7-26)	1 (0-5)	<0.001
<33 weeks	13.5 (5-23)	22 (12-31)	5 (0-5)	<0.001
≥33 weeks	1 (0-6)	16 (6-25)	1 (0-5)	<0.001
STOPS				
Entire cohort	2 (2-4)	4 (3-7)	2 (2-2)	<0.001
<33 weeks	3 (2-5)	4 (3-7)	2 (2-2)	<0.001
≥33 weeks	2 (2-2)	4 (3-7)	2 (2-2)	<0.001
MSNS				
Entire cohort	11 (8-13)	7 (5-9)	12 (11-13)	<0.001
<33 weeks	8 (6-10.5)	6 (4-8)	10 (10-12)	<0.001
≥33 weeks	12 (10-13)	8 (6-10)	12 (11-13)	<0.001
nSOFA				
Entire cohort	2 (0-4)	6 (4-8)	0 (0-2)	<0.001
<33 weeks	4 (2-6)	5 (4-7)	2 (1-3)	<0.001
≥33 weeks	1 (0-2)	6 (2-8)	0 (0-2)	<0.001

Numbers of participants <33 and ≥33 week-gestation are 104 and 195, respectively.

Data are presented as median (IQR).

CRIB II, Clinical Risk Index for Babies II; MSNS, Modified Sick Neonatal Score; nSOFA, Neonatal Sequential Organ Failure Assessment; SNAP-II, Score for Neonatal Acute Physiology II; SNAPPE-II, SNAP Perinatal Extension II; STOPS, Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar.

Table S8 Abilities of scoring systems for predicting in-hospital neonatal mortality stratified by gestational age

Score	AUC (95% CI)		
	Total (<i>n</i> =299)	<33 weeks (<i>n</i> =104)	≥33 weeks (<i>n</i> =195)
CRIB II	0.816 (0.764-0.867)	0.822 (0.742-0.902)	0.717 (0.625-0.809)
SNAP-II	0.875 (0.835-0.914)	0.847 (0.780-0.914)	0.863 (0.798-0.928)
SNAPPE-II	0.888 (0.848-0.927)	0.863 (0.795-0.931)	0.870 (0.805-0.936)
STOPS	0.885 (0.843-0.928)	0.893 (0.836-0.950)	0.850 (0.770-0.930)
MSNS	0.911 (0.874-0.949)	0.900 (0.843-0.958)	0.874 (0.801-0.947)
nSOFA	0.876 (0.831-0.921)	0.845 (0.772-0.917)	0.858 (0.781-0.935)

AUC, area under the receiver operating characteristics curve. CRIB II, Clinical Risk Index for Babies II; MSNS, Modified Sick Neonatal Score; NPV, negative predictive value; nSOFA, neonatal sequential organ failure assessment; PPV, positive predictive value; SNAP-II, Score for Neonatal Acute Physiology II; SNAPPE-II, SNAP Perinatal Extension II; STOPS, Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar

Table S9 Comparison of AUC measures among neonatal death prediction scores in newborns <33 week-gestation*

Score	CRIB II	SNAP-II	SNAPPE-II	STOPS	MSNS	nSOFA
CRIB II	–	<i>p</i> 0.587	<i>p</i> 0.270	<i>p</i> 0.144	<i>p</i> <0.027	<i>p</i> 0.645
SNAP-II		–	<i>p</i> 0.475	<i>p</i> 0.163	<i>p</i> 0.127	<i>p</i> 0.953
SNAPPE-II			–	<i>p</i> 0.415	<i>p</i> 0.256	<i>p</i> 0.627
STOPS				–	<i>p</i> 0.824	<i>p</i> 0.237
MSNS					–	<i>p</i> 0.124
nSOFA						–

* Using DeLong test

AUC, area under the receiver operating characteristics curve; CRIB II, Clinical Risk Index for Babies II; MSNS, Modified Sick Neonatal Score; nSOFA, neonatal sequential organ failure assessment; SNAP-II, Score for Neonatal Acute Physiology II; SNAPPE-II, SNAP Perinatal Extension II; STOPS, Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar.

Table S10 Comparison of AUC measures among neonatal death prediction scores in newborns ≥ 33 week-gestation*

Score	CRIB II	SNAP-II	SNAPPE-II	STOPS	MSNS	nSOFA
CRIB II	–	<i>p</i> 0.002	<i>p</i> 0.001	<i>p</i> 0.010	<i>p</i> <0.001	<i>p</i> 0.009
SNAP-II		–	<i>p</i> 0.445	<i>p</i> 0.707	<i>p</i> 0.732	<i>p</i> 0.856
SNAPPE-II			–	<i>p</i> 0.560	<i>p</i> 0.910	<i>p</i> 0.679
STOPS				–	<i>p</i> 0.204	<i>p</i> 0.808
MSNS					–	<i>p</i> 0.601
nSOFA						–

* Using DeLong test

AUC, area under the receiver operating characteristics curve; CRIB II, Clinical Risk Index for Babies II; MSNS, Modified Sick Neonatal Score; nSOFA, neonatal sequential organ failure assessment; SNAP-II, Score for Neonatal Acute Physiology II; SNAPPE-II, SNAP Perinatal Extension II; STOPS, Sensorium, temperature, oxygenation, perfusion, skin color, and blood sugar.