Supplementary Materials

Systemic inflammatory markers as a supplement to nutrition risk screening of ICU patients

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Supplementary Table 1. Cox regression analysis of the discrimination of the mNUTRIC combined with inflammation marker and the original mNUTRIC for 60-day survival

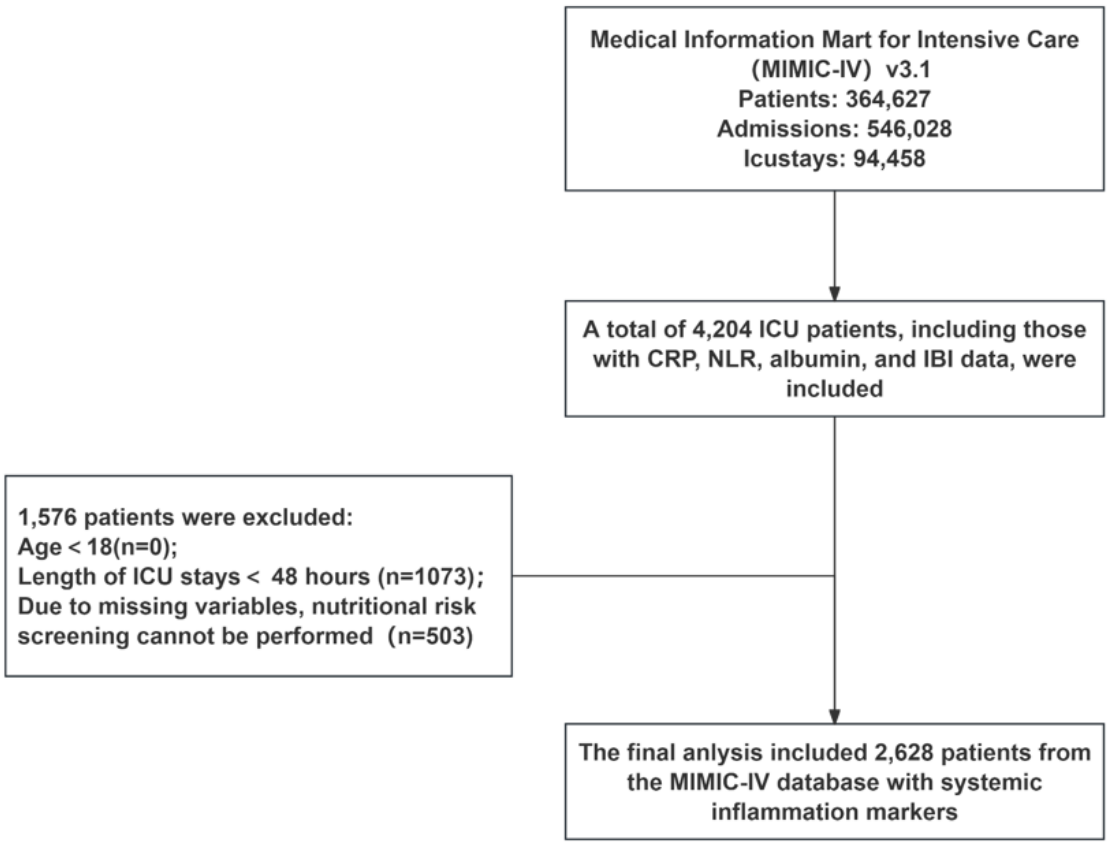
Categories	Model a	p value	Model b	p value	Model c	p value
mNUTRIC	1.680 (1.566,1.802)	<0.001	1.592 (1.462,1.734)	<0.001	1.547 (1.418,1.688)	<0.001
mNUTRIC + CRP	2.619 (2.191,3.132)	<0.001	1.910 (1.572,2.319)	<0.001	1.838 (1.513,2.232)	<0.001
mNUTRIC + NLR	2.349 (1.959,2.818)	<0.001	1.721 (1.418,2.089)	<0.001	1.651 (1.359,2.005)	<0.001
mNUTRIC + Albumin	3.170 (2.657,3.783)	<0.001	2.418 (1.979,2.954)	<0.001	2.274 (1.859,2.783)	<0.001

mNUTRIC, Modified Nutritional Risk in Critically Ill; CRP, C-reactive Protein; NLR, Neutrophil-to-Lymphocyte Ratio; BMI, body mass index; ICU, intensive care unit; COPD, chronic obstructive pulmonary disease.
Model a: Not adjusted.
Model b: Adjusted for age, sex, BMI, ICU mode.
Model c: Adjusted for age, sex, BMI,ICU mode, ventilation, diabetes mellitus, malignant tumor, pneumonia, COPD.

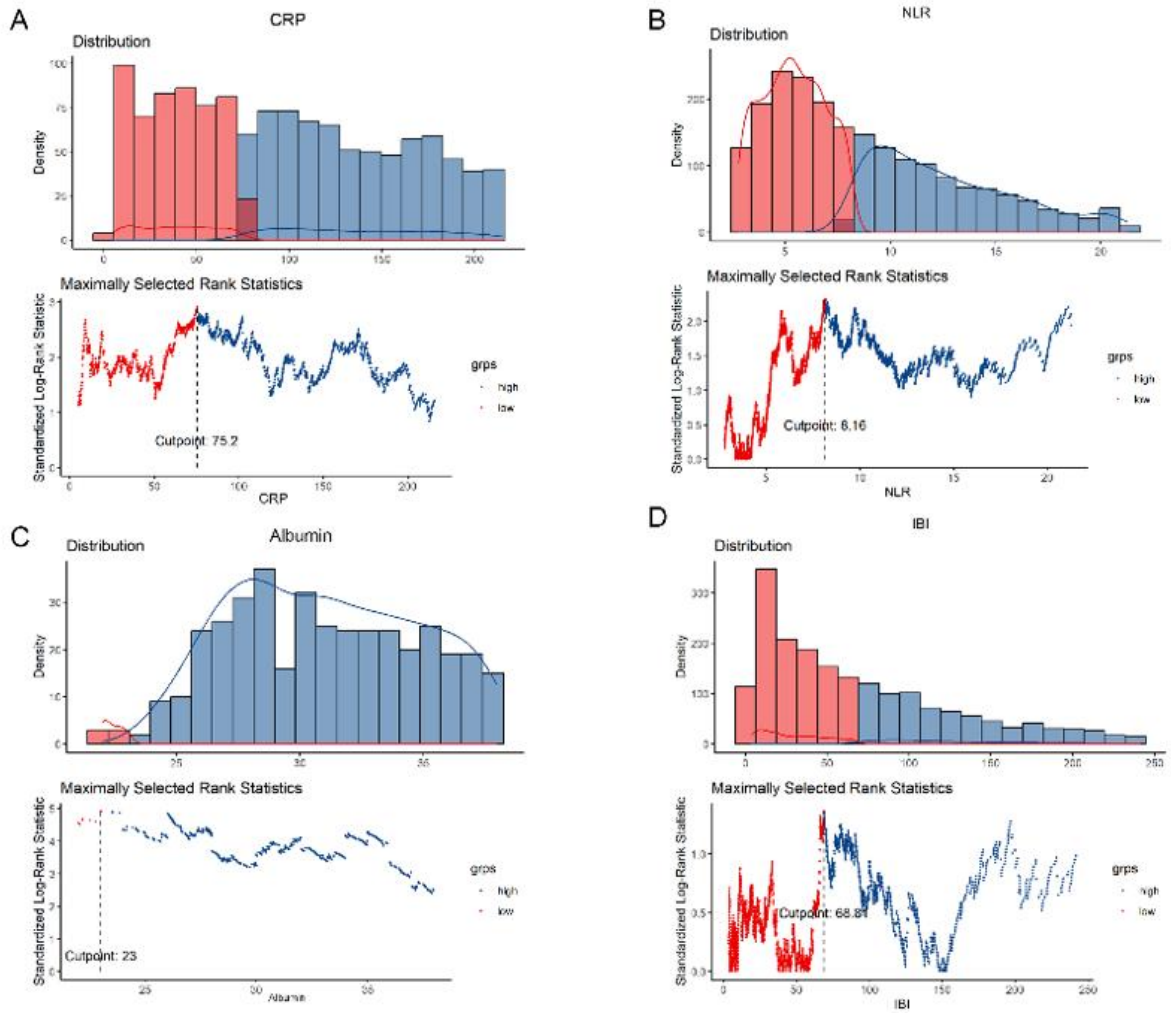
Supplementary Table 2. Cox regression analysis of the discrimination of the mNUTRIC combined with inflammation marker and the original mNUTRIC for 90-day survival

Categories	Model a	p value	Model b	p value	Model c	p value
mNUTRIC	1.620 (1.518,1.728)	<0.001	1.538 (1.420,1.666)	<0.001	1.487 (1.371,1.614)	<0.001
mNUTRIC + CRP	2.375 (2.005,2.812)	<0.001	1.736 (1.445,2.085)	<0.001	1.669 (1.389,2.004)	<0.001
mNUTRIC + NLR	2.275 (1.918,2.698)	<0.001	1.689 (1.408,2.026)	<0.001	1.611 (1.342,1.933)	<0.001
mNUTRIC + Albumin	2.866 (2.435,3.374)	<0.001	2.193 (1.823,2.639)	<0.001	2.046 (1.698,2.465)	<0.001

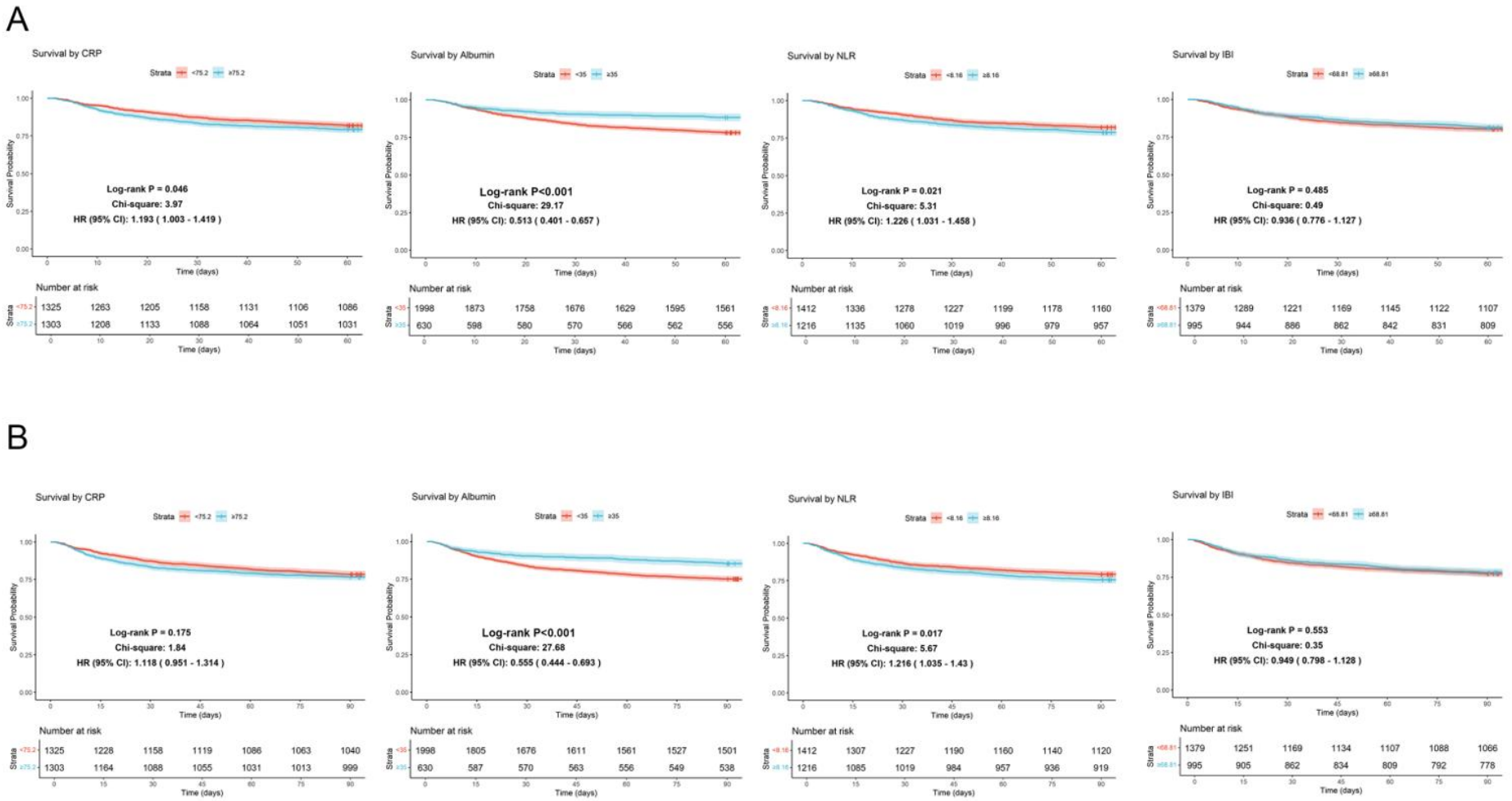
mNUTRIC, Modified Nutritional Risk in Critically Ill; CRP, C-reactive Protein; NLR, Neutrophil-to-Lymphocyte Ratio; BMI, body mass index; ICU, intensive care unit; COPD, chronic obstructive pulmonary disease.
Model a: Not adjusted.
Model b: Adjusted for age, sex, BMI, ICU mode.
Model c: Adjusted for age, sex, BMI,ICU mode, ventilation, diabetes mellitus, malignant tumor, pneumonia, COPD.



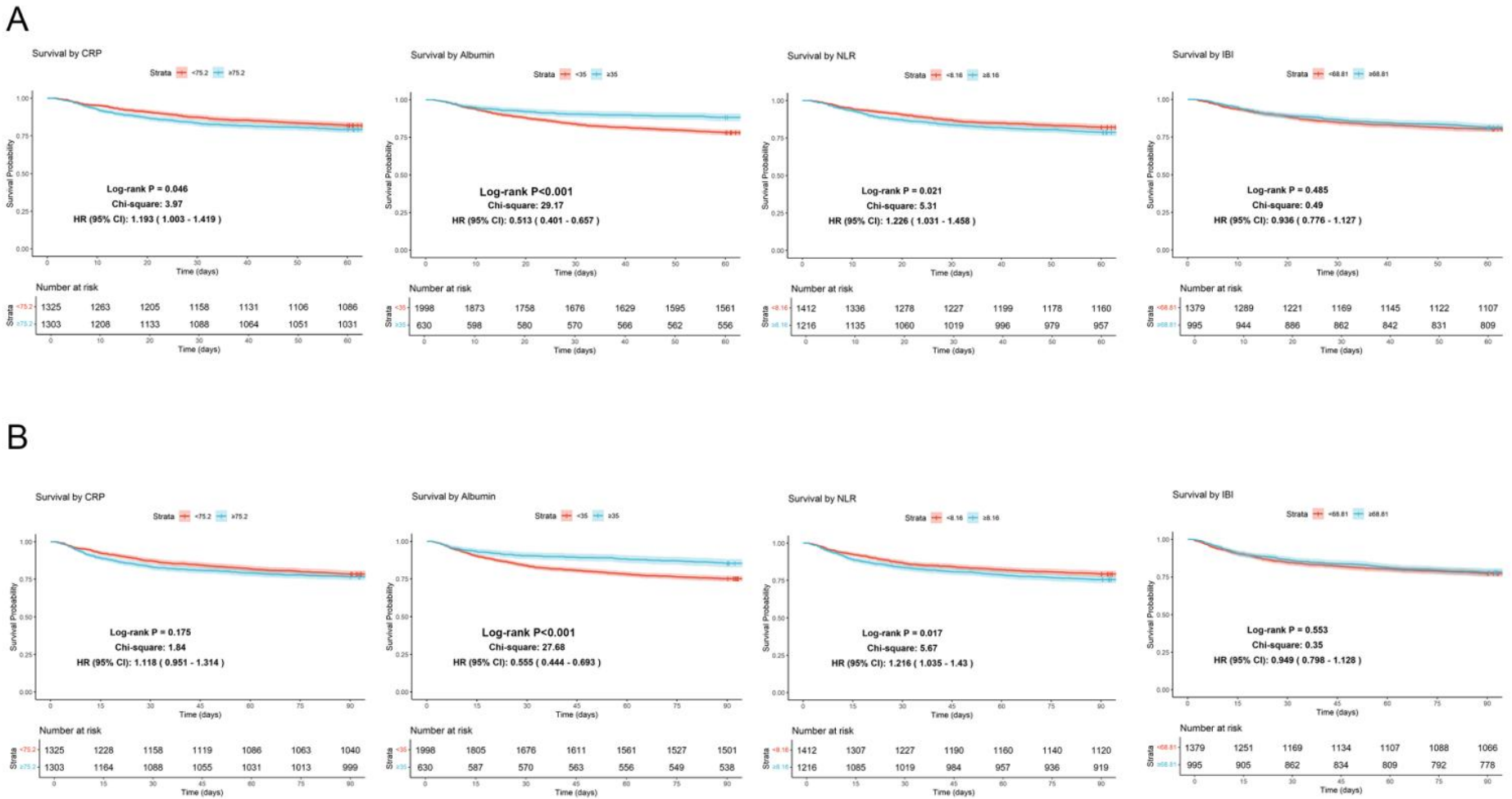
Supplementary Figure 1. Flowchart of patient selection



Supplementary Figure 2. The optimal cutoff values for systemic inflammatory markers. A, C-reaction protein; B, Neutrophil to lymphocyte ratio; C, Albumin; D, inflammatory burden index

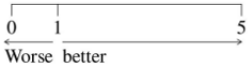


Supplementary Figure 3. Kaplan-Meier survival curves for overall survival stratified by inflammation markers (CRP, Albumin, NLR, and IBI). (A) Survival curves for the following markers at 60-day survival:CRP, Albumin, NLR, and IBI; (B) Survival curves for the same markers at 90-day survival



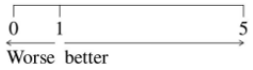
Supplementary Figure 4. Kaplan-Meier survival curves for overall survival stratified by the combined mNUTRIC Scores and inflammation markers (CRP, NLR, and Albumin). (A) Survival curves for the following combined markers at 60-day survival(CRP, NLR, and Albumin); (B) Survival curves for the same combined markers at 90-day survival

Variables	n (%)	0	1	HR (95%CI)	P	P for interaction
		No. of events/ No. of total				
All patients	2628 (100.00)	149/1718	233/910	3.25 (2.65 ~ 3.99)	<.001	
Age						<.001
<65	1327 (50.49)	88/665	168/662	2.06 (1.59 ~ 2.66)	<.001	
≥65	1301 (49.51)	61/1053	65/248	5.05 (3.56 ~ 7.17)	<.001	
Gender						0.053
Male	1472 (56.01)	91/954	124/518	2.72 (2.08 ~ 3.57)	<.001	
Female	1156 (43.99)	58/764	109/392	4.11 (2.99 ~ 5.65)	<.001	
BMI						0.790
≤18.5	1296 (49.32)	77/838	119/458	3.12 (2.34 ~ 4.16)	<.001	
>18，<24	66 (2.51)	3/49	5/17	5.42 (1.29 ~ 22.71)	0.021	
>24，<28	561 (21.35)	34/363	50/198	2.97 (1.92 ~ 4.59)	<.001	
≥28	705 (26.83)	35/468	59/237	3.63 (2.39 ~ 5.52)	<.001	
ICUmode						0.407
CCU	496 (18.87)	31/307	40/189	2.24 (1.40 ~ 3.59)	<.001	
MICU	620 (23.59)	35/364	77/256	3.57 (2.40 ~ 5.33)	<.001	
ICU	412 (15.68)	22/250	48/162	3.79 (2.29 ~ 6.28)	<.001	
NCU	594 (22.60)	25/389	47/205	3.96 (2.44 ~ 6.43)	<.001	
SICU	506 (19.25)	36/408	21/98	2.54 (1.48 ~ 4.35)	<.001	
Malignant tumor						0.116
Yes	242 (9.21)	16/111	36/131	2.02 (1.12 ~ 3.65)	0.019	
No	2386 (90.79)	133/1607	197/779	3.37 (2.71 ~ 4.20)	<.001	
Diabetes mellitus						0.190
Yes	757 (28.81)	43/409	88/348	2.61 (1.81 ~ 3.75)	<.001	
No	1871 (71.19)	106/1309	145/562	3.53 (2.75 ~ 4.53)	<.001	
Pneumonia						0.415
Yes	905 (34.44)	57/531	105/374	2.89 (2.10 ~ 4.00)	<.001	
No	1723 (65.56)	92/1187	128/536	3.38 (2.59 ~ 4.42)	<.001	
COPD						0.507
Yes	231 (8.79)	16/118	35/113	2.61 (1.45 ~ 4.72)	0.001	
No	2397 (91.21)	133/1600	198/797	3.27 (2.63 ~ 4.07)	<.001	
Ventilation						<.001
Yes	2197 (83.60)	140/1384	203/813	2.68 (2.16 ~ 3.33)	<.001	
No	431 (16.40)	9/334	30/97	13.52 (6.41 ~ 28.48)	<.001	



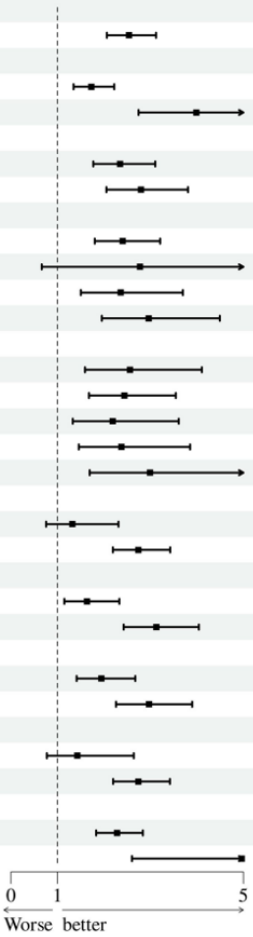
Supplementary Figure 5. Subgroup analysis of mNUTRIC and albumin for overall survival

Variables	n (%)	0	1	HR (95%CI)	P	P for interaction
		No. of events/ No. of total				
All patients	2628 (100.00)	149/1718	233/910	3.25 (2.65 ~ 3.99)	<.001	
Age						<.001
<65	1327 (50.49)	88/665	168/662	2.06 (1.59 ~ 2.66)	<.001	
≥65	1301 (49.51)	61/1053	65/248	5.05 (3.56 ~ 7.17)	<.001	
Gender						0.053
Male	1472 (56.01)	91/954	124/518	2.72 (2.08 ~ 3.57)	<.001	
Female	1156 (43.99)	58/764	109/392	4.11 (2.99 ~ 5.65)	<.001	
BMI						0.790
≤18.5	1296 (49.32)	77/838	119/458	3.12 (2.34 ~ 4.16)	<.001	
>18，<24	66 (2.51)	3/49	5/17	5.42 (1.29 ~ 22.71)	0.021	
>24，<28	561 (21.35)	34/363	50/198	2.97 (1.92 ~ 4.59)	<.001	
≥28	705 (26.83)	35/468	59/237	3.63 (2.39 ~ 5.52)	<.001	
ICUmode						0.407
CCU	496 (18.87)	31/307	40/189	2.24 (1.40 ~ 3.59)	<.001	
MICU	620 (23.59)	35/364	77/256	3.57 (2.40 ~ 5.33)	<.001	
ICU	412 (15.68)	22/250	48/162	3.79 (2.29 ~ 6.28)	<.001	
NCU	594 (22.60)	25/389	47/205	3.96 (2.44 ~ 6.43)	<.001	
SICU	506 (19.25)	36/408	21/98	2.54 (1.48 ~ 4.35)	<.001	
Malignant tumor						0.116
Yes	242 (9.21)	16/111	36/131	2.02 (1.12 ~ 3.65)	0.019	
No	2386 (90.79)	133/1607	197/779	3.37 (2.71 ~ 4.20)	<.001	
Diabetes mellitus						0.190
Yes	757 (28.81)	43/409	88/348	2.61 (1.81 ~ 3.75)	<.001	
No	1871 (71.19)	106/1309	145/562	3.53 (2.75 ~ 4.53)	<.001	
Pneumonia						0.415
Yes	905 (34.44)	57/531	105/374	2.89 (2.10 ~ 4.00)	<.001	
No	1723 (65.56)	92/1187	128/536	3.38 (2.59 ~ 4.42)	<.001	
COPD						0.507
Yes	231 (8.79)	16/118	35/113	2.61 (1.45 ~ 4.72)	0.001	
No	2397 (91.21)	133/1600	198/797	3.27 (2.63 ~ 4.07)	<.001	
Ventilation						<.001
Yes	2197 (83.60)	140/1384	203/813	2.68 (2.16 ~ 3.33)	<.001	
No	431 (16.40)	9/334	30/97	13.52 (6.41 ~ 28.48)	<.001	



Supplementary Figure 6. Subgroup analysis of mNUTRIC and CRP for overall survival

Variables	n (%)	0	1	HR (95%CI)	P	P for interaction
		No. of events/ No. of total				
All patients	2628 (100.00)	239/2086	143/542	2.54 (2.06 ~ 3.12)	<.001	
Age						<.001
<65	1327 (50.49)	154/940	102/387	1.73 (1.35 ~ 2.22)	<.001	
≥65	1301 (49.51)	85/1146	41/155	3.99 (2.75 ~ 5.79)	<.001	
Gender						0.406
Male	1472 (56.01)	140/1177	75/295	2.35 (1.77 ~ 3.10)	<.001	
Female	1156 (43.99)	99/909	68/247	2.80 (2.05 ~ 3.81)	<.001	
BMI						0.849
≤18.5	1296 (49.32)	121/1011	75/285	2.41 (1.80 ~ 3.21)	<.001	
>18，<24	66 (2.51)	5/54	3/12	2.78 (0.66 ~ 11.62)	0.162	
>24，<28	561 (21.35)	55/451	29/110	2.36 (1.50 ~ 3.70)	<.001	
≥28	705 (26.83)	58/570	36/135	2.96 (1.96 ~ 4.49)	<.001	
ICUmode						0.937
CCU	496 (18.87)	42/383	29/113	2.56 (1.59 ~ 4.11)	<.001	
MICU	620 (23.59)	63/457	49/163	2.44 (1.68 ~ 3.55)	<.001	
ICU	412 (15.68)	47/331	23/81	2.19 (1.33 ~ 3.61)	0.002	
NCU	594 (22.60)	47/479	25/115	2.37 (1.46 ~ 3.85)	<.001	
SICU	506 (19.25)	40/436	17/70	2.99 (1.69 ~ 5.27)	<.001	
Malignant tumor						0.018
Yes	242 (9.21)	32/163	20/79	1.32 (0.76 ~ 2.31)	0.327	
No	2386 (90.79)	207/1923	123/463	2.74 (2.19 ~ 3.43)	<.001	
Diabetes mellitus						0.004
Yes	757 (28.81)	82/548	49/209	1.64 (1.15 ~ 2.33)	0.006	
No	1871 (71.19)	157/1538	94/333	3.13 (2.42 ~ 4.04)	<.001	
Pneumonia						0.040
Yes	905 (34.44)	102/680	60/225	1.94 (1.41 ~ 2.68)	<.001	
No	1723 (65.56)	137/1406	83/317	2.97 (2.26 ~ 3.90)	<.001	
COPD						0.051
Yes	231 (8.79)	37/181	14/50	1.43 (0.77 ~ 2.64)	0.256	
No	2397 (91.21)	202/1905	129/492	2.74 (2.20 ~ 3.42)	<.001	
Ventilation						0.022
Yes	2197 (83.60)	215/1710	128/487	2.28 (1.83 ~ 2.84)	<.001	
No	431 (16.40)	24/376	15/55	4.97 (2.60 ~ 9.47)	<.001	



Supplementary Figure 7. Subgroup analysis of mNUTRIC and NLR for overall survival