Supplementary

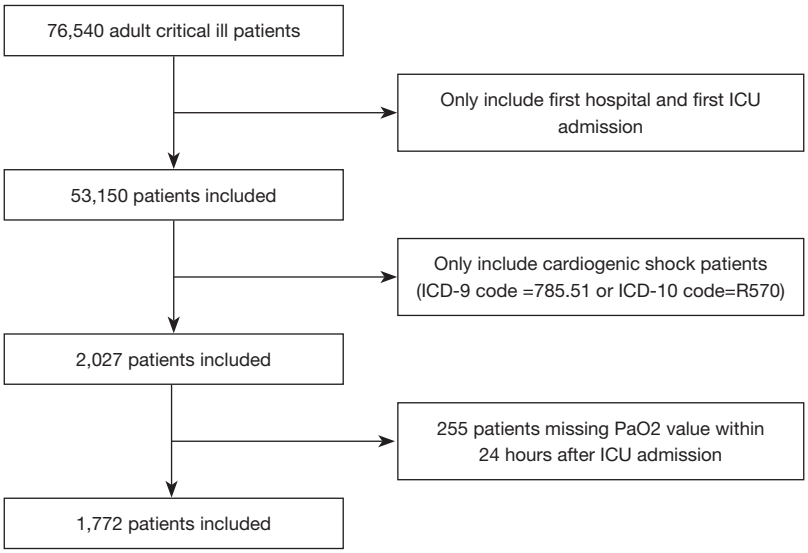

Figure S1 The flowchart of this study.

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Table S1 Baseline characteristics of the participants stratified by PaO_2

Variables	Total (n=1772)	PaO_2 <60 mmHg (n=536)	PaO_2 60-100 mmHg (n=539)	PaO_2 >100 mmHg (n=697)	P value
Age (years)	70.6 ± 14.6	73.1 ± 14.6	69.3 ± 15.1	69.7 ± 13.9	< 0.001
Sex,(Male), n (%)	1052 (59.4)	303 (56.5)	330 (61.2)	419 (60.1)	0.257
Heart rate (bpm)	89.4 ± 18.2	91.6 ± 19.1	90.7 ± 18.1	86.6 ± 17.3	< 0.001
MAP (mmHg)	60.5 ± 36.2	58.5 ± 27.6	58.0 ± 36.6	63.9 ± 41.1	0.006
Respiratory rate (bpm)	21.0 ± 4.2	21.5 ± 4.0	21.8 ± 4.3	20.1 ± 4.0	< 0.001
Glucose (mmol/L)	152.8 (124.0, 203.5)	147.9 (119.3, 199.4)	157.8 (123.0, 213.8)	153.0 (127.8, 199.0)	0.048
Hemoglobin (g/L)	10.1 ± 2.4	10.1 ± 2.3	10.6 ± 2.4	9.7 ± 2.4	< 0.001
Platelets ($\times10^{12}$)	165.0 (115.0, 227.0)	169.5 (122.0, 233.0)	172.0 (126.5, 233.0)	153.0 (105.0, 213.0)	< 0.001
WBC ($\times10^{9}$)	15.1 (11.0, 20.2)	13.3 (9.7, 17.5)	15.9 (11.5, 21.4)	16.4 (12.3, 21.5)	< 0.001
Bicarbonate (mmol/L)	18.5 ± 5.5	19.0 ± 5.9	18.4 ± 5.5	18.2 ± 5.2	0.037
Creatinine (mg/dL)	1.8 (1.2, 2.8)	2.0 (1.3, 3.1)	1.9 (1.3, 2.8)	1.7 (1.1, 2.5)	< 0.001
Sodium (mmol/L)	135.3 ± 5.8	134.5 ± 6.3	135.1 ± 6.2	136.1 ± 5.0	< 0.001
Potassium (mmol/L)	5.0 ± 1.0	5.1 ± 1.1	5.1 ± 1.0	5.0 ± 1.0	0.409
Vasopressor use, n (%)	1382 (78.0)	375 (70)	413 (76.6)	594 (85.2)	< 0.001
Ventilator use, n (%)	1017 (57.4)	155 (28.9)	316 (58.6)	546 (78.3)	< 0.001
Chronic pulmonary disease, n (%)	539 (30.4)	176 (32.8)	167 (31)	196 (28.1)	0.192
Hypertension, n (%)	478 (27.0)	104 (19.4)	154 (28.6)	220 (31.6)	< 0.001
Myocardial infarct, n (%)	881 (49.7)	241 (45)	277 (51.4)	363 (52.1)	0.03
Congestive heart failure, n (%)	1358 (76.6)	441 (82.3)	422 (78.3)	495 (71)	< 0.001
Rheumatic disease, n (%)	71 (4.0)	19 (3.5)	20 (3.7)	32 (4.6)	0.595
Peptic ulcer disease, n (%)	40 (2.3)	10 (1.9)	12 (2.2)	18 (2.6)	0.702
Renal disease, n (%)	693 (39.1)	248 (46.3)	190 (35.3)	255 (36.6)	< 0.001
DM, n (%)	698 (39.4)	221 (41.2)	211 (39.1)	266 (38.2)	0.545
OASIS score	38.9 ± 9.9	36.3 ± 9.9	39.6 ± 10.4	40.2 ± 9.2	< 0.001
SOFA score	9.3 ± 4.0	8.4 ± 4.0	9.7 ± 4.2	9.6 ± 3.8	< 0.001
SAPS II score	48.6 ± 15.8	46.6 ± 15.4	50.2 ± 17.2	48.8 ± 14.7	< 0.001
Charlson comorbidity index	7.0 (5.0, 9.0)	8.0 (6.0, 9.0)	7.0 (5.0, 9.0)	7.0 (5.0, 9.0)	< 0.001
In-hospital mortality	724 (40.9)	231 (43.1)	234 (43.4)	259 (37.2)	0.038

Data are means ± SD, n (%), and median (IQR). MAP, mean artery pressure; WBC, White blood cell; DM, Diabetes mellitus; OASIS, Oxford Acute Severity of Illness Score; SOFA, Sequential Organ Failure Assessment; SAPS, simplified acute physiology score.

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Table S2 Sex modified the effect of association between the arithmetic mean of PaO_2 (continuous and categorical variables) variable and in-hospital mortality

	Variable	Crude model HR (95%CI)	P value	Adjusted model HR (95% CI)	P value	P for interaction
	Continuous variable					
Male	PaO_2 (mmHg)	0.999 (0.998~1.001)	0.3894	0.998 (0.996~0.999)	0.006	0.124
Female	PaO_2 (mmHg)	1.000 (0.999~1.002)	0.727	1.000 (0.998~1.001)	0.573	
	Categorical variables					
Male	PaO_2 < 60 mmHg	1 (Ref)		1 (Ref)		0.014
	PaO_2 60-100 mmHg	1.168 (0.876~1.557)	0.2899	0.779 (0.572~1.063)	0.1152	
	PaO_2 >100 mmHg	0.944 (0.73~1.22)	0.6592	0.588 (0.436~0.794)	<0.001	
Female	PaO_2 < 60 mmHg	1 (Ref)		1 (Ref)		
	PaO_2 60- 100 mmHg	1.230 (0.882~1.716)	0.223	1.333 (0.933~1.905)		
	PaO_2 > 100 mmHg	1.242 (0.926~1.664)	0.147	1.165 (0.838~1.62)	0.1146	

In adjusted model, we adjusted for all the confounders in *Table 1*

Table S3 Sex modified the effect of the association between the arithmetic mean of PaO_2 (continuous and categorical variables) and in-hospital mortality in patients aged >50 years

	Variable	Crude model HR (95% CI)	P value	Adjusted model HR (95% CI)	P value	P for interaction
	Continuous variable					
Male	PaO_2(mmHg)	0.998 (0.996~1)	0.0537	0.997 (0.995~1.000)	0.0230	0.006
Female	PaO_2 (mmHg)	1.001 (0.999~1.002)	0.4678	1.002 (1.000~1.004)	0.0439	
	Categorical variables					
Male	PO_2 < 60 mmHg	1 (Ref)		1 (Ref)		0.009
	PaO_2 60-100 mmHg	1.017 (0.793~1.305)	0.892	0.795 (0.610~1.037)	0.0907	
	PaO_2 >100 mmHg	0.677 (0.527~0.870)	0.002	0.582 (0.441~0.768)	< 0.001	
Female	PaO_2 < 60 mmHg	0.822 (0.728~0.927)	0.0015	0.762 (0.664~0.875)	< 0.001	
	PaO_2 60-100 mmHg	1 (Ref)		1 (Ref)		
	PaO_2 > 100 mmHg	1.018 (0.759~1.364)	0.906	1.184 (0.861~1.629)	0.298	

In adjusted model, we adjusted for all the confounders in *Table 1*

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Table S4 Sex modified the effect of the association between the PaO_2 (continuous and categorical variables) and in-hospital mortality after multiple imputation

	Variable	Crude model HR (95% CI)	P value	Adjusted model HR (95% CI)	P value	P for interaction
	Continuous variable					
Male	PaO_2 (mmHg)	0.998 (0.997~0.999)	0.042	0.997 (0.996~0.999)	0.007	0.001
Female	PaO_2 (mmHg)	1.001 (0.999~1.004)	0.320	1.001 (0.999~1.003)	0.154	
	Categorical variables					
Male	PaO_2 < 60 mmHg	1(Ref)		1(Ref)		0.007
	PaO_2 60-100 mmHg	1.030 (0.810~1.308)	0.809	0.887 (0.69~1.144)	0.345	
	PaO_2 >100 mmHg	0.812 (0.723~0.914)	0.001	0.799 (0.712~0.910)	0.001	
Female	PaO_2 < 60 mmHg	1(Ref)		1(Ref)		
	PaO_2 60-100 mmHg	1.045 (0.791~1.389)	0.753	1.000 (0.739~1.348)	0.979	
	PaO_2 > 100 mmHg	0.999 (0.772~1.309)	0.972	1.062 (0.787~1.412)	0.719	

In adjusted model, we adjusted for all the confounders in *Table 1*

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