

Table S1. Demographics and baseline characteristics of patients with COVID-19.

Variables	Total (N=2041)
Gender (Female) n (%)	1035 (50.7)
Age (years) median (IQR)	62.0 (50.0, 70.0)
Diabetes n (%)	274 (13.4)
Hypertension n (%)	550 (26.9)
Chronic obstructive pulmonary disease n (%)	73 (3.6)
Cancer* n (%)	28 (1.4)
Chronic kidney disease n (%)	49 (2.4)
Smoking history n (%)	311 (15.2)
Admission glucose (mmol/L) median (IQR)	6.0 (5.1, 7.6)
Normal (<6.1) n (%)	1078 (52.8)
Hyperglycemia (\geq 6.1) n (%)	963 (47.2)
Occurrence of hypoglycemia n (%)	94 (4.6)
Median blood glucose n (%)	
Tight (<6.1)	1120 (54.9)
Moderate (6.1-7.7)	493 (24.2)
Mild (7.8-9.9)	226 (11.1)
Very Mild (\geq 10.0)	202 (9.9)
Median glucose (mmol/L) median (IQR)	5.9 (5.1, 7.4)
Glucose coefficient of variation median (IQR)	0.2 (0.1, 0.3)
Maximum glucose (mmol/L) median (IQR)	6.8 (5.4, 9.0)
Minimum glucose (mmol/L) median (IQR)	5.2 (4.6, 6.3)
Admission white blood cell counts ($10^9/L$) median (IQR)	5.4 (4.1, 7.1)
Admission lymphocyte counts ($10^9/L$) median (IQR)	0.9 (0.7, 1.4)
Admission D-Dimer (mg/L) median (IQR)	0.4 (0.2, 0.9)
Admission AST (U/L) median (IQR)	25.8 (18.0, 38.6)
Admission ALT (U/L) median (IQR)	23.0 (15.7, 36.0)
Admission creatinine (μ mol/L) median (IQR)	69.0 (57.0, 85.7)
Corticosteroid use n (%)	809 (39.6)
Insulin use n (%)	264 (12.9)
Oxygen therapy n (%)	1937 (94.9)
Mechanical ventilation n (%)	564 (27.6)
Admission to ICU n (%)	342 (16.8)
Shock n (%)	29 (1.4)
Median length of in-hospital stay (days)	13.5 (7.8, 20.9)
Death n (%)	193 (9.5)

COVID-19, coronavirus disease 2019; ICU, intensive care unit; IQR, interquartile range.

* Included in this category is any type of cancer.

Table S2. Univariable Cox regression of association between blood glucose and the multiple glucose indexes and progression to critical cases/death from non-critical cases at admission in COVID-19 patients.

Variables	HR (95% CI)	P value
Gender (Female vs Male)	0.71 (0.58, 0.86)	0.001
Age	1.03 (1.02, 1.04)	<0.001
Diabetes	1.53 (1.17, 1.99)	0.002
Hypertension	1.45 (1.17, 1.80)	0.001
Chronic obstructive pulmonary disease	1.42 (0.83, 2.42)	0.199
Cancer	1.19 (0.53, 2.67)	0.669
Chronic kidney disease	1.83 (1.03, 3.25)	0.040
Smoking history	1.27 (0.97, 1.68)	0.086
Admission glucose group		
Normal (<6.1)	1.00 (reference)	
Hyperglycemia (\geq 6.1)	2.08 (1.69, 2.56)	<0.001
Admission glucose	1.07 (1.05, 1.10)	<0.001
Glucose coefficient of variation	6.11 (3.24, 11.53)	<0.001
Occurrence of hypoglycemia	1.27 (0.84, 1.93)	0.257
Median blood glucose		
Tight (<6.1)	1.00 (reference)	
Moderate (6.1-7.7)	2.83 (2.21, 3.62)	<0.001
Mild (7.8-9.9)	3.93 (2.93, 5.27)	<0.001
Very Mild (\geq 10.0)	3.28 (2.40, 4.48)	<0.001
Median glucose	1.12 (1.10, 1.15)	<0.001
Maximum glucose	1.09 (1.07, 1.11)	<0.001
Minimum glucose	1.10 (1.07, 1.13)	<0.001
Admission white blood cell counts	1.13 (1.11, 1.16)	<0.001
Admission lymphocyte counts	0.31 (0.24, 0.40)	<0.001
Admission D-Dimer	1.10 (1.08, 1.12)	<0.001
Admission AST	1.00 (1.00, 1.00)	<0.001
Admission ALT	1.00 (1.00, 1.00)	<0.001
Admission creatinine	1.00 (1.00, 1.00)	0.603
Insulin treatment	1.79 (1.39, 2.31)	<0.001
Corticosteroid use	2.69 (2.19, 3.32)	<0.001

COVID-19, coronavirus disease 2019.

Table S3. Univariable Cox regression of association between blood glucose and the multiple glucose indexes and in-hospital mortality in critical cases of COVID-19.*

Variables	HR (95% CI)	P value
Gender (Female vs Male)	0.44 (0.29, 0.66)	<0.001
Age	1.03 (1.02, 1.04)	<0.001
Diabetes	1.38 (0.92, 2.07)	0.122
Hypertension	1.39 (0.98, 1.99)	0.066
Chronic obstructive pulmonary disease	0.91 (0.44, 1.89)	0.798
Cancer	1.14 (0.36, 3.59)	0.820
Chronic kidney disease	1.76 (0.82, 3.77)	0.147
Smoking history	1.80 (1.22, 2.67)	0.003
Initial glucose of critical diagnosis group		
Normal (<6.1)	1.00 (reference)	
Hyperglycemia (\geq 6.1)	2.21 (1.43, 3.43)	<0.001
Initial glucose	1.08 (1.04, 1.12)	<0.001
Occurrence of hypoglycemia	0.97 (0.47, 1.99)	0.928
Median blood glucose		
Tight (<6.1)	1.00 (reference)	
Moderate (6.1-7.7)	2.54 (1.44, 4.49)	0.001
Mild (7.8-9.9)	3.96 (2.20, 7.14)	<0.001
Very Mild (\geq 10.0)	6.60 (3.70, 11.78)	<0.001
Median glucose	1.13 (1.10, 1.17)	<0.001
Glucose coefficient of variation	3.27 (0.75, 14.36)	0.116
Maximum glucose	1.08 (1.05, 1.11)	<0.001
Minimum glucose	1.14 (1.11, 1.18)	<0.001
Admission white blood cell counts	1.12 (1.09, 1.15)	<0.001
Admission lymphocyte counts	0.38 (0.23, 0.64)	<0.001
Admission D-Dimer	1.05 (1.03, 1.07)	<0.001
Admission AST	1.00 (1.00, 1.00)	0.241
Admission ALT	1.00 (1.00, 1.00)	0.824
Admission creatinine	1.00 (1.00, 1.00)	<0.001
Insulin treatment	1.74 (1.20, 2.53)	0.003
Corticosteroid use	4.92 (2.82, 8.59)	<0.001

COVID-19, coronavirus disease 2019.

* The glucose-associated indexes of critical cases were analyzed based on the blood glucose concentration after diagnosis of critical case.

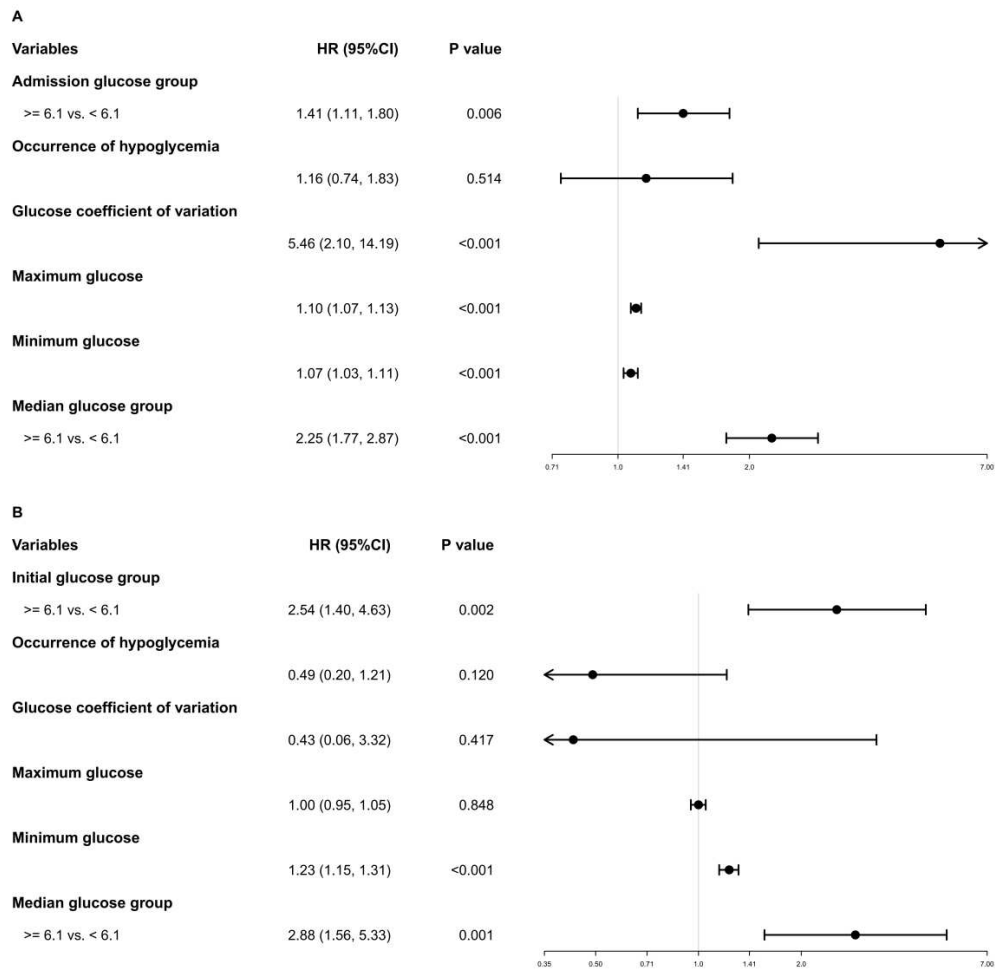


Figure S1. Forest plots of the association of multiple glucose indexes a) with progression to critical cases/death among non-critical COVID-19 patients without diabetes at admission; b) with in-hospital mortality among critical COVID-19 patients without diabetes in multivariable Cox regression analysis.