

**Supplementary Table 5.** Multivariate logistic regression analyses for prolonged ED length of stay longer than 12 hours

Variable	Univariate analysis		Multivariate analysis	
	OR	P-value	aOR	P-value
<b>Age group</b>				
Pediatric (0–19 yr)	0.425 (0.421–0.428)	<0.001	0.513 (0.507–0.518)	<0.001
Adult (20–64 yr)	Reference	-	Reference	-
Elderly (≥65 yr)	2.360 (2.350–2.370)	<0.001	1.325 (1.319–1.332)	<0.001
<b>Sex</b>				
Male	1.173 (1.169–1.178)	<0.001	1.118 (1.113–1.123)	<0.001
Female	Reference	-	Reference	-
<b>Geographic location</b>				
Metropolitan area	Reference	-	Reference	-
Gangwon-do	0.599 (0.590–0.607)	<0.001	0.444 (0.437–0.451)	<0.001
Chungcheongnam-do	0.513 (0.508–0.519)	<0.001	0.485 (0.480–0.490)	<0.001
Chungcheongbuk-do	0.623 (0.612–0.634)	<0.001	0.608 (0.598–0.619)	<0.001
Gyeongsangbuk-do	1.808 (1.797–1.820)	<0.001	1.549 (1.538–1.560)	<0.001
Gyeongsangnam-do	1.589 (1.580–1.599)	<0.001	1.298 (1.289–1.307)	<0.001
Jeollabuk-do	2.092 (2.076–2.109)	<0.001	1.950 (1.933–1.967)	<0.001
Jeollanam-do	1.334 (1.322–1.346)	<0.001	0.991 (0.982–1.001)	<0.001
Jeju Island	0.283 (0.276–0.290)	<0.001	0.345 (0.336–0.353)	<0.001
<b>Insurance type</b>				
National health insurance	Reference	-	1.000	-
Automobile Insurance	0.448 (0.440–0.455)	<0.001	0.475 (0.467–0.484)	<0.001
Medical aid	1.855 (1.842–1.868)	<0.001	1.279 (1.269–1.288)	<0.001
Other (including private insurance)	0.632 (0.621–0.644)	<0.001	0.767 (0.752–0.781)	<0.001
<b>ED type</b>				
Level I	Reference	-	Reference	-
Level II	0.636 (0.633–0.638)	<0.001	0.850 (0.846–0.854)	<0.001
<b>Arrival route</b>				
Direct visit	Reference	-	Reference	-
Transfer	3.490 (3.473–3.507)	<0.001	1.425 (1.416–1.434)	<0.001
Referral from outpatient	3.498 (3.463–3.533)	<0.001	1.797 (1.777–1.818)	<0.001
Other	1.955 (1.739–2.197)	<0.001	1.415 (1.246–1.606)	<0.001
<b>Means of arrival</b>				
On foot	Reference	-	Reference	-
Emergency medical services (119 ambulance)	1.455 (1.424–1.487)	<0.001	1.076 (1.051–1.103)	<0.001
Other vehicles	0.815 (0.797–0.833)	<0.001	0.943 (0.921–0.966)	<0.001
Other	2.452 (2.340–2.569)	<0.001	1.324 (1.258–1.393)	<0.001
<b>Admission season</b>				
Spring (March–May)	Reference	-	Reference	-
Summer (June–August)	0.897 (0.891–0.902)	<0.001	0.911 (0.906–0.917)	<0.001
Fall (September–November)	0.868 (0.863–0.873)	<0.001	0.875 (0.870–0.881)	<0.001
Winter (December–February)	0.896 (0.891–0.901)	<0.001	0.938 (0.932–0.944)	<0.001
<b>Admission time</b>				
Morning (08:00–15:59)	0.917 (0.911–0.923)	<0.001	0.519 (0.515–0.523)	<0.001
Evening (16:00–23:59)	1.594 (1.585–1.604)	<0.001	1.581 (1.571–1.591)	<0.001
Night (00:00–07:59)	Reference	-	Reference	-
Emergency symptom	6.094 (6.034–6.156)	<0.001	2.006 (1.985–2.028)	<0.001

KTAS				
Level 1	1.789 (1.765–1.813)	<0.001	1.100 (1.081–1.121)	<0.001
Level 2	1.781 (1.770–1.792)	<0.001	1.135 (1.126–1.143)	<0.001
Level 3	Reference	-	Reference	-
Level 4	0.286 (0.285–0.288)	<0.001	0.673 (0.669–0.677)	<0.001
Level 5	0.112 (0.111–0.114)	<0.001	0.419 (0.413–0.426)	<0.001
Initial level of consciousness				
Alert	Reference	-	Reference	-
Verbal	4.329 (4.289–4.369)	<0.001	1.554 (1.538–1.571)	<0.001
Pain response	4.557 (4.507–4.608)	<0.001	1.488 (1.468–1.508)	<0.001
Unresponsive	1.778 (1.741–1.817)	<0.001	0.679 (0.658–0.700)	<0.001
Initial systolic blood pressure				
Normal	Reference	-	Reference	-
Abnormal	0.684 (0.682–0.687)	<0.001	0.846 (0.841–0.850)	<0.001
Other	0.285 (0.282–0.287)	<0.001	0.536 (0.498–0.576)	<0.001
Initial diastolic blood pressure				
Normal	Reference	-	Reference	-
Abnormal	0.785 (0.781–0.788)	<0.001	1.012 (1.007–1.018)	<0.001
Other	0.320 (0.317–0.323)	<0.001	1.310 (1.220–1.407)	<0.001
Initial heart rate				
Normal	Reference	-	Reference	-
Abnormal	1.791 (1.783–1.799)	<0.001	1.269 (1.263–1.275)	<0.001
Other	0.499 (0.493–0.506)	<0.001	1.636 (1.575–1.700)	<0.001
Initial body temperature				
Normal	Reference	-	Reference	-
Abnormal	1.357 (1.351–1.363)	<0.001	1.135 (1.130–1.140)	<0.001
Other	0.693 (0.676–0.711)	<0.001	0.782 (0.758–0.806)	<0.001
Initial respiratory rate				
Normal	Reference	-	Reference	-
Abnormal	1.789 (1.779–1.799)	<0.001	1.090 (1.083–1.097)	<0.001
Other	0.479 (0.473–0.485)	<0.001	1.179 (1.137–1.222)	<0.001
Initial SpO <sub>2</sub>				
Normal	Reference	-	Reference	-
Abnormal	2.991 (2.957–3.026)	<0.001	0.972 (0.959–0.985)	<0.001
Other	0.289 (0.287–0.290)	<0.001	0.537 (0.534–0.540)	<0.001
Myocardial infarction				
Diagnosed	3.341 (3.290–3.392)	<0.001	0.932 (0.916–0.948)	<0.001
Excluded	Reference	-	Reference	-
Cerebral infarction				
Diagnosed	2.617 (2.589–2.645)	<0.001	0.693 (0.685–0.701)	<0.001
Excluded	Reference	-	Reference	-
Sepsis				
Diagnosed	4.975 (4.907–5.043)	<0.001	1.182 (1.164–1.200)	<0.001
Excluded	Reference	-	Reference	-
Intracranial hemorrhage				
Diagnosed	1.726 (1.690–1.763)	<0.001	0.495 (0.484–0.506)	<0.001
Excluded	Reference	-	Reference	-
COVID-19				
Diagnosed	2.883 (2.846–2.920)	<0.001	1.633 (1.610–1.656)	<0.001
Excluded	Reference	-	Reference	-
Severe illness (28 diseases)				
Diagnosed	4.262 (4.243–4.281)	<0.001	1.138 (1.132–1.145)	<0.001

Excluded	Reference	-	Reference	-
ED outcome				
Discharge	Reference	-	Reference	-
Transfer to another hospital	14.661 (14.523–14.801)	<0.001	7.429 (7.352–7.507)	<0.001
General ward admission	11.419 (11.362–11.476)	<0.001	6.157 (5.955–6.366)	<0.001
ICU admission	7.781 (7.716–7.847)	<0.001	2.538 (2.453–2.627)	<0.001
Death	6.757 (6.607–6.911)	<0.001	3.370 (3.273–3.469)	<0.001
Hospital outcome				
Discharge	Reference	-	Reference	-
Transfer to another hospital	1.055 (1.046–1.065)	<0.001	0.886 (0.878–0.895)	<0.001
Death	1.413 (1.398–1.429)	<0.001	1.112 (1.099–1.126)	<0.001
Other	1.127 (1.077–1.180)	<0.001	0.838 (0.799–0.879)	<0.001

ED, emergency department; OR, odds ratio; CI, confidence interval; aOR, adjusted odds ratio; KTAS, Korean Triage and Acuity Scale; SpO<sub>2</sub>, oxygen saturation as measured by pulse oximetry; ICU, intensive care unit.