

Supplement 1. Further baseline characteristics.

	Total (n=473)
Type of admission	
Walk-In	173 (36.6)
Ambulance	124 (26.2)
General Practitioner	92 (19.5)
External Hospital	40 (8.5)
Internal Referral	15 (3.2)
Police	6 (1.3)
Urgent care center	6 (1.3)
Air Rescue	1 (0.2)
Repatriation	1 (0.2)
Other	4 (0.9)
No Information	11 (2.3)
Discharge diagnosis class	
Diseases of the circulatory system	88 (18.6)
Diseases of the respiratory system	78 (16.5)
Diseases of the digestive system	54 (11.4)
Endocrine, nutritional, metabolic diseases and immunity disorders	32 (6.8)
Diseases of the genitourinary system	30 (6.3)
Infectious and parasitic diseases	26 (5.5)
Diseases of the nervous system and sense organs	22 (4.7)
Diseases of the musculoskeletal system and connective tissue	20 (4.2)
Mental Illness	19 (4.0)
Injury and poisoning	18 (3.8)
Neoplasms	13 (2.7)
Diseases of the blood and blood-forming organs	9 (1.9)
Diseases of the skin and subcutaneous tissue	4 (0.8)
Others	53 (11.2)
Missing	7 (1.5)

Supplement 2. Spearman rank correlation coefficients between predictor variables per cluster (n=473).

Patient's condition (chronic)

	Sex	Age	Case sev.
Sex	1.00		
Age	-0.14	1.00	
Case severity	0.05	0.01	1.00

Patient's condition (acuity)

	Triage	Resus. Bay	BP <90mmHg	HR deviation	Oxygen sat. <90%
Triage, more acute	1.000				
Resus. bay	0.311	1.000			
Systolic BP <90mmHg	0.152	0.088	1.000		
Heart rate <50/>110/min	-0.058	-0.022	-0.013	1.000	
Oxygen saturation <90%	0.084	0.112	0.018	-0.013	1.000

Subjective case difficulty

	Security	Difficulty	Familiarity
Security, more unsecure	1.000		
Difficulty, more	0.731	1.000	
Familiarity, less familiar	0.471	0.500	1.000

Context characteristics

	Tired	Work. subj.	Work. obj.	Weekend	Night adm.
Tired, more	1.000				
Workload (subjective), higher	0.213	1.000			
Workload (objective), higher	-0.091	0.312	1.000		
Weekend	0.101	-0.064	-0.094	1.000	
Night admission	0.156	-0.116	-0.555	0.029	1.000

**Supplement 3. Multilevel mixed-effects linear regression model
(physician identification number as the random-intercept model)
including all predictor potential variables (n=473).**

Total ED diagnostic resources	Coefficient	95% Confidence interval	p-Value
Patient's condition (chronic)			
Age, older	0	(-3.4, 3.4)	0.997
Sex, male	-5.8	(-126.5, 114.9)	0.925
Case severity index, more severe	78.5	(18.5, 138.6)	0.01
Patient's condition (acuity)			
Triage category, more urgent	246.6	(148.1, 345.2)	<0.001
Resuscitation Bay, yes	265.4	(51, 479.7)	0.015
Systolic blood pressure <90mmHg, yes	131.5	(-190.4, 453.4)	0.422
Heart rate deviation, >110 or <50bpm, yes	-681.3	(-1603.3, 240.7)	0.147
Oxygen saturation <90%, yes	-53.6	(-359.9, 252.7)	0.731
Physician's characteristics			
Experienced, less	59.5	(-15.9, 134.9)	0.121
Context characteristics			
Tiredness, more	5.4	(-52.1, 62.8)	0.855
Workload NEDOCS (objective), higher	-1.6	(-5.1, 1.8)	0.354
Workload (subjective), higher	18.5	(-38.8, 75.8)	0.526
Night admission, yes	-77.9	(-236.4, 80.6)	0.335
Weekend consultation, no	-51.8	(-194.4, 90.8)	0.476
Subjective case difficulty			
Insecurity, higher	-67.6	(-151.9, 16.7)	0.116
Difficulty, more difficult	166.4	(82.8, 250)	<0.001
Familiarity, less familiar	59.7	(-12.8, 132.3)	0.106
Constant	-141.5	(-680.5, 397.5)	0.606

Abbreviations: ED, Emergency Department; NEDOCS, National Emergency Department Overcrowding Score.

Supplement 4. Multilevel mixed-effects linear regression model (physician identification number as the random-intercept model) to model the total ED diagnostic resources with covariables obtained through principal component analysis (PCA) in each cluster (z-transformed variables).

Total ED diagnostic resources	Coefficient	95% Confidence interval	p-Value
PCA Physician's experience	-33.5	(-93.9, 26.8)	0.3
PCA Patient's condition (chronic)	17.0	(-41.9, 75.9)	0.6
PCA Patient's condition (acuity)	189.1	(129.9, 248.3)	<0.001
PCA Context characteristics	19.3	(-40.9, 79.6)	0.5
PCA Subjective case difficulty	151.8	(92.7, 210.8)	<0.001
Constant	1333.9	(1275.2, 1392.6)	<0.001