**Supplementary Figure 1 Identifying predictors of severe acute pancreatitis and acute respiratory distress syndrome with the least absolute and selection operator regression model.** A: The plot of the error rate of cross-validation; B: Least absolute shrinkage operator coefficient profiles; C: The plot of the error rate of cross-validation; D: Least absolute shrinkage operator coefficient profiles. SAP: Severe acute pancreatitis; ARDS: Acute respiratory distress syndrome.

**Supplementary Table 1 LASSO regression analysis to extract predictors from derivation cohort**

| Variable | SAP | | ARDS | |
|---|---|---|---|---|
| | lambda.min = 0.023 | lambda.1se = 0.070 | lambda.min = 0.020 | lambda.1se = 0.055 |
| Intercept | -13.64657545 | -4.549899327 | -11.58688233 | -3.93756635 |
| Sex | 0 | 0 | 0 | 0 |
| Weekend admission | 0.3344206 | 0 | 0.009077004 | 0 |
| Etiology | -0.003347715 | 0 | 0 | 0 |
| Peritoneal irritation | 0 | 0 | 0 | 0 |
| GCS < 15 | -0.070943662 | 0 | 0 | 0 |
| Age (yr) | 0 | 0 | 0 | 0 |
| Tem (℃) | 0.238398476 | 0 | 0.188984639 | 0 |
| SBP (mmHg) | 0 | 0 | 0 | 0 |
| HR (bpm) | 0.040390356 | 0.034672244 | 0.035273751 | 0.03058679 |
| RR (bpm) | 0.04467852 | 0.009393944 | 0.067984204 | 0.03779147 |
| WBC (× $10^9$/L) | 0 | 0 | 0 | 0 |
| HCT (%) | 0 | 0 | 0.01216631 | 0 |
| PLT (× $10^9$/L) | -0.001611491 | 0 | 0 | 0 |
| K (mmol/L) | 0 | 0 | -0.112735061 | 0 |
| Na (mmol/L) | 0 | 0 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| Ca (mmol/L) | -1.004289516 | -0.331332696 | -1.331050516 | -0.83285438 |
| Cr (µmol/L) | 0 | 0 | 0 | 0 |
| BUN (mmol/L) | 0.102369184 | 0.044631072 | 0.085098517 | 0.02532607 |
| Glu (mmol/L) | 0 | 0 | 0 | 0 |

LASSO: Least absolute shrinkage and selection operator; SAP: Severe acute pancreatitis; ARDS: Acute respiratory distress syndrome; GCS: Glasgow coma score; Tem: Temperature; SBP: Systolic blood pressure; HR: Heart rate; RR: Respiratory rate; WBC: White blood cell; HCT: Hematocrit; PLT: Platelet; Cr: Creatine; BUN: Blood urea nitrogen; Glu: Glucose.