**Supplementary Table S1**. Factors associated with in-hospital mortality selected for the multivariate analysis using the stepwise method (including laboratory values on day 1 *)

| Variables | Estimate | Standard Error | $\chi^2$ | *p*-Value |
|---|---|---|---|---|
| Sex | −0.4091 | 0.1119 | 13,374 | <0.001 |
| Age | 0.0919 | 0.0053 | 295.152 | <0.001 |
| BMI | 0.0161 | 0.0128 | 1.583 | 0.18 |
| Cardiovascular diseases | 0.5373 | 0.1409 | 14,547 | <0.001 |
| Respiratory diseases | 0.4889 | 0.1385 | 12,454 | <0.001 |
| Liver diseases | 0.6836 | 0.2553 | 7.172 | 0.008 |
| Renal diseases | 0.4112 | 0.2791 | 2.170 | 0.15 |
| Neoplasms | 0.6049 | 0.1531 | 15,610 | <0.001 |
| Diabetes mellitus | 0.3371 | 0.1118 | 9.090 | 0.004 |
| Cerebrovascular diseases | 0.3071 | 0.1368 | 5.040 | 0.03 |
| Lymphocytes_day1 | −0.0409 | 0.0056 | 54,199 | <0.001 |
| Creatinine_day1 | 0.1471 | 0.0338 | 18,975 | <0.001 |
| Platelets_day1 | −0.0020 | 0.0006 | 10,660 | 0.001 |
| CK_day1 | 0.0001 | 0.0000 | 3.561 | 0.05 |
| CRP_day1 | 0.0010 | 0.0005 | 3.826 | 0.06 |

* Day 1 refers to the day when the patient was admitted to the hospital. Abbreviations: BMI, body mass index; CI, confidence interval; CK, creatine kinase; CRP, C-reactive protein; LDH, lactate dehydrogenase; OR, odds ratio; WBC, white blood cell.

**Supplementary Table S2** Factors associated with in-hospital mortality selected for the multivariate analysis using the stepwise method (including laboratory values on days 1 and 8)

| Variables | Adjusted OR | 95% CI | | | $\chi^2$ |
|---|---|---|---|---|---|
| Sex | 0.804 | 0.624 | to | 1.036 | 2.836 |
| Age | 1.085 | 1.071 | to | 1.100 | 150,602 |
| BMI | 0.972 | 0.944 | to | 1.000 | 3.733 |
| Cardiovascular diseases | 1.575 | 1.146 | to | 2.164 | 7.851 |
| Respiratory diseases | 1.562 | 1.144 | to | 2.133 | 7.862 |
| Liver diseases | 1.640 | 0.901 | to | 2.988 | 2.618 |
| Renal diseases | 1.495 | 0.817 | to | 2.734 | 1.700 |
| Neoplasms | 1.816 | 1.281 | to | 2.576 | 11,202 |
| Diabetes mellitus | 1.446 | 1.123 | to | 1.864 | 8.151 |
| Cerebrovascular diseases | 1.386 | 1.018 | to | 1.888 | 4.306 |
| LDH_day8 | 1.006 | 1.005 | to | 1.007 | 250,747 |
| lymphocyte_day8 | 0.893 | 0.875 | to | 0.911 | 127,419 |
| CRP_day8 | 1.018 | 1.011 | to | 1.026 | 25,150 |
| Platelets_day8 | 0.998 | 0.997 | to | 0.999 | 10,983 |
| Creatinine_day1 * | 1.098 | 1.017 | to | 1.186 | 5.679 |
| CK_day8 | 1.000 | 0.999 | to | 1.000 | 4.739 |
| CRP_day1 | 1.001 | 1.000 | to | 1.002 | 1.638 |

* Day 1 refers to the day when the patient was admitted to the hospital. Abbreviations: BMI, body mass index; CI, confidence interval; CK, creatine kinase; CRP, C-reactive protein; LDH, lactate dehydrogenase; OR, odds ratio; WBC, white blood cell.

**Supplementary Table S3** Predictive characteristics of in-hospital mortality based on LDH values on admission day 8 (*n* = 8860)

| LDH Threshold (U/L) | Sensitivity | Specificity | PPV | NPV | True Negative | True Positive | False Negative | False Positive |
|---|---|---|---|---|---|---|---|---|
| 100 | 99.58% | 0.27% | 5.35% | 92.00% | 23 | 473 | 2 | 8362 |
| 150 | 99.37% | 6.82% | 5.70% | 99.48% | 572 | 472 | 3 | 7813 |
| 200 | 97.47% | 31.10% | 7.42% | 99.54% | 2608 | 463 | 12 | 5777 |
| 220 | 96.42% | 42.52% | 8.68% | 99.53% | 3565 | 458 | 17 | 4820 |
| 222 | 95.79% | 43.32% | 8.74% | 99.45% | 3632 | 455 | 20 | 4753 |
| 250 | 92.21% | 57.89% | 11.04% | 99.24% | 4854 | 438 | 37 | 3531 |
| 300 | 84.00% | 76.31% | 16.73% | 98.83% | 6399 | 399 | 76 | 1986 |
| 320 | 80.84% | 80.94% | 19.37% | 98.68% | 6787 | 384 | 91 | 1598 |
| 330 | 78.74% | 82.85% | 20.64% | 98.57% | 6947 | 374 | 101 | 1438 |
| 333 | 77.89% | 83.59% | 21.19% | 98.52% | 7009 | 370 | 105 | 1376 |
| 350 | 73.26% | 86.44% | 23.43% | 98.28% | 7248 | 348 | 127 | 1137 |
| 400 | 59.16% | 92.52% | 30.95% | 97.56% | 7758 | 281 | 194 | 627 |
| 440 | 50.95% | 94.94% | 36.34% | 97.16% | 7961 | 242 | 233 | 424 |
| 444 | 49.68% | 95.17% | 36.82% | 97.09% | 7980 | 236 | 239 | 405 |
| 660 | 17.68% | 99.22% | 56.38% | 95.51% | 8320 | 84 | 391 | 65 |

Abbreviations: LDH, lactate dehydrogenase; NPV, negative predictive value; PPV, positive predictive value.

**Supplementary Table S4** Clinical prediction models for in-hospital mortality based on the multivariate analysis

| (A) Baseline model (excluding laboratory values from the analysis) | | | |
|---|---|---|---|
| **Variables** | **Estimate** | **Standard Error** | **$\chi 2$** |
| Sex | −0.5693 | 0.1086 | 27,479 |
| Age | 0.0906 | 0.0051 | 310,676 |
| BMI | 0.0112 | 0.0126 | 0.781 |
| Cardiovascular diseases | 0.5097 | 0.1390 | 13,440 |
| Respiratory diseases | 0.5265 | 0.1354 | 15,117 |
| Liver diseases | 0.5982 | 0.2533 | 5579 |
| Renal diseases | 1.2967 | 0.2081 | 38,813 |
| Neoplasms | 0.6127 | 0.1500 | 16,671 |
| Diabetes mellitus | 0.4022 | 0.1095 | 13,498 |
| Cerebrovascular diseases | 0.3138 | 0.1344 | 5452 |
| **(B) Model incorporating laboratory values on day 8 using the stepwise method** | | | |
| **Variables** | **Estimate** | **Standard Error** | **$\chi 2$** |
| Sex | −0.2408 | 0.1297 | 3448 |
| Age | 0.0809 | 0.0066 | 148,767 |
| BMI | −0.0289 | 0.0148 | 3826 |
| Cardiovascular diseases | 0.4500 | 0.1628 | 7634 |
| Respiratory diseases | 0.4208 | 0.1596 | 6948 |
| Liver diseases | 0.4781 | 0.3058 | 2446 |
| Renal diseases | 0.6267 | 0.2778 | 5090 |
| Neoplasms | 0.5977 | 0.1782 | 11,249 |
| Diabetes mellitus | 0.3983 | 0.1290 | 9530 |
| Cerebrovascular diseases | 0.3262 | 0.1576 | 4285 |
| LDH on day 8 | 0.0061 | 0.0004 | 249,514 |
| Lymphocytes on day 8 | −0.1145 | 0.0100 | 130,211 |
| CRP on day 8 | 0.0185 | 0.0035 | 27,868 |
| Platelet count on day 8 | −0.0019 | 0.0005 | 11,916 |
| CK on day 8 | −0.0003 | 0.0002 | 4942 |

| | | | |
|---|---|---|---|
| Creatinine day 8 | 0.0487 | 0.0309 | 2487 |

| (C) Baseline model plus LDH on day 8 | | | |
|---|---|---|---|
| **Variables** | **Estimate** | **Standard Error** | **$\chi^2$** |
| Sex | −0.4235 | 0.1238 | 11,710 |
| Age | 0.0932 | 0.0062 | 224,880 |
| BMI | −0.0305 | 0.0149 | 4211 |
| Cardiovascular diseases | 0.5624 | 0.1552 | 13,126 |
| Respiratory diseases | 0.4887 | 0.1533 | 10,163 |
| Liver diseases | 0.3732 | 0.3057 | 1491 |
| Renal diseases | 1.2710 | 0.2366 | 28,858 |
| Neoplasms | 0.6276 | 0.1730 | 13,162 |
| Diabetes mellitus | 0.4443 | 0.1253 | 12,574 |
| Cerebrovascular diseases | 0.2911 | 0.1517 | 3679 |
| LDH on day 8 | 0.0082 | 0.0004 | 501,267 |

| (D) Baseline model plus lymphocyte fraction on day 8 | | | |
|---|---|---|---|
| **Variables** | **Estimate** | **Standard Error** | **$\chi^2$** |
| Sex | −0.2723 | 0.1171 | 5410 |
| Age | 0.0741 | 0.0058 | 164,609 |
| BMI | 0.0042 | 0.0132 | 0.102 |
| Cardiovascular diseases | 0.3971 | 0.1507 | 6948 |
| Respiratory diseases | 0.4307 | 0.1456 | 8750 |
| Liver diseases | 0.6336 | 0.2713 | 5452 |
| Renal diseases | 0.6490 | 0.2224 | 8515 |
| Neoplasms | 0.5871 | 0.1614 | 13,242 |
| Diabetes mellitus | 0.3232 | 0.1168 | 7651 |
| Cerebrovascular diseases | 0.3431 | 0.1437 | 5698 |
| Lymphocyte day 8 | −0.1751 | 0.0098 | 322,203 |

The day of hospitalization is set as day 1. Abbreviations: BMI, body mass index; CK, creatine kinase; CRP, C-reactive protein; LDH, lactate dehydrogenase; WBC, white blood cell.