

## Supplementary Materials

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**Table S1.** - ICD-9-CM and definition of HAS-BLED score.

| Item                              | ICD 9   | ICD 10  | score |
|-----------------------------------|---|---|-------|
| Hypertension                      | 401.1, 401.9, 402.10, 402.90, 404.10,<br>404.90, 405.11, 405.19, 405.91,<br>405.99  | I10, I11, I12, I13, I15, N26.2  | 1     |
| Renal disease                     | 582, 585, 586, V56,<br>588.0, V42.0, V45.1, 403.01,<br>403.11, 403.91, 404.02, 404.03,<br>404.12, 404.13, 404.92, 404.93, 583.0,<br>583.1, 583.2, 583.3, 583.4, 583.5,<br>583.6, 583.7  | N18, N19, I12.0, I13.1,<br>N03.2, N03.3, N03.4, N03.5,<br>N03.6, N03.7, N05.2, N05.3,<br>N05.4, N05.5, N05.6, N05.7,<br>N25.0, Z49.0, Z49.1, Z49.2,<br>Z94.0, Z99.2   | 1     |
| Liver disease                     | 570, 571, 070.6, 070.9,<br>573.3, 573.4, 573.8, 573.9,<br>V42.7, 070.22, 070.23, 070.32,<br>070.33, 070.44, 070.54, 456.0, 456.1,<br>456.2,<br>572.2, 572.3, 572.4, 572.8   | B18, K73, K74, K70.0,<br>K70.1, K70.2, K70.3, K70.9,<br>K71.3, K71.4, K71.5, K71.7,<br>K76.0, K76/2, K76/3, K76.4,<br>K76.8, K76.9, Z94.4, I85.0, I85.9,<br>I86.4, I98.2,<br>K70.4, K71.1, K72.1, K72.9,<br>K76.5, K76.6, K76.7   | 1     |
| Stroke, transient ischemic attack | 430, 431, 432.0, 432.1, 432.9, 433,<br>434, 436, 437.0, 437.1,  | I60, I61, I62.0, I62.9, I63, I65, I66   | 1     |
| Bleeding history                  | ICH:<br>430, 431, 432.0, 432.1, 432.9<br>Extra-cranial:<br>531.0, 531.2, 531.4, 531.6, 532.0,<br>532.2, 532.4, 532.6, 533.0, 533.2,<br>533.4, 533.6, 534.0, 534.2, 534.4,<br>534.6, 578.0, 578.1, 578.9, 569.3,<br>287.8, 287.9, 596.7, 784.8, 599.7,<br>627.1, 459.0, 719.1, 786.3 | ICH:<br>I60, I61, I62.0, I62.9<br>Extra-cranial:<br>K92.0, K92.1, I85.0, I98.20, I98.3,<br>K22.10, K22.12, K22.14, K22.16,<br>K25.0, K25.2, K25.4, K25.6,<br>K26.0, K26.2, K26.4, K26.6,<br>K27.0, K27.2, K27.4, K27.6,<br>K28.0, K28.2, K28.4, K28.6,<br>K29.0, K63.80, K31.80, K55.20,<br>K62.5, K92.2, N02.0, N02.1,<br>N02.2, N02.3, N02.4, N02.5,<br>N02.6, N02.7, N02.8, N02.9,<br>K66.1, N93.8, N93.9, N95.0,<br>R04.1, R04.2, R04.8, R04.9,<br>R31.0, R31.1, R31.8, R58, D68.3,<br>H35.6, H43.1, H45.0, M25.0 | 1     |
| INR > 4                           | NA  | NA  | 1     |

|  |   |   |                              |
|--|---|---|------------------------------|
| Age  | NA  | NA  | 1, age ≥ 65;<br>0, age < 65. |
| Medication usage<br>predisposing to bleeding | NA  | NA  | 1                            |
| Alcohol use                                  | 291.1, 291.2, 291.5, 291.8, 291.9,<br>303.93, 305.03, V11.3 | F10, E52, G62.1, I42.6, K29.2,<br>K70.0, K70.3, K70.9, T51, Z71.4,<br>Z65.8 | 1                            |

Table S2. - ICD-9-CM and definition of Charlson comorbidity Index.

| Condition                                | ICD 9   | ICD 10   | Weight  |
|--|---|--|---|
| Age score                                | NA  | NA   | 4, Age ≥ 70;<br>3, 70 > Age ≥ 61;<br>2, 60 > Age ≥ 51;<br>1, 50 > Age ≥ 41;<br>0, Age < 40. |
| Myocardial infarct                       | 410, 412  | I21, I22, I25.2  | 1   |
| Congestive heart failure                 | 428, 398.91, 402.01, 402.11,<br>402.91, 404.01, 404.03, 404.11,<br>404.13, 404.91, 404.93, 425.4, 425.9<br>440, 441, 093.0, 437.3,  | I43, I50, I09.9, I11.0, I13.0, I13.2,<br>I25.5, I42.0, I42.5, I42.6, I42.7,<br>I42.8, I42.9, P29.0<br>I70, I71, I73.1, I73.8,<br>I73.9, I77.1, I79.0, I79.2,   | 1   |
| Peripheral vascular disease              | 447.1, 557.1, 557.9, V43.4,<br>443.1, 443.9   | K55.1, K55.8, K55.9, Z95.8,<br>Z95.9   | 1   |
| Cerebrovascular disease                  | 430, 431, 432, 433, 434, 435, 436,<br>437, 438, 362.34  | G45, G46, I60~I69,<br>H34.0  | 1   |
| Dementia                                 | 290, 294.1, 331.2   | F00, F01, F02, F03,<br>G30, F051, G311<br>J40~J47, J60~J67,  | 1   |
| Chronic pulmonary disease                | 490, 491, 492, 493, 494, 495, 496,<br>500, 501, 502, 503, 504, 505, 4168,<br>4169, 506.4, 508.1, 508.8<br>725, 446.5, 710.0, 710.1, | I27.8, I27.9, J68.4, J70.1,<br>J703<br>M05, M06, M32, M33,<br>M34, M31.5, M35.1, M35.3,<br>M36.0   | 1   |
| Rheumatic disease                        | 710.2, 710.3, 710.4, 714.0,<br>714.1, 714.2, 714.8  |  | 1   |
| Peptic ulcer disease                     | 531, 532, 533, 534  | K25, K26, K27, K28<br>B18, K73, K74, K70.0,<br>K70.1, K70.2, K70.3, K70.9,<br>K71.3, K71.4, K71.5, K71.7,<br>K76.0, K76/2, K76/3, K76.4,<br>K76.8, K76.9, Z94.4  | 1   |
| Mild liver disease                       | 570, 571, 070.6, 070.9,<br>573.3, 573.4, 573.8, 573.9,<br>V42.7, 070.22, 070.23, 070.32,<br>070.33, 070.44, 070.54                  | E10.0, E10.1, E10.6, E10.8, E10.9,<br>E11.0, E11.1, E11.6, E11.8,<br>E11.9, E12.0, E12.1, E12.6,<br>E12.8, E12.9, E13.0, E13.1,<br>E13.6, E13.8, E13.9, E14.0,<br>E14.1, E14.6, E14.8,<br>E14.9<br>E10.2, E10.3, E10.4, E10.5,<br>E10.7, E11.2, E11.3, E11.4, E11.5,<br>E11.7, E12.2, E12.3,<br>E12.4, E12.5, E12.7, E13.2,<br>E13.3, E13.4, E13.5, E13.7,<br>E14.2, E14.3, E14.4, E14.5,<br>E14.7 | 1   |
| Diabetes without chronic<br>complication | 250.0, 250.1, 250.2, 250.3,<br>250.8, 250.9   |  | 1   |
| Diabetes with chronic<br>complication    | 250.4, 250.5, 250.6, 250.7  |  | 2   |
| Paraplegia                               | 342, 343, 3341, 344.0,<br>344.1, 344.2, 344.3, 344.4,<br>344.5, 344.6, 344.9  | G81, G82, G04.1, G11.4,<br>G80.1, G80.2, G83.0, G83.1,<br>G83.2, G83.3, G83.4, G83.9   | 2   |
| Renal disease                            | 582, 585, 586, V56,   | N18, N19, I12.0, I13.1,  | 2   |

|                        |   |  |   |
|------------------------|---|--|---|
|                        | 588.0, V42.0, V45.1, 403.01,<br>403.11, 403.91, 404.02, 404.03,<br>404.12, 404.13, 404.92, 404.93,<br>583.0, 583.1, 583.2, 583.3, 583.4,<br>583.5, 583.6, 583.7 | N03.2, N03.3, N03.4, N03.5,<br>N03.6, N03.7, N05.2, N05.3,<br>N05.4, N05.5, N05.6, N05.7,<br>N25.0, Z49.0, Z49.1, Z49.2,<br>Z94.0, Z99.2 |   |
| Malignant cancer       | 140~172, 1740~1958,<br>200~208, 238.6   | C43,C88, C00~C26,<br>C30~C34, C37~C41,<br>C45~C58, C60~C76,<br>C81~C85, C90~C97  | 2 |
| Severe liver disease   | 456.0, 456.1, 456.2,<br>572.2, 572.3, 572.4, 572.8  | I85.0, I85.9, I86.4, I98.2,<br>K70.4, K71.1, K72.1, K72.9,<br>K76.5, K76.6, K76.7  | 3 |
| Metastatic solid tumor | 196, 197, 198, 199  | C77, C78, C79, C80   | 6 |
| HIV/AIDS               | 042, 043, 044   | B20, B21, B22, B24   | 6 |

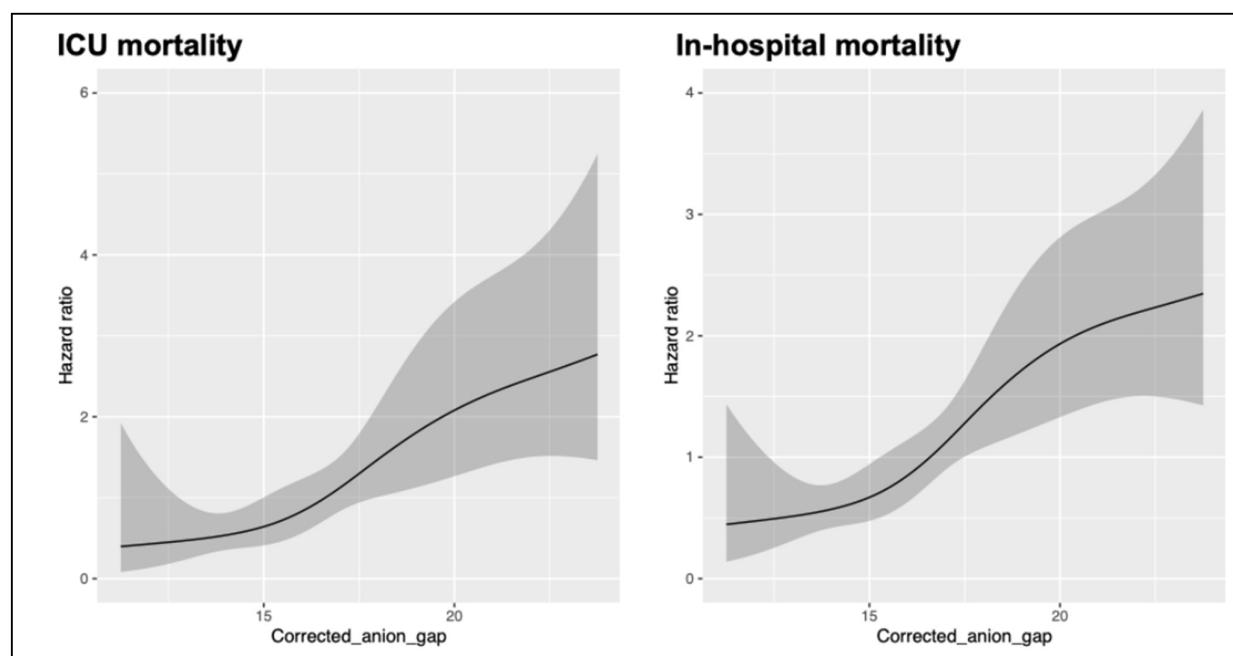
Table S3. Comparison of Kaplan–Meier estimate.

| Outcomes: in-hospital mortality (Measure: Hazard ratio) |                     |                     |                     |
|---|---------------------|---------------------|---------------------|
| Category 1  | 1.793 (1.159–2.775) | 2.722 (1.742–4.253) | 2.744 (1.744–4.315) |
| —   | Category 2          | 1.518 (1.001–2.302) | 1.530 (1.002–2.337) |
| —   | —                   | Category 3          | 1.008 (0.653–1.555) |
| —   | —                   | —                   | Category 4          |

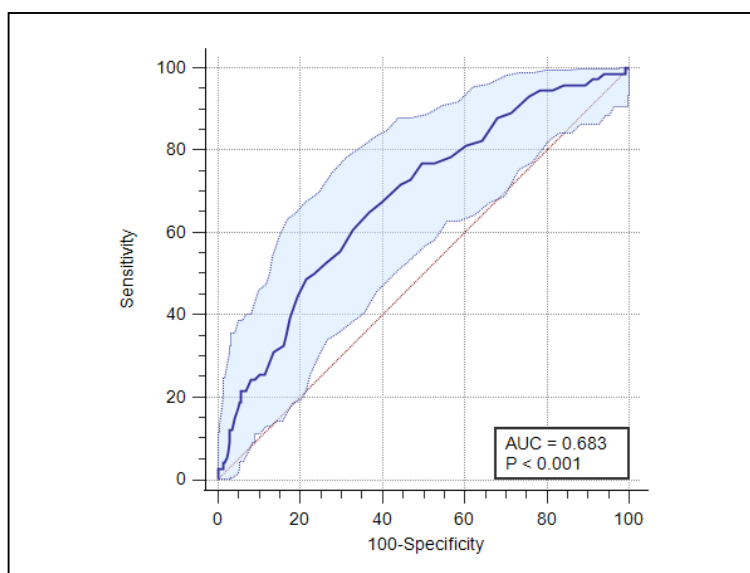
Data are presented as the hazard ratio with 95% confidence interval in the column-defining category compared with row-defining category.

Comparisons should be read from left to right.

CI: confidence interval; HR: hazard ratio.



**Figure S1.** Relationship between the plasma corrected anion gap and the risk of intensive care unit and in-hospital mortality. Shaded areas around the curves depict 95% confidence intervals. ICU: intensive care unit.



**Figure S2.** Receiver operating characteristic curves for the predictive ability of plasma corrected anion gap for the in-hospital mortality in stroke patients.