Supplemental material

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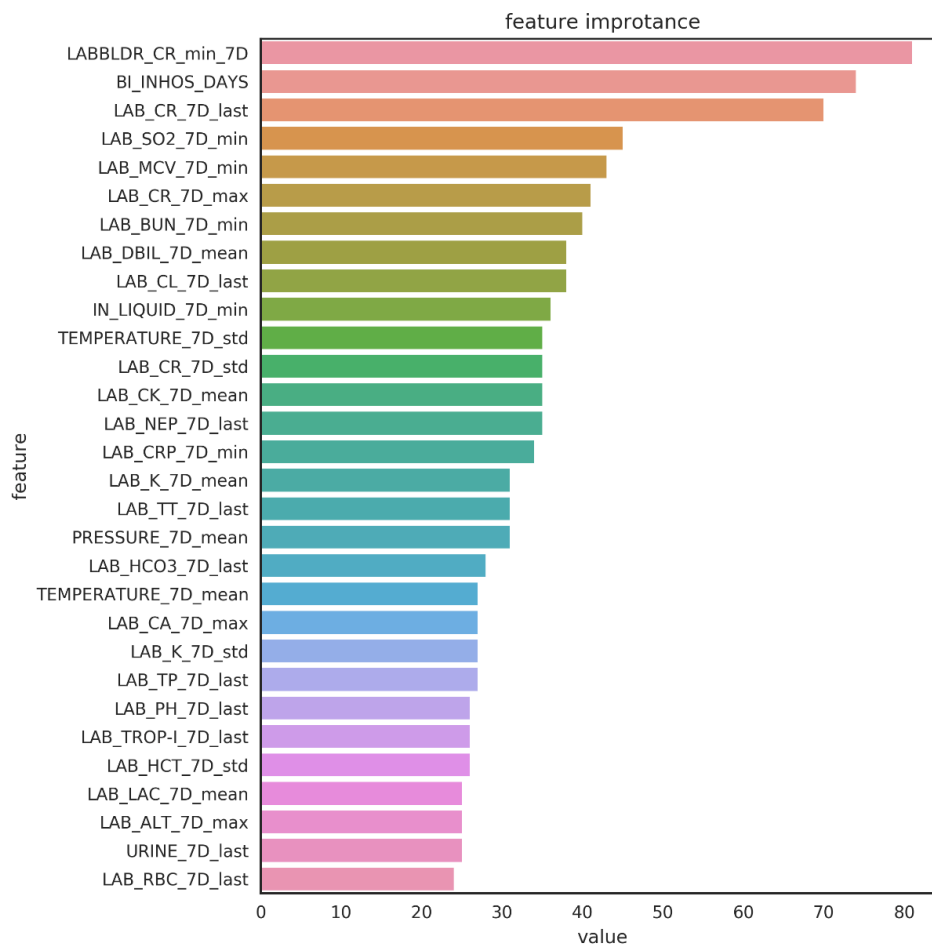
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**Supplemental Figure:**
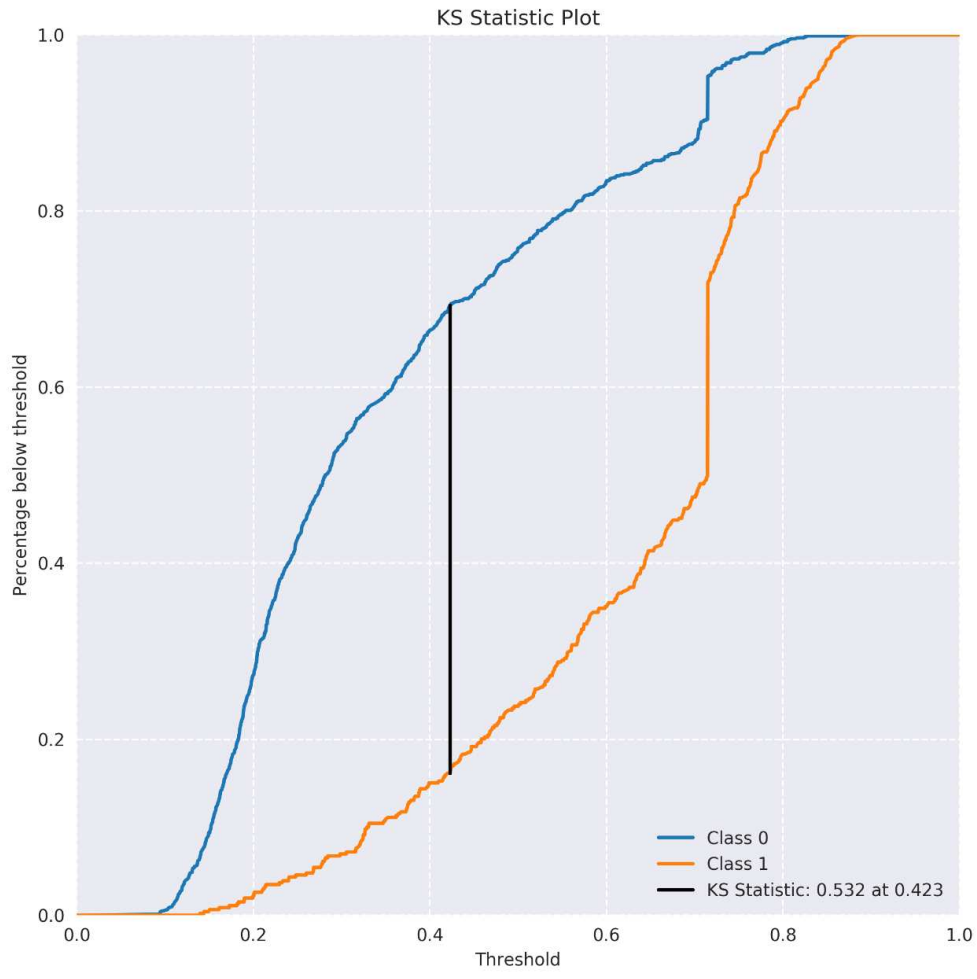
File name: **Figure S1.tif**

Title and Description of data: The variable importance parameter histogram of early diagnosis prediction

models of severe AKI uses a multiple logistic regression algorithm and five machine learning algorithms.



File name: **Figure S2.tif**

Title and Description of data: The K-S curve used to determine the cut-off value of positive and negative

diagnosis of early diagnosis prediction models of severe AKI.

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KS Statistic Plot

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File name: **Table S1.docx**

Title and of Description data: Missing data between three databases in the study and values included in

the model.

| | SHZJU-ICU | MIMIC | AmsterdamUMC | Including in Model |
|---|---|---|---|---|
| **Age** | √ | √ | √ | √ |
| **Gender** | √ | √ | √ | √ |
| **Race** | √ | √ | × | × |
| **Primary disease** | √ | √ | × | × |
| **Comorbidity** | √ | √ | × | × |
| **Ventilation** | √ | √ | √ | √ |
| **Operation** | √ | √ | × | × |
| **ICU hours** | √ | √ | √ | √ |
| **Survived** | √ | √ | √ | √ |
| **Vital sign** | | | | |
| **Temperature** | √ | √ | √ | √ |
| **Systolic pressure** | √ | √ | √ | √ |
| **Diastolic pressure** | √ | √ | √ | √ |
| **Respiratory rate** | √ | √ | √ | √ |
| **Heart rate** | √ | √ | √ | √ |
| **Oxygen saturation** | √ | √ | √ | √ |
| **Urine** | √ | √ | √ | √ |
| **GCS score** | √ | × | × | × |
| **Laboratory results** | | | | |
| **Scr** | √ | √ | √ | √ |
| **BUN** | √ | √ | √ | √ |
| **RBC** | √ | √ | √ | √ |
| **MCV** | √ | √ | √ | √ |
| **Hb** | √ | √ | √ | √ |
| **WBC** | √ | √ | √ | √ |
| **NEUT** | √ | √ | √ | √ |
| **PLT** | √ | √ | √ | √ |
| **HCV** | √ | √ | × | × |
| **TBLB** | √ | √ | √ | √ |
| **DBLB** | √ | √ | √ | √ |
| **IBLB** | √ | √ | √ | √ |
| **CRP** | √ | √ | √ | √ |
| **PCT** | √ | × | × | × |
| **Serum kalium** | √ | √ | √ | √ |
| **Serum natrium** | √ | √ | √ | √ |
| **Serum chlorine** | √ | √ | √ | √ |

| | | | | |
|---|---|---|---|---|
| **PT** | √ | √ | √ | √ |
| **APTT** | √ | √ | √ | √ |
| **INR** | √ | √ | √ | √ |
| **CK** | √ | √ | √ | √ |
| **LDH** | √ | √ | √ | √ |
| **Troponin** | √ | √ | √ | √ |
| **Blood glucose** | √ | √ | √ | √ |
| **PH** | √ | √ | √ | √ |
| **Lactic acid** | √ | √ | √ | √ |
| **Anion gap** | √ | √ | √ | √ |
| **ABC** | √ | √ | √ | √ |
| **SBC** | √ | √ | √ | √ |
| **PaCO₂** | √ | √ | √ | √ |
| **PaO₂** | √ | √ | √ | √ |

SHZJU-ICU: The general ICU database of the second affiliated hospital of Zhejiang university school of medicine; MIMIC: Medical Information Mart for Intensive Care; APTT: Activated partial thromboplastin time; INR: International normalized ratio; LDH: Lactate dehydrogenase; $PaCO_2$: Partial pressure of carbon dioxide; $PaO_2$ Partial pressure of oxygen; MCV: Mean corpuscular volume; PH: Potential of hydrogen; WBC: White blood cell count; NEUT: Proportion of neutrophils; CK: Creatine kinase; Scr: Serum Creatinine; BUN: Blood urea nitrogen; RBC: Red blood cell count; Hb: Hemoglobin; PT: Prothrombin time; TBLB: Total bilirubin; DBLB: Direct bilirubin; IBLB: Indirect bilirubin; CRP: C-reactive protein; HCV: Hematocrit value; PCT: Procalcitonin; ABC: Actual Bicarbonate Radical; SBC: Standard Bicarbonate Radical; PLT: Platelet count

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File name: **Table S2.docx**

Title and of Description data: Clinical Demographics and Outcomes of SHZJU-ICU patients in model

building set and prospective validation.

| | SHZJU-ICU Negative (N=5695) | SHZJU-ICU Severe AKI (N=766) | P-value | SHZJU-ICU Prospective Negative (N=2188) | SHZJU-ICU Prospective Positive (N=344) | P-value |
|---|---|---|---|---|---|---|
| **Age, median [IQR]** | 60.5 [48.8-70.1] | 62.1 [50.1-72.5] | 0.004 | 61.3 [47.5-73.4] | 62.1 [51.2-70.5] | 0.03 |
| **Gender, male (%)** | 3561 (64.9) | 438 (59.8) | 0.007 | 1365 (62.4) | 207 (60.2) | 0.438 |
| **Race** | | | | | | |
| **White** | 3 (0.05) | 1 (0.1) | 1 | 2 (0.001) | 0 | 1 |
| **Black** | 1 (0.02) | 0 | 1 | 0 | 0 | 1 |
| **Asian** | 5691(99.9) | 764 (99.7) | 1 | 2185 (99.9) | 344(100) | 1 |
| **Other** | 0 | 1 (0.1) | 1 | 1 (0.001) | 0 | 1 |
| **Admission Scr (mg/dL), mean (sd)** | 0.9 (0.34) | 1.0 (0.40) | <0.001 | 0.8 (0.32) | 0.9 (0.35) | <0.001 |
| **Admission BUN (mg/dL), mean (sd)** | 18 (11) | 21 (9) | <0.001 | 17 (11) | 20 (10) | 0.007 |
| **Cancer, n (%)** | 644 (11.3) | 48 (6.3) | <0.001 | 230 (10.5) | 26 (7.6) | 0.102 |
| **Cirrhosis, n (%)** | 43 (0.8) | 6 (0.8) | 0.89 | 15 (0.7) | 3 (0.8) | 0.726 |
| **Cardiopathy, n (%)** | 231 (4.1) | 42 (5.5) | 0.08 | 98 (4.5) | 19 (5.7) | 0.403 |
| **Diabetes, n (%)** | 305 (5.4) | 63 (8.2) | 0.002 | 142 (6.5) | 29 (8.6) | 0.203 |
| **Hypertension, n (%)** | 889 (15.6) | 115 (15.0) | 0.70 | 324(14.8) | 56 (16.4) | 0.466 |
| **Ventilation, n (%)** | 2569 (45.1) | 592 (77.3) | <0.001 | 1102 (50.4) | 239 (69.5) | <0.001 |
| **Operation, n (%)** | 3361 (59.1) | 373 (48.7) | <0.001 | 1234(56.4) | 160 (46.7) | 0.001 |
| **ICU Hours, median [IQR]** | 50.8 [23.0-139.5] | 164.4 [70.3-328.6] | <0.001 | 58.7 [34.2-160.4] | 145.6 [68.5-314.8] | <0.001 |
| **Survived, n (%)** | 4997 (87.7) | 380 (49.6) | <0.001 | 1868 (85.4) | 178 (51.9) | <0.001 |

*SHZJU-ICU*: The general ICU database of the second affiliated hospital of Zhejiang university school of medicine; *MIMIC*: Medical Information Mart for Intensive Care; *IQR*: Inter-Quartile Range; *ICU*: Intensive Care Unit; *AKI*: Acute Kidney Injury. *Scr*: serum creatinine; *BUN*: blood urea nitrogen.