SUPPLEMENTAL MATERIAL

Supplemental Figure number: 6

Supplemental Figure 1. Gender-stratified smooth curves of SCr with respect to age in the study population.

Supplemental Figure 2. Density plot of serum creatinine in different age strata.

Supplemental Figure 3. Histograms of serum creatinine in different age strata.

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Supplemental table number: 8

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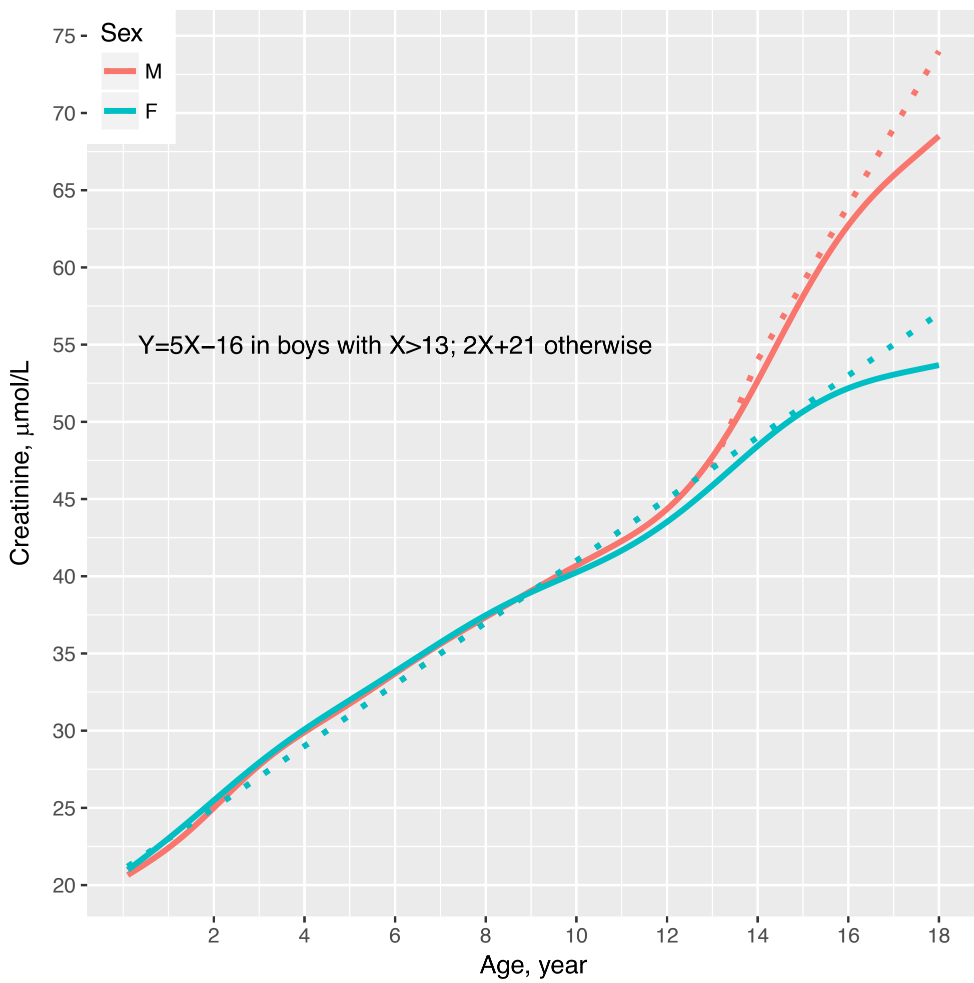
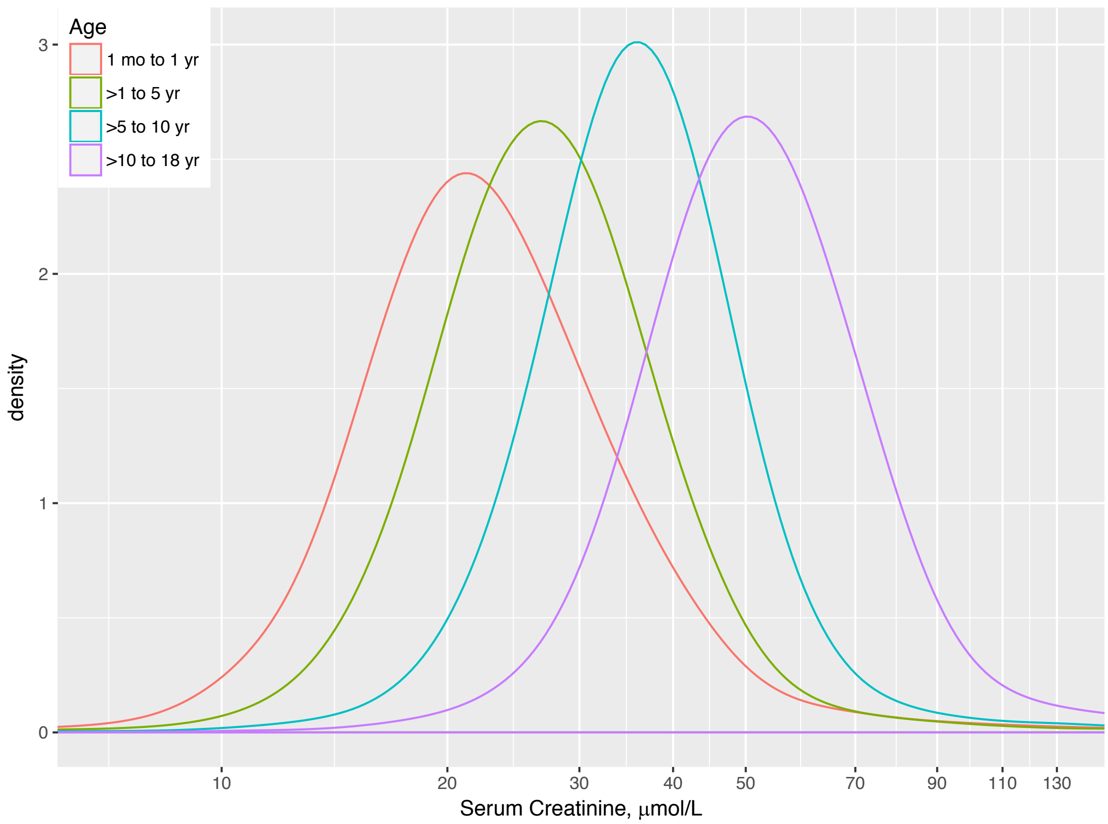
Supplemental Table 8. Association of pROCK-defined AKI with progression to CKD within 1 year.

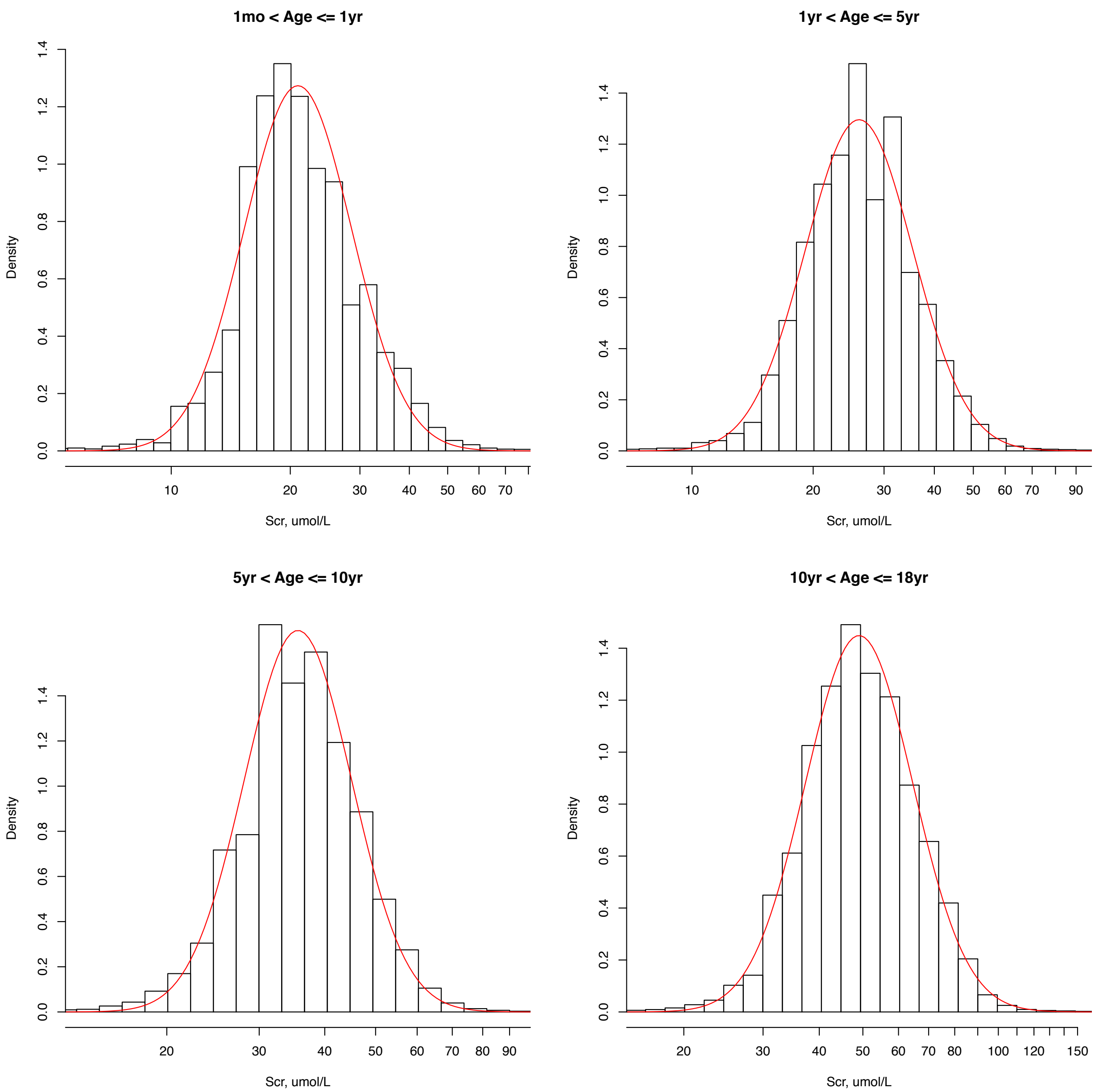
Supplemental Figure 1. Gender-stratified smooth curves of SCr with respect to age in the study population. Only the first SCr value from each patient was used to derive the smoothed curves. An equation for the age- and gender- specific SCr reference was derived by 2-segment linear regression (the dotted lines) as: SCr = 5*age-16 in boys when age>13 years; 2*age+21 otherwise; where SCr is in unit of μmol/L, and age is in unit of year.



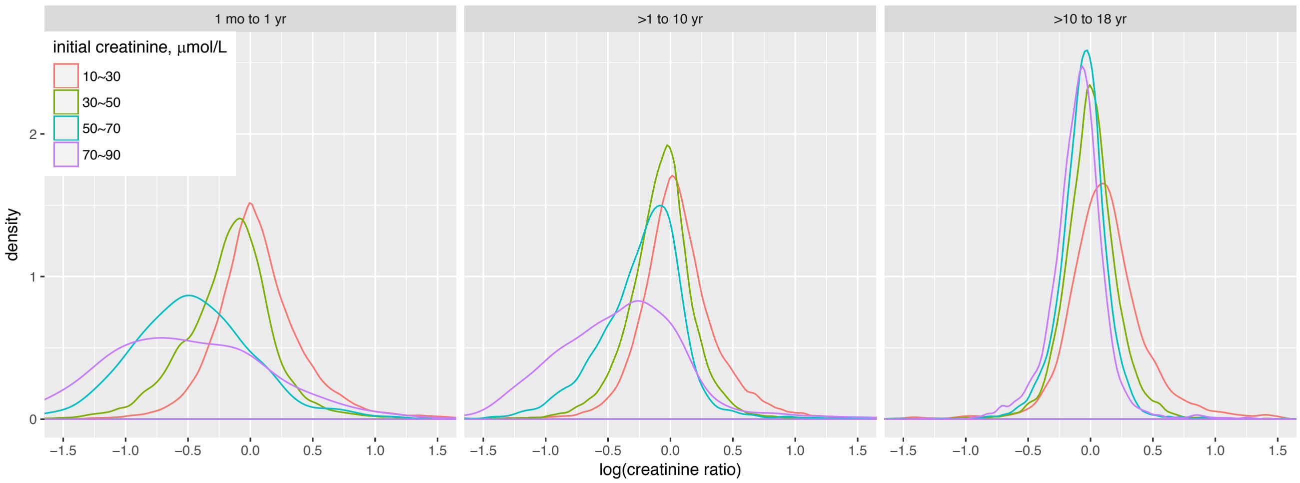
Supplemental Figure 2. Density plots of serum creatinine in different age strata. Age were divided into 4 strata: 1mo. To 1 year, >1 to 5 years, >5 to 10 years, and >10 to 18 years.



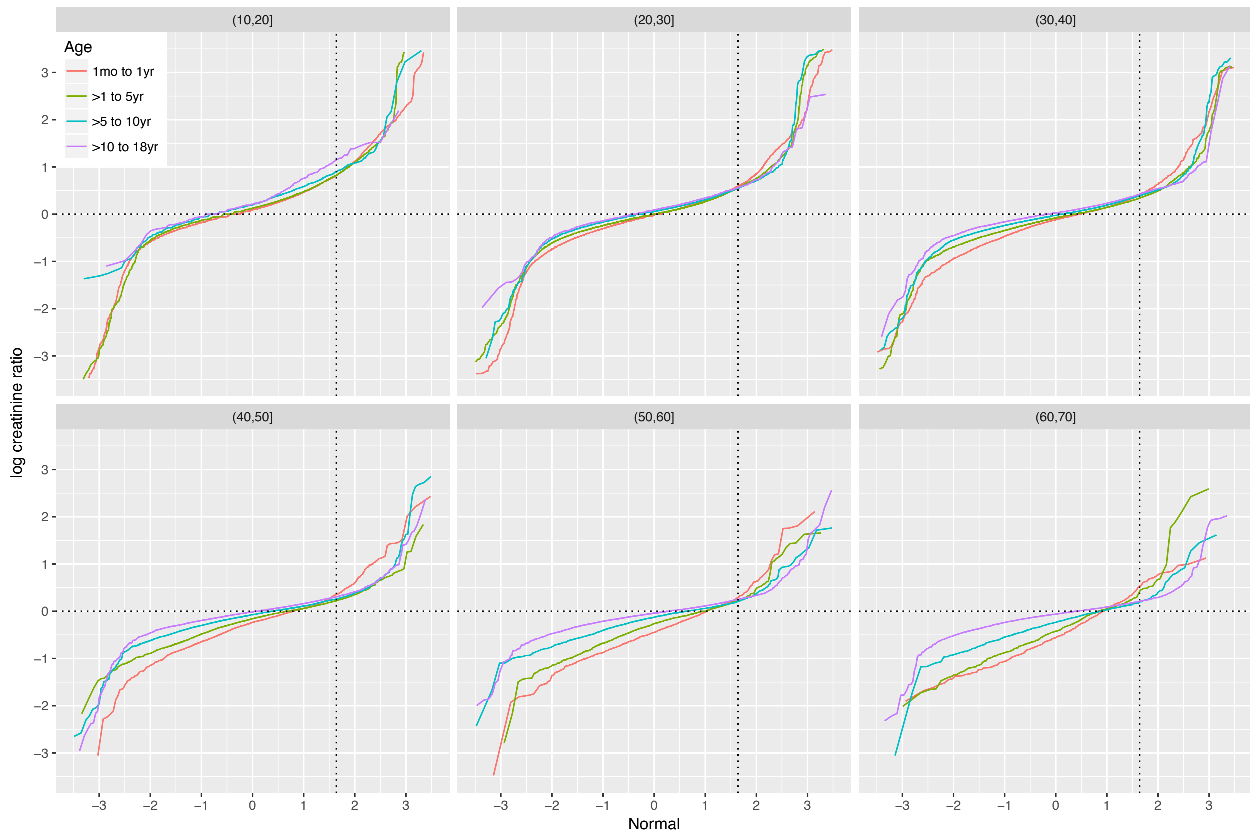
Supplemental Figure 3. Histograms of serum creatinine in different age strata. The red lines are the probability density curves of the estimated log-normal distributions of serum creatinine.



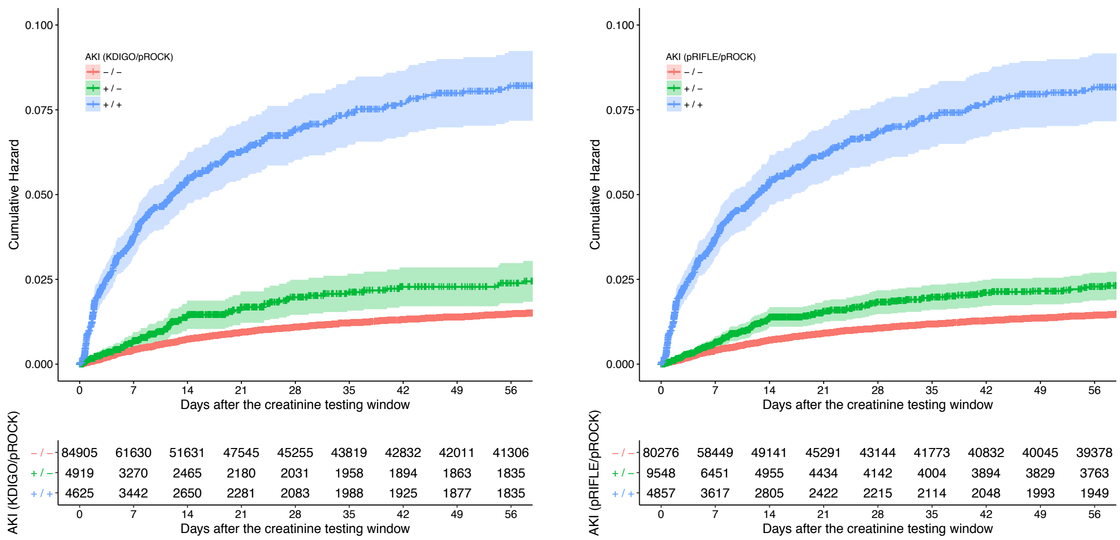
Supplemental Figure 4. Density plots of log creatinine ratios in different strata of age and initial creatinine level.



Supplemental Figure 5. Quantile-quantile plots of log creatinine ratios in different strata of age and initial creatinine level. The initial creatinine level from 10 to 70 μmol/L is divided into 6 strata and shown in the 6 subpanels. The vertical dotted line indicates the 95th percentile under normal distribution. Age were divided into 4 strata: 1mo. To 1 year, >1 to 5 years, >5 to 10 years, and >10 to 18 years.



Supplemental Figure 6. Kaplan-Meier curves of cumulative death hazard by different AKI definitions. The curves of KDIGO-/pROCK+ (n=266) and pRIFLE-/pROCK+ (n=34) strata are not plotted due to limited size of these two strata.



Supplemental Table 1. The SCr criteria for diagnosis of AKI in children

Definition	**Diagnosis**	**Staging**
KDIGO	SCr increase of ≥26.5 µmol/L (0.3mg/dL) within 48 hours; or ≥50% within 7 days	Stage 1: SCr increase <100% Stage 2: 100% ≤SCr increase < 200% Stage 3: SCr increase ≥200%
pRIFLE*	SCr increase of ≥33% within 7 days	Stage 1: SCr increase <100% Stage 2: 100% ≤SCr increase < 300% Stage 3: SCr increase ≥300%
pROCK	SCr increase of both ≥30% and ≥20 µmol/L within 7 days	Stage 1: SCr increase <60% and 40 µmol/L Stage 2: 60% and 40 µmol/L ≤ SCr increase < 120% and 80 µmol/L Stage 3: SCr increase ≥120% and 80 µmol/L

* SCr increase of 33%, 100%, 300% in children is equivalent to CrCl decrease of 25%, 50%, and 75%, respectively, according to the SCr-based Schwartz equation.

Supplemental Table 2. Incidences of AKI during the 7-day AKI screening window

pROCK	KDIGO		pRIFLE		Subtotal
	-	+	-	+	
-	92,089	5,296	87,134	10,251	97,385
+	282	5,150	36	5,396	5,432
Subtotal	92,371	10,446	87,170	15,647	102,817

Supplemental Table 3. Incidence of AKI stratified by the components of the KDIGO SCr criteria

KDIGO definition*	pROCK definition	
	Non-AKI	AKI
Non-AKI	92,089 (99.7%)	282 (0.3%)
KDIGO-1 AKI	14 (1.3%)	987 (98.7%)
KDIGO-2 AKI	5282 (55.9%)	4163 (44.1%)

*KDIGO-1 AKI: SCr increase ≥ 26.5 umol/L (0.3 mg/dl) over the baseline within 48 hours.
KDIGO-2 AKI: SCr increase ≥50% over the baseline within 7 days, but the increase does not meet the KDIGO-1 criterion or does not have SCr measurements within 48 hours.

Supplemental Table 4. Performance of predictive models for time to death incorporating different AKI definitions.

Criteria	HR (95% CI)[a]	AIC[b]	c-index	P value[c]
All patients				
pROCK	3.57 (3.15, 4.04)	-	0.678	-
KDIGO	2.57 (2.28, 2.90)	108.1	0.670	0.002
pRIFLE	2.22 (1.99, 2.48)	133.6	0.669	0.009
Patients with intensive care				
pROCK	4.15 (3.40, 5.06)	-	0.677	-
KDIGO	2.52 (2.06, 3.09)	80.3	0.653	<0.001
pRIFLE	2.32 (1.92, 2.81)	82.0	0.651	<0.001
Patients without intensive care				
pROCK	3.29 (2.80, 3.87)	-	0.637	-
KDIGO	2.68 (2.30, 3.11)	24.9	0.628	0.05
pRIFLE	2.24 (1.95, 2.57)	47.5	0.630	0.23

[a] Cox proportional hazard models with AKI status, age, sex, initial creatinine value, and need for intensive care as predictors.
[b] AIC: Alkaike information criterion; with pROCK as reference.
[c] P value was from the test comparing the c-index with that of pROCK.

Supplemental Table 5. Death risk stratified by the status and severity of different AKI definitions

pROCK	KDIGO	pRIFLE	Total, N	Dead, N	Person year	Death rate[a]	HR (95% CI)
non-AKI	non-AKI		84,905	1,453	46,834	3,102	-
non-AKI	mild AKI[#]		4,052	81	1,831	4,424	1.25 (0.99-1.58)
non-AKI	severe AKI		867	10	357	2,800	0.65 (0.33-1.26)
AKI	non-AKI		266	15	161	9,341	2.36 (1.41-3.96)
AKI	mild AKI		1,386	76	689	11,026	2.69 (2.13-3.40)
AKI	severe AKI		3,239	220	1508	14,589	4.22 (3.65 -4.89)
non-AKI		non-AKI	80,276	1,365	44,679	3,055	-
non-AKI		mild AKI	8,681	169	3,986	4,240	1.26 (1.06-1.49)
non-AKI		severe AKI	867	10	357	2,800	0.67 (0.34-1.30)
AKI		non-AKI	34	1	27	*	*
AKI		mild AKI	1,681	90	823	10.938	2.71 (2.19-3.37)
AKI		severe AKI	3,239	220	1508	14,589	4.29 (3.70 -4.97)

[#]Mild AKI is defined as stage 1 AKI, severe AKI is defined as stage 2 or 3 AKI.
[*]Do to calculate due to limited observations.

Supplemental Table 6. Performance of predictive models for risk of death by fixed time points incorporating different AKI definitions in patients with and without intensive care

Definition	OR[a]	95% CI of OR	AIC[b]	AUC	P difference in AUC	Sensitivity[c]	95% CI for sensitivity	P difference in sensitivity
With Intensive Care								
Day 15, 9,556 survivors and 290 death								
pROCK	5.88	4.50, 7.70	-	0.709	-	29.3%	24.1%, 34.8%	-
KDIGO	3.56	2.71, 4.68	59.0	0.675	<0.001	25.5%	20.7%, 31.0%	0.04
pRIFLE	3.26	2.51, 4.24	59.5	0.686	0.04	24.8%	20.0%, 30.0%	0.03
Day 30, 8,266 survivors and 373 death								
pROCK	5.83	4.55, 7.45	-	0.704	-	28.2%	23.6%, 32.7%	-
KDIGO	3.41	2.66, 4.36	73.4	0.682	0.006	23.9%	19.6%, 28.7%	0.04
pRIFLE	3.05	2.41, 3.86	78.2	0.683	0.02	24.1%	19.8%, 29.0%	0.07
Day 60, 7,453 survivors and 434 death								
pROCK	5.50	4.33, 6.99	-	0.720	-	26.3%	21.9%, 31.1%	-
KDIGO	3.08	2.43, 3.89	81.9	0.688	<0.001	21.4%	17.7%, 25.1%	0.01
pRIFLE	2.72	2.18, 3.39	88.4	0.686	<0.001	22.4%	18.2%, 26.5%	0.04
Day 90, 7073 survivors and 455 death								
pROCK	5.33	4.20, 6.76	-	0.711	-	25.5%	20.9%, 30.1%	-
KDIGO	2.90	2.30, 3.66	84.9	0.677	<0.001	22.0%	18.2%, 26.2%	0.08
pRIFLE	2.53	2.03, 3.15	93.4	0.675	<0.001	22.4%	18.5%, 26.6%	0.16
Without Intensive Care								
Day 15, 45,301 survivors and 475 death								
pROCK	7.29	5.91, 8.98	-	0.721	-	30.7%	26.5%, 34.9%	-
KDIGO	6.07	4.97, 7.42	9.1	0.716	0.32	28.2%	24.2%, 32.4%	0.25
pRIFLE	5.13	4.22 ,6.22	20.6	0.721	0.99	28.0%	24.0%, 32.2%	0.22
Day 30, 39,828 survivors and 612 death								
pROCK	6.40	5.26, 7.80	-	0.713	-	27.5%	24.0%, 30.9%	-
KDIGO	5.26	4.36, 6.35	10.6	0.706	0.12	26.8%	23.5%, 30.4%	0.65
pRIFLE	4.33	3.62, 5.18	31.3	0.707	0.25	26.6%	23.0%, 30.1%	0.59
Day 60, 36,582 survivors and 748 death								
pROCK	5.72	4.75, 6.90	-	0.693	-	24.7%	21.7%, 27.7%	-
KDIGO	4.68	3.92, 5.58	12.6	0.687	0.18	24.1%	21.1%, 27.4%	0.52
pRIFLE	3.88	3.29, 4.59	31.2	0.689	0.45	23.8%	20.7%, 26.9%	0.52

Day 90, 34,661 survivors and 840 death								
pROCK	5.15	4.29, 6.19	-	0.684	-	22.4%	20.0%, 25.2%	-
KDIGO	4.20	3.53, 4.98	14.0	0.680	0.19	22.5%	19.6%, 25.7%	0.92
pRIFLE	3.50	2.98, 4.11	31.2	0.681	0.50	21.3%	18.5%, 23.9%	0.30

[a] logistic models with AKI status, age, sex, initial creatinine value, and need for intensive care as predictors.
[b] AIC: Alkaike information criterion; with pROCK as reference.
[c] sensitivity given a specificity of 0.95.

Supplemental Table 7. Association of AKI by different definitions with length of stay and average daily cost during hospitalization.

pROCK	KDIGO	pRIFLE	Length of stay (day)			Average daily cost (yuan)		
			N	Median (q25,q75)	Ratio* (95% CI)	N	Median (q25,q75)	Ratio* (95% CI)
-	-		91,312	14 (10, 22)	-	77,672	1480 (876, 2541)	-
-	+		5,207	14 (10, 20)	0.97 (0.96, 0.99)	4,634	2311 (1166, 3613)	1.10 (1.08, 1.11)
+	-		271	15 (10.5, 25)	1.04 (0.97, 1.11)	246	1750 (1019, 3282)	1.08 (1.01, 1.15)
+	+		4,722	17 (12, 26)	1.09 (1.07, 1.11)	3,871	2838 (1523, 4188)	1.23 (1.21, 1.25)
-		-	86,425	14 (9, 22)	-	73,444	1463 (870, 2497)	-
-		+	10,094	14 (10, 20)	0.98 (0.97, 0.99)	8,862	2105 (1091, 3442)	1.09 (1.07, 1.10)
+		-	35	16 (13, 24.5)	1.06 (0.88, 1.28)	28	1514 (730, 4218)	0.99 (0.81, 1.19)
+		+	4,958	17 (12, 26)	1.08 (1.06, 1.10)	4,089	2779 (1463, 4156)	1.23 (1.21, 1.25)

* Ratios were calculated using -/- (pROCK/KDIGO or pROCK/pRIFLE) as the reference. The effects of AKI by different definitions on log-transformed length of stay (LOS) and average cost were analyzed in regression models with adjustment for age, gender, need for intensive care, comorbidities, and medical center. 1301 patients died during hospitalization were excluded in the LOS analysis. 16,392 patients with missing hospitalization cost were excluded in the cost analysis.

Supplemental Table 8. Association of pROCK-defined AKI with progression to CKD within 1 year[a]

AKI Status	N	CKD[b]	Rate	OR[c]	95% CI[c]
No	4,398	19	0.43%	-	-
yes	193	6	3.11%	7.56	2.95, 19.41

[a] The analysis included a total of 4,591 patients whose baseline SCr was <1.5 times of age- and sex-specific reference of SCr (see Supplemental Figure 1) and had multiple SCr measurements till one year after the 7-day screening window (so the status of progression to CKD by 1 year could be determined).

[b] Progression to CKD was defined as an increase in SCr of ≥20 μmol/L and 30% from the baseline, and to a level of ≥1.5 times of the age- and sex-specific reference of SCr, lasting for at least 90 days.

[c] Logistic model with adjustment for age, gender, baseline SCr, and need for intensive care.