

Supplementary Methods

A supplementary analysis of time to death/discharge to hospice according to ICU admission and the occurrence of all AKI, or AKI requiring dialysis was performed as follows: We fitted a competing risk model for the mortality or hospice outcome with time from first admission as the start point. We considered discharge from hospital to be a competing risk [1], since mortality data are limited after that point unless the patient is readmitted to our system. Patients still in hospital as of 24 August 2020 were counted as censored. The model was fitted with the R library cmprisk [2].

Supplementary Referencex

- [1] Fine JP, Grey RJ. A proportional hazards model for the subdistribution of a competing risk. *J Am Stat Assoc* 1999;94:496-09doi:10.1080/01621459.1999.10474144.
- [2] Gray B cmprsk: Subdistribution Analysis of Competing Risks. R package version . 2020 2.2-10. <https://CRAN.R-project.org/package=cmprsk>

Supplementary Table 1. Patient characteristics by AKI stage

Characteristic	Total N = 4,732 N (%) or median (IQR)	No AKI N = 3346 N (%) or median (IQR)	AKI Stage 1 N = 717 N (%) or median (IQR)	AKI Stage 2 N=132 N (%) or median (IQR)	AKI Stage 3 without RRT, N=300 N (%) or median (IQR)	New RRT N = 237 N (%) or median (IQR)
Age, median, years	65 (51, 76)	62 (48, 75)	71 (60, 82)	68 (59.5, 78.5)	69.5 (61, 79)	63 (53, 71)
Age, years						
19-44	805 (17.01)	701 (20.95)	62 (8.65)	14 (10.61)	10 (3.33)	15 (6.82)
45-54	622 (13.14)	488 (14.58)	55 (7.67)	8 (6.06)	28 (9.33)	36 (16.36)
55-64	916 (19.36)	647 (19.34)	117 (16.32)	25 (18.94)	62 (20.67)	65 (29.55)
65-74	1056 (22.32)	652 (19.49)	196 (27.34)	43 (32.58)	87 (29.00)	75 (34.09)
≥75	1333 (28.17)	858 (25.64)	287 (40.03)	42 (31.82)	113 (37.67)	29 (13.18)
Male	2702 (57.10)	1790 (53.5)	440 (61.37)	81 (61.36)	197 (65.67)	182 (82.73)
Race/ethnicity						
Asian	333 (7.04)	232 (6.93)	46 (6.42)	9 (6.82)	23 (7.67)	22 (10)
Non-Hispanic African American	686 (14.50)	483 (14.44)	102 (14.23)	17 (12.88)	50 (16.67)	29 (13.18)
Hispanic	1291 (27.28)	945 (28.24)	167 (23.29)	37 (28.03)	67 (22.33)	70 (31.82)
Other/ Multiracial	337 (7.12)	243 (7.26)	45 (6.28)	14 (10.61)	20 (6.67)	15 (6.82)
Unknown	154 (3.25)	110 (3.29)	29 (4.04)	1 (0.76)	8 (2.67)	7 (3.18)
Non-Hispanic white	1931 (40.81)	1333 (39.84)	328 (45.75)	54 (40.91)	132 (44.00)	77 (35)
Tobacco use						
Current	283 (5.98)	205 (6.13)	47 (6.56)	5 (3.79)	13 (4.33)	12 (5.45)
Former	1019 (21.53)	670 (20.02)	208 (29.01)	32 (24.24)	75 (25.00)	32 (14.55)
Never	2717 (57.42)	1992 (59.53)	357 (49.79)	76 (57.58)	151 (50.33)	128 (58.18)
Unknown	713 (15.07)	479 (14.32)	105 (14.64)	19 (14.39)	61 (20.33)	48 (21.82)
Obesity						
BMI <25 kg/m ²	1087 (22.97)	768 (22.95)	192 (26.78)	22 (16.67)	64 (21.33)	35 (15.91)
BMI 25 to <30 kg/m ²	1557 (32.90)	1100 (32.88)	233 (32.5)	49 (37.12)	109 (36.33)	63 (28.64)
BMI 30 to <40 kg/m ²	1551 (32.78)	1103 (32.96)	213 (29.71)	49 (37.12)	87 (29.00)	93 (42.27)
BMI ≥40 kg/m ²	384 (8.11)	248 (7.41)	63 (8.79)	12 (9.09)	31 (10.33)	28 (12.73)
Unknown	153 (3.23)	127 (3.8)	16 (2.23)	0 (0)	9 (3.00)	1 (0.45)
Any chronic condition*	3857 (81.51)	2609 (77.97)	651 (90.79)	121 (91.67)	271 (90.33)	178 (80.91)

Characteristic	Total N = 4,732 N (%) or median (IQR)	No AKI N = 3346 N (%) or median (IQR)	AKI Stage 1 N = 717 N (%) or median (IQR)	AKI Stage 2 N=132 N (%) or median (IQR)	AKI Stage 3 without RRT, N=300 N (%) or median (IQR)	New RRT N = 237 N (%) or median (IQR)
Coronary artery disease	707 (14.94)	410 (12.25)	165 (23.01)	29 (21.97)	64 (21.33)	35 (15.91)
Heart failure	488 (10.31)	249 (7.44)	153 (21.34)	26 (19.7)	42 (14.00)	13 (5.91)
Hyperlipidemia	2052 (43.36)	1341 (40.08)	376 (52.44)	75 (56.82)	154 (51.33)	92 (41.82)
Hypertension	2738 (57.86)	1736 (51.88)	537 (74.9)	98 (74.24)	209 (69.67)	140 (63.64)
Diabetes	1646 (34.78)	1054 (31.5)	312 (43.51)	52 (39.39)	133 (44.33)	88 (40)
Asthma or chronic obstructive pulmonary disorder	815 (17.22)	555 (16.59)	144 (20.08)	23 (17.42)	61 (20.33)	26 (11.82)
Chronic kidney disease	761 (16.08)	343 (10.25)	218 (30.4)	41 (31.06)	86 (28.67)	57 (25.91)
Cancer	582 (12.30)	377 (11.27)	104 (14.5)	30 (22.73)	47 (15.67)	23 (10.45)
Oxygen saturation ≤88 percent at presentation	601 (12.70)	271 (8.1)	134 (18.69)	36 (27.27)	85 (28.33)	75 (34.09)
Systolic blood pressure < 100 at presentation	289 (6.11)	185 (5.53)	161 (22.45)	40 (30.3)	75 (25.00)	8 (3.64)
First urinalysis						
RBC, n(%)						
Missing	2282	1954	203	25	64	31
Large	254 (10.37)	104 (3.11)	55 (7.67)	21 (15.91)	33 (11.00)	40 (21.16)
Moderate	348 (14.20)	157 (4.69)	75 (10.46)	17 (12.88)	46 (15.33)	49 (25.93)
Negative	1507 (61.51)	973 (29.08)	291 (40.59)	56 (42.42)	114 (38.00)	67 (35.45)
Small	341 (13.92)	158 (4.72)	93 (12.97)	13 (9.85)	43 (14.33)	33 (17.46)
WBC/hpf, mean, n(%)						
Missing	2282	1954	203	25	64	31
Large	168 (6.86)	102 (3.05)	37 (5.16)	6 (4.55)	17 (5.67)	6 (3.17)
Moderate	179 (7.31)	104 (3.11)	32 (4.46)	8 (6.06)	22 (7.33)	12 (6.35)
Negative	1901 (77.59)	1074 (32.10)	402 (56.07)	81 (61.36)	180 (60.00)	154 (81.48)
Small	202 (8.24)	112 (3.35)	43 (6.00)	12 (9.09)	17 (5.67)	17 (8.99)
Urine protein						
Missing	2259	1933	200	25	65	31
Large	206 (8.33)	92 (2.75)	48 (6.69)	11 (8.33)	25 (8.33)	26 (13.76)
Moderate	683 (27.62)	352 (10.52)	131 (18.27)	33 (25.00)	81 (27.00)	84 (44.44)

Characteristic	Total N = 4,732 N (%) or median (IQR)	No AKI N = 3346 N (%) or median (IQR)	AKI Stage 1 N = 717 N (%) or median (IQR)	AKI Stage 2 N=132 N (%) or median (IQR)	AKI Stage 3 without RRT, N=300 N (%) or median (IQR)	New RRT N = 237 N (%) or median (IQR)
Negative	860 (34.78)	561 (16.77)	182 (25.38)	32 (24.24)	55 (18.33)	29 (15.34)
Small	724 (29.28)	408 (12.19)	156 (21.76)	31 (23.48)	74 (24.67)	50 (26.46)
D-dimer, N, median (IQR)	4158, 422.5 (247, 846)	2853, 380 (223, 709)	664, 525.5 (303, 1129)	126, 474 (307, 1307)	281, 585 (322, 1961)	234, 558 (318, 1763)
Creatinine, N, median (IQR)	4723, 0.989 (0.79, 1.33)	3339, 0.9 (0.75, 1.17)	716, 1.27 (0.98, 1.79)	132, 1.14 (0.86, 1.60)	300, 1.27 (0.9, 2.33)	236, 1.21 (0.9505, 2.09)
Sodium, N, median (IQR)	4723, 137 (134, 140)	3339, 137 (134, 140)	716, 137 (133, 140)	132, 136 (133, 140)	300, 136 (132, 140)	236, 135 (131.5, 139)
Potassium, N, median (IQR)	4591, 4. (3.7, 4.4)	3250, 4 (3.7, 4.4)	691, 4.2 (3.8, 4.6)	129, 4.1 (3.7, 4.5)	294, 4.2 (3.7, 4.6)	227, 4.1 (3.7, 4.6)
Bicarbonate, N, median (IQR)	4721, 24 (21, 26)	3338, 24 (22, 26)	716, 23 (20,	131, 23 (20,	300, 22 (19,	236, 22 (19.5, 25)
CK, N, median (IQR)	3270, 136 (62, 327)	2109, 114 (57, 277)	563, 152 (64, 381)	115, 171 (80, 481)	259, 183 (80, 429)	224, 268.5 (120.5, 578.5)
IL-6, N, median (IQR)	2710, 11.2 (5, 31)	1684, 8 (5, 19)	499, 18.3 (7, 50)	98, 17.5 (6, 45)	227, 24 (10, 64)	202, 32.5 (15, 92)
CRP, median (IQR)	4353, 95.7 (38.79, 161)	3005, 82.96 (31.1, 147)	690, 110.17 (46.5, 179.2)	127, 126 (66.7, 187.6)	294, 138.19 (83.3, 211.1)	237, 148.8 (93.45, 210)
Use of high flow oxygen	321 (6.78)	216 (6.46)	78 (10.88)	5 (3.79)	17 (5.67)	2 (0.91)
Mechanical ventilation	876 (18.51)	133 (3.97)	248 (34.59)	79 (59.85)	205 (68.33)	208 (94.55)
ECMO	48 (1.01)	3 (0.09)	24 (3.35)	6 (4.55)	1 (0.33)	12 (5.45)
Median length of stay	6 (3, 11)	5 (3, 8)	11 (6, 21)	12 (6, 28)	10 (6, 19)	21 (11, 40.5)
Hospital day first with any AKI	N/A	N/A	3 (1, 6)	3 (1, 6)	3 (1, 5)	2 (1, 5)
Renal recovery*	N/A	N/A	392 (83.9)	41 (67.2)	62 (75.6)	28 (41.2)
Cessation of new dialysis**	N/A	N/A	N/A	N/A	N/A	41 (62.1)

* Among patients not on chronic dialysis and who did not die or were not discharged to hospice

**Among patients who did not die or were not discharged to hospice

The N is provided within each row for laboratory tests not done on all patients

Supplementary Table 2. Incidence of AKI according to admission week

Characteristic	Total N = 4,732 N (%)	No AKI N = 3346 N (%)	Any AKI N = 1,386 N (%)	New RRT N = 237 N (%)
Week of admission				
9 (March 2-8)	7 (0.15)	3 (42.86)	4 (57.14)	0 (0)
10 (March 9-15)	45 (0.95)	29 (64.44)	16 (35.56)	5 (11.11)
11 (March 16-22)	306 (6.47)	195 (63.73)	111 (36.27)	27 (8.82)
12 (March 23-29)	756 (15.98)	513 (67.86)	243 (32.14)	46 (6.08)
13 (March 30-April 5)	1038 (21.94)	709 (68.3)	329 (31.7)	66 (6.36)
14 (April 6-April 12)	763 (16.12)	510 (66.84)	253 (33.16)	42 (5.5)
15 (April 13-19)	476 (10.06)	325 (68.28)	151 (31.72)	24 (5.04)
16 (April 20-26)	280 (5.92)	208 (74.29)	72 (25.71)	10 (3.57)
17 (April 27-May 3)	185 (3.91)	137 (74.05)	48 (25.95)	5 (2.7)
18 (May 4-10)	155 (3.28)	128 (82.58)	27 (17.42)	3 (1.94)
19 (May 11-17)	124 (2.62)	97 (78.23)	27 (21.77)	0 (0)
20 (May 18-24)	69 (1.46)	61 (88.41)	8 (11.59)	3 (4.35)
21 (May 25-31)	64 (1.35)	53 (82.81)	11 (17.19)	1 (1.56)
22 (June 1-7)	57 (1.20)	45 (78.95)	12 (21.05)	1 (1.75)
23 (June 8-14)	31 (0.66)	26 (83.87)	5 (16.13)	0 (0)
24 (June 15-21)	38 (0.80)	28 (73.68)	10 (26.32)	0 (0)
25 (June 22-29)	38 (0.80)	34 (89.47)	4 (10.53)	1 (2.63)
26 (June 30-July 6)	49 (1.04)	39 (79.59)	10 (20.41)	0 (0)
27 (July 7-13)	48 (1.01)	38 (79.17)	10 (20.83)	1 (2.08)
28 (July 14-20)	38 (0.80)	31 (81.58)	7 (18.42)	0 (0)
29 (July 21-27)	34 (0.72)	28 (82.35)	6 (17.65)	2 (5.88)
30 (July 28-August 3)	50 (1.06)	42 (84)	8 (16)	0 (0)
31 (August 4-10)	36 (0.76)	30 (83.33)	6 (16.67)	0 (0)
32 (August 11-17)	28 (0.59)	22 (78.57)	6 (21.43)	0 (0)
33 (August 18-24)	11 (0.23)	10 (90.91)	1 (9.09)	0 (0)
34 (August 19-25)	6 (0.13)	5 (83.33)	1 (16.67)	0 (0)

Supplementary Table 3. Risks of combined mortality and discharge to hospice according to AKI and initiation of RRT, by level of care

AKI severity	Non-ICU patients (N =3676)				ICU patients (N =1056)			
	n (%)				n (%)			
	Discharged	Deceased or Hospice	Still Admitted	P value	Discharged	Deceased or Hospice	Still Admitted	P value
No AKI	2844 (92.4)	226 (7.3)	8 (0.3)	<0.001	207 (77.2)	61 (22.8)	0 (0.0)	<0.001
AKI	370 (61.9)	226 (37.8)	2 (0.3)		295 (37.4)	482 (61.2)	11 (1.4)	
Hazard ratio (95% CI)	5.88 (4.9 - 7.06)			<0.001	3.37 (2.54 - 4.46)			<0.001
Never dialysis	3198 (87.6)	444 (12.2)	10 (0.3)	<0.001	452 (53.6)	382 (45.3)	9 (1.1)	<0.001
New dialysis	16 (66.7)	8 (33.3)	0 (0.0)		50 (23.5)	161 (75.6)	2 (0.9)	
Hazard ratio (95% CI)	2.75 (1.49 - 5.09)			0.001	1.82 (1.55 - 2.14)			<0.001

Supplementary Table 4. Outcomes of AKI and of initiation of renal replacement therapy, by level of care

AKI severity	Non-ICU patients				ICU patients			
	Discharged	Deceased or Hospice	Still Admitted	P value	Discharged	Deceased or Hospice	Still Admitted	P value
No AKI	2844 (92.4)	226 (7.3)	8 (0.3)	<0.001	207 (77.2)	61 (22.8)	0 (0.0)	<0.001
AKI stage 1	288 (68.1)	134 (31.7)	1 (0.2)		171 (58.2)	116 (39.5)	7 (2.4)	
AKI stage 2	24 (48.0)	25 (50.0)	1 (2.0)		36 (43.9)	46 (56.1)	0 (0.0)	
AKI stage 3	58 (46.4)	67 (53.6)	0 (0.0)		88 (21.4)	320 (77.7)	4 (1.0)	
Never dialysis	3198 (87.6)	444 (12.2)	10 (0.3)	<0.001	452 (53.6)	382 (45.3)	9 (1.1)	<0.001
New dialysis	16 (66.7)	8 (33.3)	0 (0.0)		50 (23.5)	161 (75.6)	2 (0.9)	

Supplementary Table 5. Adjusted risk of death during hospital admission

	OR	95% CI	P
Variable			
AKI during admission	10.22	8.39-12.49	<0.001
Male sex	1.03	0.85-1.26	0.74
Race			
White	Ref	--	--
Asian	1.08	0.75-1.56	0.67
Black	0.62	0.45-0.83	0.002
Hispanic	1.19	0.94-1.52	0.15
Other/Multi-racial	1.13	0.78-1.64	0.51
Unknown	1.00	0.60-1.64	0.99
Age, years			
19-44	Ref	--	--
45-54	2.46	1.50-4.11	<0.001
55-64	3.16	2.00-5.12	<0.001
65-74	5.00	3.19-8.07	<0.001
≥75	14.19	8.95-23.15	<0.001
Smoking			
Never	Ref	--	--
Current	0.90	0.58-1.38	0.64
Former	1.14	0.91-1.43	0.27
Unknown	1.97	1.52-2.54	<0.001
Cancer	1.68	1.30-2.17	<0.001
Chronic kidney disease	0.72	0.56-0.92	0.01
Coronary artery disease	0.87	0.67-1.13	0.30
Diabetes	1.06	0.87-1.29	0.57
Heart failure	1.69	1.31-2.18	<0.001
Hyperlipidemia	0.80	0.65-0.99	0.04
Hypertension	0.95	0.76-1.20	0.68

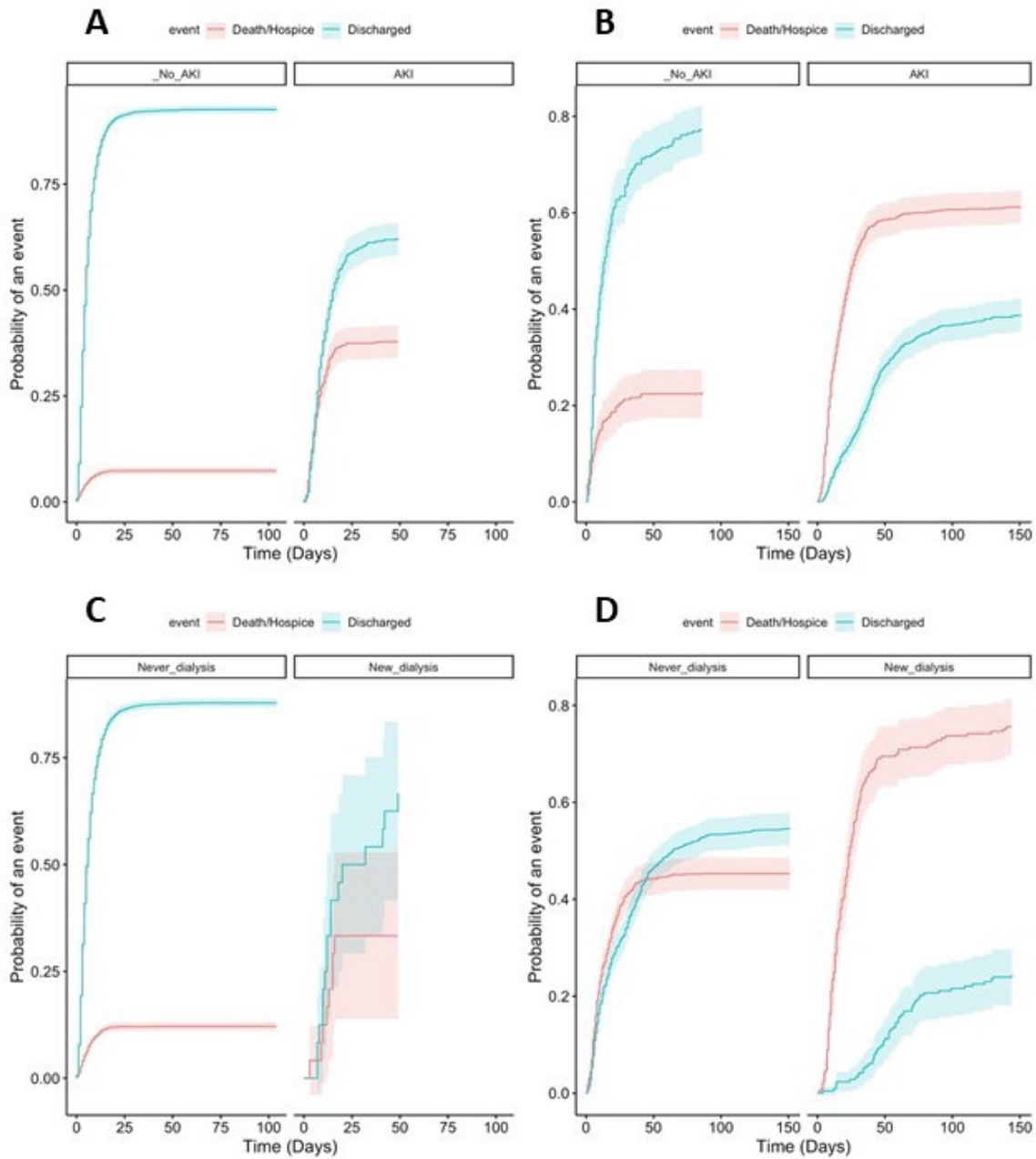
Pulmonary disease	0.94	0.73-1.20	0.60
BMI			
<25 kg/m ²	Ref	--	--
25 to <30 kg/m ²	0.86	0.67-1.10	0.22
30 to <40 kg/m ²	1.06	0.82-1.38	0.64
40 kg/m ²	1.25	0.85-1.84	0.25
Unknown	2.63	1.62-4.25	<0.001
Systolic blood pressure, mm mercury			
101-120	Ref	--	--
<100	1.75	1.21-2.51	0.003
121-160	0.88	0.70-1.09	0.24
>160	0.71	0.50-1.01	0.06
Oxygen Saturation, %	0.71	0.50-1.01	0.06
93-100	Ref	--	--
89-92	1.72	1.37-2.15	<0.001
<88	2.94	2.29-3.76	<0.001
Temperature, degrees Celsius			
<37.0	Ref	--	--
>39.0	0.96	0.67-1.37	0.84
38.1-39.0	1.22	0.92-1.62	0.17
37.5 - 38.0	0.83	0.67-1.03	0.09
D_Dimer, ng/mL			
0-250	Ref	--	--
251-500	1.56	1.17-2.08	0.003
501-1000	1.78	1.31-2.42	<0.001
1001-2500	1.85	1.28-2.69	0.001
>2500	2.71	1.93-3.83	<0.001
Missing	1.77	1.15-2.74	0.01
Date of Admit			
10 (March 9-15)	Ref	--	--
11 (March 16-22)	1.31	0.56-3.17	0.54
12 (March 23-29)	0.99	0.43-2.38	0.99

13 (March 30-April 5)	1.08	0.47-2.59	0.86
14 (April 6-April 12)	0.90	0.39-2.16	0.80
15 (April 13-19)	0.80	0.34-1.95	0.61
16 (April 20-26)	0.62	0.25-1.58	0.31
17 (April 27-May 3)	0.51	0.20-1.36	0.17
18 (May 4-10)	0.40	0.14-1.12	0.08
19 (May 11-17)	0.31	0.10-0.90	0.03
20 (May 18-24)	0.66	0.17-2.36	0.54
21 (May 25-31)	0.05	0.00-0.29	0.01
22 (June 1-7)	0.40	0.11-1.42	0.16
23 (June 8-14)	0.32	0.04-1.76	0.23
24 (June 15-21)	0.05	0.00-0.35	0.01
25 (June 22-29)	0.00	0.00-0.00	0.98
26 (June 30-July 6)	0.10	0.01-0.50	0.01
27 (July 7-13)	0.00	0.00-0.00	0.97
28 (July 14-20)	0.55	0.12-2.18	0.41
29 (July 21-27)	0.15	0.01-1.07	0.10
30 (July 28-August 3)	0.00	0.00-0.00	0.97
31 (August 4-10)	0.31	0.05-1.49	0.16
32 (August 11-17)	0.00	0.00-0.00	0.98
33 (August 18-24)	0.00	0.00-0.00	0.99
34 (August 19-25)	0.00	0.00-0.00	0.99

Supplementary Table 6. Adjusted risk of death among those requiring renal replacement therapy

	OR	95% CI	P
Variable			
Male sex	1.83	0.77-4.33	0.17
Race			
White	Ref	--	--
Asian	0.67	0.20-2.44	0.53
Black	0.58	0.20-1.69	0.31
Hispanic	0.99	0.40-2.46	0.98
Other/Multi-racial	0.92	0.22-4.86	0.91
Unknown	0.11	0.01-0.70	0.02
Age, years			
19-44	Ref	--	--
45-54	1.22	0.27-5.14	0.79
55-64	1.74	0.41-7.11	0.44
65-74	3.39	0.76-14.87	0.10
≥75	3.43	0.64-19.01	0.15
Smoking			
Never	Ref	--	--
Current	1.82	0.41-9.83	0.45
Former	2.40	0.83-7.71	0.12
Unknown	2.00	0.83-5.18	0.14
Cancer	5.56	1.48-29.08	0.02
Chronic kidney disease	0.43	0.19-0.93	0.03
Coronary artery disease	0.32	0.11-0.88	0.03
Diabetes	0.79	0.37-1.68	0.53
Heart failure	2.43	0.54-12.45	0.26
Hyperlipidemia	1.39	0.64-3.12	0.41
Hypertension	0.29	0.11-0.73	0.01

Pulmonary disease	1.14	0.36-3.79	0.82
BMI			
<25 kg/m ²	Ref	--	--
25 to <30 kg/m ²	1.92	0.73-5.18	0.19
30 to <40 kg/m ²	3.93	1.53-10.47	0.005
≥40 kg/m ²	9.10	2.36-40.68	0.002



Supplementary Figure 1. Time to event for combined mortality and discharge to hospice according AKI or of initiation of RRT, by level of care. A) Non-ICU patients according to presence or absence of any AKI. B) ICU patients according to presence of any AKI. C) Non-ICU patients according dialysis requiring AKI. D) ICU patients according to dialysis requiring AKI. Red-discharged to hospice or died in-hospital. Green discharged alive.