Supplemental table 1: Baseline characteristics of the overall cohort and by pattern of hospitalization.

		The overall cohort	Patients with no hospitalization	Patients with at least 1 hospitalization	Patients with hospitalization but no readmission†	Patients with at least 1 readmission†
Number (%)		247,888	170,668 (68.9)	77,220 (31.2)	53,465 (69.2)	23,755 (30.8)
Kidney function decline	**No decline in kidney function€** (eGFR change > 0 ml/min/1.73m^2/year)	111,318 (44.9)	77,535 (69.7)	33,783 (31.3)	24,198 (71.6)	9,585 (28.4)
	Mild CKD progression€ (eGFR change between 0 and -1 ml/min/1.73m^2/year)	36,132 (14.6)	25,613 (70.9)	10,519 (29.1)	7,466 (71.0)	3,053 (39.0)
	Moderate CKD progression€ (eGFR change between -1 and -5 ml/min/1.73m^2/year)	74,117 (29.9)	49,336 (66.6)	24,781 (33.4)	16,630 (67.1)	8,151 (32.9)
	Severe CKD progression€ (eGFR change < -5 ml/min/1.73m^2/year)	26,321 (10.6)	18,184 (69.1)	8,137 (30.9)	5,171 (63.5)	2,966 (36.5)
Age (SD)		70.3 (8.3)	71.0 (7.8)	68.8 (9.0)	68.8 (9.0)	68.6 (8.9)
Race	**White (%)**	216,775 (87.5)	153,554 (90.0)	63,221 (81.9)	43,766 (81.9)	19,455 (81.9)
	Black (%)	26,714 (10.8)	14,158 (8.3)	12,556 (16.3)	8,661 (16.2)	3,895 (16.4)
	Other (%)	4,399 (1.8)	2,956 (1.7)	1,443 (1.9)	1,038 (1.9)	405 (1.7)
Male Gender (%)		237,128 (95.7)	163,790 (96.0)	73,338 (95.0)	50,558 (94.6)	22,780 (95.9)
Diabetes Mellitus (%)		87,807 (35.4)	55,915 (32.8)	31,892 (41.3)	20,719 (38.8)	11,173 (47.0)

Hypertension (%)	207,621 (83.8)	140,022 (82.0)	67,599 (87.5)	46,322 (86.6)	21,277 (89.6)
Cardiovascular Disease (%)	116,593 (47.0)	76,407 (44.8)	40,186 (52.0)	26,481 (49.5)	13,705 (57.7)
Hyperlipidemia (%)	176,627 (71.3)	122,643 (71.9)	53,984 (69.9)	37,132 (69.5)	16,852 (70.9)
Peripheral Artery Disease (%)	12,396 (5.0)	5,998 (3.5)	6,398 (8.3)	3,893 (7.3)	2,505 (10.6)
Cerebrovascular Disease (%)	2,331 (0.9)	1,071 (0.6)	1,260 (1.6)	780 (1.5)	480 (2.0)
Chronic Lung Disease (%)	58,418 (23.6)	33,922 (19.9)	24,496 (31.7)	15,921 (29.8)	8,575 (36.1)
Hepatitis C (%)	3,964 (1.6)	1,810 (1.1)	2,154 (2.8)	1,313 (2.5)	841 (3.5)
HIV (%)	14,376 (5.8)	6,621 (3.9)	7,755 (10.0)	4,879 (9.1)	2,876 (12.1)
Dementia (%)	10,995 (4.4)	6,046 (3.5)	4,949 (6.4)	3,324 (6.2)	1,625 (6.8)
Death (%)	108,478 (43.8)	69,187 (40.5)	39,291 (50.9)	24,452 (45.7)	14,839 (62.5)
Average initial eGFR in ml/min/1.73m^2 (SD)	54.0 (4.2)	54.0 (4.2)	53.9 (4.2)	54.0 (4.2)	53.7 (4.5)
Average final eGFR in ml/min/1.73m^2 (SD)	54.5 (13.5)	54.6 (12.8)	54.3 (15.0)	54.8 (14.6)	53.0 (15.8)
Average rate of eGFR change ml/min/1.73m^2/year * (SD)	0.2 (6.2)	0.3 (6.3)	-0.1 (5.9)	0.1 (5.9)	-0.5 (5.9)
Median follow-up in years (IQR)**	9.0 (5.3-9.0)	9.0 (5.5-9.0)	9.0 (4.9-9.0)	9.0 (5.3-9.0)	7.6 (4.4-9.0)
Median number of eGFR measure (IQR)	7 (4-11)	6 (4-9)	10 (6-15)	9 (6-14)	11 (7-18)

Median duration between first and last eGFR in years (IQR)	3.2 (2.0-4.2)	3.0 (1.8-4.0)	3.8 (2.7-4.4)	3.8 (2.6-4.4)	4.0 (2.9-4.5)
Number of patients with hospitalizations during baseline period ¥ (%)	51,566 (20.8)	18,768 (11.0)	32,798 (42.5)	20,440 (38.2)	12,358 (52.0)
Average number of hospitalizations during baseline period ¥ (SD)	0.5 (1.4)	0.2 (0.9)	1.1 (1.9)	0.9 (1.6)	1.5 (2.4)
Average number of hospitalizations after time zero (SD)	1.0 (2.3)	0 (0)	3.1 (3.3)	1.9 (1.4)	5.9 (4.4)
Median length of hospital stay in days/year (IQR)	2.0 (0.8-5.7)	0 (0-0)	2.0 (0.8-5.7)	1.2 (0.6-3.0)	5.9 (2.9-12.1)
Average length of hospital stay in days/year (SD)	7.3 (22.6)	0 (0)	7.3 (22.6)	5.3 (22.1)	12.1 (22.9)

SD=Standard Deviation
† Denominator for % presented in these columns is number of patients with at least one hospitalization.
% Represents the column percentage except for Kidney function decline group showing in row percentage.
€ Presented as row percentages
*Reflects the rate of change of eGFR per year calculated using an Ordinary Least Squares (OLS) regression method fitted to all outpatient eGFR readings for each patient. The slope of the regression line describes the rate of change in kidney function (eGFR) over time.
**Follow up time is the time between time zero and censorship
¥ Denotes baseline period from October 1999 to last eGFR measurement (Time zero).

Supplemental table 2: Hazard ratio of the association between rate of decline and risk of at least 1, 2, 3, 4, 5 or more hospitalizations controlling for first eGFR.

Risk of at least	**No decline in kidney function** (eGFR change >0 ml/min/1.73m^2/year)	**Mild CKD progression** (eGFR change between 0 and -1 ml/min/1.73m^2/year)	**Moderate CKD progression** (eGFR change between -1 and -5 ml/min/1.73m^2/year)	**Severe CKD progression** (eGFR change < -5 ml/min/1.73m^2/year)
1 Hospitalization N=77,220 % HR (CI)	n=33,783 43.7% 1.00 (0.98,1.03)	n=10,519 13.6% 1.00	n=24,783 32.1% 1.16 (1.13,1.19)	n=8,137 10.5% 1.18 (1.14,1.22)
2 Hospitalizations N=47,373 % HR (CI)	n=20,064 42.4% 0.99 (0.97,1.02)	n=6,293 13.3% 1.00	n=15,694 33.1% 1.21 (1.17,1.25)**	n=5,322 11.2% 1.28 (1.23,1.32)**
3 Hospitalizations N=31,183 % HR (CI)	n=12,796 41.0% 0.98 (0.94,1.01)	n=4,072 13.1% 1.00	n=10,607 34.0% 1.25 (1.21,1.30)*	n=3,708 11.9% 1.34 (1.30,1.42)**
4 Hospitalizations N=21,433 % HR (CI)	n=8,602 40.1% 0.98 (0.94,1.02)	n=2,723 12.7% 1.00	n=7,423 34.6% 1.30 (1.24,1.36)*	n=2,685 12.5% 1.45 (1.38,1.53)**
5 Hospitalizations N=15,143 % HR (CI)	n=5,912 39.0% 0.97 (0.92,1.02)	n=1,889 12.5% 1.00	n=5,348 35.3% 1.34 (1.28,1.41)*	n=1,994 13.2% 1.55 (1.45,1.65)**
P value for trend	0.14	N/A	<0.001	<0.001

Models adjusted for first eGFR, age. race, gender, diabetes mellitus, hypertension, cardiovascular disease, hyperlipidemia, peripheral artery disease, cerebrovascular disease, chronic lung disease, hepatitis C, HIV and dementia

*p value for interaction <0.05 ** p value for interaction <0.001

p value for interaction denotes a significant interaction between CKD progression group and stratum (number of hospitalizations) and indicates that stratum's hazard ratio is significantly different from previous stratum in the same CKD progression group.

p value for trend obtained from an interaction between CKD progression group and number of hospitalizations while treating number of hospitalizations as a continous variable. A significant p value for trend indicates that compared to the referent category (patients with mild CKD progression), the hazard ratio of the category of interest significantly increases as number of hospitalizations increase.

Supplemental table 3: Hazard ratio of the association between rate of decline and risk of at least 1, 2, 3, 4, 5 or more readmissions controlling for first eGFR.

Risk of at least	**No decline in kidney function** (eGFR change >0 ml/min/1.73m^2/year)	**Mild CKD progression** (eGFR change between 0 and -1 ml/min/1.73m^2/year)	**Moderate CKD progression** (eGFR change between -1 and -5 ml/min/1.73m^2/year)	**Severe CKD progression** (eGFR change < -5 ml/min/1.73m^2/year)
1 Readmission N=23,755 % HR (CI)	n=9,585 40.3% 0.98 (0.94,1.02)	n=3,053 12.8% 1.00	n=8,151 34.3% 1.17 (1.12,1.22)	n=2,966 12.5% 1.44 (1.37,1.52)
2 Readmissions N=10,404 % HR (CI)	n=4,016 38.6% 0.97 (0.91,1.03)	n=1,296 12.5% 1.00	n=3,636 35.0% 1.21 (1.14,1.29)	n=1,456 14.0% 1.62 (1.50,1.74)*
3 Readmissions N=5,267 % HR (CI)	n=1,979 37.6% 0.96 (0.88,1.05)	n=644 12.2% 1.00	n=1,842 35.0% 1.23 (1.13,1.35)	n=802 15.2% 1.77 (1.60,1.97)*
4 Readmissions N=2,936 % HR (CI)	n=1,045 35.6% 0.94 (0.83,1.06)	n=347 11.8% 1.00	n=1,053 35.9% 1.31 (1.16,1.47)	n=491 16.7% 2.00 (1.74,2.29)*
5 Readmissions N=1,799 % HR (CI)	n=639 35.5% 0.92 (0.79,1.08)	n=216 12.0% 1.00	n=642 35.7% 1.28 (1.09,1.49)	n=302 16.8% 1.96 (1.65,2.33)
P value for trend	0.46	N/A	0.09	<0.001

Models adjusted for first eGFR, age. race, gender, diabetes mellitus, hypertension, cardiovascular disease, hyperlipidemia, peripheral artery disease, cerebrovascular disease, chronic lung disease, hepatitis C, HIV and dementia

*p value for interaction <0.05 ** p value for interaction <0.001

p value for interaction denotes a significant interaction between CKD progression group and stratum (number of readmissions) and indicates that stratum's hazard ratio is significantly different from previous stratum in the same CKD progression group.

p value for trend obtained from an interaction between CKD progression group and number of readmisisons while treating number of readmissions as a continous variable. A significant p value for trend indicates that compared to the referent category (patients with mild CKD progression), the hazard ratio of the category of interest significantly increases as number of readmissions increase.

Supplemental table 4: Results of sensitivity analyses according to annual percentage change in eGFR

		Change>0%	0%>Change>-2%	-2%>Change>-9%	-9%>Change
Grouped by annual percent change in eGFR N=247,888	Risk of Hospitalizations	109,915(44.3%)	46,400(18.7%)	64,987(26.2%)	26,586(10.7%)
		1.08(1.05,1.11)	1.00	1.33(1.29,1.37)	1.46(1.41,1.52)
	Risk of readmissions	34,644(44.9%)	12,406(16.1%)	22,127(28.6%)	8,043(10.4%)
		0.96(0.91,1.01)	1.00	1.21(1.15,1.28)	1.65(1.54,1.76)
Models adjusted for first eGFR value, age, race, gender, diabetes mellitus, hypertension, cardiovascular disease, hyperlipidemia, peripheral artery disease, cerebrovascular disease, chronic lung disease, hepatitis C, HIV and dementia					

Supplemental table 5: Additional sensitivity analyses

	Number of patients at risk (%) Hazard ratio (CI)		**No decline in kidney function** (eGFR change >0 ml/min/1.73m^2/year)	**Mild CKD progression** (eGFR change between 0 and -1 ml/min/1.73m^2/year)	**Moderate CKD progression** (eGFR change between -1 and -5 ml/min/1.73m^2/year)	**Severe CKD progression** (eGFR change < -5 ml/min/1.73m^2/year)
MDRD to estimate eGFR N=247,888	Risk of Hospitalizations		111,318(44.9%)	36,132(14.6%)	74,117(29.9%)	26,321(10.6%)
			0.96(0.94,0.99)	1.00	1.20(1.17,1.24)	1.29(1.24,1.33)
	Risk of readmissions		33,783(43.7%)	10,519(13.6%)	24,781(32.1%)	8,137(10.5%)
			0.94(0.89,0.99)	1.00	1.17(1.10,1.24)	1.51(1.42,1.61)
Censored patients at time of renal transplant, ESRD, or dialysis N=247,888	Risk of Hospitalizations		111,318(44.9%)	36,132(14.6%)	74,117(29.9%)	26,321(10.6%)
			1.01(0.98,1.04)	1.00	1.18(1.15,1.22)	1.17(1.12,1.21)
	Risk of readmissions		33,783(43.7%)	10,519(13.6%)	24,781(32.1%)	8,137(10.5%)
			1.00(0.94,1.06)	1.00	1.14(1.08,1.21)	1.33(1.23,1.43)
Restricted the analyses to those who remain alive at end of study follow up N=139,410	Risk of Hospitalizations		69,079(49.5%)	21,831(15.7%)	37,920(27.2%)	10,580(7.6%)
			0.98(0.94,1.02)	1.00	1.18(1.13,1.23)	1.17(1.11,1.24)
	Risk of readmissions		18,589(49.0%)	5,441(14.3%)	11,045(29.1%)	2,854(7.5%)
			0.97(0.88,1.06)	1.00	1.18(1.07,1.30)	1.34(1.19,1.51)
Used competing risk models, hazard ratio of 1st event N=247,888	Risk of Hospitalization	N (%)	111,318(44.9%)	36,132(14.6%)	74,117(29.9%)	26,321(10.6%)
		Death	1.00(0.98,1.02)	1.00	1.22(1.20,1.25)	1.69(1.65,1.73)
		Hospitalization	1.09(1.07,1.11)	1.00	1.15(1.12,1.17)	1.17(1.14,1.21)
	Risk of readmission	N (%)	33,783(43.7%)	10,519(13.6%)	24,781(32.1%)	8,137(10.5%)
		Death	1.00(0.97,1.03)	1.00	1.17(1.14,1.21)	1.61(1.54,1.67)
		Readmission	1.05(1.01,1.10)	1.00	1.16(1.11,1.21)	1.53(1.45,1.61)

Models adjusted for first eGFR value, age, race, gender, diabetes mellitus, hypertension, cardiovascular disease, hyperlipidemia, peripheral artery disease, cerebrovascular disease, chronic lung disease, hepatitis C, HIV and dementia