Supplement

Supplemental Methods

Summary of analytical performance for the four filtration markers

Creatinine: On the MDRD, AASK, CRIC and Pima studies, serum creatinine was measured by the Roche enzymatic method (Roche-Hitachi P-Module instrument with Roche Creatininase Plus assay, Hoffman-La Roche, Ltd., Basel, Switzerland) at the University of Minnesota (UMN) (CV 1.71% at mean concentration 3.69 mg/dlk and 2.43% at mean concentration of 0.808 mg/dl), traceable to the National Institute of Standards and Technology (NIST) creatinine standard reference material 967(1). Creatinine assays for ARIC and NHANES (CV 1.2% at 1.00 mg/dL and 1.6% at 3.84 mg/dL), results were calibrated to this method.

Assays were conducted from March 22, 2012 to July 29, 2012 for the Pima study; from Aug 8, 2012 to March 18, 2013 for the CRIC study; from April 1, 2013 to June 27, 2013 for AASK and from May 23, 2013 to June 20, 2013 for the MDRD Study.

Blind replicate data were available on 200 CRIC participants and 50 Pima participants for measurements performed at UMN. For the CRIC samples, the mean difference between the two measurements was 0.001(SD 0.044), CV 0.98%. Deming regression equation creatinine2: 0.01 + 0.99 * creatinine 1, R=0.997. For the Pima samples, the mean difference between the two measurements was 0.006 (SD 0.02), CV 1.95%, Deming regression equation: 0.01 + 0.98 * creatinine 1 (R=0.994).

ARIC specimens were assayed at Baylor College of Medicine (BCM) between 1996-1998 using a modified kinetic Jaffé method (reliability coefficient, 0.95 in 439 blinded replicates). Creatinine concentration was calibrated indirectly to isotope-dilution mass spectrometry–traceable measurements at the Cleveland Clinic Research Laboratory (CCFL) (2).

NHANES specimens were assayed between 1988-1994 at the White Sands Research Center (Coulston Foundation) laboratory (Alamogordo, NM) by using a Roche/Hitachi 737 analyzer (Roche Diagnostics, Indianapolis, IN; kinetic alkaline picrate reaction). The assay was calibrated to the Roche enzymatic assay at CCFL in 2005. The CV at CCFL during this time was 1.2% at 1.00 mg/dL and 1.6% at 3.84 mg/dL) (3).

Cystatin C: Cystatin C was measured by the particle-enhanced immunonephelometric assay (PENIA) and a Siemens BN II nephelometer at the CCFL for the MDRD Study (2007), AASK (2007) and NHANES (2006) , at the University of Pennsylvania for the CRIC study (2007), and at BCM for the ARIC study. At CCF, interassay CVs were 5.1% and 4.9% at mean concentrations of 0.97 and 1.90 mg/L, respectively. For the NAHNES samples, the intra-assay CV was 2.0 - 3.0% and inter-assay CV of 3.2 - 4.4%. At Penn, interassay CV's were 4.9%. Pima specimens were assayed at the Advanced Research and Diagnostic Laboratory at the University of Minnesota using Gentian Cystatin C reagent on the Roche Modular P800 Chemistry analyzer (Roche Diagnostic Corporation). The inter-assay CV's were 3.1% and 2.5% at concentrations of 0.90 mg/L and f 3.98 mg/L, respectively. For all studies, values were adjusted so that they could be traceable to the ERM-DA471/IFCC certified reference material (2, 4-8).

Blind replicate data were available on 200 CRIC participants, and 50 Pima participants for measurements performed at UMN using the Siemens assays. For the CRIC samples, the mean difference between the two measurements was -0.01(SD 0.06), CV 2.23%. Deming regression equation cystatin C2: -0.06 + 1.03 * cystatin C1 (R=0.993). For the Pima samples, the mean difference between the two measurements was 0.005 (SD 0.045), CV 4.37%. Deming regression equation cystatin C2: −0.01 + 1.01 * Cystatin C 1 (R=0.956). At Baylor, blind replicate data were available on 411 ARIC participants. Reliability coefficients after removing outliers (>3-standard deviation difference) for blinded replicates were 0.94 in 411 replicates (10 outliers).

BTP: For Pima, MDRD Study, AASK, CRIC and NHANES, BTP was measured on the Siemens ProSpec nephelometer at UMN (CV 5.36% at mean concentration of 1.683 mg/L and 6.41% at mean concentration of 0.567 mg/L (9).

Blind replicate data were available on 200 CRIC participants and 48 Pima participants for measurements performed at UMN. For the CRIC samples, the mean difference between the two measurements was 0.001(SD 0.123), CV 6.44%. Deming regression equation BTP2: 0.04 + 0.97 * BTP1 (R=0.977). For the Pima samples, the mean difference between the two measurements was -0.041 (SD 0.121), CV 16.1%. Deming regression equation BTP2: 0 + 1.09 * BTP1 (R=0.81).

For ARIC, BTP was measured by a particle-enhanced immunonephelometric assay with a BNII nephelometer (Siemens Healthcare Diagnostics) at Baylor College of Medicine in 2010. Reliability coefficients after removing outliers (>3-standard deviation difference) for blinded replicates was 0.96 in 381 replicates (7 outliers). Calibration to UMN was performed and has been described in Parrinello et al Deming regression showed calibration to be UMN=BCM*1.036-0.099(10).

B2M: B2M was measured at UMN on the Siemens Prospec nephelometer for NHANES and CRIC (CV 2.7%) and on the Roche Modular P (CV 3.2%) for the MDRD Study and AASK (9). For the Siemens assay, CV was 3.09% at a mean concentration of 4.89 mg/L and 3.28% at a mean concentration of 1.74 mg/L. For the Roche assay, CV was 3.2% at a mean concentration of 1.67 mg/L. We performed comparison studies to show the equivalence of the two assays and their stability over time. We used a 40 sample calibration panel with the samples measured twice for each method and then averaged. Using Deming regression, there was a nonsignificant intercept with a slope of 0.98 (SE 0.051) between the Siemens and the Roche instruments.

Blind replicate data were available on 200 CRIC participants and 48 Pima participants for measurements performed at UMN using the Siemens assays. For the CRIC samples, the mean difference between the two measurements was 0.023 (SD 0.27) mg/L, CV 3.08%. Deming regression equation B2M2: 0.05 + 0.99 * B2M, R=0.992). For the Pima samples, the mean difference between the two measurements was 0.014 (SD 0.234), CV 6.45%. Deming regression equation B2M2: −0.08 + 1.03 * B2M1 (R=0.927).

For the ARIC Study, B2M was measured at BCM by a particle-enhanced immunonephelometric assay with a BNII nephelometer (Siemens Healthcare Diagnostics). Reliability coefficients after removing outliers (>3-standard deviation difference) for blinded replicates was 0.98 in 390 replicates (9 outliers). Calibration to UMN was performed and has been described in Parrinello et al. Deming regression showed calibration to be UMN=BCM*0.961+0.054 (10).

Supplemental Table 1: Total population of studies and population used in analysis

Study	Total population N	Analytical cohort N
NHANES III	7,596	7061
ARIC	11,656	10583
CRIC	3938	3792
Pima	260	259
MDRD	804	795
AASK	830	828

Supplement Table 2: Definitions of All-Cause Mortality and End-Stage Renal Disease outcomes across participating cohorts

Cohort	Definition of All-Cause Mortality	Definition of End-Stage Renal Disease
PIMA(11)	Ascertained through community surveillance, contact with participants during examinations, review of local newspaper obituaries, and regular requests to the National Death Index.	Defined as the initiation of renal replacement therapy or an underlying cause of death due to diabetic kidney failure.
NHANES(12-14)	Ascertained using the public-use NHANES III mortality linkage, which links participants to mortality data through the National Death Index.	Defined as initiation of dialysis, kidney transplantation
CRIC(15)	Deaths were identified through report from next of kin, retrieval of death certificates or obituaries, review of hospital records, and linkage with the Social Security Mortality Master File through May 31, 2012.	Defined as either initiation of dialysis therapy or kidney transplantation.
ARIC(13, 14)	Ascertained by active surveillance of local hospital discharge records, state death records, and linkage to the National Death Index combined with information from annual phone interviews with participants or proxies from 1996 through December 31, 2011	Defined as initiation of dialysis, kidney transplantation
MDRD(14, 16)	Survival status, through December 31, 2000, was ascertained by review of death certificates using the National Death Index (NDI).	Defined as the start of renal replacement therapy
AASK(14, 16)	Ascertained by study personnel with a final determination made by the AASK Clinical Outcome committee.	Defined as the start of renal replacement therapy

Supplement Table 3: Hazard ratios for end stage renal disease by eGFR category and by categories of change in eGFR category for novel filtration markers compared to $eGFR_{CR}$

	Creatinine	Cystatin C	BTP	B2M	Cr-Cys	All 4 markers
General population						
90+	**0.53 (0.38, 0.74)**	0.74 (0.42, 1.30)	1.20 (0.76, 1.88)	1.21 (0.65, 2.26)	**0.48 (0.33, 0.70)**	0.73 (0.50, 1.06)
60-89	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**
45-59	**5.36 (2.37, 12.13)**	**3.09 (1.38, 6.91)**	**2.55 (1.91, 3.39)**	**2.28 (1.37, 3.80)**	**3.40 (1.34, 8.65)**	**4.80 (2.80, 8.20)**
30-44	**13.13 (6.62, 26.04)**	**7.84 (4.30, 14.31)**	**13.01 (8.20, 20.63)**	**10.45 (1.43, 76.43)**	**10.52 (4.95, 22.39)**	**16.32 (9.59, 27.77)**
15-29	**46.85 (10.31, 212.97)**	**16.18 (10.63, 24.62)**	**38.82 (22.96, 65.64)**	**61.58 (14.50, 261.50)**	**22.78 (11.38, 45.61)**	**55.08 (31.50, 96.29)**
<15	30.82 (0.54, 1754.92)	**17.61 (1.73, 179.57)**	**62.90 (8.60, 462.00)**	0.45 (0.02, 9.61)	40.23 (0.77, 2113.54)	**2640.40 (597.29, 11672)**
Chronic Kidney Disease cohorts						
90+	0.31 (0.04, 2.25)	0.71 (0.10, 5.23)	0.40 (0.08, 2.14)	NA	NA	NA
60-89	**0.54 (0.29, 0.99)**	**0.66 (0.46, 0.92)**	**0.45 (0.23, 0.87)**	**0.34 (0.20, 0.59)**	**0.52 (0.35, 0.78)**	**0.38 (0.23, 0.63)**
45-59	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**
30-44	**2.12 (1.80, 2.50)**	**1.94 (1.30, 2.90)**	**1.92 (1.17, 3.13)**	**2.26 (1.66, 3.08)**	**2.19 (1.51, 3.18)**	**2.36 (1.44, 3.88)**
15-29	**4.67 (3.37, 6.48)**	**5.18 (3.37, 7.97)**	**5.22 (2.89, 9.45)**	**5.47 (3.38, 8.86)**	**5.86 (3.64, 9.42)**	**6.83 (3.83, 12.18)**
<15	**14.62 (6.99, 30.55)**	**9.84 (4.25, 22.78)**	**49.82 (6.34, 391.36)**	**14.00 (8.37, 23.43)**	**12.62 (8.69, 18.32)**	**18.69 (3.59, 97.25)**

Bolded values indicate those with confidence intervals that do not cross 1

Supplemental Table 4: Comparison of associations of estimated GFR from novel filtration markers compared to estimated GFR from creatinine across different eGFR ranges by subgroups

a. **Age**

		Creatinine	Cystatin C	BTP	B2M	Cr-Cys	Average 4
				ESRD GP			
Age < 65	**eGFR<60**	2.88 (0.69, 12.04)	2.50 (1.19, 5.24)	3.85 (2.55, 5.81)	4.74[a] (1.54, 14.58)	2.64 (0.72, 9.68)	3.84[a] (0.80, 18.34)
	eGFR 60-90	4.80 (1.50, 15.38)	3.59 (1.75, 7.38)	2.22 (1.36, 3.63)	2.25[a] (1.29, 3.94)	4.96 (1.39, 17.65)	4.65 (1.99, 10.88)
Age > 65	**eGFR<60**	6.32 (3.29, 12.14)	3.49[a] (2.55, 4.78)	10.90[a] (3.23, 36.84)	6.88 (4.17, 11.36)	5.35 (3.94, 7.27)	8.24[a] (5.57, 12.17)
	eGFR 60-90	1.90 (1.47, 2.44)	2.71 (0.86, 8.59)	1.90 (1.17, 3.09)	2.87 (0.95, 8.67)	2.04 (1.08, 3.88)	2.48 (1.16, 5.33)
				ESRD CKD			
Age < 60	**eGFR<60**	2.73 (2.16, 3.46)	2.59 (1.82, 3.68)	3.64[a] (2.04, 6.50)	2.86 (1.93, 4.24)	2.89 (2.13, 3.90)	3.37[a] (2.20, 5.14)
	eGFR 60-90	1.11 (0.53, 2.30)	1.37 (0.67, 2.82)	1.23 (0.80, 1.88)	5.02[a] (1.03, 24.50)	1.11 (0.33, 3.75)	3.36[a] (0.71, 15.94)
Age > 60	**eGFR<60**	3.85 (3.11, 4.76)	4.12 (3.67, 4.63)	7.43[a] (5.18, 10.65)	4.66 (4.14, 5.24)	4.51[a] (4.02, 5.07)	6.10[a] (5.36, 6.95)
	eGFR 60-90	1.55 (0.71, 3.37)	1.61 (0.78, 3.28)	0.94 (0.58, 1.53)	6.44 (0.85, 48.67)	1.39 (0.54, 3.56)	1.11 (0.39, 3.15)
				ACM GP/HR			
Age < 65	**eGFR<60**	1.54 (1.32, 1.80)	1.54 (1.36, 1.76)	1.93[a] (1.49, 2.50)	1.76[a] (1.45, 2.15)	1.53 (1.32, 1.77)	1.66[a] (1.41, 1.95)
	eGFR 60-90	1.48 (1.26, 1.74)	1.35 (1.20, 1.52)	1.13[a] (0.97, 1.33)	1.36 (1.21, 1.53)	1.47 (1.31, 1.65)	1.44 (1.27, 1.64)
Age > 65	**eGFR<60**	1.70 (1.40, 2.07)	1.50 (1.35, 1.67)	1.76 (1.63, 1.90)	1.72 (1.35, 2.19)	1.61 (1.38, 1.87)	1.77 (1.44, 2.16)
	eGFR 60-90	1.03 (0.94, 1.13)	1.14 (1.07, 1.22)	1.00 (0.83, 1.21)	1.26[a] (1.17, 1.35)	1.13[a] (1.06, 1.20)	1.20[a] (1.11, 1.29)
				ACM CKD			
Age < 60	**eGFR<60**	1.27 (1.08, 1.48)	1.64[a] (1.38, 1.94)	1.74[a] (1.36, 2.23)	1.71[a] (1.42, 2.05)	1.45[a] (1.23, 1.71)	1.64[a] (1.36, 1.97)
	eGFR 60-90	1.20 (0.78, 1.85)	1.02 (0.69, 1.51)	0.83 (0.56, 1.22)	1.38 (0.53, 3.60)	1.26 (0.76, 2.09)	1.80 (0.21, 15.39)
Age > 60	**eGFR<60**	1.34 (1.12, 1.60)	1.70[a] (1.55, 1.86)	1.74[a] (1.52, 1.98)	1.81[a] (1.54, 2.14)	1.53[a] (1.30, 1.79)	1.73[a] (1.51, 1.99)
	eGFR 60-90	0.91 (0.56, 1.47)	1.29 (0.91, 1.82)	1.09 (0.83, 1.43)	1.34 (0.40, 4.49)	1.38 (0.73, 2.59)	0.86 (0.19, 3.93)

b. Sex

		Creatinine	Cystatin C	BTP	B2M	Cr-Cys	Average 4
ESRD GP							
Male	**eGFR<60**	4.08 (2.97, 5.61)	3.37 (2.76, 4.12)	4.78[a] (3.86, 5.92)	5.46[a] (4.19, 7.11)	4.02 (2.45, 6.59)	5.39[a] (2.63, 11.04)
	eGFR 60-90	4.12 (1.12, 15.17)	2.51 (0.80, 7.85)	2.14[a] (0.64, 7.18)	3.26 (0.71, 15.09)	3.58 (0.87, 14.76)	3.87 (0.85, 17.54)
Female	**eGFR<60**	3.97 (2.11, 7.49)	2.92 (2.39, 3.55)	7.62[a] (5.99, 9.68)	5.84[a] (4.53, 7.51)	3.98 (2.44, 6.49)	5.74[a] (3.6, 10.77)
	eGFR 60-90	2.42 (1.33, 4.41)	2.96 (1.97, 4.45)	1.25 (0.25, 6.24)	2.23 (1.50, 3.31)	2.98 (1.25, 7.11)	3.21[a] (2.17, 4.77)
ESRD CKD							
Male	**eGFR<60**	3.15 (2.40, 4.13)	2.96 (2.13, 4.13)	4.36[a] (2.93, 6.51)	3.40 (2.39, 4.85)	3.35 (2.48, 4.52)	4.09[a] (2.75, 6.09)
	eGFR 60-90	1.26 (0.79, 2.02)	1.33 (0.77, 2.30)	0.45 (0.12, 1.67)	4.12 (0.96, 17.62)	1.50 (0.83, 2.70)	2.03 (0.84, 4.91)
Female	**eGFR<60**	3.20 (2.43, 4.22)	3.55 (2.98, 4.21)	5.26[a] (4.49, 6.16)	3.37 (2.38, 4.78)	3.68[a] (2.79, 4.87)	4.49[a] (3.38, 5.97)
	eGFR 60-90	1.38 (0.73, 2.61)	1.24 (0.33, 4.73)	1.07 (0.53, 2.14)	3.51 (0.58, 21.19)	1.25 (0.26, 5.99)	2.82 (0.15, 54.51)
ACM GP							
Male	**eGFR<60**	1.53 (1.19, 1.97)	1.44 (1.25, 1.65)	1.68 (1.53, 1.84)	1.62 (1.32, 1.98)	1.46 (1.20, 1.79)	1.58 (1.25, 1.98)
	eGFR 60-90	1.08 (1.00, 1.16)	1.17[a] (1.08, 1.26)	1.06 (0.95, 1.17)	1.28[a] (1.18, 1.38)	1.16[a] (1.07, 1.26)	1.22[a] (1.11, 1.33)
Female	**eGFR<60**	1.77 (1.57, 1.99)	1.56 (1.45, 1.68)	1.96 (1.74, 2.20)	1.86 (1.67, 2.07)	1.72 (1.56, 1.89)	1.94 (1.75, 2.15)
	eGFR 60-90	1.15 (1.06, 1.24)	1.21[a] (1.11, 1.31)	0.95 (0.65, 1.39)	1.27[a] (1.11, 1.44)	1.21[a] (1.11, 1.31)	1.28[a] (1.17, 1.41)
ACM CKD							
Male	**eGFR<60**	1.32 (1.16, 1.51)	1.59[a] (1.44, 1.76)	1.66[a] (1.47, 1.88)	1.80[a] (1.62, 2.01)	1.48[a] (1.33, 1.65)	1.67[a] (1.49, 1.86)
	eGFR 60-90	0.92 (0.50, 1.69)	1.32 (0.95, 1.84)	1.05 (0.82, 1.34)	1.18 (0.38, 3.61)	1.52 (0.96, 2.40)	0.77 (0.13, 4.51)
Female	**eGFR<60**	1.31 (1.03, 1.66)	1.76[a] (1.40, 2.21)	1.75[a] (1.19, 2.59)	1.80[a] (1.35, 2.39)	1.57[a] (1.23, 1.99)	1.71[a] (1.26, 2.31)
	eGFR 60-90	1.10 (0.61, 1.96)	1.11 (0.56, 2.19)	1.15 (0.69, 1.93)	2.00 (0.65, 6.17)	0.97 (0.63, 1.49)	1.48 (0.37, 5.95)

c. Race

		Creatinine	Cystatin C	BTP	B2M	Cr-Cys	Average 4
				ESRD GP/HR			
NonBlack	**eGFR<60**	6.00 (4.58, 7.85)	2.88[a] (2.40, 3.44)	7.96 (3.80, 16.68)	5.82 (4.33, 7.84)	4.98 (3.87, 6.40)	7.42[a] (5.72, 9.62)
	eGFR 60-90	3.40 (0.99, 11.65)	4.05 (1.07, 15.39)	1.98 (1.15, 3.43)	2.79 (1.87, 4.15)	4.81 (0.56, 41.21)	5.58[a] (1.22, 25.528)
Black	**eGFR<60**	2.90 (1.23, 6.82)	3.32 (2.09, 5.28)	3.79[a] (2.50, 5.76)	4.07[a] (1.46, 11.35)	3.31 (1.39, 7.89)	4.21[a] (1.20, 14.75)
	eGFR 60-90	2.22 (1.40, 3.54)	1.55 (1.08, 2.22)	2.30 (1.50, 3.51)	2.11 (0.96, 4.63)	2.03 (1.45, 2.84)	2.42 (1.72, 3.39)
				ACM GP/HR			
NonBlack	**eGFR<60**	1.67 (1.45, 1.92)	1.50 (1.41, 1.60)	1.79 (1.65, 1.95)	1.75 (1.50, 2.04)	1.58 (1.46, 1.71)	1.78 (1.56, 2.04)
	eGFR 60-90	1.10 (1.04, 1.16)	1.20[a] (1.12, 1.27)	1.03 (0.90, 1.18)	1.29[a] (1.19, 1.41)	1.21[a] (1.13, 1.28)	1.27[a] (1.18, 1.37)
Black	**eGFR<60**	1.58 (1.30, 1.93)	1.48 (1.18, 1.86)	1.72 (1.54, 1.92)	1.62 (1.31, 2.01)	1.57 (1.24, 1.99)	1.61 (1.25, 2.09)
	eGFR 60-90	1.13 (1.03, 1.25)	1.21 (1.10, 1.34)	1.18 (1.03, 1.34)	1.35 (1.18, 1.55)	1.15 (1.05, 1.27)	1.26 (1.15, 1.39)

Blacks and non Blacks were only represented in one of the CKD studies and thus subgroup analysis could be not be performed

d. Diabetes

		Creatinine	Cystatin C	BTP	B2M	Cr-Cys	Average 4
				ESRD GP			
No Diabetes	**eGFR<60**	5.95 (3.21, 11.05)	3.21 (2.63, 3.92)	5.21 (4.20, 6.47)	6.03 (4.05, 8.97)	5.21 (3.80, 7.15)	6.57 (2.80, 15.41)
	eGFR 60-90	2.12 (1.17, 3.83)	3.05 (1.51, 6.15)	4.93 (0.30, 80.34)	3.96 (1.11, 14.15)	2.76 (1.31, 5.83)	4.37[a] (1.23, 15.48)
Diabetes	**eGFR<60**	3.31 (1.89, 5.78)	3.24 (2.65, 3.95)	6.29[a] (4.73, 8.36)	5.18[a] (4.09, 6.56)	3.49 (1.85, 6.57)	5.05[a] (2.89, 8.79)
	eGFR 60-90	3.84 (1.12, 13.14)	2.42 (1.06, 5.49)	1.53 (0.78, 2.99)	1.81 (1.29, 2.54)	3.56 (0.86, 14.71)	2.69 (1.75, 4.16)
				ESRD CKD			
No Diabetes	**eGFR<60**	3.28 (2.00, 5.36)	3.01 (1.80, 5.02)	4.39[a] (2.78, 6.93)	3.16 (1.90, 5.27)	3.47[a] (2.10, 5.72)	4.05[a] (2.32, 7.08)
	eGFR 60-90	1.51 (0.24, 9.54)	1.37 (0.46, 4.11)	2.70 (0.19, 39.30)	3.36 (0.86, 13.19)	1.07 (0.07, 16.36)	5.00 (0.67, 37.49)
Diabetes	**eGFR<60**	2.70 (1.52, 4.79)	3.36 (2.97, 3.81)	5.69[a] (4.88, 6.63)	4.37[a] (3.81, 5.00)	3.54 (2.65, 4.72)	4.89[a] (3.63, 6.58)
	eGFR 60-90	4.02 (0.10, 161.35)	1.95 (0.88, 4.32)	0.20 (0.01, 4.23)	16.46 (0.33, 826.59)	1.49 (0.70, 3.18)	1.47 (0.48, 4.54)
				ACM GP			
No Diabetes	**eGFR<60**	1.67 (1.46, 1.90)	1.46 (1.37, 1.56)	1.75 (1.39, 2.20)	1.70 (1.52, 1.89)	1.57 (1.44, 1.71)	1.75 (1.59, 1.91)
	eGFR 60-90	1.10 (1.03, 1.17)	1.20[a] (1.12, 1.28)	1.03 (0.94, 1.14)	1.29[a] (1.21, 1.39)	1.19[a] (1.11, 1.27)	1.25[a] (1.16, 1.35)
Diabetes	**eGFR<60**	1.66 (1.37, 2.01)	1.59 (1.28, 1.98)	1.87[a] (1.47, 2.37)	1.84 (1.53, 2.21)	1.63 (1.29, 2.07)	1.79 (1.44, 2.23)
	eGFR 60-90	1.14 (1.03, 1.27)	1.17 (1.05, 1.31)	1.18 (1.03, 1.36)	1.27[a] (1.13, 1.41)	1.21 (1.09, 1.35)	1.28[a] (1.14, 1.43)
				ACM CKD			
No Diabetes	**eGFR<60**	1.44 (1.13, 1.83)	1.67[a] (1.48, 1.89)	1.83[a] (1.56, 2.14)	1.85[a] (1.59, 2.16)	1.55[a] (1.24, 1.93)	1.79[a] (1.56, 2.05)
	eGFR 60-90	0.80 (0.56, 1.15)	1.44 (0.53, 3.91)	0.94 (0.63, 1.40)	0.94 (0.31, 2.87)	3.33 (0.03, 437.38)	0.50 (0.06, 4.35)
Diabetes	**eGFR<60**	1.24 (0.94, 1.63)	1.68[a] (1.50, 1.89)	1.79[a] (1.56, 2.05)	1.72 (1.26, 2.35)	1.49[a] (1.20, 1.86)	1.69[a] (1.34, 2.13)
	eGFR 60-90	1.04 (0.72, 1.49)	0.90 (0.62, 1.31)	0.96 (0.68, 1.37)	0.92 (0.38, 2.25)	0.93 (0.61, 1.41)	0.87 (0.48, 1.56)

e. **Coronary heart disease**

		Creatinine	Cystatin C	BTP	B2M	Cr-Cys	Average 4
ESRD GP							
non CHD	**eGFR<60**	3.47 (1.77, 6.82)	2.84 (1.90, 4.25)	5.33[a] (3.94, 7.20)	4.70[a] (2.78, 7.95)	3.52 (1.51, 8.21)	4.68 (1.62, 13.50)
	eGFR 60-90	2.85 (1.63, 4.99)	2.70 (1.33, 5.46)	1.82 (1.29, 2.58)	2.28 (1.55, 3.34)	3.01 (1.16, 7.84)	3.48 (1.70, 7.13)
CHD	**eGFR<60**	4.89 (3.16, 7.57)	4.59 (1.64, 12.83)	8.77 (1.62, 47.58)	7.32 (2.84, 18.88)	4.05 (2.53, 6.51)	7.02 (3.35, 14.74)
	eGFR 60-90	7.12 (0.24, 211.18)	6.51 (0.37, 113.83)	1.87 (0.53, 6.57)	1.90 (0.63, 5.71)	13.23 (0.25, 690.17)	8.32 (0.28, 243.27)
ESRD CKD							
non CHD	**eGFR<60**	3.16 (2.23, 4.48)	3.22 (2.32, 4.48)	4.76[a] (3.22, 7.03)	3.39 (2.39, 4.82)	3.47[a] (2.49, 4.83)	4.24[a] (2.82, 6.36)
	eGFR 60-90	1.03 (0.56, 1.90)	1.36 (0.57, 3.26)	1.26 (0.61, 2.60)	6.74[a] (1.28, 35.55)	1.11 (0.28, 4.31)	4.49[a] (0.82, 24.68)
CHD	**eGFR<60**	3.39 (2.58, 4.46)	3.42 (2.85, 4.09)	5.29[a] (3.67, 7.62)	3.96[a] (2.38, 6.60)	3.83 (2.94, 5.00)	5.06[a] (3.28, 7.82)
	eGFR 60-90	1.50 (0.69, 3.28)	0.93 (0.50, 1.72)	0.78 (0.43, 1.42)	4.88 (0.04, 580.17)	1.03 (0.45, 2.39)	1.13 (0.14, 9.36)
ACM GP							
non CHD	**eGFR<60**	1.61 (1.33, 1.95)	1.50 (1.38, 1.62)	1.85[a] (1.71, 2.01)	1.75[a] (1.56, 1.97)	1.57 (1.36, 1.81)	1.75[a] (1.47, 2.07)
	eGFR 60-90	1.13 (1.07, 1.20)	1.22 (1.13, 1.33)	1.01 (0.88, 1.17)	1.29[a] (1.21, 1.38)	1.21[a] (1.14, 1.29)	1.27[a] (1.18, 1.36)
CHD	**eGFR<60**	1.74 (1.50, 2.01)	1.58 (1.42, 1.76)	1.68 (1.31, 2.15)	1.71 (1.36, 2.14)	1.65 (1.48, 1.83)	1.78 (1.58, 2.00)
	eGFR 60-90	1.04 (0.92, 1.17)	1.10 (0.96, 1.27)	1.19 (0.99, 1.44)	1.20[a] (1.03, 1.38)	1.10 (0.96, 1.26)	1.15 (0.98, 1.35)
ACM CKD							
non CHD	**eGFR<60**	1.34 (1.07, 1.67)	1.69[a] (1.44, 1.98)	1.94[a] (1.68, 2.23)	1.88[a] (1.45, 2.45)	1.48[a] (1.17, 1.87)	1.72[a] (1.38, 2.16)
	eGFR 60-90	0.81 (0.61, 1.06)	1.09 (0.80, 1.49)	1.01 (0.72, 1.43)	0.81 (0.45, 1.44)	1.31 (0.58, 2.94)	0.76 (0.17, 3.33)
CHD	**eGFR<60**	1.34 (1.20, 1.50)	1.63[a] (1.46, 1.83)	1.57[a] (1.13, 2.17)	1.76[a] (1.55, 1.99)	1.55[a] (1.38, 1.74)	1.64[a] (1.37, 1.97)
	eGFR 60-90	1.40 (0.89, 2.22)	1.27 (0.78, 2.07)	1.12 (0.65, 1.95)	4.26 (1.23, 14.71)	1.44 (0.80, 2.58)	1.84 (0.58, 5.78)

Supplement Table 5: Hazard ratios for all-cause mortality by eGFR category and by categories of change in eGFR category for novel filtration markers compared to GFR_{CR}

	Creatinine	Cystatin C	BTP	B2M	Cr-Cys	All 4 markers
General population						
90+	1.05 (0.97, 1.15)	**0.85 (0.75, 0.96)**	1.11 (0.85, 1.46)	**0.83 (0.73, 0.94)**	0.92 (0.84, 1.02)	0.92 (0.81, 1.05)
60-89	Ref	**Ref**	Ref	**Ref**	Ref	Ref
45-59	**1.41 (1.27, 1.56)**	**1.31 (1.20, 1.43)**	**1.31 (1.10, 1.55)**	**1.62 (1.49, 1.76)**	**1.53 (1.38, 1.70)**	**1.59 (1.46, 1.73)**
30-44	**2.11 (1.65, 2.71)**	**1.77 (1.56, 2.01)**	**2.22 (1.92, 2.56)**	**2.22 (1.70, 2.90)**	**1.86 (1.61, 2.14)**	**2.23 (1.72, 2.88)**
15-29	**3.38 (1.48, 7.74)**	**2.75 (1.80, 4.22)**	**3.05 (1.54, 6.04)**	**4.34 (2.40, 7.86)**	**3.36 (1.98, 5.71)**	**3.82 (2.08, 6.99)**
<15	**2.10 (1.39, 3.16)**	**3.02 (2.06, 4.42)**	**2.69 (1.20, 6.03)**	**2.75 (1.38, 5.45)**	**2.22 (1.48, 3.33)**	**2.40 (1.21, 4.75)**
Chronic Kidney Disease cohorts						
90+	6.39 (0.12, 332.84)	0.57 (0.23, 1.41)	0.58 (0.24, 1.42)	2.83 (0.69, 11.57)	0.91 (0.29, 2.91)	0.74 (0.10, 5.37)
60-89	0.83 (0.64, 1.06)	**0.68 (0.50, 0.93)**	0.92 (0.69, 1.22)	**0.50 (0.35, 0.72)**	0.78 (0.58, 1.04)	0.79 (0.58, 1.06)
45-59	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**
30-44	**1.33 (1.13, 1.57)**	**1.66 (1.37, 2.02)**	**1.45 (1.21, 1.73)**	**1.80 (1.50, 2.15)**	**1.68 (1.40, 2.02)**	**1.68 (1.40, 2.00)**
15-29	**1.54 (1.28, 1.85)**	**2.35 (1.91, 2.88)**	**1.56 (0.92, 2.64)**	**2.43 (1.74, 3.38)**	**1.96 (1.52, 2.52)**	**2.17 (1.52, 3.09)**
<15	0.99 (0.59, 1.67)	**3.05 (1.96, 4.75)**	2.58 (0.36, 18.64)	**3.81 (2.25, 6.43)**	1.61 (0.96, 2.69)	**4.97 (1.42, 17.34)**

Bolded values indicate those with confidence intervals that do not cross 1

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