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Figure S1. Kernel density plots demonstrating the distribution of eGFR by CKD-EPI and BIS1 equations according to presence or absence of (panel A) diabetes and (panel B) hypertension. BIS1, Berlin Initiative Study; CKD-EPI, Chronic Kidney Disease Epidemiology Collaboration; eGFR, estimated glomerular filtration rate.

Description of the ASPREE trial

ASPREE is a large trial of 19,114 elderly participants, of whom 16,703 (all aged ≥ 70 years) are from Australia and the remainder (2,411) are from the USA. The latter group focuses on members of racial and ethnic minorities (age ≥ 65 years). Interested older people in Australia or the US who gave informed consent underwent two baseline visits to determine study eligibility, and to collect clinical, demographic, physical function, and baseline study data. Volunteers were excluded if they had a past history of cardiovascular events or established CVD, atrial fibrillation, dementia or a Modified Mini-Mental State Examination score of < 78, physical disability (defined by severe difficulty or inability to perform any of the six Katz Activities of Daily Living[1]), any major inter-current illness or chronic condition with a high current or recurrent risk of bleeding, anemia, any condition deemed likely to cause death within 5 years, current use of other antiplatelet or anticoagulant medication, or of aspirin for secondary stroke prevention, and uncontrolled high blood pressure (systolic blood pressure ≥ 180 mmHg and/or diastolic blood pressure ≥ 105 mmHg). Individuals with well-controlled diabetes mellitus were not specifically excluded, nor were those with a diagnosis of CKD. Individuals with stage 5 CKD requiring dialysis or those with a functioning kidney transplant were excluded.

Laboratory measures

In Australia, fasting blood and spot urine samples were collected with referral by a local pathology service after the first baseline visit and prior to the second. In the US, fasting blood and urine collection and analyses were conducted by the participating research clinic. Determination of serum creatinine and urine albumin and creatinine concentration were performed in local laboratories using standardized clinical pathology methods. All Australian

participants (87% of the total sample) had serum creatinine values measured in IDMS-standardized fashion. It is uncertain what proportion of US participants had serum creatinine determined using an IDMS-standardized assay. As of 2008, half of all US labs were standardized and all major worldwide assay manufacturers were providing IDMS-standardized materials as of the end of 2009 [2]. We think it likely that only a minority of US participants, if any, had non-IDMS-standardized Cr measurements given that in the US the study commenced recruitment in the second half of 2010. We therefore assumed that all creatinine measure were IDMS-standardized

Formulae GFR Estimating Equations

CKD-EPI[3]:

White or Other:

Female & <=Scr 62 μmol/L: $GFR = 144 * \left(\frac{Scr}{0.7}\right)^{-0.329} * (0.993)^{Age}$

Female & >Scr 62 μmol/L: $GFR = 144 * \left(\frac{Scr}{0.7}\right)^{(-1.209)} * (0.993)^{Age}$

Male & <=Scr 80 μmol/L: $GFR = 141 * \left(\frac{Scr}{0.9}\right)^{(-0.411)} * (0.993)^{Age}$

Male & >Scr 80 μmol/L: $GFR = 141 * \left(\frac{Scr}{0.9}\right)^{(-1.209)} * (0.993)^{Age}$

Black:

Female & <=Scr 62 μmol/L: $GFR = 166 * \left(\frac{Scr}{0.7}\right)^{-0.329} * (0.993)^{Age}$

Female & >Scr 62 μmol/L: $GFR = 166 * \left(\frac{Scr}{0.7}\right)^{(-1.209)} * (0.993)^{Age}$

Male & <=Scr 80 μmol/L: $GFR = 163 * \left(\frac{Scr}{0.9}\right)^{(-0.411)} * (0.993)^{Age}$

Male & >Scr 80 μmol/L: $GFR = 163 * \left(\frac{Scr}{0.9}\right)^{(-1.209)} * (0.993)^{Age}$

where serum creatinine is in mg/dL.

BIS1[4]

$$GFR = 3736 * Scr^{-0.95} * Age^{-0.95} * 0.82\ (if\ female)$$

where serum creatinine is in mg/dL.

The mean bias of the BIS1 equation versus measured GFR was 0.11 with a P_{30} of 95.1%[4].

References:

1. Katz S. Assessing self-maintenance: activities of daily living, mobility, and instrumental activities of daily living. *J Am Geriatr Soc*. 1983;31(12):721-727.

2. Chronic Kidney Disease (CKD) Surveillance System, CDC, USA. https://nccd.cdc.gov/ckd/detail.aspx?QNum=Q223. Accessed 27/11/2018.

3. Levey AS, Stevens LA, Schmid CH, et al. A new equation to estimate glomerular filtration rate. Ann Intern Med. 2009;150(9):604-612.

4. Schaeffner ES, Ebert N, Delanaye P, et al. Two novel equations to estimate kidney function in persons aged 70 years or older. Ann Intern Med. 2012;157(7):471-481.

Table S1. CKD Status by BIS1 Equation

	CKD Status (BIS1 Equation)			
	No CKD *n* = 9509 (54%)	CKD *n* = 8253(46%)	Total *n* = 17,762	*P*
Age at randomization, years, mean (SD)	73.8 (3.6)	76.6 (5.0)	75.1(4.6)	< 0.001
Age group, years, *n* (%)				< 0.001
65-69	367 (4)	181 (2)	548 (3)	
70-74	6324 (67)	3476 (42)	9800 (55)	
75-79	2160 (23)	2528 (31)	4688 (26)	
80-84	560 (6)	1490 (18)	2050 (12)	
≥ 85	98 (1)	578 (7)	676 (4)	
Country, *n* (%)				0.22
Australia	8347 (88)	7079 (86)	15426 (87)	
US	1162 (12)	1174 (14)	2336 (13)	
Female, *n* (%)	5392 (57)	4633 (56)	10025 (56)	< 0.001
Living Situation, *n* (%)				< 0.001
Home alone	2897 (30)	2915 (35)	5812 (33)	
Home with family, friends, spouse	6580 (69)	5290 (64)	11870 (67)	
Residential home	32 (0)	48 (1)	80 (0)	
Years of Education, *n* (%)				< 0.001
< 9	1398 (15)	1395 (17)	2793 (16)	
9-11	2771 (29)	2418 (29)	5189 (29)	
12	1136 (12)	1016 (12)	2152 (12)	
13-15	1603 (17)	1442 (17)	3045 (17)	
16	904 (10)	736 (9)	1640 (9)	
17-21	1697 (18)	1246 (15)	2943 (17)	
Family history of kidney disease, *n* (%)	645 (7)	599 (7)	1244 (7)	0.063
Diabetes mellitus, *n* (%)	881 (9)	1046 (13)	1927 (11)	< 0.001
Hypertension, *n* (%)	6601 (69)	6597 (80)	13198 (74)	< 0.001
Smoking, *n* (%)				0.59
Current	394 (4)	298 (4)	692 (4)	
Former	3900 (41)	3378 (41)	7278 (41)	
Never	5215 (55)	4577 (55)	9792 (55)	
Alcohol Use, *n* (%)				<0.001
Current	7496 (79)	6104 (74%)	13600 (77)	
Former	549 (6)	521 (6%)	1070 (6)	
Never	1464 (15)	1628 (20%)	3092 (17)	
Systolic BP, mean (SD)	138.2 (16.2)	140.3(16.8)	139.2 (16.5)	< 0.001
Diastolic BP, mean (SD)	77.5 (9.8)	77.1(10.2)	77.3 (10.0)	0.68
ACE/ARB	4305 (42)	3948 (53)	8253 (47)	<0.001
Total cholesterol, mg/DL, mean (SD)	204.2 (37.5)	200.8(38.6)	202.7 (38.1)	< 0.001
Triglyceride, mg/DL, mean (SD)	113.1 (56.8)	122.4(60.2)	117.4 (58.6)	< 0.001
Height, m, mean (SD)	1.66 (0.09)	1.65(0.09)	1.65 (0.09)	0.72
Weight, kg, mean (SD)	76.6 (14.9)	77.4(15.1)	77.0 (15.0)	< 0.001
Body mass index, kg/m^2, mean (SD)	27.9 (4.7)	28.3(4.8)	28.1(4.7)	< 0.001
eGFR (BIS1), mL/min/m^2 mean (SD)	70.0 (7.9)	54.4 (8.8)	62.7 (11.4)	< 0.001
UACR, mg/mmol, median (IQR)	0.7 (0.4-1.1)	1.0 (0.5-2.9)	0.8 (0.5-1.5)	< 0.001
Physical component t-score, mean (SD)	49.0 (8.5)	47.6(9.0)	48.4 (8.7)	< 0.001

Mental component t-score, mean (SD)	55.6 (7.1)	55.8 (7.1)	55.7 (7.1)	0.60

BIS, Berlin Initiative Study; BP, blood pressure; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; IQR, interquartile range; SD, standard deviation; UACR, urine albumin to creatinine ratio; ACE/ARB, angiotensin converting enzyme inhibitor, angiotensin receptor blocker or aldosterone antagonist use.

Table S2. Comparison between APSREE, Berlin Initiative Study and Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) Derivation Cohorts.

	Cohort		
	CKD-EPI Derivation	Berlin Initiative Study	ASPREE Study
Number of Subjects	5,504	570	17,762
Mean Age, years	47.0	78.5	
Age ≥70 years, %	~3[*]	100	97
Female, %	43	43	56
Diabetes mellitus, %	29	24	11
Hypertension, %	-	76	74
Myocardial infarction, %	-	15	0
Current or Former Smoker, %	-	52	45
Weight, kg, mean	82	77	77
Body mass index, kg/m^2, mean	28	28[**]	28

- Not available.
[*] Refers to percent >70 years.
[**] Not directly provided in paper, calculated from mean height and weight for cohort.

Figure S1A.

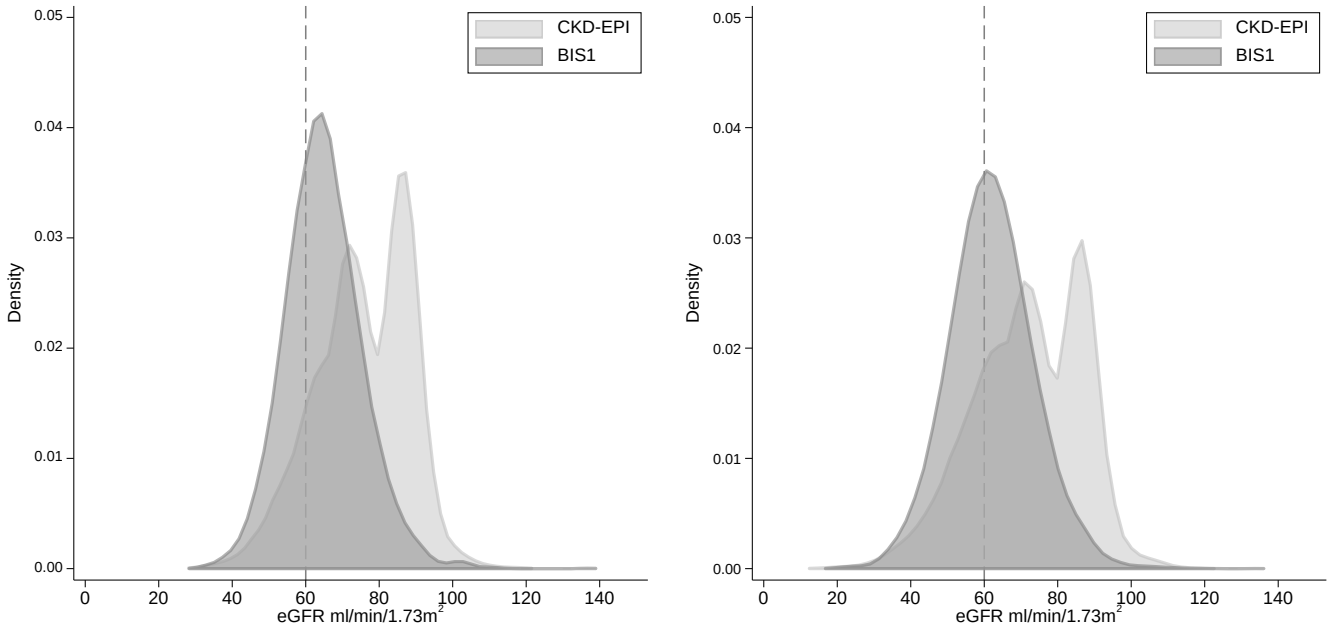
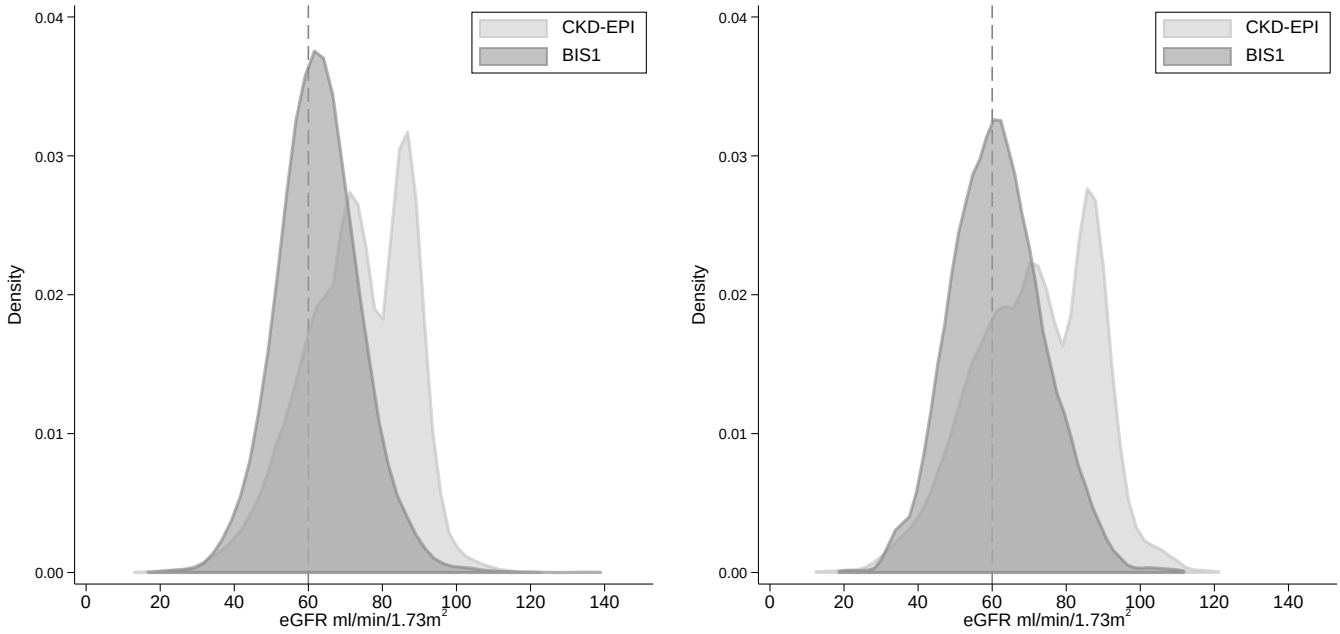

CKD-EPI
BIS1
Density
0.05
0.04
0.03
0.02
0.01
0.00
0
20
40
60
80
100
120
140
eGFR ml/min/1.73m2
CKD-EPI
BIS1
Density
0.05
0.04
0.03
0.02
0.01
0.00
0
20
40
60
80
100
120
140
eGFR ml/min/1.73m2

Figure S1B.


CKD-EPI
BIS1
Density
0.04
0.03
0.02
0.01
0.00
0
20
40
60
80
100
120
140
eGFR ml/min/1.73m2
CKD-EPI
BIS1
Density
0.04
0.03
0.02
0.01
0.00
0
20
40
60
80
100
120
140
eGFR ml/min/1.73m2