Supplementary Appendix S1

Methods for Section 3: CKD prevalence according to eGFR equation

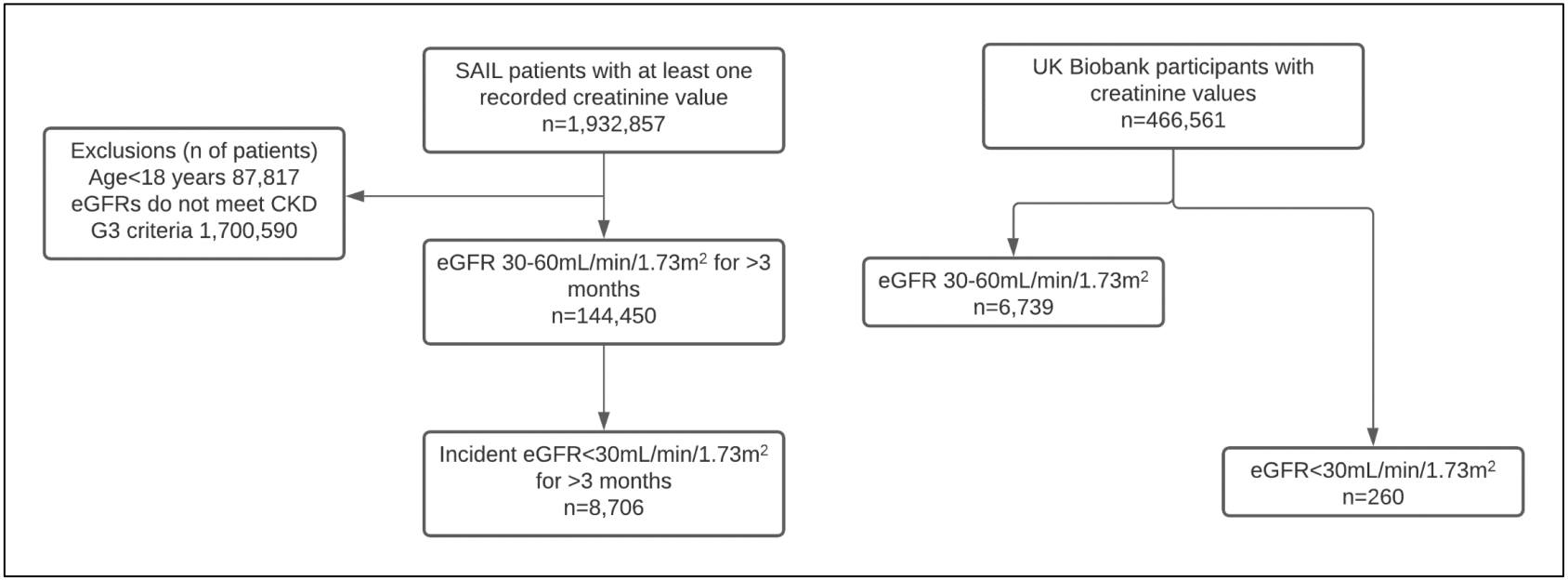
Laboratories can report eGFR using a number of equations, with many in the UK using the Modification of Diet in Renal Disease equation ($eGFR_{MDRD}$).[1] The Chronic Kidney Disease Epidemiology Collaboration equation was first developed in 2009 ($eGFR_{2009}$)[2] and the latest version does not include ethnicity ($eGFR_{2021}$).[3] Given each of these equations produce slightly different eGFR values, the equation a laboratory uses will influence CKD categorisation across eGFR fixed thresholds.

First, we calculated eGFR values for all participants with serum creatinine values in SAIL and UK Biobank using the three equations. For $eGFR_{MDRD}$ and $eGFR_{2009}$ equations which incorporate ethnicity, in SAIL all patients were assumed to be non-black (as UK laboratories do) and in UK Biobank race coefficients were used as ethnicity is self-reported.

In SAIL, we compared the eGFR values calculated by the three equations, reporting the median changes (interquartile intervals; IQIs) in individual eGFR values and displayed the variation among individuals using density plots. We identified the number of patients who would be labelled with incident CKD according to all eGFR equations, first restricting to those meeting criteria CKD G3-5 (eGFR <60mL/min/1.73m^2 for three months or more) and then CKD G4-5 (eGFR <30mL/min/1.73m^2 for three months or more). We explored the effect of age and sex on CKD diagnosis by calculating how many patients $eGFR_{2021}$ confirmed or declassified CKD G3-5 and G4-5 when changing from the $eGFR_{MDRD}$ and $eGFR_{2009}$.

We conducted the same comparisons in UK Biobank, stratified by ethnic group but without the time dependent component.

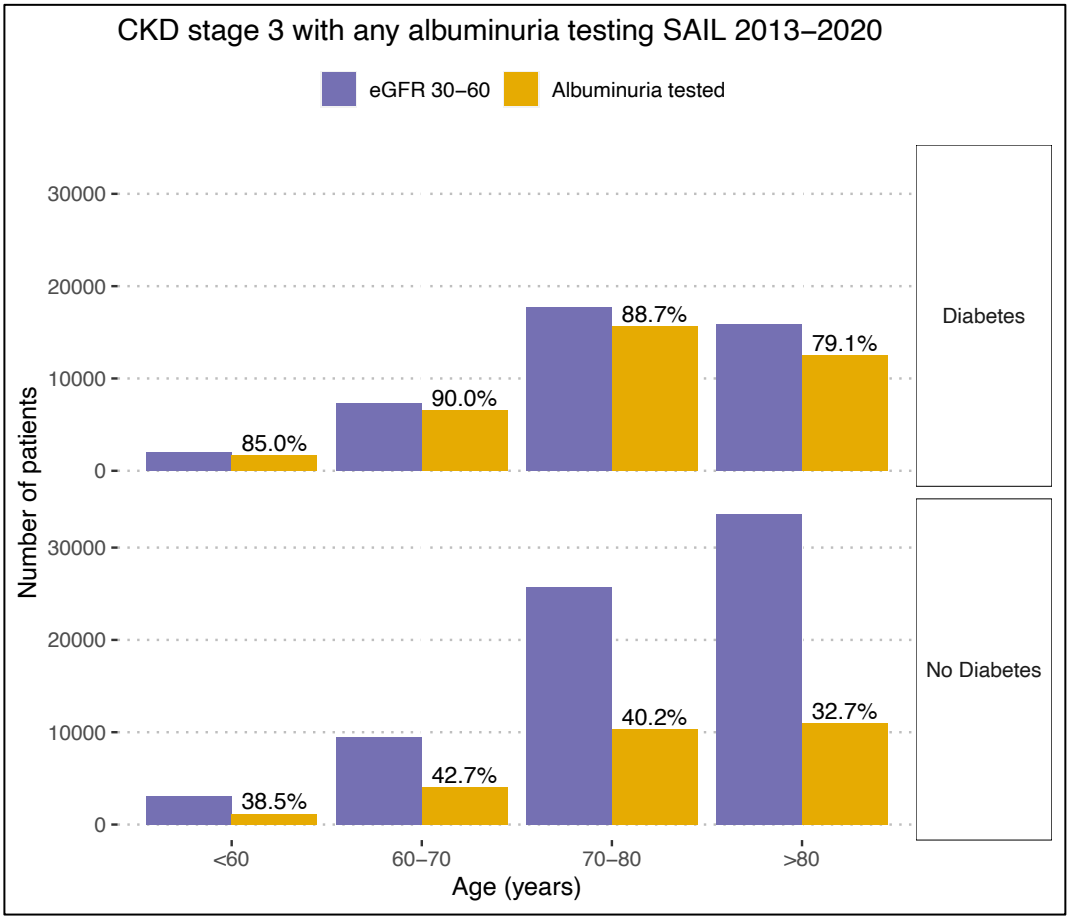
1. Levey AS, Coresh J, Greene T, et al. Expressing the Modification of Diet in Renal Disease Study Equation for Estimating Glomerular Filtration Rate with Standardized Serum Creatinine Values. *Clinical Chemistry* 2007; 53: 766–772.
2. Levey AS, Stevens LA, Schmid CH, et al. A new equation to estimate glomerular filtration rate. *Ann Intern Med* 2009; 150: 604–612.
3. Inker LA, Eneanya ND, Coresh J, et al. New Creatinine- and Cystatin C–Based Equations to Estimate GFR without Race. *New England Journal of Medicine* 2021; 385: 1737–1749.



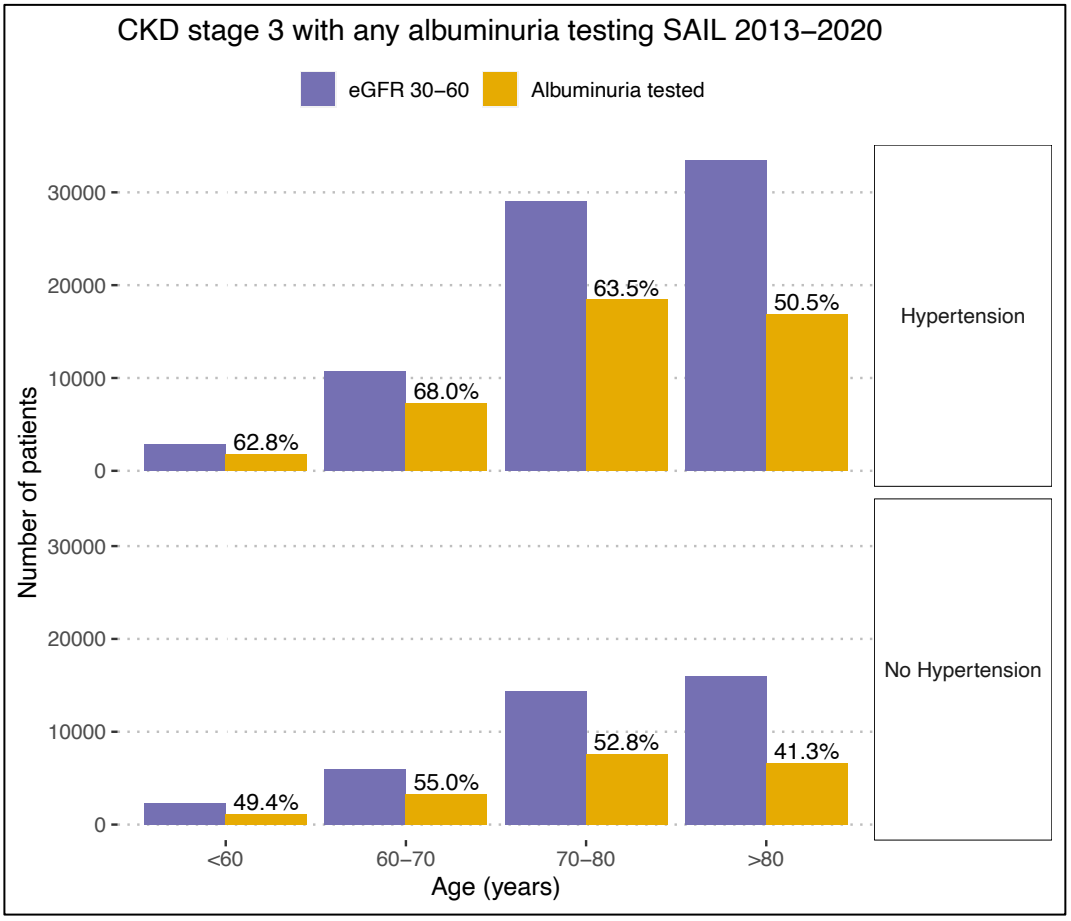
Supplementary Figure S1. Consort diagram

		uACR not tested	uACR tested	P-value
Overall N (%)		81440 (56.3)	63010 (43.6)	<0.001
Age: Median (IQI)		83 (76-89)	81 (75-87)	<0.001
Sex	Women N (%)	41437 (59.3)	39103 (52.4)	<0.001
Coded CKD		32925 (47.1)	55539 (74.5)	<0.001
Diabetes		9878 (14.1)	46767 (62.7)	<0.001
Hypertension		44343 (63.5)	55193 (74.0)	<0.001
$eGFR_{2021}$: Median (IQI)		48 (40-54)	44 (36-51)	<0.001

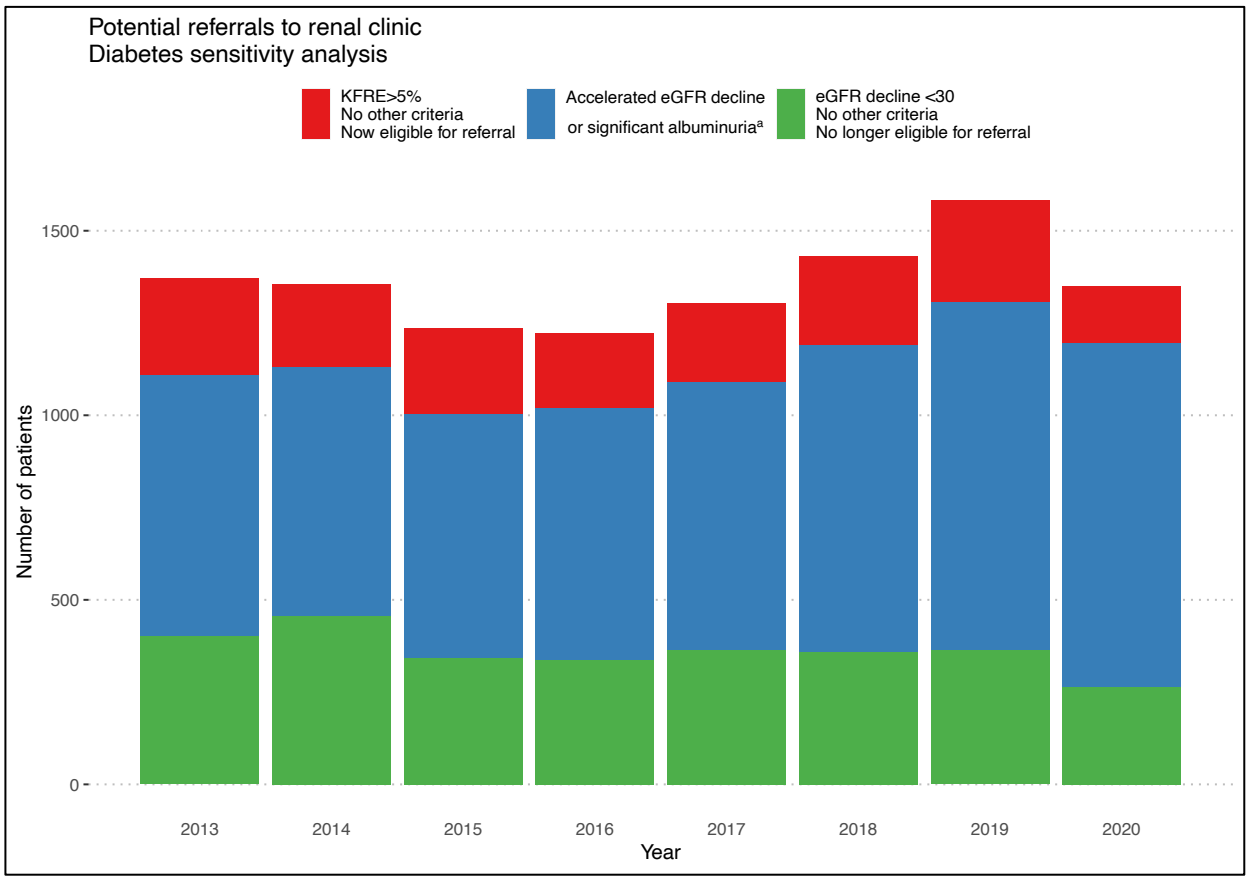
Supplementary Table S1. Characteristics of patients in SAIL with biochemical CKD G3A/G3B by testing of uACR. P-values are from chi-squared tests for categorial variable and analysis of variance tests for continuous variables



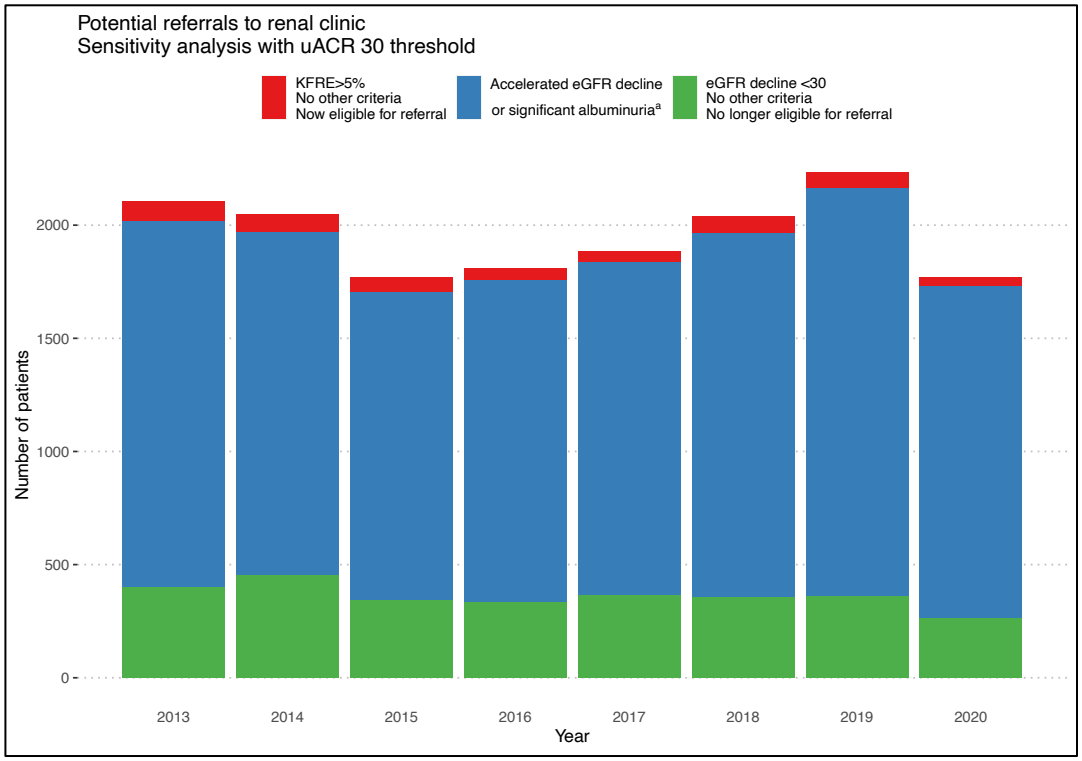
Supplementary Figure S2. Albuminuria testing at any time stratified by age and diabetes mellitus



Supplementary Figure S3. Albuminuria testing at any time stratified by age and hypertension



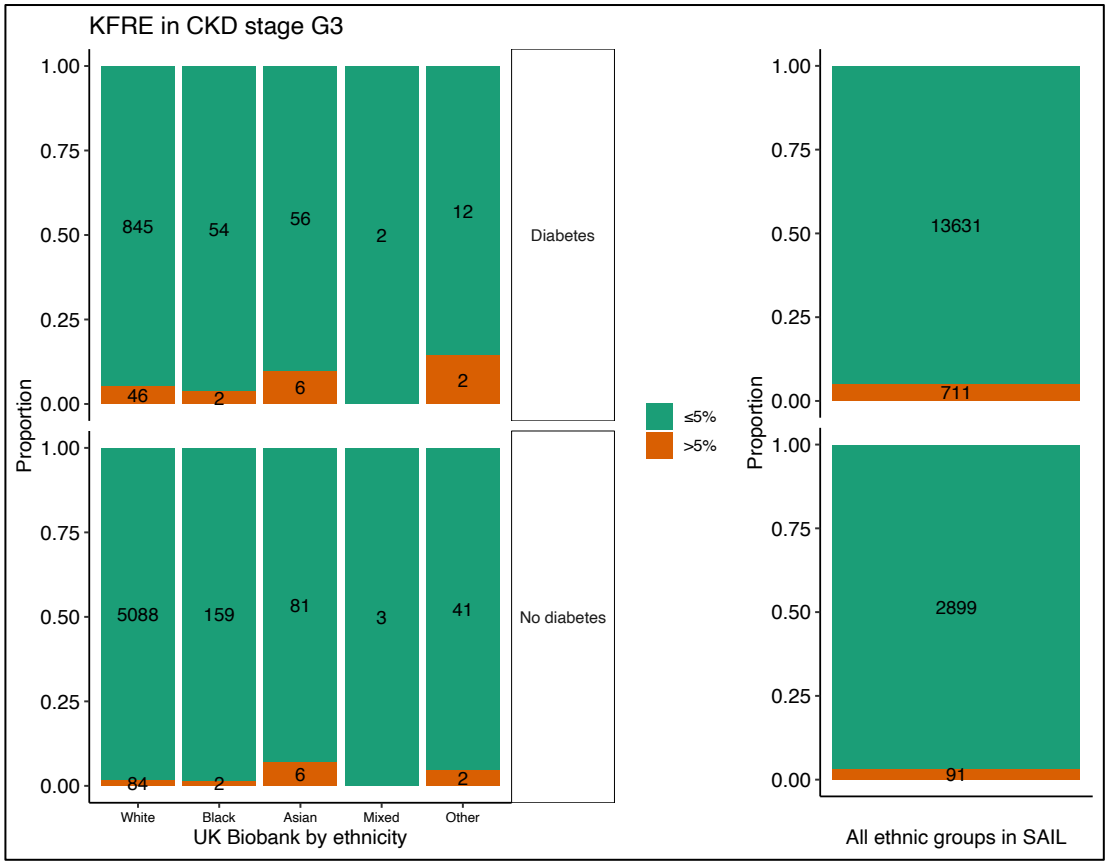
Supplementary Figure S4. Renal referral sensitivity analysis A. The albuminuria threshold for patients with diabetes was adjusted from uACR>70mg/mmol to uACR>200mg/mmol.



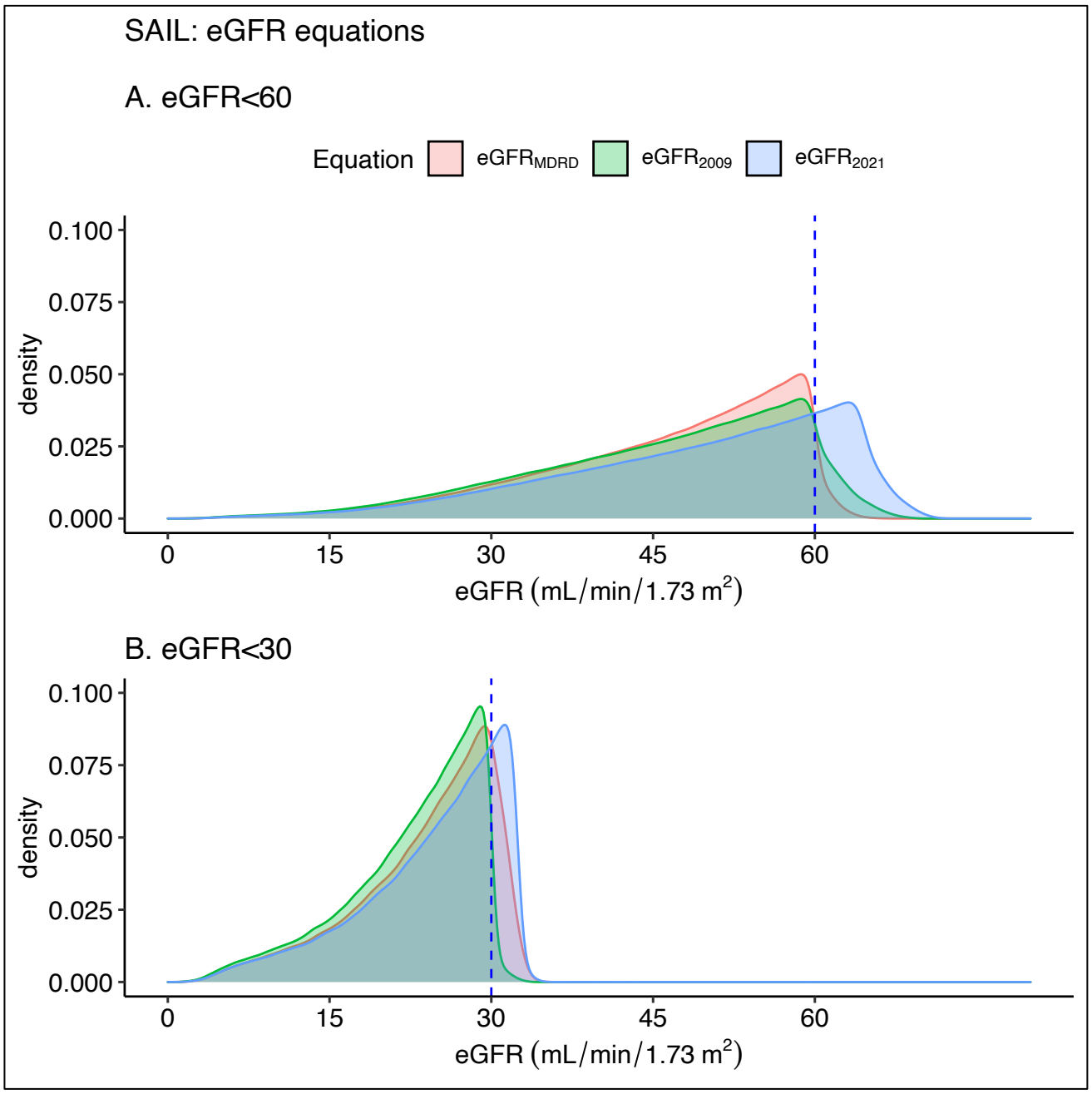
Supplementary Figure S5. Renal referral sensitivity analysis B. The albuminuria threshold was adjusted from uACR>70mg/mmol to uACR>30mg/mmol.

		Referral criteria		P-value
		eGFR	KFRE	
Age (Years, interquartile interval)	Median	83 (75-88)	78 (72-83)	<0.001
Sex N (%)	Female	232 (56.6)	41 (22.3)	<0.001
	Male	178 (43.4)	143 (77.7)	

Supplementary Table S2. Characteristics of patients in SAIL eligible for nephrology referral



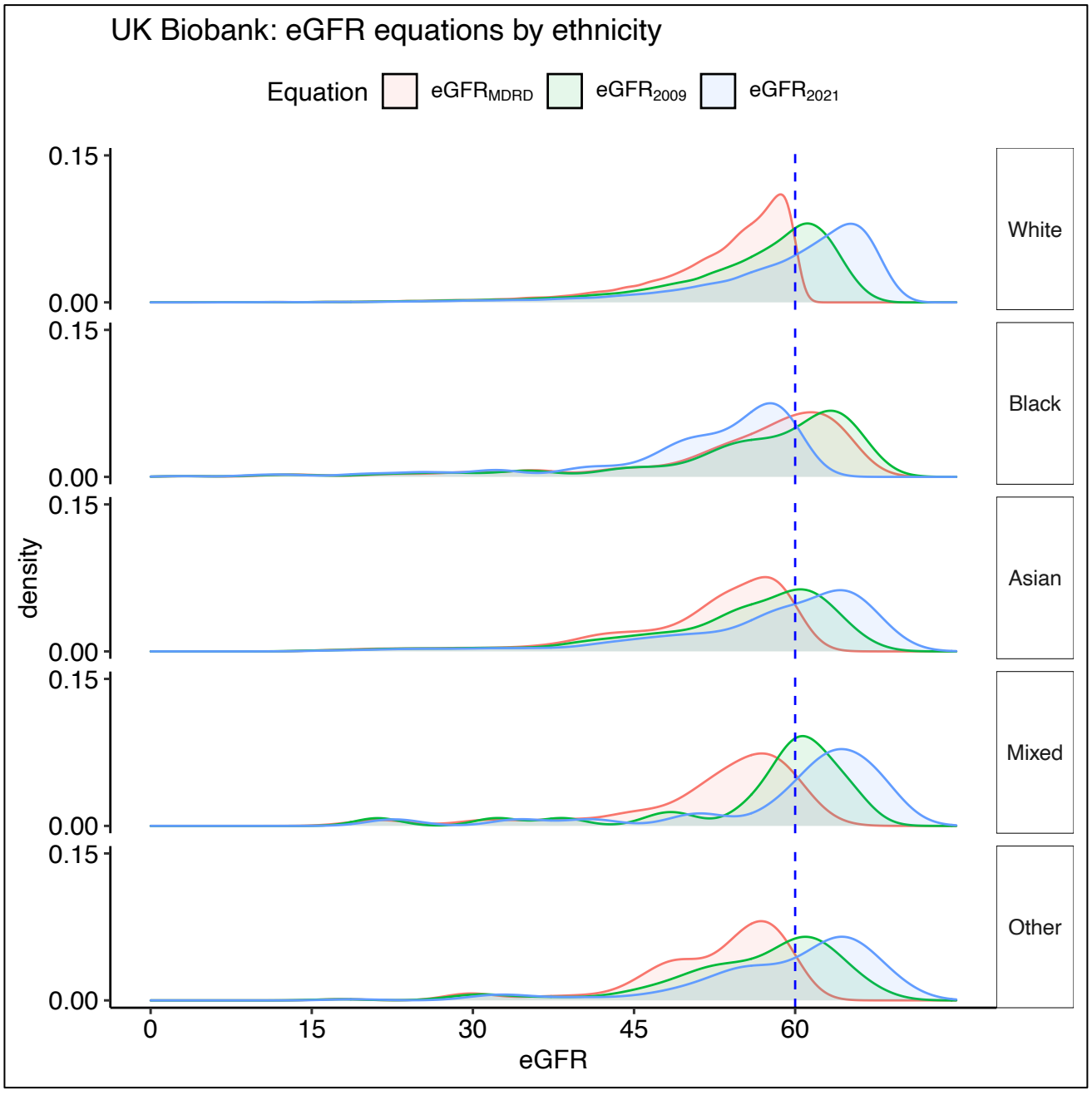
Supplementary Figure S6. Kidney failure risk in eGFR 30-60 stratified by ethnicity and diabetes mellitus



Supplementary Figure S7. Density plot of eGFR values in SAIL by equation: A. eGFR<60mL/min/1.73m^2 using any equation, B. eGFR<30mL/min/1.73m^2 using any equation

Comparator equation	Incident eGFR using comparator equations (mL/min/1.73m^2)	$eGFR_{2021}$	n	Age: years (median: IQI)	Sex: female (%)
$eGFR_{MDRD}$	<60	Confirms	49,820	78 (72-84)	53.2
		Declassifies	26,267	71 (64-78)	62.8
	<30	Confirms	8,142	80 (71-86)	47.5
		Declassifies	1,040	72 (63-79)	60.3
$eGFR_{2009}$	<60	Confirms	50,369	77 (70-83)	54.9
		Declassifies	24,487	78 (71-84)	54.1
	<30	Confirms	7,864	80 (70-86)	47.5
		Declassifies	3,039	84 (78-89)	51.3

Supplementary Table S3. CKD classification in SAIL by eGFR equation



Supplementary Figure S8. Density plot of eGFR values by ethnicity in UK Biobank (eGFR<60ml/min/1.73m^2 using any equation)

	White	Black	Asian	Mixed	Other
$eGFR_{MDRD}$ to $eGFR_{2021}$	+9.7 (+6.0 to +12.4)	-4.0 (-6.5 to -2.8)	+9.3 (+3.4 to +12.8)	+10.9 (+6.2 to +14.0)	+9.9 (+4.3 to +13.1)
$eGFR_{2009}$ to $eGFR_{2021}$	+4.2 (+3.6 to +4.6)	-9.8 (-11.6 to -8.3)	+3.9 (+3.2 to +4.4)	+3.9 (+3.4 to +4.3)	+3.8 (+3.2 to +4.3)

Supplementary Table S4. All UK Biobank participants: median changes to eGFR values in mL/min/1.73m^2 when using different equations, stratified by ethnicity