Kidney Disease, Race and GFR Estimation

Andrew S Levey, MD; Silvia M Titan, MD, PhD; Neil R Powe, MD, MS, MBA; Josef Coresh, MD, PhD; Lesley A Inker, MD, MS

Supplemental Box. Race, Ethnicity and Ancestry*
Descriptions and Methods for Ascertainment
- Race. There is no consensus on how to define race; initially proposed as a phenotypic classification based on physical features as a proxy for the identification of a pool of distinct genetic traits; currently understood as a social construct, a "culturally structured, systematic way of looking at, perceiving and interpreting" reality.(1-9)   - Ethnicity. Group of individuals tied by the assumption of a common cultural background, derived from beliefs or identities related to nationality, language, culture, diet, "race", socio-economic status, political and/or religion.(3)   - Ancestry. Defined as ancestral descent/lineage. No consensus on exact definition, neither in how to deal with multisource ancestry. May be defined geographically, geopolitically, culturally or genetically. Genetic ancestry can be measure by testing a large number of genetic variants (SNPs) and comparing results to a reference library (for example, Hap Map); alternative genetic ancestry measures are chromosome Y or mitochondrial haplogroups.(10)
2001 Revised Standards for the Classification of Federal Data on Race and Ethnicity by the US Office and Management and Budget(11)
Categories for Race   - American Indian or Alaska Native. A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.   - Asian. A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.   - Black or African American. A person having origins in any of the black racial groups or Africa.   - Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.   - White. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
Categories for Ethnicity   - Hispanic or Latino. A person of Cuban, Mexican, Puerto Rican, South or Central American, of other Spanish culture or origin, regardless of race.   - Not Hispanic or Latino.
*Definitions of race, ethnicity, and ancestry are not uniform. The 2003 report by the Institute of Medicine(12) adopted the 2001 revised classification of race and ethnicity recommended by the US Office of Management and Budget(11), because it is "… commonly accepted among researchers, and most federally funded research utilizes these terms" and "… access to and the allocation of healthcare resources differ with striking consistency across these population groups, making them useful in tracking disparities in care." However, the report noted "these definitions have been subject to considerable criticism, including: reinforcement of the concept of 'race' as reflecting genetic or biologic differences between population groups; failure to reflect the fluid and dynamic nature of sociopolitical identity; and failure to reflect the way many Americans choose to define themselves."

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Supplemental Table. Descriptive characteristics of CKD-EPI participants by race.

	CKD-EPI Development n= 8254		CKD-EPI External Validation n= 3771	
	African American (n=2601)	**Non-African American** (n=5653)	**African American** (n=372)	**Non-African American** (n=3399)
Age (years)	53 (12.0)	44 (15.2)	49 (14.0)	49 (14.7)
Age category				
< 40 years	397 (15.2)	2524 (44.6)	102 (27.4)	950 (27.9)
≥40 - <65 years	1729 (66.5)	2425 (42.9)	217 (58.3)	1927 (56.7)
≥65 years	475 (18.3)	704 (12.5)	53 (14.3)	522 (15.4)
Sex (male)	1575 (60.6)	3073 (54.4)	191 (51.3)	1849 (54.4)
Diabetes	297 (11.4)	2109 (37.3)	95 (25.5)	970 (28.5)
Transplant	24 (0.9)	336 (5.9)	52 (14.0)	1082 (31.8)
mGFR (mL/min/1.73m^2)	55 (27.2)	73 (43.0)	63 (33.7)	70 (35.7)
GFR category				
<30 (mL/min/1.73m^2)	502 (19.3)	1193 (21.1)	66 (17.7)	466 (13.7)
≥30 - <60 (mL/min/1.73m^2)	1020 (39.2)	1314 (23.2)	130 (35.0)	1017 (29.9)
≥60 - <90 (mL/min/1.73m^2)	803 (30.9)	884 (15.6)	83 (22.3)	879 (25.9)
≥90 (mL/min/1.73m^2)	276 (10.6)	2262 (40.0)	93 (25.0)	1037 (30.5)
Serum creatinine (mg/dL)	1.9 (1.1)	1.6 (1.2)	1.8 (1.3)	1.4 (0.9)
eGFR$_{cr}$ (mL/min/1.73m^2)	55.6 (27.1)	71.3 (38.5)	64.9 (36.7)	66.4 (31.8)
BSA (m^2)	2.00 (0.25)	1.90 (0.23)	1.96 (0.23)	1.89 (0.23)
BMI (kg/m^2)	30.6 (6.7)	27.2 (5.5)	30.2 (6.6)	26.7 (5.4)
BMI category				
<20 (kg/m^2)	46 (1.8)	138 (2.4)	7 (1.9)	152 (4.5)
≥20 - <25 (kg/m^2)	400 (15.4)	1828 (32.4)	68 (18.4)	1154 (34.1)
≥25 - <30 (kg/m^2)	854 (32.8)	2132 (37.7)	112 (30.4)	1253 (37.1)
≥30 (kg/m^2)	1301 (50.0)	1555 (27.5)	182 (49.3)	822 (24.3)

Variables are expressed as mean (standard deviation) or n (%). BSA, body-surface area; BMI, body-mass index; mGFR, measured GFR; eGFR$_{cr}$, estimated GFR based on the CKD-EPI creatinine equation. In the external validation population, for BMI and BSA, there were 18 missing values among non-African Americans and 3 missing values among African Americans.

From CKD-EPI study.(13, 14) Note, in the original publication, the development dataset included two subgroups: a development population (2/3) and internal validation population (1/3). African Americans were referred to as Blacks and non-African Americans included Hispanic, Asians, and white or other.

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