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# Supplemental Methods for Performance in External Validation (Bias, Precision and Accuracy):

To allow uniform comparison of each approaches’ performance in external validation with regard to statistical bias, precision and accuracy we elected to use a single dataset that had representation of both Black and non-Black individuals and which was not used in the development of any of the approaches being considered. This dataset included 11 studies of 5040 participants, 579 (14.3%) of whom were Black adults. Mean GFR 76.4 (29.6) mL/min/1.73m2 in the overall dataset and was 84.0 (26.0) mL/min/1.73m2 in Black adults.1

Bias was defined as the median difference between measured GFR (mGFR) and eGFR. Precision was defined as the interquartile range of the difference of mGFR minus eGFR. Accuracy was defined as the percentage of estimates greater than 30% of measured GFR (1- P30). 1-P30 reflects clinically relevant large errors. Accuracy metrics incorporate both bias and precision, and are most relevant for individual decision making. Bias in each group and differential bias between groups have an impact on population health such as CKD prevalence estimates and eGFR risk associations; specifically bias in one group and not in another could lead to systematic differences in treatment of patients at the same mGFR level.

For all three metrics, we calculated 95% confidence intervals by bootstrap methods (2000 bootstraps).We assessed significance of the differences between the reference and proposed alternative approaches as non-overlapping confidence intervals, equivalent to a p-value of < 0.01. For comparisons that achieved statistical significance, we then categorized the metric by its magnitude in comparison to mGFR. KDIGO CKD guidelines have previously used 20% as acceptable and 10% as optimal for 1-P30.2 We therefore categorized 1-P30 ­as small, moderate, and large < 10, 10 to 20 and > 20%, respectively.  Similar thresholds had not been previously discussed for bias and precision. The Task Force group felt it was appropriate to do so to help the reader understand the implications of changes in bias and precision for the current approach used. We categorized bias as small, moderate, and large as the absolute magnitude of the median difference of mGFR –eGFR of < +/-5, +/-5 to +/-10 or > +/-10 ml/min per 1.73 m2, respectively as compared to the reference equation. We categorized IQR as small, moderate, and large as < 10, 10 to 20 and > 20 ml/min per 1.73 m2, respectively.  We considered equations that have large bias, IQR, or 1-P30, to have poor performance.

# Supplemental Methods for Potential Consequences on clinical decision making

The potential consequences for clinical decision-making were organized into: general medical care (including medication initiation, discontinuation and dosing) and nephrology care. Most research studies that have evaluated these consequences to date are national or single institutional simulations of alternative approaches compared to approach 1, CKD-EPI eGFRcr that estimate the number of Black adults potentially impacted by shifting eGFR across thresholds commonly used for clinical decision making.

For the purposes of presentation of the simulation data on a figure, we used a single study that compared the 5 alternative approaches in 563 participants from the 1999-2000 and 2001-2002 cycles of National Health and Nutrition Examination Surveys (NHANES) who were 20 years and older and with serum creatinine or cystatin C3. Prevalence estimates for eGFR categories using guideline recommended CKD GFR (G) stages (< 30, 30-44, 45-59, 60-89 and > 90 ml/min/1.73m2)2,4 were applied to the 2019 U.S. estimate of 246.6 million adults aged >20 years.  Units of GFR are ml/min per 1.73 m2. To help the reader interpret the magnitude of the numbers, the Task Force assessed changes in the number of people estimates to change categories. Large indicates estimated changes in the number of people estimates to be below a threshold of > 1 million. Moderate – 500.000- 999,000. Small – 100,000 – 499,000. Minimal < 100,000.

# Supplemental Methods for Potential Consequences on Medication Dosing

The potential consequences on medication dosing and usage were based on changes were considered along three categories:

1. Drug Initiation to decrease CKD Progression such as angiotensin converting enzyme inhibitors/ angiotensin receptor blockers (ACEi/ARB), sodium-glucose cotransporter – 2 inhibitors (SGLT2i) and glucagon-like peptide-1 receptor agonists (GLP1-ra).
2. Inappropriate drug continuation and overdosing
   1. Medications that might be inappropriately continued when it is not appropriate include glyburide; metformin and bisphosphonates; dulaglutide and dabigatran which are counter-indicated when eGFR <60, < 30 and < 15 ml/min per 1.73 m2, respectively
   2. Increased potential for overdosing leading to potential severe adverse effects or toxicities. For example, chemotherapies (e.g., carboplatin, cisplatin, cytarabine, melphalan), anticoagulants (dabigatran, rivaroxaban), immunosuppressives/immunotherapies (e.g., methotrexate, lenalidomide)
3. Inappropriate drug discontinuation and underdosing
   1. Medications more likely to be discontinued when it is not appropriate (e.g., metformin at eGFR <30 ml/min per 1.73 m2, SGLT-2 inhibitors at various eGFR thresholds based on product label or practice guidelines, dabigatran at eGFR <15 ml/min per 1.73 m2, chemotherapies
   2. Increased potential for underdosing leading to less effective drugs: Potential for underdosing and decreased effectiveness for several chemotherapies, antibiotics, anticoagulants and many other medications.

For each category we considered the consequences for Black and non-Black race groups based on the under or overestimate compared to mGFR using the performance data shown in Tables S6, Table 2 and Figure 2. For assessment of medication dosing, we didn’t consider whether the direction of the bias changed for the new approach compared to the current approach. We used the same thresholds as described above to determine if we expected small or moderate impact. We also indicated that some approaches are more accurate leading to better decision making for individuals’.

|  |  |  |
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| Table S1: Topics and Panelists/Discussants During Phase Two | | |
| **Topic** | **Moderators and Panelists/Discussants** | **Location** |
| **Transplant Waitlist and Nephrology Referral and Kidney Donation Evaluation** | **Neil Powe, MD, MPH, MBA** | |
| Winfred Williams, MD | Boston, MA |
| Delphine Tuot, MD | San Francisco, CA |
| Vineeta Kumar, MD | Birmingham, AL |
| Tanjala Purnell, PhD | Baltimore, MD |
| Elaine Ku, MD | San Francisco,CA |
| Michelle Josephson, MD | Chicago, IL |
| Silas Norman, MD | Ann Arbor, MI |
| **Quantifying Impact of Race Removal and Patient Safety Considerations** | **Nwamaka Eneanya, MD, MPH; Mallika Mendu, MD, MBA** | |
| Arjun Manrai, MD | Boston, MA |
| Salman Ahmed, MD | Boston, MA |
| Melanie Hoenig, MD | Boston, MA |
| Rajnish Mehrotra, MD | Seattle, WA |
| Alp Ikizler, MD, PhD | Nashville, TN |
| Jeffrey Fink, PhD | Baltimore, MD |
| Karthik Sivashanker, MD | Boston, MA |
| Alan Kliger, MD | New Haven, CT |
| Lee-Ann Wagner, MD | Baltimore, MD |
| Tom Sequist, MD | Boston, MA |
| **The role of eGFR on Pharmacologic Considerations** | **Wendy St. Peter, PharmD; Mallika Mendu, MD, MBA** | |
| Amit Pai, PharmD | Ann Arbor, MN |
| Erin F. Barretto, PharmD, RPH | Rochester, MN |
| Joanna Hudson, PharmD | Nashville, TN |
| Paul Palevsky, MD | Pittsburgh, PA |
| James Wetmore, MD, MS | Minneapolis, MN |
| Thomas Nolin, PharmD, PhD | Pittsburgh, PA |
| Jeffrey Fink, PhD | Baltimore, MD |
| Silvia Titan, MD, PhD | Boston, MA |
| Katherine Tuttle, MD | Spokane, WA |
| Michael Shlipak, MD | San Francisco, CA |
| **Minority Participation in Clinical Trials and CKD Research in African Americans** | **Crystal Gadegbeku, MD; Marva M. Moxey-Mims, MD** | |
| David M. Charytan, MD | New York, NY |
| Jackson T. Wright, MD, PhD | Cleveland, OH |
| Herman A. Taylor, Jr., MD | Atlanta, GA |
| Keith C. Norris, MD | Los Angeles, CA |
| L. Ebony Boulware, MD, MPH | Durham, NC |
| Stephen B. Thomas, MS, PhD | College Park, MD |
| Akinlolu O. Ojo, MD, PhD, MBA, MPH | Kansas City, KS |
| **The Food and Drug Administration, Centers for Medicare and Medicaid Services Perspectives on Drug Approval and Population Tracking** | **Wendy St. Peter, PharmD; Nilka Rios Burrows, MPH, MT** | |
| Thomas Nolin, PharmD, PhD | Pittsburgh, PA |
| Aliza Thompson, MD, MS | Silver Spring, MD |
| Julia Breyer Lewis, MD | Nashville, TN |
| Afshin Parsa, MD, MPH | Baltimore, MD |
| Morgan Grams, MD, PhD, MHS | Baltimore, MD |
| Joseph Coresh, MD, PhD, MHS | Baltimore, MD |
| Rajiv Saran, MBBS, MD, DTCD, MS | Ann Arbor, MI |
| Jessie Roach, MD | Washington, DC |
| Kirsten Johansen, MD | Minneapolis, MN |
| Sankar Naveneethan, MD, MS, MPH | Houston, TX |
|  | Susan Crowley, MD MBA | West Haven, CT |
| **New Science** | **Cynthia Delgado, MD and Neil Powe, MD, MPH, MBA** | |
| Robert A. Star**,** MD | Bethesda, MD |
| Lawrence Agodoa, MD | Bethesda, MD |
| Afshin Parsa, MD, MPH | Bethesda, MD |
| Tom Greene, PhD | Salt Lake City, UT |
| Pierre Delanaye, MD, PhD | Liège, Belgium |
| Kate Bramham MBBS, PhD | London, UK |
| Anders Grubb | Lund, Sweden |
| Hans Pottel, PhD | Leuven, Belgium |
| Hongquan Peng,MD | Kiang Wu,Macau |
| Krista L. Lentine, MD, PhD | Saint Louis, MO |
| Mona D. Doshi, MBBS | Detroit, MI |
| Richard B. Dorshow, PhD | Saint Louis, MO |
| Stuart L. Goldstein, M | Cincinnati, OH |
| Harold I. Feldman, MD, MSCE | Philadelphia, PA |
| Chi-yuan Hsu, MD, MS | San Francisco, CA |
| Lesley A. Inker, MD, MS | Boston, MA |

# Table S2: Equation specification in each approach

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| **Approach** | **Abbreviation** | **Equation** |
| 1. CKD-EPI eGFRcr (CKD-EPI) (age, sex, race) | CKD-EPIcr | eGFR = 141 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.209 x 0.993Age x 1.018 [if female] x 1.159 [if black],  *Where Scr is serum creatinine, κ is 0.7 for females and 0.9 for males, α is -0.329 for females and -0.411 for males, min indicates the minimum of Scr/ κ or 1, and max indicates the maximum of Scr/κ or 1.* |
| 2. MDRD Study (age, sex, race ) | MDRDcr | eGFR = 175 x Scr-1.154 x age-0.203 x 1.212 [if black] x 0.742 [if female] |
| 3. eGFRcr (CKD-EPI (age, sex, race) with “black” estimate reported as “high muscle mass” and non-black estimate reported as “low muscle mass” | CKD-EPIcr\_MM | Same as #1 but reporting different |
| 4. eGFRcr (CKD-EPI) (age, sex, race) with “black” estimate reported as “high value” and Non-Black reported as “low value” | CKD-EPIcr\_H/L | Same as #1 but reporting different |
| 5. eGFRcr (CKD-EPI) (age, sex, race) with the Black coefficient removed and eGFR value for Non-Black is reported for all | CKD-EPIcr\_NB | Same as #1 but does not use race for all in computation of GFR |
| 6. eGFRcr (CKD-EPI) (age, sex, race), with the Black coefficient used and eGFR value for African Americans is reported for all | CKD-EPIcr\_B | Same as #1 but does uses race variable for all in computation of GFR |
| 7. Blended eGFRcr (CKD-EPI) (age, sex, race) using single coefficient weighted for %AA in specific population reported for all | CKD-EPIcr\_blend | Modification of #1 |
| 8. CG estimated creatinine clearance (age, sex, weight) | CG\_Clcr | CrCl = ([140-age] × weight in kg)/(serum creatinine × 72) × 0.85 [if female] |
| 9. eGFRcr (FAS) (age, sex, population specific Scr/Q) | FAScr | eGFR= 107.3/(Scr/Q) X 0.988(age-40) [if age ≥ 40 years]  *Q is 0.7 for females and 0.9 for males* |
| 10.   eGFRcr (EKFC) (age, sex, population specific Scr/Q) | EKFCcr | eGFR = 107.3 × (Scr µmol/L /Q)−0.322 × 0.990(Age − 40) [if age ≥ 40 years] (SCr µmol/L /Q <1)  eGFR = 107.3 × (Scr µmol/L /Q)−1.132 × 0.990(Age − 40) [if age ≥ 40 years] (SCr µmol/L /Q ≥1)  *For ages 2–25 y:*  Males: ln(Q) = 3.200 + 0.259 × Age − 0.543 × ln(Age) − 0.00763 × Age2 + 0.0000790 × Age3  Females: ln(Q) = 3.080 + 0.177 × Age − 0.223 × ln(Age) − 0.00596 × Age2 + 0.0000686 × Age3  *For ages >25 y:*  Males: Q = 80 µmol/L  Females: Q = 62 µmol/L |
| 11.   eGFR (LM) (age, sex) | LMcr | eGFR = eX-0.0158 X max(Age:18) = 0.438 X ln(max(Age:18))  *Where X:*  Female <150 µmol/L: X = 2:50 + 0.0121 x (150 - )  Female ≥150 µmol/L: X = 2:50 – 0.926 x ln(/150)  Male <180 µmol/L: X = 2:56 + 0.00968 x (180 - )  Male ≥180 µmol/L: X = 2:56 – 0.926 x ln(/180) |
| 12.  eGFRcr (CKD-EPI) refit without race variable | CKD-EPIcr\_R | eGFR = 142 X min(Scr/k,1)α X max(Scr/k,1)-1.200 0.994age  X 1.012 [if female]  where Scr is serum creatinine, k is 0.7 for females and 0.9 males, α is  -0.241 for females and -0.302 for males, min indicates the minimum of Scr/k or 1, max indicates the maximum of Scr/k or 1 |
| 13.   eGFRcr (CKD-EPI) refit with height + weight without race variable | CKD-EPI\_R\_HW | Not developed |
| **Creatinine in combination with cystatin C or other markers** |  |  |
| 14. eGFRcr-cys (CKD-EPI) with race coefficient (age, sex, race) | CKD-EPIcr-cys | eGFR = 135 x min(Scr/k,1)α x max(Scr/k,1)- 0.601 x min(Scys/0.8,1)- 0.375 x max(Scys/0.8,1)- 0.711 x 0.995age x 0.969 [if female] X 1.080 [if black]  *where Scr is serum creatinine, Scys is serum cystatin C κ is 0.7 for females and 0.9 for males, α is −0.248 for females and −0.207 for males, min indicates the minimum of Scr/κ or 1, and max indicates the maximum of Scr/κ or 1.* |
| 15. eGFRcr-cys (CKD-EPI) (age, sex, race) with “black” estimate reported as “high muscle mass” and non-black estimate reported as “low muscle mass” | CKD-EPIcr-cys\_MM | Same as #14 but reporting different |
| 16. eGFRcr-cys (CKD-EPI) (age, sex, race) with “black” estimate reported as “high value” and nonblack estimate reported as “low value” | CKD-EPIcr-cys\_H/L | Same as #14 but reporting different |
| 17. eGFRcr-cys (CKD-EPI) (age, sex, race) with the Black coefficient removed and value for nonBlack estimate is reported for all | CKD-EPIcr-cys\_NB | Same as #14 but does not use race for all in computation of GFR |
| 18. eGFRcr-cys (CKD-EPI) (age, sex, race), with Black coefficient used and value for Black is reported for all | CKD-EPIcr-cys\_B | Same as #14 but does uses race variable for all in computation of GFR |
| 19. Blended eGFRcr-cys (CKD-EPI) (age, sex and race) using a single coefficient weighted for % AA in the specific population is reported for all | CKD-EPIcr-cys\_blend | Modification of #14 |
| 20.eGFRcr-cys(CKD-EPI) refit without race variable | CKD-EPIcr-cys\_R | eGFR = 135 X min(Scr/k,1)α X max(Scr/k,1)-0.544  X min(Scys/0.8,1)-0.323 X max(Scys/0.8,1)-0.778 X 0.996age X 0.963 [if female]  where Scr is serum creatinine Scys is serum cystatin C, k is 0.7 for females and 0.9 males, α is -0.219 for females and -0.144 for males, min indicates the minimum of Scr/k or 1, max indicates the maximum of Scr/k or 1 |
| 21. eGFRcr-cys (FAS) (age, sex, population specific Q) | FAScr-cys | eGFR = 107.3 / α x (Scr/Qcrea) + (1 – α) x (Scys/Qcys) X 0:988(Age – 40) [if age > 40 years]  *The coefficient ‘a’ in the denominator may be considered as a weighting factor for the normalized renal biomarkers.* |
| 22. eGFRcr-cys- β2m- βtp (creatinine, cystatin C, Beta 2 microglobulin, Beta trace protein)11 (age, sex) | CKD-EPI\_4M | eGFR = 131 x min(Scr/k,1)α x max(Scr/k,1)-0.471 x min(Scys/0.8,1)-0.519 x max(Scys/0.8,1)-0.423 x B2M-0.103 x min(BTP/0.6,1)-0.004 x max(BTP/0.6,1) -0.177 x 0.996age x 0.937 [if female],  *Where k is 0.7 for females and 0.9 males, α is -0.243for females and -0.295for males, min indicates the minimum of Scr/k or 1, max indicates the maximum of Scr/k or 1* |
| **Cystatin C or Other filtration Markers** |  |  |
| 23. eGFRcys (CKD-EPI) (age, sex) | CKD-EPIcys | eGFR = 133 x min(Scys/0.8,1)-0.499 x max(Scys/0.8,1)-1.328 x 0.996age x 0.932 [if female] |
| 24. eGFRcys (FAS) (age, sex, population specific Q) | FAScys | eGFR = 107.3/(Scys/Qcys) X 0.988(Age – 40) [if age > 40 years] |
| 25. eGFRcys (CAPA) (age ) | CAPAcys | eGFR= 130 × Scys−1.069 × Age−0.117– 7 |
| 26. eGFRcys-β2m- βtp (cystatin, beta 2-microglobulin, beta-trace protein) (age, sex) | CKD-EPI\_3M | eGFR = 120 x min(Scys/0.8,1)-0.876 x max(Scys/0.8,1)-0.697 x B2M-0.205 x min(BTP/0.6,1)0.038 x max(BTP/0.6,1)-0.243 X 0.999age x 0.922 [if female] |

Creatinine is in mg/dL unless otherwise indicated. Cystatin C is in mg/L

|  |  |  |
| --- | --- | --- |
| Table S3: Summary of attributes 1 to 4: Filtration marker assay, implementation challenges, equation marker, performance compared to measured GFR\*assay**Table S3A: Metric adjudication key for attributes 1 to 4** | | |
| **Attribute** | **Metric or criterion** | **Metric adjudication key. Shading indicates evaluation as no limitations (light), some limitations (medium), or a number of limitations (darker)** |
| 1. **Filtration marker assay** | Available | Widespread (W) |
| Specialized labs (S) |
| Research labs (R) |
| Needs development (N) |
| Standardized | **Yes (Y)** |
| in progress (IP)) |
| No (N) |
| Available on high throughput analyzers | **Yes (Y)** |
| could be with effort (CE) |
| No (N) |
| 2. **Implementation challenges** | Laboratories | no change (NC) |
| Change to reporting only (CR) |
| Change to equation (CE) |
| New filtration marker (NF) |
| Additionalvariable required for computation (AV) |
| Clinical practice | No problems anticipated (NP) |
| Limited information (L) |
| Individual decision required to apply to individual patients (ID) |
| Requires information that is not reliably available (IR) |
| Variation in eGFR values across labs, difficulty in interpreting for individual patient (V) |
| 3. **Equation** | Equation requires specification of race | Yes (Y) |
| Reporting adjusted such that race not required for eGFR value (RA) |
| No (N) |
| Developed in population that included Black individuals | Yes (Y) |
| No (N) |
| Developed in a diverse population of other characteristics | Yes (Y) |
| by age (A), CKD (C) status, diabetes (D), and gender (G) |
| 4. **Performance compared to measured GFR\*** | All | Unknown due to insufficient data |
| Not significant different from reference or between groups (ND) |
| Bias (median difference of mGFR –eGFR) | Non overlapping CI vs ref and bias worse than reference with magnitude of < +/-5 (S) |
| Non overlapping CI vs ref and bias worse than reg with magnitude +/-5 to +/-10 (M) |
| Non overlapping CI vs ref and bias worse than reg with magnitude > +/-10 (L) |
| Non overlapping CI vs ref and bias better than reference with magnitude of < +/-5 (S) |
| Differential bias | Non overlapping CI between groups and differential bias 1-2.4% (S) |
| Non overlapping CI between groups and differential bias 2.5-5% (M) |
| Non overlapping CI between groups and differential bias > 5% (L) |
| Accuracy: % eGFR > 30% of mGFR (1- P30) | Non overlapping CI vs ref and 1-P­30 worse than ref with magnitude< 10% (S) |
| Non overlapping CI vs ref and 1-P­30 worse than ref with magnitude 10 to 20% (M) |
| Non overlapping CI vs ref and 1-P­30 worse than ref with magnitude > 20% (L) |
| Non overlapping CI vs ref and 1-P­30 better than ref with magnitude< 10% (S) |
| Units of bias and IQR are ml/min per 1.73 m2; CI , confidence intervals, 1-P30 is percentage of estimates within 30% of measured GFR  \*For quantitative results, please see Supplement Table 6B | | |
|  |  |  |

## **Table S3B: Summary of Attributes 1-4: Filtration marker assay, implementation challenges, equation marker, performance compared to measured GFR assay**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1.Assay** | | | **2. Implementation** | | **3. Equation Derivation Population Diversity** | | | **4. Performance in external validation** | | |
| **Equations** | **Availability** | **Standardized** | **high throughput** | **Laboratories** | **Clinical practice** | **Race specified** | **Racial\Ethnic (Y/N)** | **Other \*** | **Bias** | **Differential Bias** | **Accuracy** |
| **Creatinine** |  |  |  |  |  |  |  |  |  |  |  |
| 1. CKD-EPIcr | W | Y | Y | NC | NP | Y | Y | ACDG | **Reference equation** | | |
| 2. MDRDcr | W | Y | Y | NC | L | Y | Y | AG | **ND** | M | ND |
| 3. CKD-EPIcr\_MM | W | Y | Y | CR | ID, IR | RA | Y | ACDG | Unknown due to insufficient data | | |
| 4. CKD-EPIcr\_H/L | W | Y | Y | CR | ID | RA | Y | ACDG | Unknown but bounded by #5 and #6 | | |
| 5. CKD-EPIcr\_NB | W | Y | Y | CR | NP | RA | Y | ACDG | M | L | ND |
| 6. CKD-EPIcr\_B | W | Y | Y | CR | NP | RA | Y | ACDG | ND | L | ND |
| 7. CKD-EPIcr\_blend | W | Y | Y | CE,AV | V | RA | Y | ACDG | Unknown due to insufficient data | | |
| 8. CG\_Clcr | W | Y | Y | CE,AV | V | N | N | ACG | **ND** | M | L |
| 9. FAScr | W | Y | Y | CE,AV | V | N | N | ACG | M | L | ND |
| 10. EKFCcr | W | Y | Y | CE,AV | V | N | N | ACG | M | L | ND |
| 11. LMcr | W | Y | Y | CE | NP | N | N | ACG | **L** | L | ND |
| 12. CKD-EPIcr\_R | W | Y | Y | CE | NP | N | Y | ACDG | **ND** | L | **ND** |
| 13. CKD-EPI\_R\_HW | W | Y | Y | CE | NP | N | Y | ACDG | Equation not available | | |
| **Creatinine in combination with cystatin C or other filtration markers** | | | | | | | | | | |  |
| 14. CKD-EPIcr-cys | S | Y | CE | NF | NP | Y | Y | ACDG | ND | S | ND |
| 15. CKD-EPIcr-cys\_MM | S | Y | CE | NF | ID | RA | Y | ACDG | Unknown due to insufficient data | | |
| 16. CKD-EPIcr-cys\_H/L | S | Y | CE | NF | ID | RA | Y | ACDG | Unknown due to insufficient data | | |
| 17. CKD-EPIcr-cys\_NB | S | Y | CE | NF | NP | RA | Y | ACDG | ND | M | S |
| 18. CKD-EPIcr-cys\_B | S | Y | CE | NF | NP | RA | Y | ACDG | ND | M | ND |
| 19. CKD-EPIcr-cys\_blend | S | Y | CE | NF, AV | V | RA | Y | ACDG | Unknown due to insufficient data | | |
| 20. CKD-EPIcr-cys\_R | S | Y | CE | CE, NF | NP | N | Y | ACDG | S | M | S |
| 21. FAScr-cys | S | Y | CE | CE, NF | V | N | N | ACG | ND | M | S |
| 22. CKD-EPI\_4M | R | N | N | NF | NP | N | Y | ACDG | M | M | S |
| **Cystatin C or other filtration markers** | | | | | | | | | | | |
| 23. CKD-EPIcys | S | Y | CE | NC,NF | NP | N | Y | ACDG | S | ND | ND |
| 24. FAScys | S | Y | CE | CE, NF, AV | V | N | N | ACG | ND | ND | ND |
| 25. CAPAcys | S | Y | CE | CE, NF | NP | N | N | ACG | ND | S | ND |
| 26. CKD-EPI\_3M | R | N | N | NF | NP | N | Y | ACDG | M | ND | ND |

# Table S4: Performance compared to measured GFR in CKD-EPI 2021 Validation.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Approach** | | **Group** | | **N** | **Bias** | **Precision** | | **Accuracy** | **Interpretation** |
|  | |  | |  | **Median Difference** | **IQR** | | **1-P30** |  |
| 1. CKD-EPIcr | | Overall | | 4050 | -0.82 (-1.17, -0.28) | 16.98 (16.24, 17.57) | | 11.2 (10.2, 12.2) | **Reference:** Greater overestimation of mGFR in Black compared to non-Black (small bias), with moderate precision overall and for non-Black and large imprecision for Black; moderate accuracy for all groups, with worse accuracy for Black participants |
| Black | | 579 | -3.65 (-5.41, -1.77) | 22.79 (19.98, 24.73) | | 14.9 (12.1, 17.8) |
| Non-Black | | 3471 | -0.49 (-0.92, -0.01) | 16.14 (15.53, 16.77) | | 10.5 (9.6, 11.5) |
| 2. MDRDcr | | Overall | | 4050 | 1.16 (0.69, 1.72) | 18.31 (17.57, 19.03) | | 13.1 (12.0, 14.2) | Compared to current (#1): Small bias (underestimate mGFR) in overall population and in non-Black (unchanged in Black) |
| Black | | 579 | -2.31 (-3.65, -0.85) | 22.86 (20.28, 25.09) | | 16.8 (13.6, 19.9) |
| Non-Black | | 3471 | 1.66 (1.05, 2.14) | 17.61 (16.81, 18.29) | | 12.5 (11.4, 13.6) |
| 3. CKD-EPIcr\_MM | | Overall | |  |  |  | |  | Unknown due to insufficient data |
| Black | |  |  |  | |  |
| Non-Black | |  |  |  | |  |
| 4. CKD-EPIcr\_H/L | | Overall | |  |  |  | |  | Unknown due to insufficient data |
| Black | |  |  |  | |  |
| Non-Black | |  |  |  | |  |
| 5. CKD-EPIcr\_NB | | Overall | | 4050 | 0.37 (-0.02, 0.79) | 16.77 (16.03, 17.60) | | 11.0 (10.0, 12.0) | Compared to current (#1): Moderate bias (underestimate of mGFR) in Blacks with no change in precision or accuracy. |
| Black | | 579 | 7.07 (5.93, 8.82) | 21.36 (18.09, 23.27) | | 13.6 (10.9, 16.6) |
| Non-Black | | 3471 | -0.49 (-0.92, -0.01) | 16.14 (15.53, 16.77) | | 10.5 (9.6, 11.5) |
| 6. CKD-EPIcr\_B | | Overall | | 4050 | -10.06 (-10.62, -9.55) | 19.70 (18.95, 20.33) | | 25.4 (24.1, 26.8) | Compared to current. (#1): Large bias (overestimate of mGFR) and large inaccuracy in overall and non-Black |
| Black | | 579 | -3.65 (-5.41, -1.77) | 22.79 (19.98, 24.73) | | 14.9 (12.1, 17.8) |
| Non-Black | | 3471 | -11.10 (-11.82, -10.39) | 19.21 (18.45, 19.99) | | 27.2 (25.7, 28.6) |
| 7. CKD-EPIcr\_blend | | Overall | | 4050 |  |  | | | Unknown due to insufficient data |
| Black | | 579 |  |  | |  |
| Non-Black | | 3471 |  |  | |  |
| 8. CG\_Clcr | | Overall | | 4047 | -7.27 (-8.14, -6.57) | 26.62 (25.36, 27.96) | | 31.1 (29.7, 32.4) | Compared to current (#1): Moderate bias (Overestimation of mGFR) overall and in non-Black with small bias in Black); Large imprecision and large inaccuracy in all |
| Black | | 579 | -4.82 (-7.44, -3.32) | 29.03 (27.26, 32.76) | | 28.3 (24.7, 32.0) |
| Non-Black | | 3468 | -7.68 (-8.53, -6.82) | 26.40 (24.98, 27.66) | | 31.5 (30.0, 33.0) |
| 9. FAScr | | Overall | | 4050 | 2.62 (2.16, 3.10) | 17.01 (16.20, 17.68) | | 10.6 (9.7, 11.6) | Compared to current (#1): Small bias (underestimate of mGFR) overall and non-Black and moderate (underestimate) for Black |
| Black | | 579 | 8.34 (6.61, 9.60) | 19.16 (16.98, 21.76) | | 13.5 (10.7, 16.2) |
| Non-Black | | 3471 | 1.84 (1.52, 2.23) | 16.54 (15.80, 17.23) | | 10.2 (9.2, 11.1) |
| 10. EKFCcr | | Overall | | 4050 | 2.99 (2.54, 3.38) | 16.33 (15.64, 16.90) | | 12.2 (11.2, 13.2) | Compared to current (#1): Small bias (underestimate of mGFR) overall and non-Black, moderate (underestimate) for Black |
| Black | | 579 | 9.07 (7.65, 10.59) | 19.80 (17.76, 22.27) | | 15.0 (12.1, 18.0) |
| Non-Black | | 3471 | 2.07 (1.65, 2.57) | 15.57 (14.82, 16.36) | | 11.8 (10.7, 12.8) |
| 11. LMcr | | Overall | | 4050 | 6.97 (6.36, 7.39) | 16.78 (16.15, 17.29) | | 11.7 (10.8, 12.7) | Compared to current (#1): Moderate (Underestimate of mGFR) overall and in non-Black; Large bias (underestimate) for Black |
| Black | | 579 | 13.35 (12.33, 14.81) | 20.57 (18.61, 22.41) | | 20.2 (16.9, 23.7) |
| Non-Black | | 3471 | 5.84 (5.41, 6.34) | 15.84 (15.17, 16.57) | | 10.3 (9.3, 11.4) |
| 12. CKD-EPIcr\_R | | Overall | |  | -3.06 (-3.49, -2.63) | 17.52 (16.69, 18.10) | | 13.4 (12.4, 14.5) | Compared to current (#1): Small bias (overestimate of mGFR) in overall and non-Blacks with moderate inaccuracy; Small bias of same magnitude as current but now underestimate in Black |
| Black | |  | 3.63 (1.79, 5.47) | 21.60 (18.32, 23.60) | | 12.8 (10.0, 15.5) |
| Non-Black | |  | -3.93 (-4.38, -3.45) | 16.71 (16.01, 17.40) | | 13.5 (12.4, 14.6) |
| 13. CKD-EPI\_R\_HW | | Overall | |  |  |  | |  | Unknown due to insufficient data |
| Black | |  |  |  | |  |
| Non-Black | |  |  |  | |  |
| **Creatinine-cystatin C** | | | | | | | | | |
| 14. CKD-EPIcr-cys | Overall | | 4050 | | -0.75 (-1.08, -0.44) | 15.29 (14.71, 15.96) | 8.1 (7.3, 8.9) | | **Creatinine-cystatin C**  Compared to Cr-based ref (#1): Bias unchanged in all groups. Improved precision and accuracy overall and in non-Blacks. IN Black, precision and accuracy same although point estimate for accuracy substantially lower. |
| Black | | 579 | | -2.48 (-3.74, -1.16) | 20.30 (18.53, 21.86) | 11.4 (8.8, 14.2) | |
| Non-Black | | 3471 | | -0.61 (-0.91, -0.16) | 14.54 (13.89, 15.25) | 7.6 (6.8, 8.5) | |
| 15. CKD-EPIcr-cys\_MM | Overall | |  | |  |  |  | |  |
| Black | |  | |  |  |  | |  |
| Non-Black | |  | |  |  |  | |  |
| 16. CKD-EPIcr-cys\_H/L | Overall | |  | |  |  |  | | Unknown due to insufficient data  Unknown due to insufficient data |
| Black | |  | |  |  |  | |
| Non-Black | |  | |  |  |  | |
| 17. CKD-EPIcr-cys\_NB | Overall | | 4050 | | -0.15 (-0.55, 0.18) | 15.09 (14.56, 15.72) | 7.8 (7.0, 8.6) | | Compared to current (# 13) Bias for Black for similar magnitude but now underestimate compared to overestimate with current  Compared to Cr-based ref (#1)): Bias for Black is of similar magnitude but now underestimate of mGFR; Improved accuracy in all groups. Improved precision overall and in Non-Blacks |
| Black | | 579 | | 3.38 (1.50, 4.52) | 19.74 (17.85, 21.20) | 9.2 (6.9, 11.6) | |
| Non-Black | | 3471 | | -0.61 (-0.91, -0.16) | 14.54 (13.89, 15.25) | 7.6 (6.8, 8.5) | |
| 18. CKD-EPIcr-cys\_B | Overall | | 4050 | | -5.22 (-5.67, -4.73) | 16.67 (15.96, 17.24) | 12.9 (11.8, 13.9) | | Compared to current (#13) Overestimate of mGFR) overall and for non-Black with moderate inaccuracy for all groups  Compared to Cr-based ref (#1): Worse bias (overestimate of mGFR) overall and in non-Black; Accuracy worse for Blacks. |
| Black | | 579 | | -2.48 (-3.74, -1.16) | 20.30 (18.53, 21.86) | 11.4 (8.8, 14.2) | |
| Non-Black | | 3471 | | -5.58 (-6.00, -5.05) | 16.35 (15.64, 16.98) | 13.1 (12.0, 14.2) | |
| 19. CKD-EPIcr-cys\_blend | Overall | |  | |  |  |  | | Unknown due to insufficient data  Unknown due to insufficient data |
| Black | |  | |  |  |  | |
| Non-Black | |  | |  |  |  | |
| 20. CKD-EPIcr-cys\_R | Overall | | 4050 | | -2.52 (-2.89, -2.15) | 15.75 (15.19, 16.34) | 9.2 (8.4, 10.1) | | Compared to current (#13) Small bias (underestimate) in Black and unchanged overall and non-Black; precision unchanged; small inaccuracy in all groups  Compared to Cr-based ref (#1): Bias for Black remains small but reduced magnitude and now an underestimate of mGFR; precision unchanged. Improved accuracy overall and in Blacks |
| Black | | 579 | | 0.13 (-0.91, 1.55) | 20.13 (18.53, 22.00) | 9.5 (7.1, 11.9) | |
| Non-Black | | 3471 | | -2.87 (-3.31, -2.47) | 15.36 (14.72, 15.96) | 9.2 (8.2, 10.1) | |
| 21. FAScr-cys | Overall | | 4050 | | 2.99 (2.45, 3.41) | 16.11 (15.56, 16.64) | 8.4 (7.5, 9.3) | | Compared to current (#13) Small bias (underestimate) in Overall and non-block, moderate bias for Black, precision unchanged; small inaccuracy for all groups  Compared to Cr-based ref (#1): Bias overall and in non-Black of similar small magnitude but now underestimated compared to overestimated in #1 and now with worse moderate bias (overestimate) in Black; precision unchanged; Improved accuracy for all groups |
| Black | | 579 | | 6.68 (5.34, 7.95) | 19.06 (16.94, 20.80) | 9.2 (6.9, 11.6) | |
| Non-Black | | 3471 | | 2.37 (1.86, 2.93) | 15.64 (15.02, 16.24) | 8.3 (7.3, 9.2) | |
| 22. CKD-EPI\_4M | Overall | | 2245 | | 3.6 (3.1, 4.0) | 16.9 (15.9, 18.0) | 8.6 (7.5, 9.8) | |  |
| Black | | 539 | | 6.1 (4.4, 7.8) | 20.7 (18.2, 22.9) | 9.1 (6.9, 11.5) | |
| Non-Black | | 1706 | | 3.0 (2.3, 3.6) | 16.0 (15.2, 16.9) | 8.5 (7.2, 9.8) | |
| **Cystatin C** |  | |  | |  |  |  | |  |
| 23. CKD-EPIcys | Overall | | 4050 | | 0.61 (0.09, 1.04) | 17.95 (17.27, 18.71) | 11.8 (10.8, 12.8) | | Compared to Cr-based ref (#1): Bias in overall and non-Black remain small but now underestimate of mGFR with unchanged bias in Black; precision and accuracy unchanged |
| Black | | 579 | | -0.14 (-1.52, 1.57) | 22.82 (20.94, 24.72) | 15.4 (12.4, 18.3) | |
| Non-Black | | 3471 | | 0.70 (0.19, 1.19) | 17.23 (16.54, 18.03) | 11.1 (10.1, 12.1) | |
| 24. FAScys | Overall | | 4050 | | 2.57 (2.17, 3.01) | 18.90 (18.13, 19.45) | 14.4 (13.3, 15.5) | | Compared to Cr-based ref (#1): Greater bias overall and in non-Blacks with worse precision and accuracy |
| Black | | 579 | | 3.30 (2.23, 5.08) | 22.59 (19.86, 24.65) | 15.0 (12.2, 18.0) | |
| Non-Black | | 3471 | | 2.46 (1.92, 2.96) | 18.48 (17.65, 19.16) | 14.3 (13.1, 15.4) | |
| 25. CAPAcys | Overall | | 4050 | | 1.94 (1.45, 2.39) | 17.78 (17.13, 18.43) | 13.3 (12.2, 14.3) | | Compared to Cr-based ref (#1): Greater bias overall and in nonblack Similar accuracy and precision |
| Black | | 579 | | 3.43 (2.20, 5.16) | 24.16 (21.36, 25.87) | 18.3 (15.2, 21.6) | |
| Non-Black | | 3471 | | 1.66 (1.29, 2.13) | 17.02 (16.22, 17.77) | 12.4 (11.4, 13.5) | |
| 26. CKD-EPI\_3M | Overall | | 2245 | | 6.6 (5.8, 7.4) | 19.5 (18.3, 20.5) | 15.6 (14.2, 17.1) | |  |
| Black | | 539 | | 6.3 (4.1, 8.2) | 23.1 (20.8, 26.7) | 18.0 (15.0, 21.2) | |
| Non-Black | | 1706 | | 6.7 (5.8, 7.5) | 18.4 (17.2, 19.6) | 14.9 (13.2, 16.6) | |

mGFR = measured GFR; eGFR = estimated GFR, N = number of people. Overall refers to the analyses performed in the total dataset; Black and non-Black refer to Black participants and non-Black participants included in the dataset. Results are shown for the 2021 CKD-EPI validation dataset, except for approaches CKD-EPI\_4M and CKD-EPI\_3M which are in a subset of the 2020 CKD-EPI validation dataset (\*)3,5 and approaches MDRDcr, CKD-EPIcr\_B, FAScr and CKD-EPIcr-cys\_blend which are unpublished data (personal communication L. Inker). These comparisons were made to Approach 1 in that dataset. For Cockcroft and Gault, total body weight was used.

Median difference is a measure of bias and is the difference between mGFR -eGFR [mGFR-eGFR]; positive value shows that eGFR underestimates (is less than) mGFR; negative value shows that eGFR overestimates (is more than) mGFR. IQR = interquartile range which is a measure of precision of difference between measured and estimated eGFR (smaller value is more precise). 1-P30 reflects accuracy as defined by the % of participants for whom the difference in eGFR is >30% of the mGFR (smaller value is more accurate).

Values in parentheses are the lower and upper 95% confidence intervals for each value. Purple shaded cells indicate worse performance compared to Approach CKD-EPIcr as indicated by non-overlapping confidence intervals. Orange shaded cells indicate better performance compared to Approach CKD-EPIcr as indicated by non-overlapping confidence intervals. Dark shading shows better performance and light shading shows worse performance. Dark shading indicates median difference between 0 to +/-5, IQR < 10 ml/min per 1.73 m2 or 1-P30 < 10%. Medium shading indicates median difference between +/-5 to +/-10, IQR and 1-P30 10-20%. Dark shading indicates median difference between > +/- 10, IQR > 20 ml/min per 1.73 m2 and 1-P30 > 20%.

# Table S5: Possible Consequences of Approaches for Clinical Decision Making (Attribute 5): General Medical Care Evaluation and Management

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | |  | **General medical care** | |  | **Risk** |  |
|  |  | | **CKD screening or detection** | | **Nephrology referral** | **Radiographic diagnostic assessment** | **Mortality** | **ESRD** | **Incident CKD** |
|  | |  | | **< 60** | **< 30** | **< 30** | **All** | **All** | **> 60** |
| 1. CKD-EPIcr | | adults below/above threshold\*\* | | 1-2.1 M\*\* | 100-600K | 100-600K | 31M^ | 31M^ | 27M^^ |
| 2. MDRDcr | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 3. CKD-EPIcr\_MM | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 4. CKD-EPIcr\_H/L | | no. Black adults changed | | <1-2 M | <120K | <120K | NDA | NDA | <2 M |
| Possible benefits to Black adults | | NDA; Benefits and harms are dependent on how many Black adults are assigned the non-Black coefficient. Max amount be that listed for approach #5 | | | | | |
| Possible harms to Black adults | |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 5. CKD-EPIcr\_NB | | no. Black adults changed | | 1-2 M | <120K | <120K |  |  | >2 M |
| Possible benefits to Black adults | | Large increase No. diagnosed | Small increase No. referred | Small Decreased harm of assessment | Over-predict of risk | Over-predict risk | Over-predict risk |
| Possible harms to Black adults | | Large increase No. false diagnoses of CKD | Small increase No. refereed | Small decrease No. assessed | Excess risk hidden | Excess risk hidden | Excess risk hidden |
| Possible Non-Black adult changes | | None | None | None | None | None | None |
| 6. CKD-EPIcr\_B | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA; Non Black adults would be more severely affected than Black adults | | | | | |
| 7. CKD-EPIcr\_blend | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA; Both Black adults and non Black Adults would be affected and would differ depending upon how applied in each clinical setting | | | | | |
| Possible harms to non-Black adults | |
| Possible Non-Black adult changes | |
| 8. CG\_Clcr | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 9. FAScr | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 10.   EKFCcr | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 11.   LMcr | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 12.   CKD-EPIcr\_R | | no. Black adults changed | | ~0.64M[31] | ~0.04 M [9] | ~0.04M [9] | NA | NA | NA |
| Possible benefits to Black adults | | Moderate increased No. diagnosed | Minimal increased No. referred | Minimal decreased No. harm of assessment | Over-predict risk | | |
| Possible harms to Black adults | | Moderate increased no. false diagnoses of CKD | Minimal increased No. referred | Minimal decreased No. assessed | Excess risk hidden | | |
| Possible Non-Black adult changes | | Large decreased No. diagnosed of CKD 3.14 [23] | Small decreased No. referred 0.29 M [26] | Small decreased No assessed/harm of assessment 0.29 M [26] |  |  |  |
| 13.   CKD-EPI\_R\_HW | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 14. CKD-EPIcr-cys | | no. Black adults changed | | - 0.18 M [9] | -0.1 M [22] | -0.1 M [22] |  |  |  |
| Possible benefits to Black adults | | Small increased No. diagnosed | Minimal increased No. referred | Minimal decreased No. harm of assessment | Similar risk predictions and associations seen | | |
| Possible harms to Black adults | | Small increased No. false diagnoses of CKD | Minimal increased No. referred | Minimal decreased No. assessed |
| Possible Non-Black adult changes | | Moderate increase 0.74 M [5%] | Moderate increase 0.75 M [68%] | Moderate increase 0.75 M [68%] |  |  |  |
| 15. CKD-EPIcr-cys\_MM | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 16. CKD-EPIcr-cys\_H/L | | no. Black adults changed | | <- 0.18 M [9] | <-0.1 M [22] | <-0.1 M [22] | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 17. CKD-EPIcr-cys\_NB | | no. Black adults changed | | + 0.22 M [11%] | + 0.12 M [27%] | ~0.12 M [27%] | NA | NA | NA |
| Possible benefits to Black adults | | Small increased No. diagnosed | Small increased No. referred | Small decreased No. harm of assessment | Similar risk predictions and associations seen | | |
| Possible harms to Black adults | | Small increased no. false diagnoses of CKD |  | Small decreased No. assessed |
| Possible Non-Black adult changes | | 0.74 M [5%] | Moderate increase 0.75 M [68%] | Moderate increase 0.75 M [68%] |  |  |  |
| 18. CKD-EPIcr-cys\_B | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA; Both Black adults and non Black Adults would be affected and would differ depending upon how applied in each clinical setting | | | | | |
| Possible harms to Black adults | |
| Possible Non-Black adult changes | |
| 19. CKD-EPIcr-cys\_blend | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 20. CKD-EPIcr-cys\_R | | no. Black adults changed | | 0.09 M [4] | 0.1 M [22] | '0.1 M [22] | NA | NA | NA |
|  | | Possible benefits to Black adults | | Minimal increased No. diagnosed | Minimal increased No. referred | Minimal decreased No. harm of assessment | Similar risk predictions and associations seen | | |
|  | | Possible harms to Black adults | | Minimal increased No. false diagnoses of CKD | Minimal decreased No. referred | Minimal decreased No. assessed |
|  | | Possible Non-Black adult changes | | Large decreased ~1.36 M (9%) | Moderate increased No. ~0. 61 M [55] | Moderate increased No. ~0. 61 M [55] |  |  |  |
| 21. FAScr-cys | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 22.  CKD-EPI\_4M | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 23. CKD-EPIcys | | no. Black adults changed | | 0.09 M [4] | 0.12 M [26] | 0.12 M [26] |  |  |  |
| Possible benefits to Black adults | | Minimal increased No. diagnosed | Small increase No. referred |  | Greater risk observed | | |
| Possible harms to Black adults | | Minimal increased No. false diagnoses of CKD | Small increase No. referred |  |  |  |  |
| Possible Non-Black adult changes | | Large increase 4.29 M [ 29] | Large increase 1.46 [133] | Large increase 1.46 [133] |  |  |  |
| 24. FAScys | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 25. CAPAcys | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |
| 26. CKD-EPI\_3M | | no. Black adults changed | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | | NDA | NDA | NDA | NDA | NDA | NDA |

Large indicates estimated changes in the number of people estimates to be below a threshold of > 1 million. Moderate – 500.000- 999,000. Small – 100,000 – 499,000. Minimal < 100,000.

Abbreviations, eGFR, estimated GFR; cr, creatinine, cys, cystatin C, NDA, No data available or analyzed. NQ, not quantified. NA, not applicable; No., number

\* CKD is defined as GFR < 60 or presence of kidney damage that is presented for at least 3 months. For this table, we are using only a one time measurement of GFR < 60 ml/min per 1.73 m2 to isolate impact of new GFR equations on CKD prevalence.

\*\*All values are approximate and are based on combination of reports using simulations of NHANESs or clinical datasets.3,6-10 This might not indicate what occurs in practice and cannot incorporate health care professionals or patient behavior.

^ Estimated N of Black adults living in the US from 2019 US census.

^^ Estimated N of Black adults with GFR > 60 living in the US estimated from 2019 census and multiplied by portion without CKD as defined by GFR < 60 and albuminuria from NHANES data (ref Inker et al).3

**Table S6: Possible Consequences of Approaches for Clinical Decision Making (Attribute 5): Medication-Related Decision Making**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Approach** | **Group** | **Drug Initiation to decrease CKD Progressiona** | **Inappropriate Drug Continuationb**  **and**  **Overdosing (adverse effects/toxicity)c** | **Inappropriate Drug Discontinuationd**  **and**  **Underdosing**  **(less effective)e** | **Bias**  **from mGFR** |  | **Absolute Difference from  Reference (#1)**  **(mL/min/1.73m2)** | **Accuracy**  **Compared to Reference (#1)** |
| 1. CKD-EPIcr | Black |  | | | Overestimate: 3.7 |  | **Reference** | |
| Non-Black | Overestimate: 0.5 |  |
| 2. MDRDcr | Black | ↑ | ↓ | -- | Overestimate: 2.3 |  | 1.3 | NC |
| Non-Black | ↑ | -- | ↑ | Underestimate: 1.7 |  | 2.2 | NC |
| 3. CKD-EPIcr\_MM | Black | U | U | U | U |  |  | U |
| Non-Black | U | U | U | U |  |  | U |
| 4. CKD-EPIcr\_H/L | Black | U | U | U | U |  |  | U |
| Non-Black | U | U | U | U |  |  | U |
| 5. CKD-EPIcr\_NB | Black | ↑↑ | -- | ↑↑ | Underestimate: 7.1 |  | 10.8 | NC |
| Non-Black | NC | NC | NC | Overestimate: 0.5 |  | 0 | NC |
| 6. CKD-EPIcr\_B | Black | NC | NC | NC | Overestimate: 3.7 |  | 0 | NC |
| Non-Black | ↓↓↓ | ↑↑↑ | -- | Overestimate: 11.1 |  | 10.6 | ↓↓↓ |
| 7. CKD-EPIcr\_blend | Black | U | U | U | U |  |  | U |
| Non-Black | U | U | U | U |  |  | U |
| 8. CG\_Clcr | Black | ↓ | ↑ | -- | Overestimate: 4.8 |  | 1.2 | ↓↓↓ |
| Non-Black | ↓↓ | ↑↑ | -- | Overestimate: 7.7 |  | 7.2 | ↓↓↓ |
| 9. FAScr | Black | ↑↑↑ | -- | ↑↑↑ | Underestimate: 8.3 |  | 12.0 | NC |
| Non-Black | ↑ | -- | ↑ | Underestimate: 1.8 |  | 2.3 | NC |
| 10. EKFCcr | Black | ↑↑↑ | -- | ↑↑↑ | Underestimate: 9.1 |  | 12.7 | NC |
| Non-Black | ↑ | -- | ↑ | Underestimate: 2.1 |  | 2.6 | NC |
| 11. LMcr | Black | ↑↑↑↑ | -- | ↑↑↑↑ | Underestimate: 13.4 |  | 17.1 | ↓ |
| Non-Black | ↑↑ | -- | ↑↑ | Underestimate: 5.8 |  | 6.3 | NC |
| 12. CKD-EPIcr\_R | Black | ↑↑ | -- | ↑↑ | Underestimate: 3.6 |  | 7.3 | NC |
| Non-Black | ↓ | ↑ | -- | Overestimate: 3.9 |  | 0.2 | ↓ |
| 13. CKD-EPI\_R\_HW | Black | U | U | U | U |  |  | U |
| Non-Black | U | U | U | U |  |  | U |
| 14. CKD-EPIcr-cys | Black | ↑ | ↓ | -- | Overestimate: 2.5 |  | 1.2 | ↑ |
| Non-Black | NC | NC | NC | Overestimate: 0.6 |  | 0.1 | ↑ |
| 15. CKD-EPIcr-cys\_MM | Black | U | U | U | U |  |  | U |
| Non-Black | U | U | U | U |  |  | U |
| 16. CKD-EPIcr-cys\_H/L | Black | U | U | U | U |  |  | U |
| Non-Black | U | U | U | U |  |  | U |
| 17. CKD-EPIcr-cys\_NB | Black | ↑ | -- | ↑ | Underestimate: 3.4 |  | 7.1 | ↑ |
| Non-Black | NC | NC | NC | Overestimate: 0.6 |  | 0.1 | ↑ |
| 18. CKD-EPIcr-cys\_B | Black | ↑ | ↓ | -- | Overestimate: 2.5 |  | 1.2 | ↑ |
| Non-Black | ↓↓ | ↑↑ | -- | Overestimate: 5.6 |  | 5.1 | ↓ |
| 19. CKD-EPIcr-cys\_blend | Black | U | U | U | U |  |  | U |
| Non-Black | U | U | U | U |  |  | U |
| 20. CKD-EPIcr-cys\_R | Black | -- | -- | -- | Underestimate: 0.1 |  | 3.8 | ↑ |
| Non-Black | ↓ | ↑ | -- | Overestimate: 2.9 |  | 2.4 | ↑ |
| 21. FAScr-cys | Black | ↑↑↑ | -- | ↑↑↑ | Underestimate: 6.7 |  | 10.3 | ↑ |
| Non-Black | ↑ | -- | ↑ | Underestimate: 2.4 |  | 2.9 | ↑ |
| 22. CKD-EPI\_4M | Black | -- | -- | -- | Overestimate: 0.1 |  | 3.6 | NC |
| Non-Black | NC | NC | NC | Underestimate:0 .6 |  | 1.1 | NC |
| 23. CKD-EPIcys | Black | ↑↑ | -- | ↑↑ | Underestimate: 3.3 |  | 7.0 | NC |
| Non-Black | ↑ | -- | ↑ | Underestimate: 2.5 |  | 3.0 | ↓ |
| 24. FAScys | Black | ↑↑ | -- | ↑↑ | Underestimate: 3.4 |  | 7.1 | ↓ |
| Non-Black | ↑ | -- | ↑ | Underestimate: 1.7 |  | 2.2 | ↓ |

Performance data compared to mGFR are shown in Figure 2 and Table S7. NC, no change from approach CKD-EPIcr. --, there was a change from approach CKD-EPIcr, but alternative approach does not increase potential for the indicated concern. Arrows represent extent of over or underestimate of mGFR, and thus potential for benefits or harm for drug decision-making for the group. The number of arrows represent the magnitude the bias, categorized as was done for assessment of the performance (See Manuscript Table 2 and Table S4). Plus and minus signs indicate changes in accuracy compared to approach CKD-EPIcr, and thus potential for benefits or harm for drug decision-making for individuals. For details, see supplemental methods.

U, unknown due to insufficient data

**aDrug initiation:** Medications (e.g. ACE inibitor, ARB, SGLT-2 inhibitor, GLP-1 receptor agonist) more or less likely to be initiated for decreasing CKD progression and CVD risk.

**bMedications more likely to be continued when it is not appropriate** (e.g. glyburide; metformin and bisphosphonates; dulaglutide and dabigatran are counter-indicated when eGFR <60, < 30 and < 15, respectively.

**cIncreased potential for overdosing (adverse effects/toxicity):** Potential for overdosing of several chemotherapies and potential severe adverse effects or toxicities (e.g. carboplatin, cisplatin, cytarabine, melphalen), anticoagulants (dabigatran, rivaroxaban), immunosuppressives/immunotherapies (e.g. methotrexate, lenalidomide) and many other medications

**dMedications more likely to be discontinued when it is not appropriate** (e.g. metformin at eGFR <30, SGLT-2 inhibitors at various eGFR thresholds based on product label or practice guidelines, dabigatran at eGFR <15, chemotherapies))

**eIncreased potential for underdosing (less effective):** Potential for underdosing and decreased effectiveness for several chemotherapies , antibiotics, anticoagulants and many other medications.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S7: Possible Consequences of Approaches for Clinical Decision Making (Attribute 5): Nephrology Evaluation and Management** | | | | | | | | |
|  |  | **Nephrology Care** | | | | | **Candidate Kidney Donor Assessment** | |
|  |  | **Medical nutrition benefit** | **Kidney Disease Education Covered** | **Vascular Access Referral** | **Initiation of dialysis** | **Transplant Referral** | **N eliminated or accepted via an intial single screening** | **Risk prediction for ESKD in Donors** |
|  |  | **13-50** | **< 30** | **< 18** | **< 15** | **< 20** | **< 60** | **> 60** |
| 1. CKD-EPIcr | no. U.S.Black adults below/(above) threshold\*\* | ~1 M | ~100-600K | ~<100K | ~<100K | ~<100K | 1-2.1 M | (~27 M) |
| 2. MDRDcr | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 3. CKD-EPIcr\_MM | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 4. CKD-EPIcr\_H/L | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 5. CKD-EPIcr\_NB | no. Black adults changed | ~400K [+49] | <120K[+27-52] | 0-26K[0-29] | 0-26K[+0-29] | 0-29K [+0-29] | 1-2 M [+(16-102)] | >2 M[-9] |
| Possible benefits to Black adults | Small increased No. eligible for benefit | Minimal Increased No. eligible for benefit | Minimal Increased No with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. | Minimal Increased No .with earlier referral. |  |  |
| Possible harms to Black adults | - | - | Minimal increased No. with AVF put in early or unneeded | Unclear - no absolute eGFR for initiation. |  | Large increased No. eliminated if single screening | Large Increased No eliminated due to overprediction of risk |
| Possible Non-Black adult changes | None | None | None | None | None | None | None |
| 6. CKD-EPIcr\_B | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 7. CKD-EPIcr\_blend | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 8. CG\_Clcr | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 9. FAScr | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 10. EKFCcr | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 11. LMcr | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 12. CKD-EPIcr\_R | no. Black adults changed | NQ | ~0.04 M [9] | NQ | NQ | NQ | ~0.64M[31] | NQ |
| Possible benefits to Black adults | Small increased no. eligible for benefit | Minimal increased no. eligible for benefit | Minimal increased no. with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. | Slightly increased no. with earlier referral |  |  |
| Possible harms to Black adults | - | - | Minimal increase no with AVF put in early or unneeded | Unclear - no absolute eGFR for initiation. |  | Moderate increased No. eliminated if single screening used | Moderate Increased No eliminated due to overprediction of risk |
| Possible Non-Black adult changes | Small decreased No. eligible for benefit | Small decreased No eligible for benefit, -0.29M [26%] | Minimal decreased no. with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. |  | Large N now potentially now accepted ~3.41M [23%] | Large N potentially accepted due to perceived lower risk |
| 13. CKD-EPI\_R\_HW | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA |  |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA |  |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA |  |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA |  |
| 14. CKD-EPIcr-cys | no. Black adults changed | NQ | ~0.1 M [22] | NQ | NQ | NQ |  | NQ |
| Possible benefits to Black adults |  | Minimal increased no. eligible for benefit | Minimal increased no. with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. | Slightly increased no. with earlier referral | - | - |
| Possible harms to Black adults | - | - | Minimal increase no with AVF put in early or unneeded | Unclear - no absolute eGFR for initiation. |  | Moderate increased No. eliminated if single screening used | Moderate Increased No eliminated due to overprediction of risk |
| Possible Non-Black adult changes | Moderate increase No eligible for benefit | Moderate increase 0.75 M [68%] | Modrate increased no with AVF placed at time of HD initation | Unclear - no absolute eGFR for initiation. | Moderate increase in earlier referral | Moderate increased No. eliminated if single screening used 0.74 M [5%] | Moderate Increased No eliminated due to overprediction of risk |
| 15. CKD-EPIcr-cys\_MM | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 16. CKD-EPIcr-cys\_H/L | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 17. CKD-EPIcr-cys\_NB | no. Black adults changed | NQ | + 0.12 M [27%] | NQ | NQ | NQ | + 0.22 M [11%] | NQ |
| Possible benefits to Black adults | Small increased no. eligible for benefit | Small increased no. eligible for benefit | Minimal increased no with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. | Earlier referral. |  |  |
| Possible harms to Black adults | - | - | Minimal increase no with AVF put in early or unneeded | Unclear - no absolute eGFR for initiation. |  | Small increased No. eliminated if single screening used | Small No. eliminated due to overprediction of risk |
| Possible Non-Black adult changes | Moderate increase No eligible for benefit | Moderate increase 0.75 M [68%] | Moderare increase No with AVF put in earlier | Unclear - no absolute eGFR for initiation. | Moderate increase in earlier referral | Moderate increased No. eliminated if single screening used 0.74 M [5%] | Moderate Increased No eliminated due to overprediction of risk |
| 18. CKD-EPIcr-cys\_B | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 19. CKD-EPIcr-cys\_blend | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 20. CKD-EPIcr-cys\_R | no. Black adults changed | NQ | 0.1 M [22] | NQ | NQ | NQ | - 0.09 M [4] | NQ |
| Possible benefits to Black adults | Small increased no. eligible for benefit | Small increased no. eligible for benefit | Small increased no. with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. | Small increase in earlier referral | - |  |
| Possible harms to Black adults | - | - | Slightly increase no with AVF put in early or unneeded | Unclear - no absolute eGFR for initiation. | - | Minimal N now potentially now accepted | Minimal No. accepted with uNDAerprediction of risk |
| Possible Non-Black adult changes | Moderate decreased No. eligible for benefit | Moderate decreased No. eligible for benefit 0.61 [55%] | Minimal decreased no. with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. | Moderate decrease referred | Large N now potentially now accepted ~1.36 M (9%) | Large N potentially accepted due to perceived lower risk |
| 21. FAScr-cys | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 22. CKD-EPI\_4M | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 23. CKD-EPIcys | no. Black adults changed | NQ | +0.12 M [26] | NQ | NQ | NQ | +0.09 M [4] | NQ |
| Possible benefits to Black adults | Small increased no. eligible for benefit | Small increased no. eligible for benefit | Small increased no. with AVF placed at time of HD initiation | Unclear - no absolute eGFR for initiation. | Earlier referral. |  |  |
| Possible harms to Black adults |  | - | Slightly increase no with AVF put in early or unneeded | Unclear - no absolute eGFR for initiation. |  | Minimal increased No. eliminated if single screening used | Minimal No. potentially eliminated due to overprediction of risk |
| Possible Non-Black adult changes | Large increase No eligible for in benefit | Large increased No. eligible for benefit +1.46 [133] | Large increased No with AFV placed earlier | Unclear - no absolute eGFR for initiation. |  | Large increased No. eliminated if single screening 4.29 M [ 29%] | Large increased No. now potentaly eliminated due to over prediction of risk |
| 24. FAScys | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 25. CAPAcys | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| 26. CKD-EPI\_3M | no. Black adults changed | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible benefits to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible harms to Black adults | NDA | NDA | NDA | NDA | NDA | NDA | NDA |
| Possible Non-Black adult changes | NDA | NDA | NDA | NDA | NDA | NDA | NDA |

NDA, No data available or analyzed. NQ, not quantified but relative magnitude estimated based on data in Table 3. NA, not applicable; No., number

\*\*All values are approximate and are based on combination of reports using simulations of NHANESs or clinical datasets ref).3,6-10 This might not indicate what occurs in practice and cannot incorporate health care professionals or patient behavior.

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