**Supplementary 1 Table A: Bias and Precision of ACR and eAER compared to mAER in Males**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **N= 119** | **Median (IQR) Value [mg/day]** | **Median Bias  [mg/24h]** | **% Median Bias** | **Precision**  **[mg/24h]** | **P Value** |
| mAER | 40 (16, 204) | -- | - | -- | -- |
| ACR | 30.9 (10-120) | -10.4 | -33.7% | 34.0 | **<0.01\*** |
| **eAER by:** |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 49.7 (17,193) | 0.6 | 2.6% | 36.4 | 0.32 |
| CKD-EPI([13](#_ENREF_13)) | 47.9 (15, 204) | 0.5 | 5.0% | 37.7 | 0.23 |
| Cockcroft-Gault([14](#_ENREF_14)) | 45.6 (13, 179) | -3.5 | -15.5% | 29.6 | 0.07 |
| Walser([15](#_ENREF_15)) | 49.3 (14, 199) | -1.8 | -3.9% | 35.0 | 0.94 |
| Goldwasser([16](#_ENREF_16)) | 44.0 (14, 187 | -2.6 | -10.9% | 33.0 | 0.21 |
| Rule([17](#_ENREF_17)) | 49.3 (14, 182) | -0.4 | -1.4% | 32.7 | 0.63 |

Median Bias: estimated value (either ACR or eAER) - measured value (mAER).

% Median Bias: ((estimated value (either ACR or eAER) – measured value (mAER)/ measured value (mAER))\*100

Precision: Interquartile range (IQR) of median bias.

ACR: Albumin excretion rate calculated from albumin-creatinine ratio.

eAER: Expected albumin excretion rate.

mAER: Measured albumin excretion rate (24-hour urine albumin).

P-value is for comparison between eAER or ACR and mAER.

\*Indicates statistically significant result (P<0.007 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).

**Supplementary 1 Table B: Bias and Precision of ACR and eAER compared to mAER in Females**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **N= 62** | **Median (IQR) Value [mg/day]** | **Median Bias  [mg/24h]** | **% Median Bias** | **Precision**  **[mg/24h]** | **P Value** |
| mAER | 23 (13, 82) | -- | - | -- | -- |
| ACR | 22.5 (12, 88) | -1.1 | -9.8% | 21.6 | 0.30 |
| **eAER by:** |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 23.1 (13, 82) | -1.6 | -9.2% | 22.3 | 0.22 |
| CKD-EPI([13](#_ENREF_13)) | 24.8 (13, 95) | -1.2 | -4.3% | 25.4 | 0.57 |
| Cockcroft-Gault([14](#_ENREF_14)) | 24.3 (13, 84) | -2.8 | -11.8% | 23.4 | 0.28 |
| Walser([15](#_ENREF_15)) | 26.3 (14, 98) | -0.8 | -3.7% | 24.7 | 0.88 |
| Goldwasser([16](#_ENREF_16)) | 28.7 (15, 114) | 0.4 | 5.0% | 18.3 | 0.53 |
| Rule([17](#_ENREF_17)) | 22.9 (13, 77) | -1.7 | -5.8% | 25.1 | 0.36 |

Median Bias: estimated value (either ACR or eAER) - measured value (mAER).

% Median Bias: ((estimated value (either ACR or eAER) – measured value (mAER)/ measured value (mAER))\*100

Precision: Interquartile range (IQR) of median bias.

ACR: Albumin excretion rate calculated from albumin-creatinine ratio.

eAER: Expected albumin excretion rate.

mAER: Measured albumin excretion rate (24-hour urine albumin).

P-value is for comparison between eAER or ACR and mAER.

No result was statistically significant (P<0.007 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).

**Supplementary 1 Table C: Accuracy of ACR and eAER compared to mAER in Males**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **N= 119** | **P15%** | **P-valueα** | **P30%** | **P-valueβ** | **P50%** | **P-valueµ** |
| ACR | 16 (10, 24) | - | 36 (28, 46) | - | 65 (55, 73) | - |
| **eAER by:** |  |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 26 (18, 35) | 0.08 | 47 (38, 56) | 0.03 | 66 (57, 75) | 0.73 |
| CKD-EPI([13](#_ENREF_13)) | 29 (21, 39) | 0.03 | 50 (40, 59) | 0.04 | 71 (62, 79) | 0.18 |
| Cockcroft-Gault([14](#_ENREF_14)) | 20 (13, 29) | 0.35 | 47 (38, 56) | 0.04 | 71 (63, 80) | 0.09 |
| Walser([15](#_ENREF_15)) | 27 (19, 36) | 0.04 | 52 (43, 61) | **<0.01\*** | 70 (61, 78) | 0.24 |
| Goldwasser([16](#_ENREF_16)) | 26 (18, 35) | 0.05 | 52 (43, 61) | **<0.01\*** | 73 (64, 81) | 0.03 |
| Rule([17](#_ENREF_17)) | 26 (18, 35) | 0.06 | 51 (42, 61) | 0.02 | 69 (60, 77) | 0.37 |

P1 5%, P30%, P50%: Proportion of ACR or eAER within 15%, 30% and 50% of reference standard (measured 24-hour urine albumin) respectively.

αP, βP, µP: P-value for comparison between accuracy of eAER vs accuracy of ACR for P15%, P30% and P50% respectively.

ACR: Albumin excretion rate calculated from albumin-creatinine ratio.

eAER: Expected albumin excretion rate.

\*Indicates statistically significant result (P<0.008 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).

**Supplementary 1 Table D: Accuracy of ACR and eAER compared to mAER in Females**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **N= 62** | **P15%** | **P-valueα** | **P30%** | **P-valueβ** | **P50%** | **P-valueµ** |
| ACR | 21 (12, 33) | - | 42 (30, 55) | - | 61 (48, 73) | - |
| **eAER by:** |  |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 19 (10, 31) | 0.74 | 44 (31, 57) | 0.97 | 60 (47, 72) | 0.56 |
| CKD-EPI([13](#_ENREF_13)) | 13 (6, 24) | 0.13 | 45 (33, 58) | 0.59 | 68 (55, 79) | 0.10 |
| Cockcroft-Gault([14](#_ENREF_14)) | 19 (10, 31) | 0.81 | 50 (37, 63) | 0.23 | 65 (51, 76) | 0.48 |
| Walser([15](#_ENREF_15)) | 18 (9, 30) | 0.62 | 44 (31, 57) | 0.81 | 68 (55, 79) | 0.10 |
| Goldwasser([16](#_ENREF_16)) | 24 (14, 37) | 0.59 | 36 (24, 49) | 0.39 | 58 (45, 71) | 0.53 |
| Rule([17](#_ENREF_17)) | 23 (13, 35) | 0.76 | 45 (33, 58) | 0.53 | 65 (51, 76) | 0.32 |

P1 5%, P30%, P50%: Proportion of ACR or eAER within 15%, 30% and 50% of reference standard (measured 24-hour urine albumin) respectively.

αP, βP, µP: P-value for comparison between accuracy of eAER vs accuracy of ACR for P15%, P30% and P50% respectively.

ACR: Albumin excretion rate calculated from albumin-creatinine ratio.

eAER: Expected albumin excretion rate.

No result was statistically significant (P<0.008 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).

**Supplementary 1 Table E:** **Bias and Precision of PCR and ePER compared to mPER in Males**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **N=119** | **Median (IQR) Value [mg/day]** | **Median Bias  [mg/24h]** | **% Median Bias** | **Precision**  **[mg/24h]** | **P Value** |
| mPER | 240 (100, 480) | - |  | - | - |
| PCR | 151 (85, 326) | -62.5 | -28.5% | 153 | **<0.01\*** |
| **ePER by:** |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 238 (122, 528) | 16.4 | 9.9% | 162 | 0.20 |
| CKD-EPI([13](#_ENREF_13)) | 238 (132, 484) | 15.6 | 11.4% | 146 | 0.22 |
| Cockcroft-Gault([14](#_ENREF_14)) | 194 (109, 410) | -15.5 | -10.3% | 150 | 0.01 |
| Walser([15](#_ENREF_15)) | 216 (124, 452) | 3.1 | 2.1% | 151 | 0.92 |
| Goldwasser([16](#_ENREF_16)) | 202 (114, 406) | -9.7 | -5.9% | 153 | 0.08 |
| Rule([17](#_ENREF_17)) | 220 (119, 469) | 12.2 | 5.5% | 130 | 0.82 |

Median Bias: estimated value (either PCR or ePER) - measured value (mPER).

% Median Bias: ((estimated value (either PCR or ePER) – measured value (mPER)/ measured value (mPER))\*100

Precision: Interquartile range (IQR) of median bias.

PCR: Protein excretion rate calculated from protein-creatinine ratio.

ePER: Expected protein excretion rate.

mPER: Measured protein excretion rate (24-hour urine protein).

P-value is for comparison between ePER or PCR and mPER.

\*Indicates statistically significant result (P<0.007 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).

**Supplementary 1 Table F:** **Bias and Precision of PCR and ePER compared to mPER in Females**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **N=62** | **Median (IQR) Value [mg/day]** | **Median Bias  [mg/24h]** | **% Median Bias** | **Precision**  **[mg/24h]** | **P Value** |
| mPER | 150 (70, 360) | - |  | - | - |
| PCR | 149 (88, 239) | -0.6 | -0.7% | 91 | 0.72 |
| **ePER by:** |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 144 (87, 257) | -7.7 | -5.8% | 93 | 0.54 |
| CKD-EPI([13](#_ENREF_13)) | 161 (90, 250) | 0.4 | 0.5% | 98 | 0.89 |
| Cockcroft-Gault([14](#_ENREF_14)) | 148 (86, 281) | -9.9 | -8.7% | 107 | 0.38 |
| Walser([15](#_ENREF_15)) | 166 (94, 281) | 2.2 | 2.4% | 103 | 0.74 |
| Goldwasser([16](#_ENREF_16)) | 182 (103, 305) | 16.4 | 15.1% | 112 | 0.10 |
| Rule([17](#_ENREF_17)) | 148 (91, 238) | -5.5 | -5.7% | 113 | 0.58 |

Median Bias: estimated value (either PCR or ePER) - measured value (mPER).

% Median Bias: ((estimated value (either PCR or ePER) – measured value (mPER)/ measured value (mPER))\*100

Precision: Interquartile range (IQR) of median bias.

PCR: Protein excretion rate calculated from protein-creatinine ratio.

ePER: Expected protein excretion rate.

mPER: Measured protein excretion rate (24-hour urine protein).

P-value is for comparison between ePER or PCR and mPER.

No result was statistically significant (P<0.007 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).

**Supplementary 1 Table G: Accuracy of PCR and ePER compared to mPER in Males**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **N= 119** | **P15%** | **P-valueα** | **P30%** | **P-valueβ** | **P50%** | **P-valueµ** |
| PCR | 18 (11, 26) | - | 43 (34, 52) | - | 47 (38, 56) | - |
| **ePER by:** |  |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 21 (14, 29) | 0.55 | 45 (36, 55) | 0.72 | 61 (51, 69) | 0.03 |
| CKD-EPI([13](#_ENREF_13)) | 27 (19, 36) | 0.12 | 55 (45, 64) | 0.07 | 62 (54, 71) | 0.02 |
| Cockcroft-Gault([14](#_ENREF_14)) | 24 (17, 33) | 0.18 | 50 (40, 59) | 0.18 | 56 (46, 65) | 0.09 |
| Walser([15](#_ENREF_15)) | 28 (20, 37) | 0.05 | 52 (43, 61) | 0.12 | 62 (53, 71) | 0.01 |
| Goldwasser([16](#_ENREF_16)) | 28 (20, 37) | 0.05 | 50 (41, 60) | 0.14 | 56 (47, 65) | 0.07 |
| Rule([17](#_ENREF_17)) | 27 (19, 36) | 0.09 | 55 (45, 64) | 0.07 | 73 (64, 81) | **<0.01\*** |

P15%, P30%, P50%: Proportion of PCR or ePER within 15%, 30% and 50% of reference standard (measured 24-hour urine protein) respectively.

αP, βP, µP: P-value for comparison between accuracy of ePER vs accuracy of PCR for P15%, P30% and P50% respectively.

PCR: Protein excretion rate calculated from protein-creatinine ratio.

ePER: Expected protein excretion rate.

\*Indicates statistically significant result (P<0.008 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).

**Supplementary 1 Table H: Accuracy of PCR and ePER compared to mPER in Females**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **N= 62** | **P15%** | **P-valueα** | **P30%** | **P-valueβ** | **P50%** | **P-valueµ** |
| PCR | 31 (20, 44) | - | 42 (30, 55) | - | 48 (36, 61) | - |
| **ePER by:** |  |  |  |  |  |  |
| Fotheringham([9](#_ENREF_9)) | 27 (17, 40) | 0.32 | 48 (36, 61) | 0.16 | 53 (40, 66) | 0.08 |
| CKD-EPI([13](#_ENREF_13)) | 23 (13, 35) | 0.20 | 52 (39, 65) | 0.11 | 57 (43, 69) | 0.10 |
| Cockcroft-Gault([14](#_ENREF_14)) | 26 (16, 39) | 0.51 | 45 (33, 58) | 0.62 | 50 (37, 63) | 0.78 |
| Walser([15](#_ENREF_15)) | 21 (12, 33) | 0.13 | 52 (39, 65) | 0.13 | 55 (42, 68) | 0.25 |
| Goldwasser([16](#_ENREF_16)) | 23 (13, 35) | 0.28 | 40 (28, 54) | 0.82 | 57 (43, 69) | 0.20 |
| Rule([17](#_ENREF_17)) | 26 (16, 39) | 0.37 | 48 (36, 61) | 0.21 | 73 (60, 83) | **<0.01\*** |

P15%, P30%, P50%: Proportion of PCR or ePER within 15%, 30% and 50% of reference standard (measured 24-hour urine protein) respectively.

αP, βP, µP: P-value for comparison between accuracy of ePER vs accuracy of PCR for P15%, P30% and P50% respectively.

PCR: Protein excretion rate calculated from protein-creatinine ratio.

ePER: Expected protein excretion rate.

\*Indicates statistically significant result (P<0.008 considered statistically significant with Bonferroni correction for multiple comparisons; See Methods).