Table 1: Biomarkers estimated by the SAMBA function and an independent analyst in non-pregnant women 15-49 y using National Health and Nutrition Examination Survey 2003-2006 and in children < 5 y using a single-site Kenya study.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Biomarker | n | Deficiency or at risk, % | | mean | | Geometric mean | | 25th percentile | | 50th percentile | | 75th percentile | |
| SAMBA | Independent analyst | SAMBA | Independent analyst | SAMBA | Independent analyst | SAMBA | Independent analyst | SAMBA | Independent analyst | SAMBA | Independent analyst |
| Kenya (children < 5 y) |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Retinol binding protein, μmol/L | 896 | 23.0±1.4 | 23.0±1.4 | 0.89±0.01 | 0.89±0.01 | 0.85±0.84 | 0.85±0.84 | 0.71±0.01 | 0.71±0.01 | 0.88±0.01 | 0.88±0.01 | 1.06±0.01 | 1.06±0.01 |
| Adj. retinol binding protein, μmol/L | 896 | 6.3±0.8 | 6.3±0.8 | 1.12±0.01 | 1.12±0.01 | 1.08±1.06 | 1.08±1.06 | 0.91±0.01 | 0.91±0.01 | 1.08±0.01 | 1.08±0.01 | 1.30±0.02 | 1.30±0.02 |
| Serum ferritin, μg/L | 896 | 38.7±1.6 | 38.7±1.6 | 29.91±1.48 | 29.91±1.48 | 16.13±15.01 | 16.13±15.01 | 7.48±0.39 | 7.48±0.39 | 15.58±0.75 | 15.58±0.75 | 31.56±1.64 | 31.56±1.64 |
| Adj. serum ferritin, μg/L | 896 | 72.4±1.5 | 72.4±1.5 | 10.05±0.35 | 10.05±0.35 | 6.57±6.17 | 6.57±6.17 | 3.53±0.15 | 3.53±0.15 | 6.74±0.26 | 6.74±0.26 | 12.97±0.46 | 12.97±0.46 |
| sTfR, mg/L | 896 | 35.5±1.6 | 35.5±1.6 | 8.59±0.19 | 8.59±0.19 | 7.34±7.07 | 7.34±7.07 | 5.65±0.10 | 5.65±0.10 | 7.09±0.10 | 7.09±0.10 | 9.49±0.22 | 9.49±0.22 |
| Adj. sTfR, mg/L | 896 | 27.2±1.5 | 27.2±1.5 | 7.81±0.17 | 7.81±0.17 | 6.69±6.45 | 6.69±6.45 | 5.10±0.10 | 5.10±0.10 | 6.59±0.08 | 6.59±0.08 | 8.64±0.21 | 8.64±0.21 |
| CRP, mg/L | 896 | 27.8±1.5 | 27.8±1.5 | 5.22±0.27 | 5.22±0.27 | 1.38±1.21 | 1.38±1.21 | 0.40±0.03 | 0.40±0.03 | 1.53±0.13 | 1.53±0.13 | 6.15±0.56 | 6.15±0.56 |
| AGP, g/L | 896 | 64.2±1.6 | 64.2±1.6 | 1.26±0.02 | 1.26±0.02 | 1.17±1.14 | 1.17±1.14 | 0.88±0.02 | 0.88±0.02 | 1.16±0.02 | 1.16±0.02 | 1.60±0.04 | 1.60±0.04 |
| NHANES (non-pregnant women 15-49 y) |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Serum retinol, nmol/L | 3145 | 0.3±0.1 | 0.3±0.1 | 1.84±0.01 | 1.84±0.01 | 1.76±1.74 | 1.74±1.79 | 1.46±0.01 | 1.46±0.01 | 1.75±0.01 | 1.75±0.01 | 2.13±0.02 | 2.13±0.02 |
| Adj. serum retinol, μmol/L | 3145 | 0.5±0.2 | 0.5±0.2 | 1.77±0.01 | 1.77±0.01 | 1.70±1.68 | 1.68±1.73 | 1.42±0.01 | 1.42±0.01 | 1.69±0.01 | 1.69±0.01 | 2.06±0.02 | 2.06±0.02 |
| Serum ferritin, μg/L | 3183 | 13.1±0.8 | 13.1±0.8 | 57.29±1.42 | 57.29±1.42 | 38.94±37.27 | 37.27±40.68 | 24.00±0.98 | 24.00±0.98 | 41.00±0.73 | 41.00±0.73 | 70.00±1.71 | 70.00±1.71 |
| Adj. serum ferritin, μg/L | 3183 | 20.7±1.0 | 20.7±1.0 | 41.47±0.98 | 41.47±0.98 | 28.75±27.60 | 27.60±29.96 | 17.51±0.54 | 17.51±0.54 | 30.34±0.68 | 30.34±0.68 | 51.55±0.91 | 51.55±0.91 |
| sTfR, mg/L | 3148 | 9.7±0.8 | 9.7±0.8 | 5.89±0.06 | 5.89±0.06 | 5.54±5.44 | 5.44±5.64 | 4.48±0.04 | 4.48±0.04 | 5.28±0.04 | 5.28±0.04 | 6.56±0.12 | 6.56±0.12 |
| Adj. sTfR, mg/L2 | 3148 | 9.7±0.8 | 9.7±0.8 | 5.89±0.06 | 5.89±0.06 | 5.54±5.44 | 5.44±5.64 | 4.48±0.04 | 4.48±0.04 | 5.28±0.04 | 5.28±0.04 | 6.56±0.12 | 6.56±0.12 |
| Serum B12, pmol/L | 3166 | 2.8±0.5 | 2.8±0.5 | 383.95±9.61 | 383.95±9.61 | 335.65±325.19 | 325.19±346.45 | 253.13±3.84 | 253.13±3.84 | 328.41±5.24 | 328.41±5.24 | 436.84±6.71 | 436.84±6.71 |
| RBC folate, nmol/L | 3210 | 7.6±0.5 | 7.6±0.5 | 603.60±8.33 | 603.60±8.33 | 565.37±551.43 | 551.43±579.66 | 448.50±6.12 | 448.50±6.12 | 564.00±7.22 | 564.00±7.22 | 707.57±10.60 | 707.57±10.60 |
| Serum folate, nmol/L | 3186 | 2.8±0.4 | 2.8±0.4 | 28.48±0.63 | 28.48±0.63 | 24.87±24.17 | 24.17±25.60 | 18.60±0.27 | 18.60±0.27 | 25.10±0.32 | 25.10±0.32 | 32.80±0.49 | 32.80±0.49 |
| CRP, mg/L | 3197 | 25.6±1.0 | 25.6±1.0 | 4.39±0.18 | 4.39±0.18 | 1.74±1.61 | 1.61±1.89 | 0.60±0.05 | 0.60±0.05 | 1.90±0.10 | 1.90±0.10 | 5.15±0.22 | 5.15±0.22 |
| Hemoglobin, g/L | 3226 | 6.4±0.5 | 6.4±0.5 | 136.10±0.50 | 136.10±0.50 | 135.60±134.63 | 134.63±136.57 | 130.00±0.49 | 130.00±0.49 | 137.00±0.49 | 137.00±0.49 | 143.00±0.51 | 143.00±0.51 |

1 Values are in mean±SE; Adj. Adjusted by the BRINDA method; AGP, Alpha(1)-acid glycoprotein; BRINDA, Biomarkers Reflecting Inflammation and Nutritional Determinants of Anemia; CRP, C-reactive protein; NHANES, National Health and Nutrition Examination Survey; RBC, Red Blood Cell, SAMBA, Statistical Apparatus of Micronutrient Biomarker Analysis, sTfR, Soluble Transferrin Receptor. Vitamin A deficiency defined as s serum retinol or retinol binding protein < 0.7 μmol/L; prevalence of B-12 deficiency defined as serum b12 < 150 pmol/L; prevalence of folate deficiency defined as RBC folate < 340 nmol/L or serum folate < 10 nmol/L; prevalence of iron deficiency defined as serum ferritin < 12 μg/L and 15 μg/L for children and < 15 for non-pregnant women 15-49 y, respectively; prevalence of anemia defined as hemoglobin < 110 g/L and <120 for children and < 15 for non-pregnant women 15-49 y, respectively; prevalence of inflammation defined as CRP >5 mg/L and AGP >1 g/L.

2Soluble transferrin receptor is adjusted by only AGP. Because AGP is unavailable in NHANES, the adjusted soluble transferrin receptor is the same as the unadjusted one.