**Supplemental Figure 1** Flow chart for deriving the Addis Ababa analytic sample

N=10 eleigible sub-cities

N=10 districts randomly selected

Inclusion criteria

≥1 woman of reproductive age (18-49 y)

≥1 child 6-59 months

N=1050 households

N=458 excluded

392 no data on adult man, ≥18 y

56 pregnant women

10 children with anthropometric Z-scores above or below 6 SD

N=592 households

N=5 sub-cities randomly selected

**Supplemental Figure 2** Flow chart for deriving the Kersa analytic sample

N=24 eligible kebeles

(21 rural and 3 urban)

N=12 kebeles randomly selected

(10 urban and 2 rural)

Inclusion criteria

≥1 non-pregnant woman of reproductive age (18-49 y)

≥1 child 6-59 months

≥1 adult man (≥18 y)

N=1197 households

N=335 excluded

335 at least one household member missing anthropometric data

N=862 households

**Supplemental Table 1A** Univariate factors associated with household-level forms of double burden of malnutrition in Addis Ababa using a 7-day recall period for women’s, men’s, and children’s dietary indicators

|  |  |  |  |
| --- | --- | --- | --- |
|   | Concurrent child overweight and stunting | Overweight woman and stunted child | At least one overweight adult and stunted child |
|   | β or OR | 95% CI  | p-value | correctedp-valuea | β or OR | 95% CI | p-value | corrected p-valuea | β or OR | 95% CI | p-value | corrected p-valuea |
| *Biological* |  |  |  |  |  |  |  |  |  |  |  |  |
| Child age (in months) | 0.96 | 0.94, 0.98 | <0.001 | <0.001 | 1.01 |  0.99, 1.03 | 0.164 | 0.683 | 1.01 |  0.99, 1.02 | 0.331 | 0.846 |
| Child is female | 1.39 | 0.56, 3.45 | 0.476 | 0.897 | 0.94 |  0.37, 2.37 | 0.899 | 0.959 | 1.12 |  0.51, 2.46 | 0.787 | 0.959 |
| Woman's age (in years) | 0.95 | 0.90, 1.01 | 0.087 | 0.574 | 1.09 |  1.03, 1.14 | 0.001 | 0.017 | 1.07 |  1.03, 1.11 | 0.001 | 0.017 |
| *Environmental* |  |  |  |  |  |  |  |  |  |  |  |  |
| Food supply shortage | 1.02 | 0.92, 1.13 | 0.713 | 0.959 | 1.03 |  0.97, 1.10 | 0.261 | 0.846 | 1.02 |  0.97, 1.08 | 0.384 | 0.846 |
| Distance to market (in km) | 0.80 | 0.58, 1.09 | 0.161 | 0.683 | 0.93 |  0.84, 1.03 | 0.157 | 0.683 | 0.99 |  0.94, 1.04 | 0.601 | 0.959 |
| Food expenditures (in Ethiopian birr) | 1.00 | 1.00, 1.00 | 0.671 | 0.959 | 1.00 |  1.00, 1.00 | 0.939 | 0.959 | 1.00 |  1.00, 1.00 | 0.690 | 0.959 |
| Woman is an Orthodox Christian  | 0.72 | 0.17, 3.04 | 0.659 | 0.959 | 1.49 |  0.69, 3.24 | 0.310 | 0.846 | 1.60 |  0.72, 3.55 | 0.246 | 0.846 |
| Duration of residence (in years) | 1.00 | 0.96, 1.03 | 0.856 | 0.959 | 1.06 |  1.02, 1.10 | 0.001 | 0.017 | 1.04 |  1.01, 1.07 | 0.003 | 0.040 |
| *Behavioural* |  |  |  |  |  |  |  |  |  |  |  |  |
| Woman's dietary diversity score in the past 7 days | 1.01 | 0.80, 1.26 | 0.959 | 0.959 | 0.95 | 0.81, 1.11 | 0.523 | 0.959 | 0.96 | 0.86, 1.06 | 0.406 | 0.846 |
| Woman's minimum dietary diversity in the past 7 days | 0.55 | 0.22, 1.41 | 0.216 | 0.792 | 0.69 | 0.31, 1.55 | 0.366 | 0.846 | 0.72 | 0.46, 1.13 | 0.152 | 0.683 |
| Man's dietary diversity score in the past 7 days | 1.05 | 0.86, 1.29 | 0.632 | 0.959 | 1.02 | 0.89, 1.16 | 0.812 | 0.959 | 1.06 | 0.93, 1.21 | 0.410 | 0.846 |
| Man's minimum dietary diversity in the past 7 days | 1.12 | 0.35, 3.63 | 0.846 | 0.959 | 1.05 | 0.59, 1.85 | 0.874 | 0.959 | 1.18 | 0.63, 2.22 | 0.598 | 0.959 |
| Child's dietary diversity score in the past 7 days | 0.88 | 0.74, 1.04 | 0.138 | 0.683 | 0.97 | 0.79, 1.18 | 0.743 | 0.959 | 1.01 | 0.84, 1.20 | 0.927 | 0.959 |
| Child's minimum dietary diversity in the past 7 days | 0.57 | 0.25, 1.29 | 0.176 | 0.683 | 0.71 | 0.29, 1.73 | 0.446 | 0.867 | 0.81 | 0.34, 1.94 | 0.639 | 0.959 |
| *Socio-economic and demographic* |  |  |  |  |  |  |  |  |  |  |  |  |
| Low household wealth | 1.27 |  0.36, 4.53 | 0.713 | 0.959 | 0.78 |  0.29, 2.10 | 0.617 | 0.959 | 0.93 |  0.44, 1.95 | 0.846 | 0.959 |
| High housing floor quality | 1.30 |  0.45, 3.78 | 0.633 | 0.959 | 1.37 |  0.68, 2.76 | 0.384 | 0.846 | 1.52 |  0.83, 2.76 | 0.173 | 0.683 |
| Household has access to improved latrines | 0.58 |  0.20, 1.69 | 0.320 | 0.846 | 1.12 |  0.44, 2.91 | 0.808 | 0.959 | 1.59 |  0.62, 4.07 | 0.335 | 0.846 |
| Household is food secure | 0.87 |  0.38, 1.96 | 0.734 | 0.959 | 0.98 |  0.53, 1.81 | 0.950 | 0.959 | 0.83 |  0.58, 1.17 | 0.287 | 0.846 |
| Household size | 1.02 |  0.84, 1.23 | 0.852 | 0.959 | 1.26 |  1.07, 1.48 | 0.005 | 0.055 | 1.26 |  1.06, 1.49 | 0.008 | 0.075 |
| Woman has primary education or higher | 1.28 |  0.55, 2.97 | 0.568 | 0.959 | 0.86 |  0.31, 2.42 | 0.776 | 0.959 | 0.95 |  0.42, 2.18 | 0.910 | 0.959 |
| Man has primary education or higher | 1.83 |  0.96, 3.49 | 0.065 | 0.477 | 0.70 |  0.29, 1.70 | 0.431 | 0.862 | 0.67 |  0.30, 1.49 | 0.327 | 0.846 |
| Woman is engaged in income generating activity | 2.02 | 1.14, 3.56 | 0.016 | 0.132 | 1.36 | 0.67, 2.76 | 0.388 | 0.846 | 1.04 | 0.58, 1.86 | 0.900 | 0.959 |

a p-value corrected for multiple hypothesis testing using the Benjamini-Yekutieli method to control the false discovery rate.

**Supplemental Table 1B** Univariate factors associated with household-level forms of double burden of malnutrition in Kersa using a 7-day recall period for women’s, men’s, and children’s dietary indicators

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Concurrent child overweight and stunting |  | Overweight woman and stunted child |  | At least one overweight adult and stunted child |
|   | β or OR | 95% CI | p-value | corrected p-valuea | β or OR | 95% CI | p-value | corrected p-valuea | β or OR | 95% CI | p-value | corrected p-valuea |
| *Biological* |  |  |  |  |  |  |  |  |  |  |  |  |
| Child age (in months) | 1.00 | 0.99, 1.01 | 0.687 | 0.843 | 1.02 | 1.00, 1.03 | 0.063 | 0.340 | 1.03 | 1.01, 1.05 | 0.008 | 0.086 |
| Child is female  | 1.32 | 0.75, 2.35 | 0.338 | 0.781 | 1.16 | 0.60, 2.24 | 0.652 | 0.819 | 1.28 | 0.76, 2.17 | 0.350 | 0.781 |
| Woman's age (in years) | 0.99 | 0.95, 1.03 | 0.706 | 0.846 | 0.96 | 0.88, 1.06 | 0.434 | 0.781 | 0.97 | 0.92, 1.03 | 0.324 | 0.781 |
| *Environmental* |  |  |  |  |  |  |  |  |  |  |  |  |
| Food supply shortage | 0.87 | 0.77, 0.98 | 0.024 | 0.162 | 1.12 | 0.89, 1.42 | 0.344 | 0.781 | 1.20 | 1.01, 1.42 | 0.034 | 0.204 |
| Duration of residence (in years) | 1.03 | 0.99, 1.07 | 0.210 | 0.781 | 0.99 | 0.93, 1.05 | 0.640 | 0.809 | 0.98 | 0.93, 1.03 | 0.403 | 0.781 |
| *Behavioural* |  |  |  |  |  |  |  |  |  |  |  |  |
| Woman's dietary diversity score in the past 7 days | 0.89 | 0.83, 0.95 | 0.001 | 0.014 | 0.82 | 0.61, 1.12 | 0.212 | 0.781 | 0.88 | 0.68, 1.14 | 0.342 | 0.781 |
| Woman's minimum dietary diversity in the past 7 days | 0.53 | 0.38, 0.74 | <0.001 | <0.001 | 0.64 | 0.25, 1.66 | 0.362 | 0.781 | 0.82 | 0.38, 1.75 | 0.604 | 0.809 |
| Man's dietary diversity score in the past 7 days | 0.91 | 0.85, 0.98 | 0.014 | 0.116 | 0.90 | 0.70, 1.16 | 0.416 | 0.781 | 0.91 | 0.73, 1.15 | 0.433 | 0.781 |
| Man's minimum dietary diversity in the past 7 days | 0.51 | 0.29, 0.88 | 0.015 | 0.116 | 0.97 | 0.33, 2.91 | 0.959 | 0.995 | 0.85 | 0.33, 2.17 | 0.734 | 0.862 |
| Child's dietary diversity score in the past 7 days | 0.98 | 0.82, 1.15 | 0.769 | 0.865 | 1.03 | 0.67, 1.59 | 0.881 | 0.951 | 1.00 | 0.74, 1.34 | 0.990 | 0.995 |
| Child's minimum dietary diversity in the past 7 days | 1.00 | 0.45, 2.22 | 0.995 | 0.995 | 1.36 | 0.46, 4.04 | 0.575 | 0.809 | 1.08 | 0.55, 2.11 | 0.825 | 0.909 |
| *Socio-economic and demographic* |  |  |  |  |  |  |  |  |  |  |  |  |
| Low household wealth | 2.21 | 1.58, 3.09 | <0.001 | <0.001 | 1.31 | 0.50, 3.41 | 0.586 | 0.809 | 1.27 | 0.50, 3.24 | 0.614 | 0.809 |
| High housing floor quality | 0.31 | 0.21, 0.47 | <0.001 | <0.001 | 1.53 | 0.31, 7.41 | 0.599 | 0.809 | 1.72 | 0.34, 8.77 | 0.517 | 0.809 |
| Household has access to improved latrines | 0.83 | 0.55, 1.26 | 0.378 | 0.781 | 1.92 | 0.39, 9.38 | 0.421 | 0.781 | 1.74 | 0.36, 8.54 | 0.494 | 0.809 |
| Household is food secure | 0.70 | 0.24, 1.97 | 0.495 | 0.809 | 0.61 | 0.20, 1.81 | 0.370 | 0.781 | 1.03 | 0.35, 3.03 | 0.961 | 0.995 |
| Household size | 0.98 | 0.92, 1.05 | 0.568 | 0.809 | 1.03 | 0.93, 1.13 | 0.606 | 0.809 | 0.98 | 0.86, 1.11 | 0.750 | 0.862 |
| Woman has primary education or higher  | 0.81 | 0.53, 1.24 | 0.329 | 0.781 | 1.35 | 0.49, 3.72 | 0.558 | 0.809 | 1.97 | 0.85, 4.58 | 0.114 | 0.560 |
| Man has primary education or higher  | 0.78 | 0.48, 1.27 | 0.317 | 0.781 | 1.54 | 0.56, 4.27 | 0.403 | 0.781 | 1.75 | 0.67, 4.56 | 0.255 | 0.781 |

a p-value corrected for multiple hypothesis testing using the Benjamini-Yekutieli method to control the false discovery rate.

**Supplemental Table 2A** Multivariate factors associated with household-level forms of double burden of malnutrition in Addis Ababa using a 7-day recall period for women’s, men’s, and children’s dietary indicators

|  |  |  |  |
| --- | --- | --- | --- |
|  | Concurrent child overweight and stunting | Overweight woman and stunted child | Overweight adult and stunted child |
|   | β or OR | 95% CI | p-value | corrected p-valuea | β or OR | 95% CI | p-value | corrected p-valuea | β or OR | 95% CI | p-value | corrected p-valuea |
| *Biological* |  |  |  |  |  |  |  |  |  |  |  |  |
| Child age (in months) | 0.97 | 0.95, 0.99 | 0.008 | 0.076 | 1.01 | 0.99, 1.04 | 0.208 | 0.611 | 1.00 | 0.99, 1.02 | 0.681 | 0.862 |
| Child is female | 1.32 | 0.50, 3.44 | 0.577 | 0.856 | 1.07 | 0.39, 2.96 | 0.894 | 0.915 | 1.22 | 0.52, 2.87 | 0.649 | 0.860 |
| Woman's age (in years) | 0.95 | 0.89, 1.01 | 0.075 | 0.375 | 1.02 | 0.98, 1.07 | 0.308 | 0.650 | 1.03 | 0.99, 1.06 | 0.156 | 0.530 |
| *Environmental* |  |  |  |  |  |  |  |  |  |  |  |  |
| Food supply shortage | 1.02 | 0.93, 1.13 | 0.643 | 0.860 | 1.03 | 0.97, 1.10 | 0.279 | 0.642 | 1.01 | 0.95, 1.07 | 0.711 | 0.862 |
| Distance to market (in km) | 0.80 | 0.56, 1.15 | 0.225 | 0.611 | 0.93 | 0.84, 1.04 | 0.203 | 0.611 | 1.00 | 0.95, 1.05 | 0.899 | 0.915 |
| Food expenditures (in Ethiopian birr) | 1.00 | 1.00, 1.00 | 0.699 | 0.862 | 1.00 | 1.00, 1.00 | 0.443 | 0.789 | 1.00 | 1.00, 1.00 | 0.088 | 0.386 |
| Woman is an Orthodox Christian | 0.67 | 0.16, 2.83 | 0.586 | 0.856 | 1.42 | 0.74, 2.73 | 0.285 | 0.642 | 1.88 | 0.96, 3.68 | 0.064 | 0.375 |
| Duration of residence (in years) | 1.01 | 0.98, 1.05 | 0.509 | 0.848 | 1.06 | 1.02, 1.10 | 0.003 | 0.043 | 1.03 | 1.00, 1.07 | 0.030 | 0.214 |
| *Behavioural* |  |  |  |  |  |  |  |  |  |  |  |  |
| Woman's dietary diversity score in the past 7 days | 0.97 | 0.69, 1.37 | 0.869 | 0.915 | 0.88 | 0.75, 1.03 | 0.104 | 0.395 | 0.85 | 0.74, 0.96 | 0.011 | 0.090 |
| Man's dietary diversity score in the past 7 days | 1.12 | 0.84, 1.50 | 0.432 | 0.789 | 1.21 | 1.10, 1.32 | <0.001 | 0.019 | 1.27 | 1.13, 1.44 | <0.001 | 0.019 |
| Child's dietary diversity score in the past 7 days | 0.96 | 0.71, 1.29 | 0.770 | 0.878 | 0.85 | 0.68, 1.06 | 0.158 | 0.530 | 0.94 | 0.75, 1.17 | 0.566 | 0.856 |
| *Socio-economic and demographic* |  |  |  |  |  |  |  |  |  |  |  |  |
| Low household wealth | 1.60 | 0.44, 5.75 | 0.475 | 0.820 | 1.13 | 0.51, 2.49 | 0.762 | 0.878 | 1.67 | 0.94, 2.97 | 0.079 | 0.375 |
| High housing floor quality | 1.72 | 0.51, 5.88 | 0.385 | 0.759 | 1.64 | 0.75, 3.61 | 0.219 | 0.611 | 2.01 | 0.95, 4.26 | 0.068 | 0.375 |
| Household has access to improved latrines | 0.64 | 0.23, 1.83 | 0.411 | 0.781 | 1.04 | 0.42, 2.59 | 0.935 | 0.935 | 1.52 | 0.59, 3.92 | 0.386 | 0.759 |
| Household is food secure | 0.73 | 0.28, 1.92 | 0.521 | 0.848 | 1.16 | 0.50, 2.71 | 0.726 | 0.862 | 0.91 | 0.43, 1.90 | 0.793 | 0.886 |
| Household size | 1.06 | 0.88, 1.28 | 0.548 | 0.856 | 1.17 | 0.97, 1.42 | 0.104 | 0.395 | 1.27 | 1.06, 1.52 | 0.008 | 0.076 |
| Woman has primary education or higher  | 1.09 | 0.42, 2.81 | 0.860 | 0.915 | 0.75 | 0.24, 2.38 | 0.622 | 0.860 | 0.92 | 0.31, 2.68 | 0.874 | 0.915 |
| Man has primary education or higher | 1.86 | 0.58, 5.91 | 0.293 | 0.642 | 0.66 | 0.32, 1.38 | 0.267 | 0.642 | 0.63 | 0.28, 1.41 | 0.262 | 0.642 |
| Woman is engaged in an income generating activity | 2.57 | 1.57, 4.22 | <0.001 | 0.019 | 1.13 | 0.61, 2.11 | 0.701 | 0.862 | 0.87 | 0.51, 1.49 | 0.619 | 0.860 |

a p-value corrected for multiple hypothesis testing using the Benjamini-Yekutieli method to control the false discovery rate.

**Supplemental Table 2B** Multivariate factors associated with household-level forms of double burden of malnutrition in Kersa using a 7-day recall period for women’s, men’s, and children’s dietary indicators

|  |  |  |  |
| --- | --- | --- | --- |
|  | Concurrent child overweight and stunting | Overweight woman and stunted child | Overweight adult and stunted child |
|   | β or OR | 95% CI | p-value | corrected p-valuea | β or OR | 95% CI | p-value | corrected p-valuea | β or OR | 95% CI | p-value | corrected p-valuea |
| *Biological* |  |  |  |  |  |  |  |  |  |  |  |  |
| Child age (in months) | 1.00 | 0.99, 1.02 | 0.449 | 0.748 | 1.02 | 1.00, 1.04 | 0.051 | 0.255 | 1.03 | 1.00, 1.05 | 0.022 | 0.188 |
| Child is female | 1.49 | 0.85, 2.63 | 0.167 | 0.568 | 1.20 | 0.63, 2.29 | 0.587 | 0.825 | 1.24 | 0.73, 2.11 | 0.427 | 0.748 |
| Woman's age (in years) | 0.98 | 0.93, 1.03 | 0.413 | 0.748 | 0.95 | 0.82, 1.10 | 0.507 | 0.815 | 0.98 | 0.92, 1.04 | 0.443 | 0.748 |
| *Environmental* |  |  |  |  |  |  |  |  |  |  |  |  |
| Food supply shortage | 0.88 | 0.78, 0.99 | 0.036 | 0.219 | 1.13 | 0.94, 1.36 | 0.198 | 0.568 | 1.17 | 1.04, 1.33 | 0.012 | 0.135 |
| Duration of residence (in years) | 1.02 | 0.96, 1.08 | 0.579 | 0.825 | 1.01 | 0.91, 1.12 | 0.896 | 0.916 | 0.99 | 0.93, 1.05 | 0.698 | 0.862 |
| *Behavioural* |  |  |  |  |  |  |  |  |  |  |  |  |
| Woman's dietary diversity score in the past 7 days | 0.93 | 0.81, 1.05 | 0.229 | 0.606 | 0.59 | 0.42, 0.83 | 0.003 | 0.068 | 0.76 | 0.58, 0.99 | 0.039 | 0.219 |
| Man's dietary diversity score in the past 7 days | 0.96 | 0.81, 1.14 | 0.619 | 0.829 | 1.10 | 0.81, 1.49 | 0.535 | 0.825 | 1.02 | 0.77, 1.37 | 0.870 | 0.916 |
| Child's dietary diversity score in the past 7 days | 1.22 | 0.95, 1.57 | 0.118 | 0.483 | 1.44 | 0.69, 3.02 | 0.334 | 0.748 | 1.19 | 0.76, 1.86 | 0.445 | 0.748 |
| *Socio-economic and demographic* |  |  |  |  |  |  |  |  |  |  |  |  |
| Low household wealth | 1.92 | 1.20, 3.10 | 0.007 | 0.105 | 1.32 | 0.52, 3.35 | 0.560 | 0.825 | 1.50 | 0.71, 3.18 | 0.292 | 0.692 |
| High housing floor quality | 0.34 | 0.19, 0.61 | <0.001 | 0.045 | 1.25 | 0.39, 4.01 | 0.709 | 0.862 | 1.22 | 0.55, 2.71 | 0.626 | 0.829 |
| Household has access to improved latrines | 1.96 | 1.09, 3.52 | 0.025 | 0.188 | 2.04 | 0.9, 4.64 | 0.088 | 0.396 | 1.66 | 0.78, 3.52 | 0.189 | 0.568 |
| Household is food secure | 0.64 | 0.23, 1.75 | 0.383 | 0.748 | 0.50 | 0.19, 1.29 | 0.151 | 0.566 | 0.94 | 0.41, 2.17 | 0.894 | 0.916 |
| Household size | 1.00 | 0.94, 1.07 | 0.981 | 0.981 | 1.03 | 0.96, 1.10 | 0.368 | 0.748 | 1.01 | 0.94, 1.07 | 0.873 | 0.916 |
| Woman has primary education or higher | 1.05 | 0.72, 1.53 | 0.806 | 0.916 | 0.86 | 0.24, 3.03 | 0.808 | 0.916 | 1.57 | 0.79, 3.13 | 0.202 | 0.568 |
| Man has primary education or higher | 1.05 | 0.57, 1.91 | 0.880 | 0.916 | 1.71 | 0.69, 4.25 | 0.250 | 0.625 | 1.19 | 0.56, 2.52 | 0.655 | 0.842 |

a p-value corrected for multiple hypothesis testing using the Benjamini-Yekutieli method to control the false discovery rate.