# The International Diet-Health Index: a novel tool to evaluate diet quality for cardiometabolic health across countries

Supplemental material

## Table of Contents





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**Supplemental Table 1. Definitions of 11 Dietary Factors Used in the Study**

| Dietary factors | Beneficial/ Adverse effect | Definitions | Amount per serving |
|---|---|---|---|
| Fruits | B | Total fruits (including fresh, frozen, cooked, canned or dried fruit; excluding fruit juices and salted or pickled fruit) | 100 g/day |
| Vegetables | B | Total vegetables (including fresh, frozen, cooked, canned or dried vegetables; excluding salted or pickled vegetables, vegetable juices, starchy vegetables [e.g. potatoes, corn], legumes, nuts and seeds) | 100 g/day |
| Nuts and seeds | B | Total nuts and seeds (can include peanuts, peanut butter) | 4 oz/wk |
| Whole grains | B | Total whole grains (including whole grain breakfast cereals, bread, rice, pasta, biscuits, muffins, tortillas, pancakes) | 50 g/day |
| Poly-unsaturated fatty acids | B | Polyunsaturated fatty acids (PUFA) in replacement of carbohydrates or saturated fat* | 5% of total dietary energy/day |
| Seafood omega 3 | B | Total dietary eicosapentaenoic and docosahexaenoic acid (from all dietary sources, primarily seafood; excluding supplements) | 100 mg/day |
| Processed meat | A | Total processed meat (including processed deli or luncheon meats [ham, turkey, chicken, pastrami, etc.], bacon, salami, sausages, bratwursts, frankfurters, hot dogs) | 50 g/day |
| Red meat | A | Total red meat (including beef, pork, lamb, both domesticated and game; excluding poultry, fish, eggs all processed meats; may include offal) | 100 g/day |
| Saturated fat | A | Total saturated fat (from all dietary sources, primarily meat, dairy products, and tropical oils) | 5% of total dietary energy/day |
| Sugar sweetened beverages | A | Total sugar sweetened beverages (including any beverage with added sugar and ≥ 50 kcal per 8 oz [226.8g], such as carbonated beverages, soft drinks, sodas, energy drinks, fruit drinks, etc., excluding 100% fruit and vegetable juices) | 8 oz/day |
| Dietary sodium | A | Total dietary sodium (from all dietary sources) | 2,300 mg/day |

* The health effects of PUFA are measured using clinical trials where the total energy intake is designed to be the same.[1, 2]

**Supplemental Table 2. GATHER Checklists with Description of Compliance and Location of Information in the IDHI Study**

| Item # | Checklist Item | Description of Compliance | Reported on page # |
|---|---|---|---|
| **Objectives and funding** | | | |
| 1 | Define the indicator, populations, and time period for which estimates were made. | Narrative provided in paper defining the indicator, populations, and time period | Main text (Method-Data Sources pg.9-14) |
| 2 | List the funding sources for the work. | The funding source listed in paper | Main text (Funding pg.27) |
| **Data inputs** | | | |
| *For all data inputs from multiple sources that are synthesized as part of the study* | | | |
| 3 | Describe how the data were identified and how the data were accessed. | Narrative provided in paper describing data identifying and accessing method | Main text (Method-Data Sources pg.9-12) |
| 4 | Specify the inclusion and exclusion criteria. Identify all ad-hoc exclusions | Not applicable | NA |
| 5 | Provide information about all included data sources and their main characteristics. For each data source used, report reference information or contact name/institution, population represented, data collection method, year of data collection, sex and age range, diagnostic criteria or measurement method, and sample size, as relevant. | Narrative description of included data sources provided | Main text (Method-Data Sources pg.9-12) |
| 6 | Identify and describe any categories of input data that have potentially important biases | Not applicable | NA |
| *For data inputs that contribute to the analysis but were not synthesized as part of the study* | | | |
| 7 | Describe and give sources for any other data inputs. | Not applicable | NA |
| *For all data inputs* | | | |
| 8 | Provide all data inputs in a file format from which data can be efficiently extracted (eg, a spreadsheet rather than a PDF), including all relevant meta-data listed in term 5. For any data inputs that cannot be shared because of ethical or legal reasons, such as third-party ownership, provided a contact name or the name of the institution that retains the right to the data. | All data inputs are publicly available. Data sources provided in paper | Main text (Method-Data Sources & Table1 pg.9-12) |

| | | | |
|---|---|---|---|
| **Data analysis** | | | |
| 9 | Provide a conceptual overview of the data analysis method. A diagram may be helpful. | Flow diagrams of the methodological process is provided | Main text (Method—Statistical Analysis pg.12-14), Supplemental material (Supplemental figure 1 pg.13) |
| 10 | Provide a detailed description of all steps of the analysis, including mathematical formulae. This description should cover, as relevant, data cleaning, data pre-processing, data adjustments and weighting of data sources, and mathematical or statistical model. | Narrative description of the analysis provided in paper | Main text (Method—Statistical Analysis pg.12-14) |
| 11 | Describe how candidate models were evaluated and how the final model was selected. | Not applicable | NA |
| 12 | Provide the results of an evaluation of model performance, if done, as well as the results of any relevant sensitivity analysis. | Not applicable | NA |
| 13 | Describe methods of calculating uncertainty of the estimates. State which sources of uncertainty were, and were not, accounted for in the uncertainty analysis. | Not applicable | NA |
| 14 | State how analytical or statistical source code used to generate estimates can be accessed. | Codes can be assessed by request | NA |
| **Results and discussion** | | | |
| 15 | Provide published estimates in a file format from which data can be efficiently extracted. | Results available in Supplementary Data | Main text (Result pg.16-20) and Supplemental material (supplemental table 5 pg.9-12) |
| 16 | Report a quantitative measure of the uncertainty of the estimates (eg, uncertainty intervals). | Not applicable | NA |
| 17 | Interpret results in light of existing evidence. If updating a previous set of estimates, describe the reasons for changes in estimates. | Discussion and comparison with existing evidence is presented in paper | Main text (Discussion pg.21-23) |
| 18 | Discuss limitations of the estimates. Include a discussion of any modelling assumptions or data limitations that affect interpretation of the estimates. | Discussion of limitations provided in paper | Main text (Discussion pg.25-26) |

**Supplemental Table 3. Empirical range of diet-disease inputs for IDHI based on all country-age-sex groups, and theoretical and empirical ranges of diet-disease products, $IDHI_{overall}$, $IDHI_{adverse}$, and $IDHI_{beneficial}$**

| Dietary factor-disease pair | Intake (g) | | Log (RR) per serving change | | Mediated effect | | Disease proportion (%) | | Theoretical calculated product§ | | Empirical calculated product§§ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| Vegetable-HSTK | 24.649 | 463.490 | -0.274 | -0.088 | NA | NA | 0.014 | 0.559 | $3.14*10^{-4}$ | 0.710 | 0.001 | 0.296 |
| Vegetable-IHD | 24.649 | 463.490 | -0.073 | -0.023 | NA | NA | 0.023 | 0.748 | $1.33*10^{-4}$ | 0.253 | 0.002 | 0.168 |
| Vegetable-ISTK | 24.649 | 463.490 | -0.273 | -0.088 | NA | NA | 0.006 | 0.359 | $1.29*10^{-4}$ | 0.454 | 0.001 | 0.133 |
| Fruit-HSTK | 17.329 | 394.732 | -0.466 | -0.150 | NA | NA | 0.014 | 0.559 | $3.74*10^{-4}$ | 1.028 | 0.002 | 0.237 |
| Fruit-IHD | 17.329 | 394.732 | -0.088 | -0.028 | NA | NA | 0.023 | 0.748 | $1.14*10^{-4}$ | 0.260 | 0.002 | 0.122 |
| Fruit-ISTK | 17.329 | 394.732 | -0.191 | -0.061 | NA | NA | 0.006 | 0.359 | $6.28*10^{-5}$ | 0.270 | $6.58*10^{-4}$ | 0.070 |
| Nuts-T2DM | 0.132 | 192.179 | -0.051 | -0.016 | NA | NA | 0.018 | 0.740 | $2.41*10^{-6}$ | 0.440 | $2.31*10^{-5}$ | 0.252 |
| Nuts-IHD | 0.132 | 192.179 | -0.122 | -0.039 | NA | NA | 0.023 | 0.748 | $7.29*10^{-6}$ | 1.066 | $8.00*10^{-5}$ | 0.629 |
| Omega 3-IHD | 4.012 | 5202.026 | -0.240 | -0.077 | NA | NA | 0.023 | 0.748 | $7.18*10^{-5}$ | 9.350 | $6.99*10^{-4}$ | 5.445 |
| PUFA-IHD | 1.121 | 12.918 | -0.148 | -0.047 | NA | NA | 0.023 | 0.748 | $2.45*10^{-4}$ | 0.285 | 0.002 | 0.192 |
| Whole grain-T2DM | 0.790 | 325.572 | -0.192 | -0.062 | NA | NA | 0.018 | 0.740 | $1.80*10^{-5}$ | 0.923 | $1.32*10^{-4}$ | 0.251 |
| Whole grain - HSTK | 0.790 | 325.572 | -0.134 | -0.043 | NA | NA | 0.014 | 0.559 | $9.85*10^{-6}$ | 0.488 | $2.03*10^{-4}$ | 0.146 |
| Whole grain - IHD | 0.790 | 325.572 | -0.051 | -0.016 | NA | NA | 0.023 | 0.748 | $5.99*10^{-6}$ | 0.247 | $9.85*10^{-5}$ | 0.079 |
| Whole grain - ISTK | 0.790 | 325.572 | -0.134 | -0.043 | NA | NA | 0.006 | 0.359 | $4.06*10^{-6}$ | 0.313 | $8.73*10^{-5}$ | 0.084 |
| **$IDHI_{beneficial}$¶** | NA | NA | NA | NA | NA | NA | NA | NA | 0.001 | 16.087 | 0.090 | 2.156 |
| Processed meat-T2DM | 1.769 | 75.351 | 0.196 | 0.609 | NA | NA | 0.018 | 0.740 | -0.679 | $-1.28*10^{-4}$ | -0.377 | $-4.78*10^{-4}$ |
| Processed meat-IHD | 1.769 | 75.351 | 0.150 | 0.467 | NA | NA | 0.023 | 0.748 | -0.526 | $-1.23*10^{-4}$ | -0.266 | -0.002 |
| Saturated fat-IHD | 2.195 | 28.189 | 0.045 | 0.139 | NA | NA | 0.023 | 0.748 | -0.587 | $-4.55*10^{-4}$ | -0.357 | -0.005 |
| Red meat-T2DM | 2.605 | 137.756 | 0.084 | 0.258 | NA | NA | 0.018 | 0.740 | -0.263 | $-4.01*10^{-5}$ | -0.162 | $-2.74*10^{-4}$ |
| Sodium-AA* | 1387.522 | 6401.688 | 0.152 | 0.480 | 1.349 | 11.774 | $6.00*10^{-4}$ | 0.057 | -0.090 | $-7.41*10^{-6}$ | -0.017 | $-4.08*10^{-5}$ |
| Sodium-AFF* | 1387.522 | 6401.688 | 0.130 | 0.413 | 1.349 | 11.774 | 0.000 | 0.094 | -0.128 | 0.000 | -0.019 | 0.000 |
| Sodium-CM* | 1387.522 | 6401.688 | 0.130 | 0.413 | 1.349 | 11.774 | $5.10*10^{-4}$ | 0.577 | -0.782 | $-5.40*10^{-6}$ | -0.105 | $-1.22*10^{-4}$ |
| Sodium- | 1387.522 | 6401.688 | 0.116 | 0.371 | 1.349 | 11.774 | $1.90*10^{-4}$ | 0.084 | -0.102 | $-1.79*10^{-6}$ | -0.013 | $-3.37*10^{-5}$ |

| Dietary factor-disease pair | Intake (g) | | Log (RR) per serving change | | Mediated effect | | Disease proportion (%) | | Theoretical calculated product§ | | Empirical calculated product§§ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| ENDO* | | | | | | | | | | | | |
| Sodium-HHD* | 1387.522 | 6401.688 | 0.388 | 1.190 | 1.349 | 11.774 | 0.001 | 0.293 | -1.141 | $-4.31*10^{-5}$ | -0.323 | $-4.22*10^{-4}$ |
| Sodium-HSTK* | 1387.522 | 6401.688 | 0.170 | 0.811 | 1.349 | 11.774 | 0.014 | 0.559 | -1.485 | $-1.99*10^{-4}$ | -0.366 | -0.003 |
| Sodium-IHD* | 1387.522 | 6401.688 | 0.168 | 0.596 | 1.349 | 11.774 | 0.023 | 0.748 | -1.459 | $-3.17*10^{-4}$ | -0.365 | -0.003 |
| Sodium-ISTK* | 1387.522 | 6401.688 | 0.159 | 0.833 | 1.349 | 11.774 | 0.006 | 0.359 | -0.980 | $-7.67*10^{-5}$ | -0.155 | -0.002 |
| Sodium-OTH* | 1387.522 | 6401.688 | 0.130 | 0.413 | 1.349 | 11.774 | 0.002 | 0.309 | -0.418 | $-2.49*10^{-5}$ | -0.059 | $-4.64*10^{-4}$ |
| Sodium-PVD* | 1387.522 | 6401.688 | 0.130 | 0.413 | 1.349 | 11.774 | 0.000 | 0.030 | -0.041 | 0.000 | -0.005 | 0.000 |
| Sodium-RHD* | 1387.522 | 6401.688 | 0.074 | 0.244 | 1.349 | 11.774 | $3.17*10^{-4}$ | 0.300 | -0.240 | $-1.90*10^{-6}$ | -0.033 | $-6.14*10^{-6}$ |
| SSB-T2DM | 5.967 | 1089.961 | 0.095 | 0.295 | NA | NA | 0.018 | 0.740 | -1.047 | $-4.60*10^{-5}$ | -0.668 | $-9.75*10^{-5}$ |
| SSB-IHD | 5.967 | 1089.961 | 0.090 | 0.280 | NA | NA | 0.023 | 0.748 | -1.006 | $-5.48*10^{-5}$ | -0.425 | $-8.26*10^{-4}$ |
| SSB-T2DM** | 5.967 | 1089.961 | 0.418 | 1.268 | 0.020 | 0.046 | 0.018 | 0.740 | -0.207 | $-4.05*10^{-6}$ | -0.132 | $-8.60*10^{-6}$ |
| SSB-HHD** | 5.967 | 1089.961 | 0.432 | 0.832 | 0.020 | 0.046 | 0.001 | 0.293 | -0.054 | $-3.11*10^{-7}$ | -0.010 | $-6.20*10^{-6}$ |
| SSB-HSTK** | 5.967 | 1089.961 | 0.119 | 1.111 | 0.020 | 0.046 | 0.014 | 0.559 | -0.137 | $-9.03*10^{-7}$ | -0.028 | $-6.14*10^{-6}$ |
| SSB-IHD** | 5.967 | 1089.961 | 0.172 | 0.582 | 0.020 | 0.046 | 0.023 | 0.748 | -0.096 | $-2.10*10^{-6}$ | -0.038 | $-3.17*10^{-5}$ |
| SSB-ISTK** | 5.967 | 1089.961 | 0.100 | 0.736 | 0.020 | 0.046 | 0.006 | 0.359 | -0.058 | $-3.12*10^{-7}$ | -0.007 | $-9.54*10^{-6}$ |
| **$IDHI_{adverse}$¶** | NA | NA | NA | NA | NA | NA | NA | NA | -11.526 | -0.002 | -1.425 | -0.137 |
| **$IDHI_{overall}$¶** | NA | NA | NA | NA | NA | NA | NA | NA | -11.525 | 16.086 | -1.032 | 1.368 |

* Effects of sodium on diseases that are mediated by the change in systolic blood pressure.

** Effects of SSB on disease that are mediated by the change in BMI.

§ The theoretical calculated product was the minimum or maximum value of the products based on the maximum and minimum values of the data input (i.e. intake, logRR, mediated effect value, and disease proportion) across country-age-sex groups.

§§ The empirical calculated product was the observed minimum or maximum value of the products of intake, logRR, mediated effect value, and disease proportion across country-age-sex groups.

¶ $IDHI_{beneficial}$ is the summation of the products of all above-listed beneficial diet-disease pairs. $IDHI_{adverse}$ is the summation of the products of all above-listed adverse diet-disease pairs. $IDHI_{overall}$ is the summation of the products of all diet-disease pairs.

HSTK = Hemorrhagic stroke; IHD = Ischemic heart disease; ISTK = Ischemic stroke; T2DM = Type 2 diabetes mellitus; AA = Aortic aneurysm; AFF = Atrial fibrillation and flutter; CM = Cardiomyopathy and myocarditis; ENDO = Endocarditis; HHD = Hypertensive heart disease; OTH = Other cardiovascular and circulatory diseases; PVD = Peripheral artery disease; RHD = Rheumatic heart disease; SSB = Sugar-sweetened beverage.

**Supplemental Table 4. Countries in Each Super-region**

| Region | Countries |
|---|---|
| **Central Asia and Eastern and Central Europe super-region** | |
| Central Asia (9) | Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan, Uzbekistan |
| Central Europe (13) | Albania, Bulgaria, Bosnia and Herzegovina, Czech Republic, Croatia, Hungary, The former Yugoslav Republic of Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, |
| Eastern Europe (7) | Belarus, Estonia, Lithuania, Latvia, Moldova, Russia, Ukraine |
| **Western Europe super-region** | |
| Western Europe (22) | Andorra, Austria, Belgium, Switzerland, Cyprus, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Iceland, Israel, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Sweden |
| **East and Southeast Asia super-region** | |
| East Asia (3) | China, North Korea, Taiwan |
| Southeast Asia (10) | Indonesia, Cambodia, Laos, Sri Lanka, Myanmar, Malaysia, Philippines, Thailand, Timor Leste, Vietnam |
| Asia-Pacific high income (4) | Brunei Darussalam, Japan, South Korea, Singapore |
| Oceania (9) | Fiji, Micronesia, Kiribati, Marshall Islands, Papua New Guinea, Solomon Islands, Tonga, Vanuatu, Samoa |
| **South Asia super-region** | |
| South Asia (6) | Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan |
| **Australia and New Zealand super-region** | |
| Australasia (2) | Australia, New Zealand |
| **Latin America and Caribbean super-region** | |
| Caribbean (15) | Antigua and Barbuda, Bahamas, Belize, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Lucia, Suriname, Trinidad and Tobago, Saint Vincent and the Grenadines |
| Latin America, | Bolivia, Ecuador, Peru |

| | |
|---|---|
| Andean (3) | |
| Latin America, Central (9) | Colombia, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama, El Salvador, Venezuela |
| Latin America, Southern (3) | Argentina, Chile, Uruguay |
| Latin America, Tropical (2) | Brazil, Paraguay |
| **North Africa and Middle East super-region** | |
| North Africa and Middle East (19) | United Arab Emirates, Bahrain, Algeria, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Occupied Palestinian Territory, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, Yemen |
| **Canada and U.S. super-region** | |
| North America high income (2) | Canada, United States |
| **Sub-Saharan Africa superregion** | |
| Sub-Saharan Africa, Central (6) | Angola, Central Africa, Democratic Republic of Congo, Congo, Gabon, Equatorial Guinea |
| Sub-Saharan Africa, East (17) | Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mozambique, Mauritius, Malawi, Rwanda, Sudan, Somalia, Seychelles, Tanzania, Uganda, Zambia |
| Sub-Saharan Africa, Southern (6) | Botswana, Lesotho, Namibia, Swaziland, South Africa, Zimbabwe |
| Sub-Saharan Africa, West (19) | Benin, Burkina Faso, Cote d'Ivoire, Cameroon, Cape Verde, Ghana, Guinea, The Gambia, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Sao Tome and Principe, Chad, Togo, |

**Supplemental Table 5. Population-weighted Country Mean of the IDHI***

| Country | N Population | Overall | Beneficial | Adverse |
|---|---|---|---|---|
| Afghanistan | 10,475,657 | -0.093 | 0.358 | -0.451 |
| Albania | 1,876,920 | -0.104 | 0.383 | -0.487 |
| Algeria | 18,583,306 | -0.155 | 0.346 | -0.501 |
| Andorra | 60,557 | -0.031 | 0.487 | -0.518 |
| Angola | 6,422,312 | -0.272 | 0.325 | -0.597 |
| Antigua and Barbuda | 47,251 | -0.234 | 0.385 | -0.619 |
| Argentina | 23,626,842 | -0.157 | 0.311 | -0.468 |
| Armenia | 1,896,496 | -0.423 | 0.222 | -0.645 |
| Australia | 14,538,632 | -0.055 | 0.450 | -0.505 |
| Austria | 6,123,275 | -0.255 | 0.412 | -0.666 |
| Azerbaijan | 5,339,132 | -0.298 | 0.299 | -0.597 |
| Bahamas | 205,033 | -0.320 | 0.366 | -0.686 |
| Bahrain | 821,295 | -0.214 | 0.357 | -0.570 |
| Bangladesh | 71,983,404 | 0.139 | 0.432 | -0.293 |
| Barbados | 185,898 | 0.301 | 1.068 | -0.768 |
| Belarus | 6,791,457 | -0.337 | 0.382 | -0.720 |
| Belgium | 7,695,255 | -0.229 | 0.399 | -0.628 |
| Belize | 136,075 | -0.476 | 0.307 | -0.783 |
| Benin | 3,237,093 | -0.024 | 0.389 | -0.413 |
| Bhutan | 355,955 | 0.118 | 0.456 | -0.338 |
| Bolivia | 4,354,633 | -0.351 | 0.340 | -0.691 |
| Bosnia and Herzegovina | 2,676,591 | -0.215 | 0.205 | -0.421 |
| Botswana | 909,812 | -0.299 | 0.246 | -0.545 |
| Brazil | 111,795,371 | -0.311 | 0.259 | -0.570 |
| Brunei Darussalam | 228,075 | 0.003 | 0.428 | -0.425 |
| Bulgaria | 5,608,752 | -0.046 | 0.473 | -0.519 |
| Burkina Faso | 5,679,106 | 0.046 | 0.482 | -0.436 |
| Burundi | 3,306,097 | -0.068 | 0.236 | -0.304 |
| Côte d'Ivoire | 7,654,293 | -0.047 | 0.443 | -0.490 |
| Cambodia | 6,476,701 | 0.385 | 0.844 | -0.458 |
| Cameroon | 7,589,244 | -0.098 | 0.299 | -0.397 |
| Canada | 23,474,969 | -0.194 | 0.351 | -0.545 |
| Cape Verde | 224,163 | -0.231 | 0.439 | -0.670 |
| Central African Republic | 1,714,554 | -0.223 | 0.334 | -0.558 |
| Chad | 3,909,490 | 0.166 | 0.599 | -0.433 |
| Chile | 10,075,628 | 0.092 | 0.565 | -0.474 |
| China | 855,011,404 | 0.043 | 0.463 | -0.420 |
| Colombia | 24,519,984 | -0.709 | 0.371 | -1.079 |
| Comoros | 288,353 | 0.013 | 0.424 | -0.411 |
| Congo | 1,618,576 | -0.205 | 0.322 | -0.527 |
| Costa Rica | 2,616,534 | -0.678 | 0.273 | -0.951 |
| Croatia | 3,208,837 | -0.206 | 0.403 | -0.610 |
| Cuba | 7,703,676 | -0.365 | 0.316 | -0.681 |
| Cyprus | 498,207 | 0.047 | 0.593 | -0.546 |
| Czech Republic | 7,713,756 | -0.317 | 0.279 | -0.596 |
| Democratic People's Republic of Korea | 14,858,340 | 0.206 | 0.547 | -0.340 |
| Democratic Republic of the Congo | 22,100,152 | -0.002 | 0.395 | -0.397 |

| Country | N Population | Overall | Beneficial | Adverse |
|---|---|---|---|---|
| Denmark | 3,850,947 | 0.278 | 0.857 | -0.579 |
| Djibouti | 378,775 | -0.180 | 0.426 | -0.605 |
| Dominica | 39,658 | -0.344 | 0.260 | -0.604 |
| Dominican Republic | 4,976,613 | -0.418 | 0.375 | -0.793 |
| Ecuador | 7,368,690 | -0.370 | 0.286 | -0.656 |
| Egypt | 39,531,117 | 0.008 | 0.487 | -0.479 |
| El Salvador | 2,873,894 | -0.670 | 0.300 | -0.969 |
| Equatorial Guinea | 289,591 | -0.179 | 0.310 | -0.490 |
| Eritrea | 2,009,414 | 0.144 | 0.535 | -0.391 |
| Estonia | 951,905 | -0.288 | 0.313 | -0.601 |
| Ethiopia | 30,967,557 | -0.025 | 0.346 | -0.371 |
| Fiji | 452,445 | -0.248 | 0.413 | -0.661 |
| Finland | 3,809,656 | -0.046 | 0.572 | -0.618 |
| France | 43,490,154 | 0.048 | 0.533 | -0.486 |
| Gabon | 653,119 | -0.149 | 0.394 | -0.543 |
| Gambia | 614,218 | -0.064 | 0.584 | -0.648 |
| Georgia | 2,924,276 | -0.347 | 0.342 | -0.689 |
| Germany | 62,008,047 | -0.188 | 0.401 | -0.589 |
| Ghana | 10,117,921 | 0.075 | 0.473 | -0.399 |
| Greece | 8,512,876 | 0.339 | 0.801 | -0.462 |
| Grenada | 52,212 | -0.325 | 0.377 | -0.702 |
| Guatemala | 5,505,233 | -0.523 | 0.311 | -0.834 |
| Guinea | 3,717,034 | -0.079 | 0.412 | -0.491 |
| Guinea-Bissau | 587,141 | -0.194 | 0.359 | -0.554 |
| Guyana | 363,129 | -0.216 | 0.379 | -0.595 |
| Haiti | 4,287,602 | -0.215 | 0.278 | -0.493 |
| Honduras | 3,189,161 | -0.721 | 0.306 | -1.027 |
| Hungary | 7,287,487 | -0.345 | 0.221 | -0.566 |
| Iceland | 209,377 | 0.456 | 1.054 | -0.599 |
| India | 615,485,538 | -0.065 | 0.328 | -0.394 |
| Indonesia | 131,822,966 | 0.310 | 0.773 | -0.463 |
| Iran (Islamic Republic of) | 40,748,652 | -0.079 | 0.355 | -0.434 |
| Iraq | 11,797,984 | -0.028 | 0.407 | -0.435 |
| Ireland | 2,979,737 | -0.239 | 0.299 | -0.538 |
| Israel | 4,296,425 | 0.140 | 0.521 | -0.381 |
| Italy | 45,508,557 | 0.007 | 0.499 | -0.492 |
| Jamaica | 1,450,154 | -0.143 | 0.425 | -0.569 |
| Japan | 96,444,410 | 0.319 | 0.760 | -0.441 |
| Jordan | 2,534,418 | -0.051 | 0.492 | -0.543 |
| Kazakhstan | 9,107,864 | -0.416 | 0.235 | -0.651 |
| Kenya | 14,861,580 | -0.105 | 0.313 | -0.418 |
| Kiribati | 40,551 | -0.032 | 0.607 | -0.639 |
| Kuwait | 1,582,797 | -0.201 | 0.385 | -0.586 |
| Kyrgyzstan | 2,520,055 | -0.315 | 0.258 | -0.573 |
| Lao People's Democratic Republic | 2,639,160 | 0.732 | 1.180 | -0.448 |
| Latvia | 1,619,952 | -0.248 | 0.354 | -0.601 |
| Lebanon | 2,421,171 | -0.068 | 0.492 | -0.560 |
| Lesotho | 852,101 | -0.170 | 0.250 | -0.420 |

| Country | N Population | Overall | Beneficial | Adverse |
|---|---|---|---|---|
| Liberia | 1,478,958 | -0.154 | 0.315 | -0.468 |
| Libyan Arab Jamahiriya | 3,297,929 | -0.109 | 0.379 | -0.489 |
| Lithuania | 2,336,413 | -0.147 | 0.501 | -0.649 |
| Luxembourg | 352,405 | -0.111 | 0.367 | -0.478 |
| Macedonia (Former Yugoslav Republic of) | 1,384,589 | -0.233 | 0.384 | -0.617 |
| Madagascar | 7,678,775 | 0.049 | 0.444 | -0.395 |
| Malawi | 5,037,105 | -0.089 | 0.251 | -0.340 |
| Malaysia | 14,682,491 | 0.904 | 1.529 | -0.625 |
| Mali | 5,090,019 | 0.064 | 0.564 | -0.500 |
| Malta | 294,973 | -0.185 | 0.488 | -0.674 |
| Marshall Islands | 26,845 | -0.004 | 0.570 | -0.574 |
| Mauritania | 1,388,583 | -0.138 | 0.486 | -0.625 |
| Mauritius | 798,367 | -0.025 | 0.713 | -0.739 |
| Mexico | 59,642,736 | -0.635 | 0.245 | -0.880 |
| Micronesia (Federated States of) | 45,418 | 0.078 | 0.628 | -0.550 |
| Moldova | 2,334,124 | -0.241 | 0.352 | -0.594 |
| Mongolia | 1,399,726 | -0.266 | 0.384 | -0.650 |
| Montenegro | 418,440 | -0.062 | 0.402 | -0.464 |
| Morocco | 16,734,210 | -0.064 | 0.479 | -0.542 |
| Mozambique | 8,471,890 | -0.023 | 0.382 | -0.405 |
| Myanmar | 26,712,070 | 0.306 | 0.760 | -0.454 |
| Namibia | 968,541 | -0.291 | 0.263 | -0.554 |
| Nepal | 12,908,175 | -0.045 | 0.290 | -0.335 |
| Netherlands | 11,651,997 | -0.183 | 0.370 | -0.553 |
| New Zealand | 2,835,329 | 0.075 | 0.616 | -0.541 |
| Nicaragua | 2,555,359 | -0.666 | 0.233 | -0.899 |
| Niger | 5,092,084 | 0.077 | 0.556 | -0.479 |
| Nigeria | 59,677,728 | -0.007 | 0.423 | -0.430 |
| Norway | 3,312,133 | 0.049 | 0.615 | -0.566 |
| Occupied Palestinian Territory | 1,464,791 | -0.122 | 0.325 | -0.446 |
| Oman | 1,416,030 | -0.043 | 0.434 | -0.477 |
| Pakistan | 74,938,819 | -0.213 | 0.259 | -0.472 |
| Panama | 1,889,227 | -0.533 | 0.355 | -0.888 |
| Papua New Guinea | 2,874,705 | -0.018 | 0.450 | -0.468 |
| Paraguay | 2,982,485 | -0.358 | 0.263 | -0.622 |
| Peru | 14,815,952 | -0.091 | 0.414 | -0.506 |
| Philippines | 41,644,885 | 0.200 | 0.817 | -0.617 |
| Poland | 27,049,390 | -0.172 | 0.450 | -0.622 |
| Portugal | 7,850,006 | 0.071 | 0.545 | -0.474 |
| Qatar | 1,265,654 | -0.139 | 0.374 | -0.513 |
| Republic of Korea | 33,748,963 | 0.161 | 0.553 | -0.391 |
| Romania | 15,332,693 | -0.263 | 0.370 | -0.632 |
| Russian Federation | 99,821,595 | -0.101 | 0.471 | -0.572 |
| Rwanda | 3,883,030 | -0.016 | 0.230 | -0.246 |
| São Tomé and Príncipe | 63,828 | 0.015 | 0.473 | -0.459 |
| Saint Lucia | 94,822 | -0.278 | 0.381 | -0.659 |
| Saint Vincent and the Grenadines | 59,967 | -0.452 | 0.310 | -0.762 |
| Samoa | 79,644 | 0.116 | 0.754 | -0.639 |

| Country | N Population | Overall | Beneficial | Adverse |
|---|---|---|---|---|
| Saudi Arabia | 14,170,574 | -0.084 | 0.395 | -0.479 |
| Senegal | 4,425,386 | 0.013 | 0.545 | -0.533 |
| Serbia | 6,761,778 | -0.205 | 0.374 | -0.579 |
| Seychelles | 30,989 | 0.487 | 1.304 | -0.817 |
| Sierra Leone | 2,208,402 | 0.025 | 0.487 | -0.462 |
| Singapore | 2,485,188 | -0.186 | 0.318 | -0.504 |
| Slovakia | 3,823,269 | -0.337 | 0.326 | -0.663 |
| Slovenia | 1,522,994 | -0.326 | 0.311 | -0.636 |
| Solomon Islands | 218,766 | 0.080 | 0.589 | -0.509 |
| Somalia | 3,406,325 | -0.038 | 0.356 | -0.393 |
| South Africa | 24,962,209 | -0.288 | 0.206 | -0.494 |
| Spain | 33,415,360 | 0.230 | 0.760 | -0.530 |
| Sri Lanka | 12,396,492 | 0.342 | 0.870 | -0.528 |
| Sudan | 17,525,249 | -0.267 | 0.329 | -0.596 |
| Suriname | 285,026 | -0.324 | 0.419 | -0.744 |
| Swaziland | 434,647 | -0.224 | 0.308 | -0.532 |
| Sweden | 6,517,363 | -0.105 | 0.468 | -0.572 |
| Switzerland | 5,565,876 | -0.071 | 0.357 | -0.429 |
| Syrian Arab Republic | 8,711,766 | -0.093 | 0.490 | -0.583 |
| Taiwan | 16,214,199 | 0.003 | 0.433 | -0.430 |
| Tajikistan | 2,720,049 | -0.265 | 0.257 | -0.521 |
| Thailand | 44,459,397 | 0.331 | 0.934 | -0.603 |
| Timor-Leste | 376,171 | -0.213 | 0.312 | -0.525 |
| Togo | 2,385,647 | -0.118 | 0.358 | -0.475 |
| Tonga | 45,784 | -0.181 | 0.528 | -0.709 |
| Trinidad and Tobago | 826,618 | -0.673 | 0.225 | -0.898 |
| Tunisia | 6,027,968 | -0.019 | 0.504 | -0.523 |
| Turkey | 40,688,142 | 0.298 | 0.758 | -0.460 |
| Turkmenistan | 2,467,579 | -0.253 | 0.292 | -0.544 |
| Uganda | 10,518,174 | -0.014 | 0.366 | -0.380 |
| Ukraine | 32,820,314 | -0.215 | 0.401 | -0.616 |
| United Arab Emirates | 5,021,287 | -0.075 | 0.432 | -0.507 |
| United Kingdom | 43,105,651 | -0.061 | 0.471 | -0.532 |
| United Republic of Tanzania | 15,916,459 | -0.183 | 0.286 | -0.469 |
| United States of America | 202,948,103 | -0.352 | 0.333 | -0.685 |
| Uruguay | 2,094,688 | -0.095 | 0.322 | -0.416 |
| Uzbekistan | 13,227,345 | -0.327 | 0.262 | -0.589 |
| Vanuatu | 99,955 | -0.185 | 0.386 | -0.571 |
| Venezuela (Bolivarian Republic of) | 15,040,278 | -0.590 | 0.455 | -1.046 |
| Viet Nam | 49,199,089 | 0.192 | 0.693 | -0.501 |
| Yemen | 8,086,727 | -0.117 | 0.417 | -0.534 |
| Zambia | 4,410,476 | -0.108 | 0.317 | -0.425 |
| Zimbabwe | 4,570,707 | -0.370 | 0.160 | -0.530 |

* Dietary data was not obtained from South Sudan. Maldives were excluded from the analysis because of implausible seafood omega 3 intake data.

IDHI in each country-age-sex (*cas*) group

Summation across all dietary factors and disease outcomes in each *cas* group

Intake of each dietary factor in each *cas* group

Change in mediator per unit of dietary intake in each *cas* group

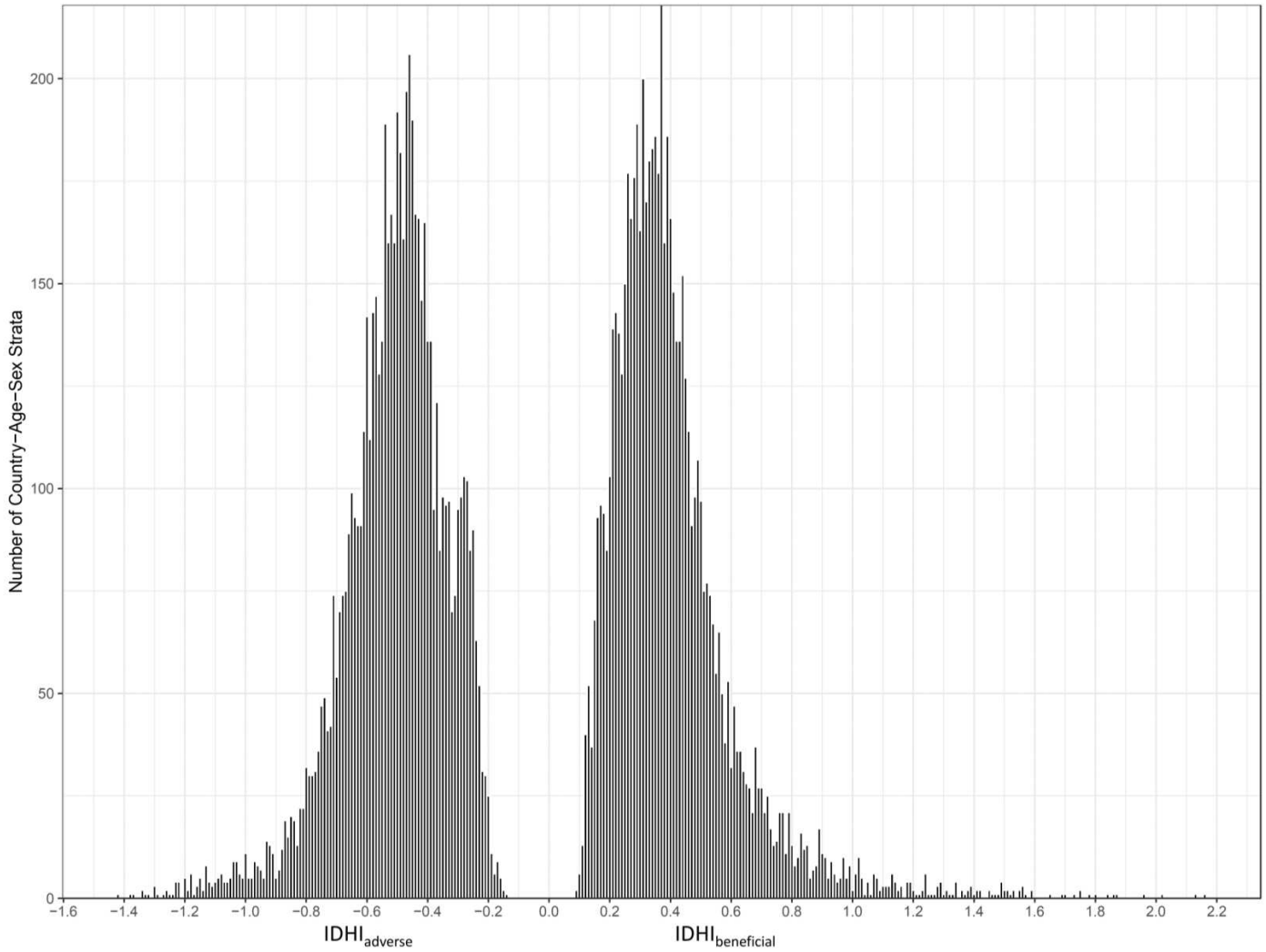
Effect of dietary factor/mediator on disease in each *cas* group

Cardiometabolic disease profile, represented by proportion of cause-specific DALYs in each *cas* group

$$IDHI_{cas} = \sum_{k=1}^{12} \left\{ \sum_{j=1}^{10} \left[ (Intake_j) \times (-\ln RR_{jk}) \times \left( \frac{DALY_k}{\sum_{k=1}^{12} DALY_k} \right) \right] + \sum_{j,i=1}^{2} \left[ (Intake_j \times \beta_{ij}) \times (-\ln RR_{ik}) \times \left( \frac{DALY_k}{\sum_{k=1}^{12} DALY_k} \right) \right] \right\}$$

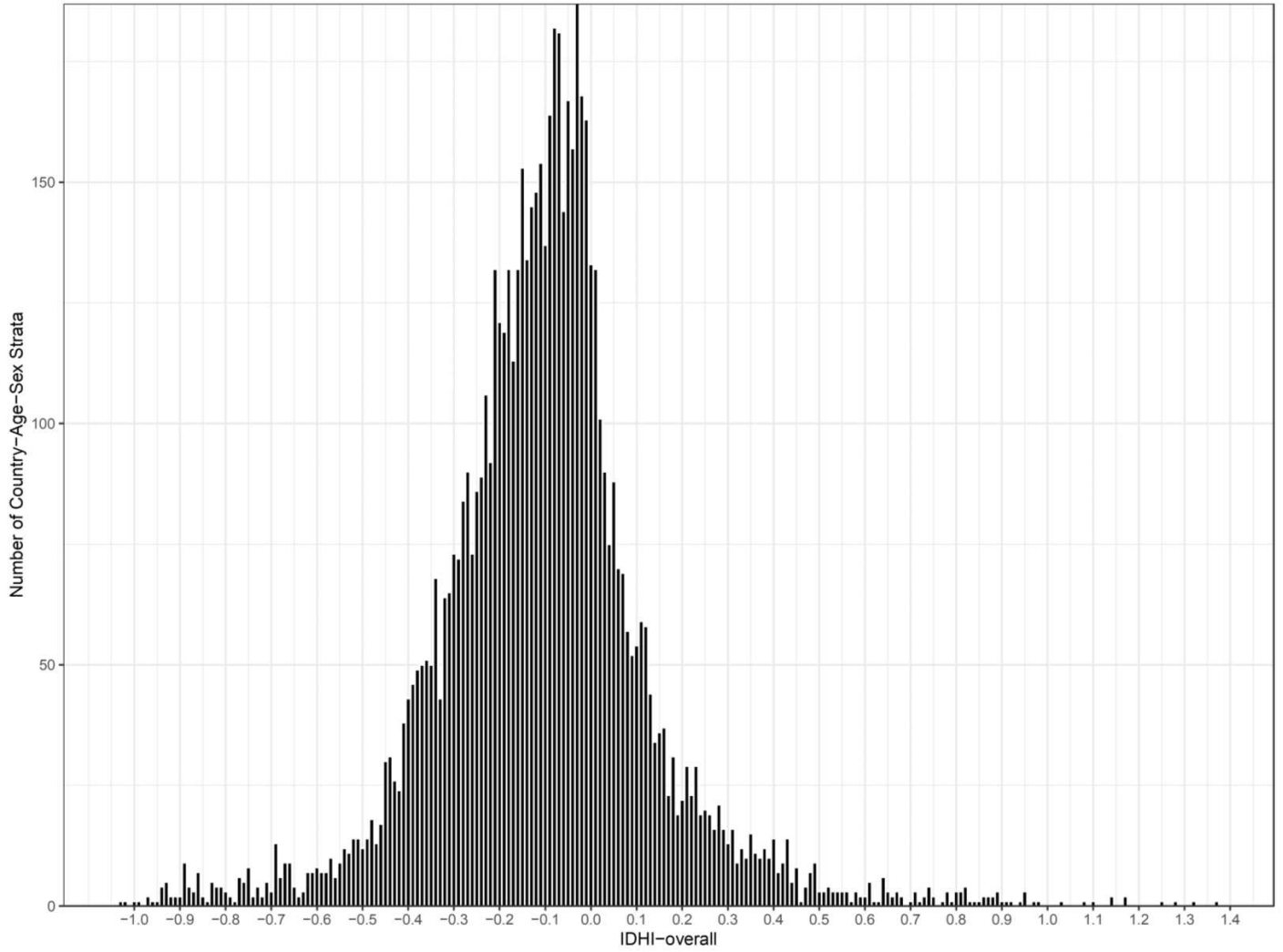
**Supplemental Figure 1. Calculation of the International Diet-Health Index (IDHI).**

Each component of the equation is explained by the corresponding color-coded text box. The IDHI is calculated at the country-age-sex level and population weights are applied to aggregate the IDHI to the overall country, region, and global levels. Dietary intake is in units of g/day, mediating factor units represent change in mediator per change in unit of dietary intake, relative risks are per unit of dietary intake or per unit of metabolic mediator. cas = the country-age-sex group; j = a dietary factor; k = a cardiometabolic disease; i = a mediator.




**Supplemental Figure 2. Distribution of $IDHI_{beneficial}$ and $IDHI_{adverse}$ at country-age-sex level.**

IDHI = International Diet-Health Index




**Supplemental Figure 3. Distribution of $IDHI_{overall}$ at country-age-sex level.**

IDHI = International Diet-Health Index

**Reference**

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