Global Dietary DATABASE

ANNUAL REPORT 2018

Tufts
UNIVERSITY

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THE GLOBAL DIETARY DATABASE:
AN INTRODUCTION

CURRENTLY, harmonized, reliable data on individual-level dietary intake is extremely limited for many nations, and those that do exist have shortcomings.

To address this gap, we have created the Global Dietary Database (GDD), a repository of dietary data collected from primary surveys administered in 185 countries around the world. By collating, standardizing, and validating these data, we are able to estimate dietary intake of major foods and nutrients in children and adults worldwide. These estimates are the most up-to-date and reliable in the world, and will act as robust foundations for global nutrition interventions and policy, particularly which target vulnerable populations.

The GDD has contributed to novel evaluations of global diet quality and trends, nutrition-related disease burdens, existing diet estimation tools, and potential impacts of global sustainability pressures on dietary intakes and health.

WORK ON THE GDD has spanned the past decade. The most recent iteration, termed "GDD 2010," evaluated the intake of 21 foods and beverages around the world, accounting for differences in individuals' age and sex.

The current iteration of the project, termed "GDD 2015," has expanded greatly upon its predecessor. GDD 2015 estimates intake of 57 dietary factors globally, accounting not just for age and sex, but also for education level, urban or rural residency, and pregnancy status.

GDD 2015 aims to assess global dietary intake throughout the lifecourse (with particular focus on children, adolescents, and pregnant/nursing mothers), understand how both under- and overnutrition affect health worldwide, and evaluate the effectiveness of global nutrition interventions.

This report provides an update of GDD 2015, broken down by its specific output targets. Updates include methodology, completed work, next steps, and impact around the world since the completion of GDD 2010.

By issuing this report, we hope to spark collaborations with other key stakeholders in the global nutrition community. It is our ambition that, both through explicit partnerships and otherwise, GDD will raise the standard of future global nutrition research and initiatives. ❀

Global Dietary
DATABASE

AIM 1

EXTEND AND EXPAND OUR INNOVATIVE WORK TO BUILD AND DEVELOP THE GLOBAL DIETARY DATABASE 2015.

DATABASE DEVELOPMENT &EXPANSION
AIM 1A

DATA PROCESSING » Using systematic search terms and direct contact with data owners, we were able to identify and retrieve hundreds of surveys containing nationally- or sub-nationally-representative dietary data collected between 1980 and 2016. These data were then prepared, standardized, and aggregated by GDD team members via a multi-stage process.

Data are typically received at the individual level in formats that vary widely on a case-by-case basis. GDD team members then extract relevant data and apply GDD coding to standardize their structure. Demographic characteristics identified in the dataset are then used to compile mean dietary intakes of groups (by age, sex, residence, education level, and pregnancy status). These group values are then compared against plausibility guidelines as a final filter before officially becoming model inputs. It's through this process that GDD is able to incorporate data from around the world, irrespective of their original formatting or collection methods.

DATA SOURCES » A breakdown of the surveys currently included in GDD 2015 is shown to the left. An additional 26 survey-years have been collected but excluded, and 18 more are being replaced by surveys with updated data.

RIGHT
Procedure for the assessment and analysis of survey data.

Pie chart
- **212** DHS SURVEY
- **264** 24-HOUR RECALL
- **158** BIOMARKER
- **299** AWAITING REVIEW
- **504** FOOD FREQUENCY QUESTIONNAIRE

ABOVE
Assessment method of 1,437 survey-years collected for GDD 2015.

AIM 1A
DATA PREPARATION WORKFLOW

DATA COLLECTION
STEP 1
Dietary intake data is contributed by a data owner or downloaded from a public resource by a GDD team member.

PRELIMINARY CHECKS
STEP 2
Survey metadata is verified and recorded. Foods or food groupings are matched to GDD dietary factors. Quality checks are completed.

CODING AND STANDARDIZATION
STEP 3
Coding and standardization of demographic and dietary variables is performed to match GDD definitions and units.

AGGREGATION
STEP 4
Survey microdata is aggregated into GDD demographic strata; mean and standard deviation for each stratum is calculated.

PLAUSIBILITY CHECKS
STEP 5
Stratum means are subject to high and low plausibility guidelines to ensure biological feasibility of values. Data is finalized for model input.

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KEY TEAM MEMBERS

Gitanjali Singh
Investigator

Jennifer Onopa
Researcher
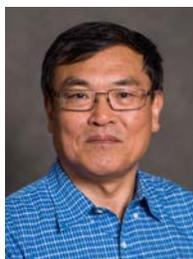
Peilin Shi
Biostatistitian

Jianyi Zhang
Biostatistitian

Julia Reedy
Research Coordinator

Jordan Balletto
Research Scholar

Global Dietary DATABASE

ACQUISITION OF SURVEY MICRODATA
AIM 1B

AIM 1B
SURVEYS WITH CHILD DATA

210
DHS QUESTIONNAIRES

51
SINGLE OR MULTIPLE DIET RECALLS/RECORDS

17
FOOD FREQUENCY QUESTIONNAIRES

12
BIOMARKER

290
TOTAL

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UNPROCESSED POULTRY   SWEET BAKERY PRODUCTS   SUGAR CONFECTIONERY   DAIRY DESSERTS

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NEW DIETARY VARIABLES» Currently, GDD contains data on the intake of 57 dietary factors, including 14 foods, 7 beverages, 15 macronutrients, 19 micronutrients, and 2 indices of carbohydrate quality. In an effort to more closely capture total diet, future data collection will include an additional 4 factors: unprocessed poultry, sweet bakery products, sugar confectionery, and dairy desserts.

ABOVE
New variables created for GDD 2015 data collection.

However, as GDD 2015 is based in the United States, our definitions have largely been formulated with traditional Western foods in mind. Therefore, to accurately capture total global diet, we will be requesting input from global stakeholders on each of our new definitions to validate their cultural and regional relevance. These additions will maximize both the comprehensiveness of the definitions and the accuracy of future data collection.

CHILD DATA» A key difference between GDD 2015 and its previous iteration, GDD 2010, is the incorporation of dietary data from babies, children, and adolescents less than 20 years of age. Therefore, team members are evaluating all surveys currently in the GDD for the presence of child data and extracting these data when available. Assessment methods of the identified surveys are outlined to the left.

Given the prevalence of child wasting and stunting in low- and middle-income countries and the growing rise of child obesity globally, children's dietary patterns are of major concern. This work will give the GDD a more comprehensive representation of children's dietary patterns. More information on child diet quality and health outcomes can be found on pages 20 and 21.

LEFT
Assessment methods of GDD surveys with available child data.

KEY TEAM MEMBERS

Renata Micha
Investigator

Jennifer Onopa
Researcher

Meghan O'Hearn
Doctoral Student

Jianyi Zhang
Biostatistitian

Julia Reedy
Research Coordinator

DATA
CHARACTERISTICS

KEY TEAM MEMBER

Gitanjali Singh
Investigator

In June, 2018, GDD team members attended The American Society for Nutrition's "Nutrition 2018," hosted in Boston, MA. Investigator Gitanjali Singh presented key data characteristic findings at the conference with a poster titled, "The 2015 Global Dietary Database: Key Characteristics of 1,395 Survey-Years of Individual-level Dietary Intake Data." The figure below details the availability of survey-level dietary data around the world, in which countries depicted in dark blue, such as India, have the most available dietary survey data. On the other hand, light yellow and orange countries, like Saudi Arabia and Somalia, are the most data-sparse. By identifying data-sparse countries, we are able to prioritize future data collection from them.

The poster also included summary statistics of the 1,395 survey-years of data currently incorporated into GDD. Key highlights are listed on the following page.

BELOW
Density of (A) total, (B) public, and (C) private survey-years of data.

DATA CHARACTERISTICS

—3%

97%

97% OF THE GLOBAL POPULATION, REPRESENTING 185 COUNTRIES, WAS COVERED BY INPUT DATA.

36%

64%
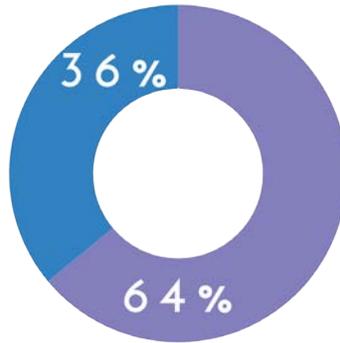
64% OF DATA WERE PUBLICLY AVAILABLE; 36% WERE CONTRIBUTED BY PRIVATE DATA OWNERS.

18%

82%
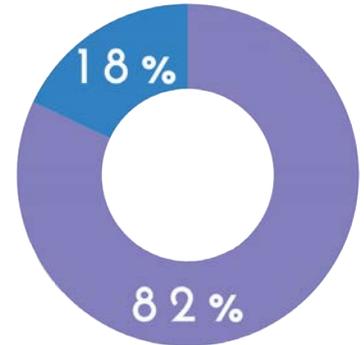
82% OF SURVEY-YEARS WERE NATIONALLY-REPRESENTATIVE. 18% WERE SUB-NATIONALLY-REPRESENTATIVE.

9% —3%

88%
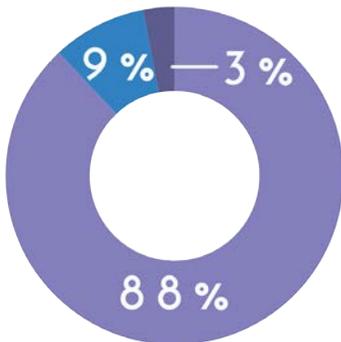
88% OF SURVEYS COVERED BOTH URBAN AND RURAL AREAS. 9% COVERED URBAN AREAS ONLY, AND 3% COVERED ONLY RURAL AREAS.

14% 22%

53%
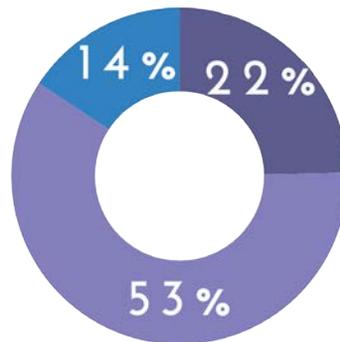
53% OF DIET SURVEYS WERE FOOD-FREQUENCY QUESTIONNAIRES. 22% WERE BASED ON DIETARY RECALLS, AND 14% WERE DHS QUESTIONNAIRES.

—8%

92%
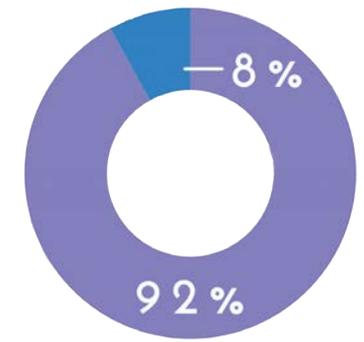
92% OF SURVEYS WERE CONTRIBUTED AS INDIVIDUAL-LEVEL DATA; 8% WERE HOUSEHOLD-LEVEL.

INCORPORATING COVARIATES & NEW MODELING METHODS
AIM 1C

COVARIATES » To achieve greater validity and precision of our final model estimates, especially for data-sparse countries, GDD team members have conducted searches to identify both private and publicly-available data on potential model covariates. These covariates, which include economic, agricultural, and environmental data, can partially help explain variation in dietary intake around the world.

In this search, over 100 new publicly-available covariates have been identified. Furthermore, we have developed a strategic partnership with the Global Expanded Nutrient Supply (GENuS) group from Harvard University to utilize country-level data on availability for 225 foods and nutrients as model covariates.

By identifying and adjusting for these influential factors, GDD is able to more closely estimate global dietary intake.

MODELING » We are currently testing and incorporating the covariates into our models. We perform checks by creating heat maps to visualize the model outputs and identify data issues. An example of a heat map is shown below.

BELOW
Model estimate heat map for intake of a single dietary variable.
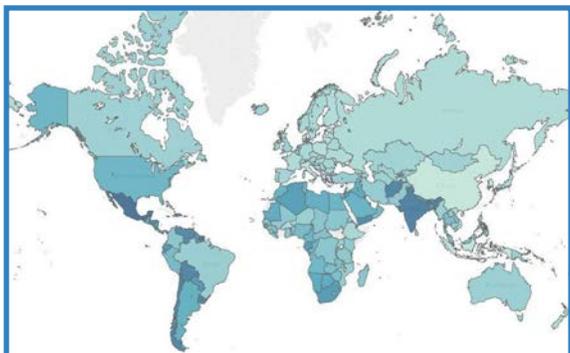
AIM 1C

COVARIATES BY CATEGORY

1. ECONOMIC FACTORS
2. DIETARY INTAKE & SALES DATA
3. AGRICULTURAL FACTORS
4. DEVELOPMENTAL FACTORS
5. ENVIRONMENTAL FACTORS

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KEY TEAM MEMBERS

Dariush Mozaffarian
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Fred Cudhea
Biostatistitian
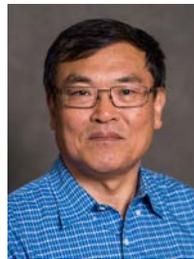
Peilin Shi
Biostatistitian

Global Dietary DATABASE

DATA AVAILABILITY

KEY TEAM MEMBER

Jennifer Onopa
Researcher

At Nutrition 2018, Researcher Jennifer Onopa presented her poster titled, "The 2015 Global Dietary Database: Availability of Individual-level Intakes of 57 Major Foods and Nutrients from 1395 Survey-years of Data."

Jennifer's work outlined the sources, collection methods, and inclusion and exclusion criteria for all survey-years of data identified for GDD input. After identifying 4,759 records of dietary data, 1,395 total years of survey data were accessible and met GDD inclusion criteria.

Key findings show that fruits, non-starchy vegetables, sugar-sweetened beverages, total milk, unprocessed red meats, and beans/legumes were the most widely reported foods and beverages in these final 1,395 survey-years. The figure below outlines the availability of data of 21 foods and beverages.

Total energy, seafood omega-3s, fiber, sodium, and calcium were the most widely reported nutrients. A corresponding figure for data availability of 36 nutrients can be found on the following page.

Food/Beverage	Proportion of 2015 World Population Represented
Fruits	96.5%
Non-starchy veg	96.1%
SSBs	81.7%
Total milk	91.2%
Red meats	91.5%
Beans & legumes	89.4%
Fruit juices	85.0%
Seafoods	87.4%
Whole grains	74.6%
Processed meats	50.7%
Refined grains	60.9%
Nuts & seeds	70.9%
Starchy veg	59.1%
Yogurt	58.0%
Eggs	55.2%
Tea	57.3%
Cheese	54.5%
Potatoes	44.3%
Coffee	22.3%
Whole fat milk	23.5%
Reduced fat milk	16.4%

Legend:
- GDD 2010 (green)
- GDD 2015 Consortium Member data (blue)
- GDD 2015 Publicly Available (yellow)

X-axis: Number of Surveys (0, 100, 200, 300, 400, 500 | 700, 800)

* Some surveys counted as consortium member contributed data are aggregations performed on publicly available data sets

	Number of Surveys	Proportion of 2015 World Population Represented
MACRONUTRIENTS/ CHO INDEX		
Total energy		83.8%
Seafood omega-3 fat		71.7%
Dietary fiber		79.3%
Saturated fat		75.3%
Dietary cholesterol		73.7%
Total omega-6 fatty acids		71.2%
Total protein		55.8%
Total carbohydrates		52.8%
Trans fatty acid*		20.4%
Plant omega-3 fat		63.2%
Monounsaturated fat		47.7%
Added sugars		17.8%
Animal protein		25.9%
Plant protein		22.7%
Dairy protein		20.6%
Glycemic load		5.4%
Glycemic index		5.4%
MICRONUTRIENTS		
Sodium*		76.7%
Calcium		79.5%
Iron		55.4%
Vitamin C		50.2%
Vitamin B2		50.7%
Vitamin B1		49.7%
Vitamin A w/o supplements		50.7%
Vitamin B3		50.1%
Potassium		49.4%
Zinc		50.2%
Vitamin B9		47.9%
Magnesium		48.5%
Vitamin E		44.4%
Vitamin B6		45.4%
Vitamin B12		39.1%
Vitamin D		24.6%
Selenium		35.9%
Iodine		24.1%
Vitamin A w/ supplements		25.5%

Legend:
- GDD 2010
- GDD 2015 Consortium Member data
- GDD 2015 Publicly Available

*Counts include dietary biomarker data in addition to dietary intake data

Global Dietary DATABASE

FOODEX2 CODING SCHEME
AIM 1D

WORKFLOW FOR FOODEX2 MAPPING

RIGHT
Process for acquiring FoodEx2-coded survey data.

A major challenge in assessing dietary intake is the variation of descriptions of individual, self-reported food items, which can ultimately lead to assessment errors. To address this issue, we will apply FoodEx2 – a sophisticated food description and classification system developed by the European Food Safety Authority (EFSA) – to dietary surveys within GDD. This work will help to standardize global dietary intake beyond the 57 dietary variables currently collected by GDD.

This year, GDD team members have developed a protocol for communication and collaboration with EFSA and FAO/WHO GIFT, as well as relevant data owners, in our work on FoodEx2 coding. This protocol is outlined to the right.

The adaptation of the FoodEx2 system is a major advancement for the collection and storage of individual-level dietary intake data. By utilizing this system, the GDD recommits to its pledge to raise the standard of data collection around the world. It's with critical tools like FoodEx2 that GDD is able to more precisely inform global nutrition interventions and policies.

IDENTIFYING ELIGIBLE SURVEYS
STEP 1

Surveys must be 24-hour recalls and capture whole diet to the highest possible extent (minimum 50 distinct food items). Otherwise, general eligibility criteria closely represents that of GDD input surveys.

PRIORITIZING ELIGIBLE SURVEYS
STEP 2

Eligible surveys are assessed using prioritization criteria.

PREPARATION OF MATERIALS
STEP 3

Development of structure mapping tools, workload preparation survey, monetary incentive algorithm, metadata form, codebook, template, and various training materials jointly with FAO/WHO GIFT.

DATA OWNER CONTACT
STEP 4

Communication with data owners to request data in predetermined format. Contact of high-priority surveys performed in conjunction with FAO/WHO GIFT.

TRAINING & SUPPORT
STEP 5

Maintaining contact with participating data owners to ease the burden of the coding process. Providing data owners with training materials and GDD-developed process webinars.

ACQUISITION OF CODED SURVEY DATA
STEP 6

Final FoodEx2-coded survey data are contributed by data owner.

KEY TEAM MEMBERS

Renata Micha
Investigator

Dimitra Karageorgou
Post-doctoral Scholar

Laura Lara-Castor
Doctoral Student

REPORTING MAJOR FINDINGS
AIM 1E

DATA COLLECTION METHODS » For low- or middle-income populations, costly data collection methods like 24-hour recalls are an impractical use of resources. In populations like these, preferred tools are ones that can be deployed quicker and at a lower cost.

One such tool is a household consumption survey, in which a single respondent provides information on the entire household's food consumption, rather than distinguishing intake by each individual household member. Researchers then use these responses to extrapolate intake of each household member using one of two calculations: the Per-Capita (PC) method, which assumes intake is symmetrical across the household, or the preferred Adult Male Equivalent (AME) method, which takes members' age and sex into account.

In a recent study, Karageorgou et al. found that household consumption surveys overestimated consumption of almost all foods when compared to 24-hour recalls, regardless of calculation method. This overestimation was especially pronounced in children and low-socioeconomic households (both of which are vulnerable populations) as well as nutrient-dense foods like fruits, vegetables, and animal-source products. These differences in turn drove overestimates of key micronutrients like vitamin A, folate, and calcium -- all of which are commonly the focus of nutrition interventions in vulnerable populations.

These findings highlight the need for more precise ways to estimate individual dietary intake from household consumption surveys, especially for children. By prioritizing accurate dietary assessment, particularly in low- and middle-income residences, the global nutrition community can save valuable resources and formulate more reliable burden analyses, interventions, and policies.

KEY TEAM MEMBER

Dimitra Karageorgou
Post-doctoral Scholar

BELOW
Percent overestimation of household consumption surveys using AME (purple) and PC (blue) methods.
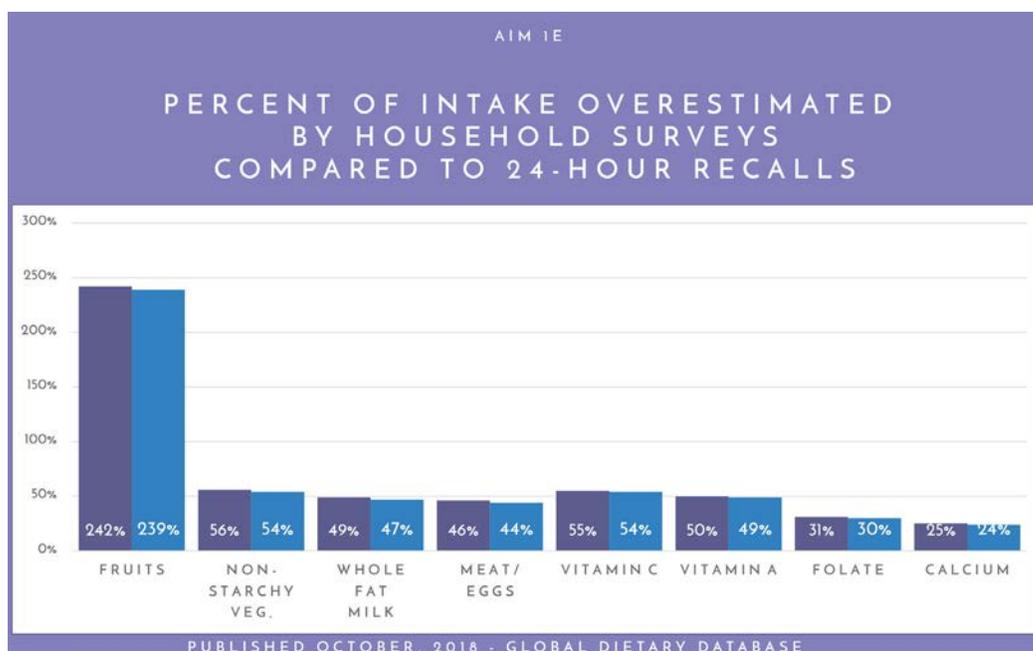
Source: Karageorgou, Dimitra, et al. "Assessing dietary intakes from household budget surveys: A national analysis in Bangladesh." PloS one 13.8 (2018): e0202831.

AIM 1E

PERCENT OF INTAKE OVERESTIMATED BY HOUSEHOLD SURVEYS COMPARED TO 24-HOUR RECALLS

	FRUITS	NON-STARCHY VEG.	WHOLE FAT MILK	MEAT/ EGGS	VITAMIN C	VITAMIN A	FOLATE	CALCIUM
AME (purple)	242%	56%	49%	46%	55%	50%	31%	25%
PC (blue)	239%	54%	47%	44%	54%	49%	30%	24%

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AIM 2

BROADLY DISSEMINATE THE GDD 2015 VIA A NEW ONLINE PLATFORM, NEW SOCIAL MEDIA AND SCIENTIFIC MEETING STRATEGIES, DEEPER RESEARCH COLLABORATIONS, AND STRATEGIC PARTNERSHIPS.

DATA SHARING AGREEMENTS
AIM 2A

SURVEY DATA SHARING » Currently, GDD output data is available for request by researchers and other stakeholders in the global nutrition community (page 17). However, no such capability exists for the request or download of GDD input data. Such a functionality would be helpful in connecting researchers both with one another and with important data on the populations they study.

Of course, it must be acknowledged that data which do not primarily belong to GDD must be handled with special care and attention. Therefore, we are pursuing data sharing agreements (DSAs) with survey owners to ensure the safe and responsible sharing of data.

At present, almost half of all GDD surveys have a corresponding signed DSA in place. For these surveys, and all others that have a signed agreement in the future, data will be made available for download on the new GDD website (more information on the GDD website can be found on page 15).

DATA FROM AGGREGATED SURVEYS » Only 70% of GDD input surveys were contributed at the most granular level possible. The remaining 30% were contributed after their owners aggregated data into groups. Therefore, GDD team members will be contacting the owners of these surveys to retrieve additional data.

UNKNOWN
41%

AGREEMENT LIKELY
7%

AGREEMENT UNLIKELY
9%

AGREEMENT RECEIVED
43%
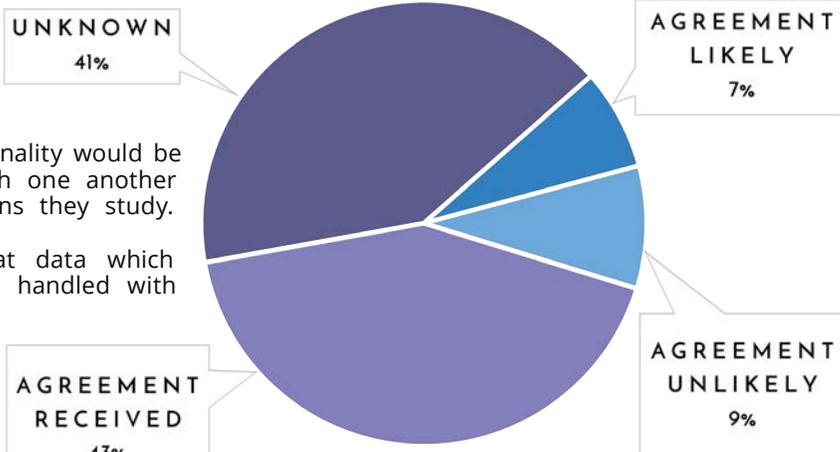
ABOVE
Status of DSAs sent to 233 GDD data owners.

AIM 2A
CATEGORIZATION OF SURVEYS WITH FINALIZED DATA SHARING AGREEMENTS

24-HOUR RECALL	FFQ	OTHER
49	59	2
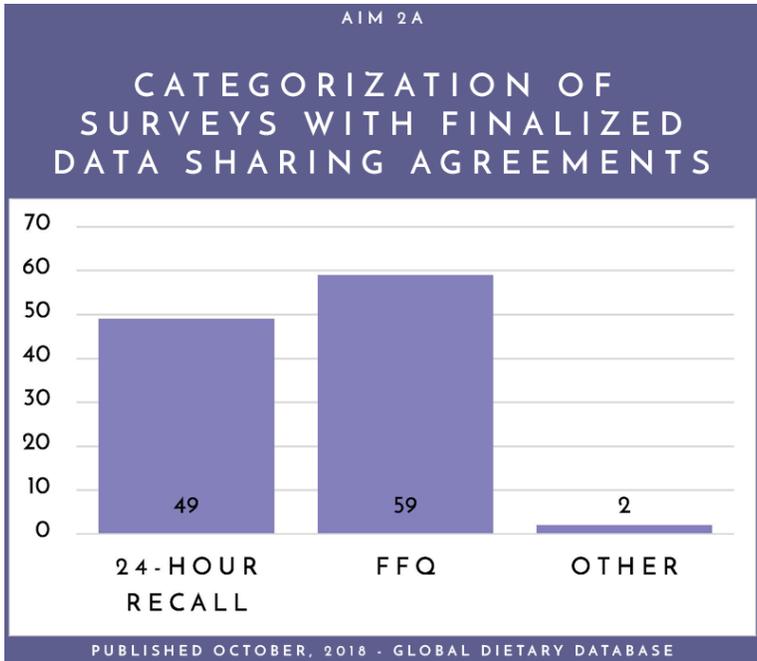
RIGHT
Survey count accepted for public dissemination, by type.

KEY TEAM MEMBERS

Renata Micha
Investigator

Orsolya Szabo
Project Administrator

Global Dietary DATABASE

DATA DISSEMINATION PLATFORM
AIM 2B

The true value of GDD lies in its use as a resource for all members of the global nutrition community. While sound data collection and statistical methods are crucial, they would be in vain if outputs were not made available in a way that was useful for policy makers, stakeholders, and researchers.

Therefore, multiple meetings have been held to gather input from potential users to ensure the project's success. Feedback from these meetings was largely concerned with data visualizations and their ability to accurately display data in a way that their viewers will understand and find useful.

RIGHT
A timeline for dissemination platform development .

Using this insight and user experience design theory, a platform is being developed to ensure that data is thoughtfully visualized and easily accessible for secondary analysis by external users.

The development of our interactive data platform is just one piece of a larger overhaul of the public-facing GDD website. With the help of Friedman Web Communications, we are updating the website to enhance navigation, functionality, accessibility, and aesthetic.

BELOW
Sample data visualizations presented to focus groups.
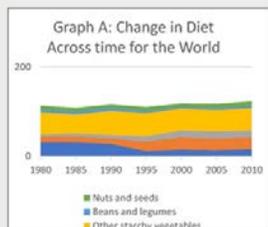
Sample data visualizations presented to focus groups, showing Graph A: Change in Diet Across time for the World; Graph C: Heat map by dietary factor; Graph B: Consumption across age groups; Graph D: Contribution to total Intake in grams*
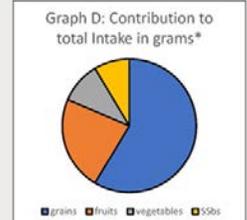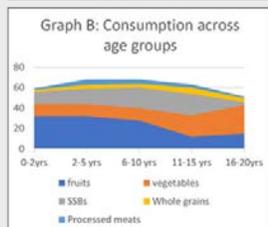
AIM 2B
GDD DISSEMINATION PLATFORM
A TIMELINE OF DEVELOPMENT

SPRING, 2018
PRELIMINARY DESIGNS

Based on input from GDD investigators, sample data visualizations and data dissemination platform wireframe plans were designed.

APRIL, 2018
FOCUS GROUPS

Experts in the areas of global nutrition, child & maternal health, sustainability, agriculture, and economics were invited to participate in focus groups to provide feedback on the preliminary designs.

AUGUST, 2018
DESIGN FINALIZED

Utilizing feedback from focus groups and investigators, final designs for both the wireframe and data visualizations were established.

SPRING, 2019
BETA LAUNCH

GDD team members and developers will build the beta-version of the GDD online data dissemination platform, user interface, and data visualizations.

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KEY TEAM MEMBERS

Gitanjali Singh
Investigator

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Researcher

Jianyi Zhang
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WEB COMMUNICATIONS & SOCIAL MEDIA
AIM 2C

SOCIAL MEDIA » Official GDD Twitter and LinkedIn accounts have been created to increase awareness of the project and easily disseminate key messages to large audiences. Doing so has also established a direct line of communication between the project and GDD data owners, strategic partners, and other collaborators.

Key social media success statistics are outlined to the right. Out of 231 data owners, 101 have connected with GDD on one or both platforms. Those who connected via LinkedIn were subsequently invited to a private group, which acts as a forum for GDD project updates, collaboration between members, and as a focus group for feedback on the project.

SOCIAL MEDIA ANALYTICS, 2018

NUMBERS AS OF OCTOBER, 2018
GLOBAL DIETARY DATABASE

AIM 2C

40+ AUTHORED POSTS

16,000+ SOCIAL MEDIA IMPRESSIONS

100+ CONNECTIONS MADE WITH DATA OWNERS

400+ PROFILE VIEWS

RIGHT
Social media highlights as of October, 2018.

NEWSLETTER » The Official GDD Newsletter is a mode of communication used to highlight the project's recent successes, upcoming directions or challenges, collaborators, and other notable happenings. Volume 01 was released August 1, 2018; each subsequent volume will follow a quarterly release schedule.

Each iteration of the newsletter contains six sections, two of which will maintain a standard format: "Meet the Corresponding Member," and "Meet the Strategic Partner." These sections are used to show appreciation to the data owners and organizations whose work is essential to GDD, and to give them an opportunity to speak about their work to a large audience.

LEFT
A portion of the first edition of the Official GDD Newsletter.

KEY TEAM MEMBERS

Dariush Mozaffarian
Principal Investigator

Julia Reedy
Research Coordinator

EXTERNAL DATA REQUESTS

AIM 2D

CURRENT DATA REQUESTS » GDD data is available for request by researchers, non-governmental and governmental organizations, and other various decision-makers in the global nutrition field. By sharing GDD data, we can increase the project's impact on nutrition and health research and, ultimately, diet-related disease risk around the world.

In 2018, 16 requests for GDD data were received. The disciplines of these requesters are outlined to the right. Those who had received GDD data in 2017 or earlier were contacted in 2018 for updates on any relevant project. Currently, no external publications have resulted from the sharing of GDD data. However, five projects are currently in varying stages of analysis and authorship.

THE FUTURE OF DATA REQUESTS » A key output of GDD 2015 is the transition to open source data access. This change will make both the project's modeled dietary estimates and its input data available to all people, rather than just to those who meet elite criteria (more information on the public dissemination of survey data can be found on page 14). It is, however, imperative that all GDD data are used appropriately. By implementing the system outlined below, we can automate the data request process while maintaining a standard of use and prioritizing high-impact requests. This process will be implemented on the newly-developed online data dissemination platform (more information on the online data dissemination platform can be found on page 15).

STUDENT 23%

NGO 15%

TRADE 15%

ACADEMIC RESEARCH 47%

ABOVE
Disciplines of 2018 GDD data requesters as of October 31.

RIGHT
Proposed flow of automated data request process

AIM 2D

FUTURE DATA REQUEST AUTOMATION PROCESS

1. CREATE USER PROFILE
2. SELECT DESIRED DATA
3. COMPLETE PROPOSAL QUESTIONNAIRE
4. SUBMIT DATA SHARING AGREEMENT
5. GDD SCREENING
6. RECEIVE DATA FILES

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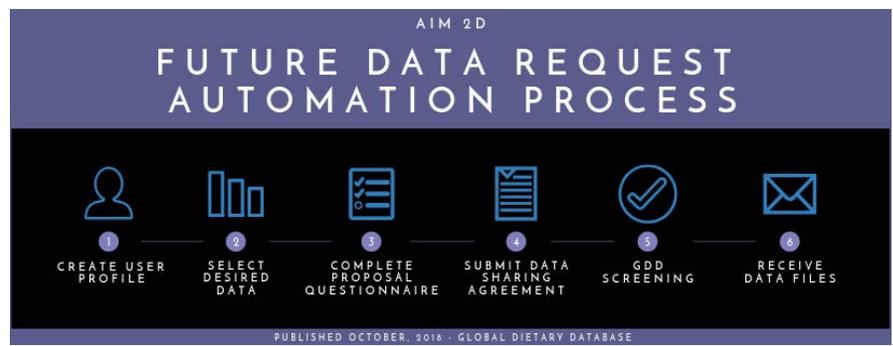
KEY TEAM MEMBERS

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Principal Investigator

Renata Micha
Investigator

Gitanjali Singh
Investigator

Patrick Webb
Investigator
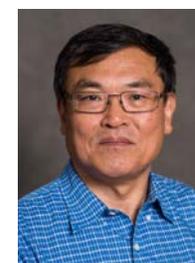
Peilin Shi
Biostatistitian

Julia Reedy
Research Coordinator

STRATEGIC PARTNERSHIPS
AIM 2E

Strategic relationships with organizations and initiatives in global health and nutrition research are a critical piece in leveraging GDD 2015. Such partnerships have the potential to save valuable resources, address gaps in vital research and programs, and globally disseminate valuable data in an efficient manner.

Efforts have been made to contact and coordinate with such organizations to identify areas of task overlap and, therefore, inherent opportunities for collaboration. These partnerships can take on many forms, depending on the core aims, mission, and values of each participating initiative. Some potential components of these partnerships are outlined to the right.

RIGHT
Categorization of areas for potential collaborations between GDD and strategic partners.

A comprehensive list of 40+ potential strategic partners was compiled and prioritized for consideration. We have reached out to and organized initial meetings with FAO/WHO GIFT, EFSA, GALLUP, GBD-IHME, FAOSTAT, GODAN, GNR, INDDEX, IFPRI, ARENA, GAIN, HarvestPlus, and the World Bank. Final collaboration agreements have been established with FAO/WHO GIFT, EFSA, and Global Nutrition Report (GNR).

AIM 2E

STRATEGIC PARTNERSHIPS
AREAS FOR COLLABORATION

① INPUTS

EXCHANGING OF SURVEY MICRODATA | EXCHANGING OF COVARIATE DATA

② METHODS

STANDARDIZED DIETARY INTAKE ESTIMATION METHODS | SHARED USE OF TOOLS & RESOURCES

③ ANALYSES

STATISTICAL ANALYSIS SUPPORT | SHARING STATISTICAL MODELING EXPERTISE

④ STUDIES

JOINT DISEASE BURDEN ANALYSES | JOINT AUTHORSHIP OF MANUSCRIPTS

⑤ PRODUCTS

HARMONIZED FINAL DATABASE | FINANCIAL SUPPORT

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AIM 2E

ORGANIZATIONS/INITIATIVES WITH FINALIZED GDD 2.0 PARTNERSHIP AGREEMENTS

EUROPEAN FOOD SAFETY AUTHORITY (EFSA) | FAO/WHO GLOBAL INDIVIDUAL FOOD CONSUMPTION DATA TOOL (GIFT) | GLOBAL NUTRITION REPORT (GNR)

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KEY TEAM MEMBERS

Dariush Mozaffarian	**Renata Micha**	**Orsolya Szabo**	**Victoria Miller**	**Dimitra Karageorgou**
Principal Investigator	Investigator	Project Administrator	Post-doctoral Scholar	Post-doctoral Scholar

Global Dietary DATABASE

AIM 3

PERFORM NEW INVESTIGATIONS AND REVIEWS ON MATERNAL AND CHILD DIET DIVERSITY/ QUALITY, BASED ON EXISTING METRICS AS WELL AS OUR PRIOR WORK CONSIDERING FOOD CONSUMPTION PATTERS, IN RELATION TO KEY HEALTH OUTCOMES.

Tufts
UNIVERSITY

Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy

DIET QUALITY & DIVERSITY METRICS
AIM 3A

Even modest dietary changes in adults and children are associated with improvements in undernutrition, micronutrient deficiencies, and diet-related chronic diseases. To better define a healthy diet for all forms of malnutrition – the underconsumption of calories, nutrients, or healthy foods or the overconsumption of unhealthy foods - GDD team members have begun a comprehensive review of dietary components to assess their relationships with disease outcomes. The review has identified more than fifteen metrics used around the world to relate diet to health outcomes.

RELATIVE RISKS » This type of analysis was completed by Micha et al., 2017, in which the evidence for effects of 16 foods and nutrients on 10 cardiometabolic diseases was reviewed and evaluated for causal diet-disease relationships. Results from this review are displayed in the matrix below.

Current work to update the relative risks for fruits, vegetables, legumes, unprocessed red meat and processed meat on cardiometabolic diseases is underway. Additionally, new searches will expand upon the matrix below by evaluating additional foods and diseases not previously considered.

The GDD website will include detailed descriptions of the methodology used to assess these relationships and progress on updated searches. The matrix below will also be displayed to communicate the causal relationships between food and disease in a way that is easily understood by viewers.

KEY TEAM MEMBERS

Patrick Webb
Investigator

Renata Micha
Investigator
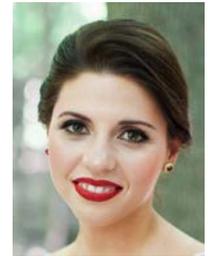
Victoria Miller
Post-doctoral Scholar

BELOW
Relative risks of 16 foods & nutrients on 10 disease outcomes.

	CVD	CHD	CHD (FATAL)	CHD (NON-FATAL)	STROKE	ISCHEMIC STROKE	HEMOR-RHAGIC STROKE	DIABETES	BODY MASS INDEX	SYSTOLIC BLOOD PRESSURE
FRUITS		▨ probable				▨ convincing	▨ convincing			
VEGETABLES		▨ probable				▨ probable				
BEANS/LEGUMES		▨ convincing								
NUTS/SEEDS			▨ convincing	▨ convincing				▨ convincing		
WHOLE GRAINS	▨ convincing	▨ convincing						▨ convincing		
RED MEAT, UNPROCESSED								▨ convincing increased		
PROCESSED MEAT		▨ convincing increased						▨ convincing increased		
YOGURT								▨ probable		
SUGAR-SWEETENED BEVERAGES		▨ convincing increased						▨ convincing increased	▨ convincing increased	
POLYUNSATURATED FATTY ACIDS		▨ probable								
SEAFOOD ω-3S (FISH/SEAFOOD)			▨ convincing							
TRANS-FATS		▨ convincing increased								
DIETARY FIBER	▨ convincing	▨ convincing			▨ convincing			▨ convincing		
GLYCEMIC LOAD		▨ convincing			▨ convincing			▨ probable		
SODIUM	▨ probable									▨ convincing
POTASSIUM					▨ convincing					

▨	CONVINCING DECREASED RISK
▨	PROBABLE DECREASED RISK
▨	CONVINCING INCREASED RISK
▨	PROBABLE INCREASED RISK
▨	SUBSTANTIAL EFFECT ON RISK UNLIKELY

Global Dietary
DATABASE

CHILD GROWTH OUTCOMES
AIM 3B

GDD 2015 now includes dietary data on infants and children aged 6 months to 19 years of age. As preliminary work, we identified and compiled private and publicly-available datasets with child dietary data and health outcomes (more information on child data can be found on page 5). We will use the relative risks outlined on the previous page to evaluate the relationship between diet quality and child health outcomes. Additionally, for the foods and nutrients not previously explored by the GDD team, we will begin new searches and analyses of evidence.

METRICS OF ANIMAL SOURCE FOODS» International guidelines recommend introducing complementary foods to children as young as 6 months old to meet the increased dietary requirements that come with rapid growth. Animal source foods are believed to play a unique role in meeting these needs because they generally contain important vitamins and minerals. However, several types of animal source foods, including processed and unprocessed red meat, have been shown to increase the risk of cardiometabolic diseases in adulthood.

Presently, there is an urgent need to identify optimal levels of intake of animal source foods for both child growth outcomes in relation to undernutrition and as a risk factor for diet-related diseases. GDD team members are conducting a comprehensive review to describe the relationship between animal source foods and health outcomes in infants and young children. Findings from this review will inform the categorization of animal source foods and further investigations on their relationships with disease in adults.

KEY TEAM MEMBERS

Patrick Webb
Investigator

Victoria Miller
Post-doctoral Scholar

AIM 3B
RELATIVE RISK WORKFLOW

1. DETERMINE SEARCH TERMS
2. DETERMINE INCLUSION/ EXCLUSION CRITERIA
3. PERFORM SEARCHES
4. SCREEN IDENTIFIED TITLES & ABSTRACTS
5. REVIEW FULL-TEXT ARTICLES
6. PERFORM DATA EXTRACTION
7. GRADE EVIDENCE FOR CAUSALITY

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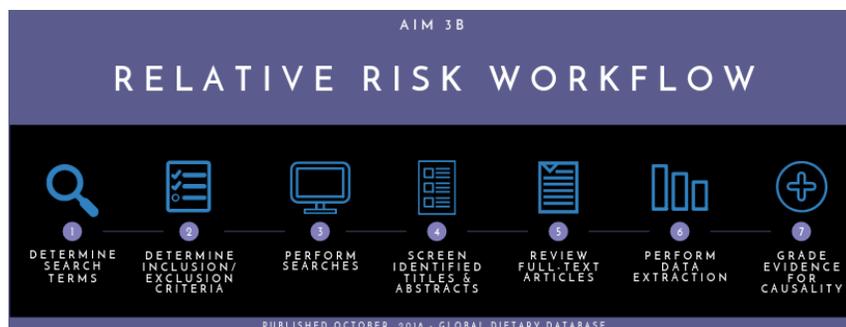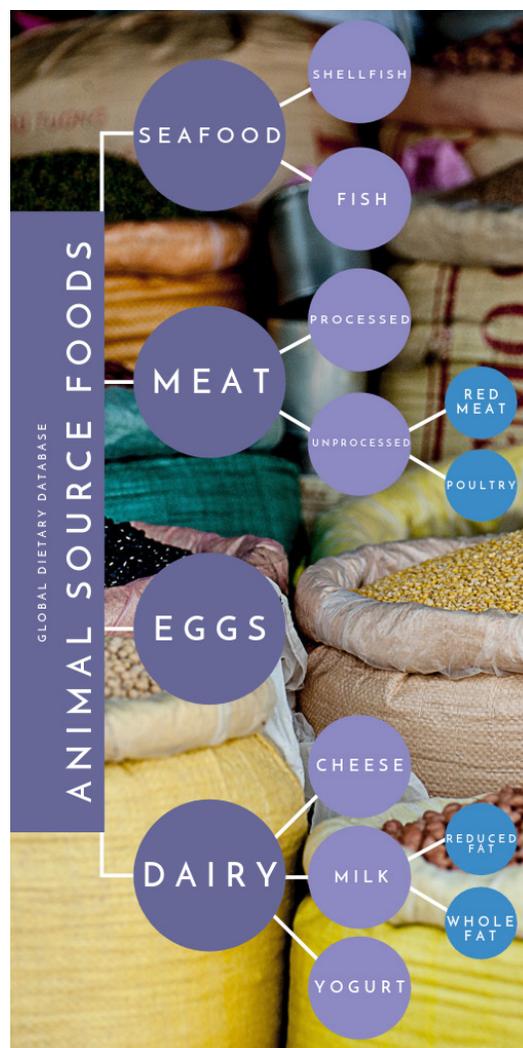
ABOVE
Process for conducting relative risk analyses of foods.

RIGHT
Categorization of animal source foods.

ANIMAL SOURCE FOODS
GLOBAL DIETARY DATABASE

SEAFOOD — SHELLFISH / FISH

MEAT — PROCESSED / UNPROCESSED — RED MEAT / POULTRY

EGGS

DAIRY — CHEESE / MILK — REDUCED FAT / WHOLE FAT / YOGURT

Global Dietary DATABASE

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Global Dietary DATABASE