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FAO/Intake joint meeting report Dietary Data Collection, Analysis and Use

Taking stock of country experiences and promising practices in low–and middle–income countries

Meeting Report
Dietary Data Collection, Analysis and Use

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
AND INTAKE-CENTER FOR DIETARY ASSESSMENT
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Abbreviations and acronyms

CIFOCOss	Chronic Individual Food Consumption Database – Summary Statistics (FAO/WHO)
EFSA	European Food Safety Authority
FBDGs	food-based dietary guidelines
FCT	food composition table
FRIL	food, recipe and ingredient listing
GIFT	Global Individual Food consumption data Tool (FAO/WHO)
IFPRI	International Food Policy Research Institute
INDDEX	International Dietary Data Expansion Project
INFORMAS	International Network for Food and Obesity/NCDs Research, Monitoring and Action Support
LMICs	low- and middle-income countries
NCDs	non-communicable diseases
NHANES	National Health and Nutrition Examination Survey (United States of America)
PSEM	portion size estimation method
WHO	World Health Organization

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Executive summary

This report provides a summary of highlights from a technical meeting on "Dietary Data Collection, Analysis and Use: Taking Stock of Country Experiences and Promising Practices in Low- and Middle-Income Countries", jointly convened by the Food and Agriculture Organization of the United Nations (FAO) and the Intake Center for Dietary Assessment, on December 11-13 December, 2019 at FAO headquarters in Rome, Italy.

A total of 52 participants attended the meeting. These consisted of experts from low- and middle-income countries (LMICs) – primarily those who have played a significant role in the collection, analysis or use of large-scale dietary data, as well as those who have not yet been involved in a national dietary survey but have expressed the need for quantitative 24-hour dietary recall data in their country. Meeting participants also included a small number of individuals from the convening organizations, FAO and Intake, along with representatives from the Bill & Melinda Gates Foundation, the European Food Safety Authority (EFSA), the International Dietary Data Expansion (INDDEX) Project and the World Health Organization (WHO).

The specific objectives of the meeting were to:

1. facilitate the sharing of country experiences on generating demand and securing funding for a national or large-scale dietary survey;
2. enable shared learning on promising practices for the implementation of a national or large-scale dietary survey; and
3. highlight the role of dietary data in informing national programmes and policies.

In addressing these objectives, the different sessions of the meeting's agenda were organized around five main topics: 1) survey initiation, planning and design; 2) pre-survey work; 3) survey team training and composition; 4) dietary data collection; and 5) data use.

Key points that emerged during the meeting included the following:

- Governments in many LMICs are currently working in the dark, due to a lack of time-relevant dietary data on which to base their programming. With the rising prevalence in LMICs of overweight and obesity, as well as of diet-related non-communicable diseases (NCDs), there is now a strong, multisectoral demand for dietary data across these countries. But obtaining the funding for a dietary survey can be challenging.
- To effectively advocate for a dietary survey to be carried out in a country, such a survey needs to be viewed as an investment that will enable the development of evidence-based policies for the country. To this end, it is useful to remember that there is always a cost associated with doing business as usual, and that this cost is often greater than the cost of implementing a better, more targeted strategy that is informed by accurate and time-relevant dietary data.
- Survey design is a careful balancing act between cost and precision. In managing the survey design process, successful experiences with dietary surveys in LMICs have shown that it is useful to:
    - identify key stakeholders with an interest in nutrition in the country, and involve them in the survey planning and decision-making process from the beginning;
    - establish a strong governance structure for survey-related decision making;
    - ensure strong coordination and communication between different entities involved in the survey;
    - develop a detailed and realistic timeline for all survey-related activities, with clearly assigned responsibility and accountability for each activity;
    - include in the protocol a complete road map of the survey;
    - ensure that key survey personnel have the necessary technical skills, and secure their long-term availability and active engagement;
    - learn from the experiences of other countries that have conducted dietary surveys; and
    - prioritize data quality when making survey design decisions.

- There are a number of challenges to conducting dietary surveys in LMICs. These relate to the extent of pre-survey work required before data collection; the number of field staff required for a large-scale dietary survey, and the need to ensure they receive high-quality training; and the difficulty of compiling a food composition database for the survey, given the gaps often found in the data available. For example, retention factors for raw to cooked foods, and nutrient values for commercially processed, packaged and fortified foods were mentioned as key areas where gaps in food composition data exist.
- To support high quality dietary data collection, analysis, and use across LMICs, Intake offers no-cost technical assistance and capacity building services to government entities planning to carry out a dietary survey. Intake is available to provide technical assistance and capacity building services across all phases of dietary survey-related activities, including: technical assistance and capacity building for statistical services related to survey design and sampling; pre-survey work; training for survey implementation; dietary data cleaning and processing; and statistical analysis, interpretation, presentation and use of dietary data.
- New technology is currently being developed by the INDDEX Project to facilitate the electronic collection of dietary data in LMICs, as well as the initial processing of the data collected. The INDDEX24 dietary assessment platform consists of a web application that manages context-specific input databases; this is linked to a mobile application which is used to conduct enumerator-administered 24-hour dietary recalls.
- Different projects and initiatives at the global and regional level have been working to harmonize the ways in which dietary data are collected and used. For example, EFSA has worked since 2005 on harmonizing dietary survey methodology and building a common European Union food consumption database. Building on EFSA's work at the European level, FAO and WHO have developed the FAO/WHO Global Individual Food consumption data Tool (FAO/WHO GIFT), an open access platform which disseminates existing dietary data from different countries at the global level. To be inserted in the platform, dietary data undergo a process of post-harmonization using EFSA's FoodEx2 classification and description system.
- Throughout the meeting's discussions on data use, participants highlighted the need to take full advantage of the many ways in which dietary data can be used to advance evidence-based policy and programming, noting that dietary data collection is not useful unless the data collected are actually used. In this context, participants described having used dietary data collected in LMICs for a broad range of purposes, including problem assessment, programme and policy design and evaluation, development of national dietary guidelines, and advocacy for food reformulation, food taxation and regulatory food packaging labels.
- Several meeting presentations introduced and discussed less traditional uses for dietary data, including as part of a dietary exposure estimation for food safety risk assessment, to assess the environmental impact of the diet, and to inform agriculture policy formulation, target-setting and evaluation.
- Beyond dietary data collection and use, meeting participants suggested that data dissemination also deserves greater emphasis in LMICs. In addition to using dietary data for policy and programme design, they highlighted the importance of communicating the information collected back to local communities, in order to share what is learned and begin discussions around the need to change dietary behaviours in pursuit of improved health and nutrition for the population.

Introduction

Background

Dietary data[1] provide critical information to guide the design of evidence-based nutrition and agriculture policies and programmes. Such information is especially crucial in low- and middle-income countries (LMICs). In addition to having the highest levels of undernutrition globally, these countries are now also seeing dramatic changes in dietary patterns, with diets shifting increasingly away from a "traditional diet", towards a diet more heavily influenced by processed, packaged and energy-dense foods with little nutrient content.

As a method for collecting data on what people eat, nationally representative, quantitative 24-hour dietary recall surveys[2] are considered the gold standard, but they are expensive, time-consuming and require specialized technical expertise to carry out. Thus, despite the clear need for dietary data in LMICs, the number of such countries with nationwide dietary data available to guide the design of policies and programmes remains relatively low.

That said, there are a few LMICs that have an established history of conducting national, quantitative 24-hour dietary recall surveys at regular intervals. And in recent years, there has been a significant uptick in the number of LMICs that are in the process of planning or securing funding for a national, quantitative 24-hour dietary recall survey, or that have expressed the need for one. There are also several LMICs that have recently completed data collection and analysis for their first such national survey. These developments signalled an opportune moment for gathering key experts from these countries, in order to share experiences and take stock of promising practices in relation to the collection, analysis and use of national dietary data across different regions of the world.

To this end, the Food and Agriculture Organization (FAO) of the United Nations and the Intake Center for Dietary Assessment convened a three-day international meeting on "Dietary Data Collection, Analysis and Use: Taking Stock of Country Experiences and Promising Practices in LMICs", held on 11–13 December 2019 at FAO headquarters in Rome, Italy.

The meeting, which brought together experts from 19 LMICs across different regions of the world, aimed overall to promote South–South learning, cross-regional networking, and the sharing of experiences with national (or large-scale), government-led, government-owned, quantitative 24-hour dietary recall surveys in LMICs. More specifically, meeting objectives were to:

1. facilitate the sharing of country experiences on generating demand and securing funding for a national or large-scale dietary survey;
2. enable shared learning on promising practices for the implementation of a national or large-scale dietary survey; and
3. highlight the role of dietary data in informing national programmes and policies.

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[1] In this report, the term "dietary data" refers to individual, quantitative food consumption data.

[2] A quantitative 24-hour dietary recall survey entails collecting data from respondents about all food and beverage items consumed during the previous 24-hour period, along with the quantity of each food and beverage reported as consumed. A second 24-hour dietary recall is typically collected from at least a random subsample of respondents, usually 3 to 10 days after the first. The collection of a second 24-hour dietary recall from at least a random subsample is deemed a standard best practice for a quantitative 24-hour dietary recall survey, as it allows for modelling on the data collected, in order to estimate the usual intake distribution of nutrients, food groups and foods consumed by the population.

About the meeting conveners

The Nutrition and Food Systems Division (ESN) of FAO works to protect, promote and improve sustainable food systems for healthy diets and improved nutrition. Together with the World Health Organization (WHO), FAO has been developing the FAO/WHO Global Individual Food consumption data Tool (FAO/WHO GIFT), an open access platform for sharing dietary data. The platform provides access to microdata, as well as food-based indicators in the form of infographics to facilitate the use of these data by policy makers. FAO/WHO GIFT is a growing repository that aims to fill a major gap in understanding what people are consuming around the world, and to promote the use of these data to better inform evidence-based policies and guidelines on healthy diets.

Intake is a Center for Dietary Assessment at FHI Solutions, established in 2016 with funding from the Bill & Melinda Gates Foundation. Intake aims to strengthen policies and programmes to improve nutritional status in LMICs by increasing the availability, quality, reliability, comparability and use of dietary data and metrics. Intake provides flexible, on-demand technical assistance to governments for collecting, analysing and using dietary intake data for evidence-based decision making in LMICs and supports research to advance dietary assessment methods and the development of validated metrics of diet quality. For more information about Intake, visit Intake.org.

FAO and Intake's work connects at various points across the survey cycle. Together, FAO and Intake work synergistically to increase the availability and use of high-quality dietary data, particularly in LMICs, where there is currently a dearth of such data.

Meeting agenda

The agenda for the meeting was organized primarily around the main phases of work implicit in carrying out a large-scale dietary survey: 1) survey initiation, planning and design; 2) pre-survey work; 3) survey team training and composition; 4) dietary data collection (including specific data collection challenges related to the increased consumption of processed, packaged and fortified foods in LMICs); and 5) data use. The agenda also focused on special topics related to dietary data collection, with a break-out session on "Collecting dietary data among adolescents" and another on "Collecting dietary data in the context of shared-plate eating".

Other technical sessions aimed at sharing relevant methods of data analysis, technology innovations for dietary data collection, and experiences with dietary data harmonization. These sessions included focused presentations on how to use dietary data for an expanded set of purposes, for example, to assess the environmental impacts of diets, to assess dietary exposure to health hazards, to inform the development of food-based dietary guidelines and to inform agriculture policy. The meeting agenda is included as Annex A.

Meeting participants

A total of 52 participants attended the meeting. These consisted of experts from LMICs – primarily those who have played a significant role in the collection, analysis or use of large-scale dietary data, as well as those who have not yet been involved in a national dietary survey but have expressed the need for quantitative 24-hour dietary recall data in their country. Participants also included a small number of individuals from the convening organizations, FAO and Intake, along with representatives from the Bill & Melinda Gates Foundation, the European Food Safety Authority (EFSA), the International Dietary Data Expansion (INDDEX) Project and WHO. A full list of meeting participants is included as Annex B.

Purpose and structure of this report

This report provides an overview and highlights from the meeting, as distilled and synthesized from the various plenary presentations and discussions that were conducted over the course of three days. The report is not intended as a technical guidance document, and therefore does not explore in depth every technical topic addressed during the meeting. Rather its purpose is to summarize the key themes that emerged as discussion points throughout the meeting.

The report is structured in two parts. The first provides an overview of key considerations that emerged from plenary presentations and discussions aimed at sharing and taking stock of country experiences and promising practices in relation to dietary data collection, analysis and use in LMICs; whereas the second provides a brief summary of the presentations made during the other technical sessions of the meeting.

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PART 1: Sharing of country experiences

1.1. Survey initiation, planning and design

Throughout the meeting, participants emphasized the need for national-level, quantitative 24-hour dietary recall surveys to be carried out in LMICs. They reported that many governments are currently working in the dark, due to a lack of time-relevant dietary data on which to base their programming. And given the rising prevalence in LMICs of overweight and obesity, as well as of diet-related non-communicable diseases (NCDs), participants noted an increasingly strong, multisectoral demand for dietary data across these countries.

As participants shared experiences on survey initiation, planning and design in the context of ensuring successful large-scale dietary surveys in LMICs, a series of recommendations emerged as enabling factors for: 1) generating momentum for initiating a dietary survey; 2) securing the funding for a dietary survey; 3) successful planning and design of a dietary survey; and 4) successful decision making. These are summarized below.

1.1.1. Enabling factors for initiating a dietary survey

A successful national dietary survey requires political will and engagement from the country government where the survey will be carried out, but generating political will for a first dietary survey in a low- or middle-income country can be especially challenging. To create the necessary momentum for such an undertaking, meeting participants recommended identifying a champion for the survey – ideally within the government itself. This "first champion" should be an individual who understands the importance of dietary data, and who will convince others in government of the need for a dietary survey. The chain of influence can continue until more and more people in government become convinced of the need to invest in a dietary survey. This "group of champions" can then consolidate and work together to advocate for initiating a dietary survey in the country.

Meeting participants also stressed the importance of demonstrating the potential uses of dietary data for decision making, as a useful strategy in building the case for a dietary survey to be carried out in a country. Clear, concrete examples of how dietary data can be used for decision making can serve to better expose and understand existing data gaps, while at the same time highlighting the benefits to be gained in evidence-based decision making. And working through such concrete examples, using different scenarios and mock dietary data (if previously collected dietary data do not exist) can prove a compelling way to convince policy makers that collecting, analysing and using dietary data is a good investment. Incorporating intervention cost data into such scenarios can further illuminate how dietary data can serve to identify the most cost-effective, evidence-based nutrition interventions for a population. In this context, meeting participants noted that there is always a cost associated with doing business as usual, and that this cost is often greater than the cost of implementing a better, more targeted strategy – a strategy informed by evidence that is in turn based on accurate and timely dietary data.

A complementary strategy for demonstrating the value of dietary data involves using a case study from a different country to illustrate how dietary data were collected, analysed and used in the country's decision-making process. Presenting the experiences of other LMICs as successful examples of what can be achieved with dietary data collection, analysis and use was cited as an especially powerful tool to advocate for these processes in countries that are new to the practice.

In addition, there are a range of secondary benefits that normally stem from carrying out a dietary survey. These are also worth highlighting when advocating for a country to undertake its first such survey, or when building the case for what is gained by investing in one. For example, the survey process itself can provide an important mechanism for building capacity within the country to produce accurate, unbiased data for a range of areas of

interest to government. Within the framework of a national dietary survey, it is possible to build a strong, diverse team of implementers, politicians, donors, researchers and statistical institutes – each of whom can bring value to the survey and help strengthen each other's technical capacities. In this way, a dietary survey can function as a tool for building national leadership in the area of nutrition, while also improving a country's use of data for evidence-based policy and programme design.

Finally, to effectively advocate for a dietary survey to be carried out in a country, meeting participants emphasized that the survey must be viewed as an investment that will enable the development of evidence-based policies for that country. Participants recommended that a conversation to advocate for a dietary survey not begin by emphasizing the associated expense, but rather by making the point that dietary surveys are an important investment that can be cost-effective, if the results are used to make better decisions regarding the design and management of intervention programmes.

1.1.2. Enabling factors for securing funding for a dietary survey

When seeking funding for a dietary survey, meeting participants suggested that the rationale for investing in a survey should not be limited to an expected return on investment for the nutritional or health status of the population. Instead, the argument should be made that nutrition is a fundamental issue for advancing the future economic development of a country. The consequences of poor-quality diets affect all aspects of society in the long term; dietary assessment must therefore begin to be understood as part of the effort to foster human development. Framing the argument for investing in a dietary survey in this way provides the rationale for requesting funding and support not only from the ministry of health, but also from the ministry of agriculture and ministry of finance. The multisectoral demand for data on diets in LMICs should be reflected in where funding for dietary surveys is sought.

Resource limitations can sometimes present a challenge when convincing governments in LMICs to provide direct financing for a national dietary survey. But, as suggested by meeting participants, government buy-in can be leveraged in other ways, for example by securing in-kind support for the survey. Even if donor funding is needed to support the undertaking of a dietary survey, the government can still contribute meaningfully, for example by making relevant equipment, vehicles, facilities, infrastructure and/or personnel available to the process.

1.1.3. Enabling factors for successful planning and design

To ensure successful planning and design for dietary surveys in LMICs, recommendations from the meeting focused on five specific areas, as follows:

Why collect dietary data

In starting the process of survey planning and design, it is essential to know why the data are being collected and how they will be used. Many reasons for collecting dietary data in LMICs were outlined during the meeting, including:

- to assess the intake of nutrients, foods or food groups;
- to assess the prevalence of nutrient adequacy;
- to assess adherence to dietary guidance;
- to provide a baseline and to assess trends;
- to inform policies and programmes; and
- to develop consumer guidance.

More specifically, meeting participants noted that the large-scale dietary surveys in which they have been engaged were conducted for the following reasons: to inform nutrition programming and policies; to guide in the design and selection of cost-effective interventions; to assess ongoing government intervention programmes;

to monitor progress in achieving national as well as global health and nutrition targets; to develop national dietary guidelines; to advocate for and inform food reformulation strategies (for example, to model the impact of trans fatty acid and sodium reduction on health and economic outcomes); to monitor access to foods (such as price, availability and points of purchase); to assess the quality of the diet; to assess trends in the consumption of minimally processed and unprocessed foods, as well as processed and ultra-processed foods; and to evaluate policy.

From whom to collect dietary data

Dietary data are typically collected for specific demographic groups, differentiated by age and sex. In planning a survey, the selection of demographic groups should be based on how the dietary data will be used. Each demographic group included or added to a survey increases the cost of overall data collection. The groups on which a dietary survey will focus should therefore be considered carefully in advance, and prioritized for inclusion according to feasibility, funding and timeline for data collection.

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In discussing the number of demographic groups of focus for dietary surveys in LMICs, meeting participants reported considerable variability among individual country experiences. In the few LMICs where dietary surveys have been carried out on a routine basis, data were reported to have been collected on as many as eight different demographic groups. More commonly however, participants reported dietary surveys in LMICs having a more limited number of demographic groups – typically three or four groups per survey, depending on the specific objectives defined for the survey.

In discussing high-priority demographic groups for dietary surveys in LMICs, some participants underscored the importance of including a focus on women, noting firstly that women are often the "entry points" to the household, and more generally that they are central to improving the diets of future generations. Moreover, participants noted that in some contexts, women's diets may be of lower quality than those of men; as such, they may be among the more vulnerable demographic groups in a country. However, the need for dietary data on men and adolescents was also clearly acknowledged. Meeting participants made an especially strong call for collecting dietary data among adolescents, citing the high levels of sugar-sweetened beverage consumption reported for this group, along with increased associated risk of obesity and diet-related NCDs.

Where to collect dietary data

As with the selection of demographic groups, it is also essential to define the geographic levels at which dietary data should be reported, as early as possible in the survey design process. Here again, the selection of the geographic levels for a survey should be guided by how the data will be used. Ideally, dietary data can be reported for geographic strata that correspond to the actual geopolitical levels of decision making in the country. In many contexts, it is also necessary to consider the expected heterogeneity in dietary patterns (for example, rural vs urban) and decide how this should be accounted for in defining the geographic strata and/or the required sample size for the survey. Each geographic stratum included will increase the cost of data collection; therefore the administrative level at which the results are to be reported should be considered carefully, and prioritized with an eye to feasibility, funding and timeline for data collection.

Across LMICs, dietary surveys conducted to date have been designed to report results at a wide variety of administrative or geographic levels, depending largely on the funding available. However, one common survey design shared at the meeting involved the use of sample sizes and sampling procedures that permitted reporting at the highest geopolitical administrative level in the country. (This geopolitical level is defined as a "region" in some countries and as a "province" in others.) This design generally allowed for data to be reported separately for rural vs urban areas, and for data to be aggregated for reporting at the national level.

When to collect dietary data

The timing of data collection for a dietary survey must also be considered as part of the overall survey planning and design process. Since dietary intakes tend to vary according to the seasonal availability of foods, the season in which the data will be collected can impact data interpretation. Decisions with regard to the target dates for data collection should ideally be guided by the specific objectives defined for the survey and by how the data will be used. For example, should the survey be timed to collect data on nutrient and food intakes that represent the season when food is most readily available and accessible, or the lean season, or an "intermediate" season?
In theory, data for a dietary survey can be collected throughout the year, but as a practical matter, such a design can be logistically difficult to implement. If the dietary data are intended to reflect year-round intake and to be comparable across the geographic areas sampled for the survey, the sampling design requires that every area to be assessed should have dietary data collected across all seasons. In most cases, this type of design is time- and cost-prohibitive.

In some LMICs where routine national dietary surveys are carried out, the design used involves data collection via a rolling survey conducted throughout the year, in an approach similar to that of the National Health and Nutrition Examination Survey (NHANES) in the United States of America. This type of rolling survey design can have the benefit of enabling more frequent estimates for different geographic/administrative levels than would otherwise be possible, but in many cases, the estimates across the different levels may not be comparable because the data were collected in different seasons.

How to collect dietary data

The survey framework or platform in which the dietary data are to be collected is relevant to all of the design considerations previously discussed. Some national dietary surveys in LMICs have been conducted as stand-alone surveys. In this context, survey design decisions can be made to accommodate the specific purposes that will best facilitate the effective use of the dietary data. In other LMICs however, a dietary module has been integrated into a pre-existing or routine national survey (for example, a household budget survey) whose primary purpose is not diet-related. Integrating a dietary module into a pre-existing national survey in this way offers some advantages, including lower cost, robust sampling methods, and the possibility of obtaining rich individual- and household-level data on non-diet-related topics, which can then be usefully linked with the dietary data. However, there is also a risk that the design of the larger survey may not be optimal for the collection of dietary data, or that the module on diets may be excluded from the survey at some point in the future.

1.1.4. Enabling factors for successful decision making

In practice, decisions about survey design are often driven by funding limitations. Compromises are often required, as most governments have limited budgets for a dietary survey. The most common compromises cited by meeting participants involved dropping some survey objectives and/or demographic groups to keep the survey within budget. In this context, participants generally agreed that when making difficult choices with regard to funding limitations, survey design decisions should be guided by the key concerns of each country. For example, in countries with a high prevalence of anaemia, it may make more sense to focus resources on exploring the underlying causes of anaemia than to include more demographic groups in the survey.
At a higher level, participants indicated the importance of accounting for the triple burden of malnutrition (i.e. the

simultaneous presence of undernutrition, overnutrition and micronutrient deficiencies) in survey design, such that the dietary survey can provide data on all forms of malnutrition. In some LMICs, national dietary surveys have been carried out to collect data on food consumption, micronutrient biomarkers and anthropometry, and sometimes also on clinical health outcomes, maternal health outcomes, and infant and young child feeding practices. An integrated survey of this kind, with all data collected at the individual level, enables researchers to look at associations across survey modules and link data at the individual level, thereby allowing for richer analyses. In some LMICs, dietary surveys are also being used for NCDs surveillance.

If the funding to conduct a dietary survey is tied to a specific timeline, this can also present challenges to ensuring an optimally designed survey. Funding allocations that are fixed to a strict schedule may have implications for what can be achieved and how, as well as for when survey data must be collected. In some cases, this may result in having to collect data in a non-optimal season (for example, given the data's intended use, or given the need for data that are seasonally comparable with the results of an earlier survey).

Throughout these discussions, meeting participants noted that designing a large-scale dietary survey is an iterative, complex process that requires significant advance planning and sustained, long-term technical engagement. Every survey design decision has implications for logistics, feasibility, human resources, timeline and budget. Thus, survey design must involve a careful balancing act between cost and precision. In managing this difficult decision-making process, successful experiences with dietary surveys in LMICs have shown that it is useful to:

- identify key stakeholders with an interest in nutrition in the country, and involve them in the survey planning and decision-making process from the beginning;
- establish a strong governance structure for survey-related decision making;
- ensure strong coordination and communication between different entities involved in the survey;
- develop a detailed and realistic timeline for all survey-related activities, with clearly assigned responsibility and accountability for each activity;
- include in the protocol a complete road map of the survey;
- ensure that key survey personnel have the necessary technical skills, and secure their long-term availability and active engagement;
- learn from the experiences of other countries that have conducted dietary surveys; and
- prioritize data quality when making survey design decisions.

1.2. Pre-survey work

The preparatory or pre-survey work[3] required before data collection for a dietary survey can begin is more extensive than for most other types of survey, largely due to the complexity of the multiple-pass, 24-hour dietary recall method. [4]Unlike most other types of survey, a dietary survey requires the preparation of several auxiliary databases before data collection begins. These databases serve as the foundation for country-specific data collection tools and job aids for survey enumerators, and are used to facilitate the conversion of foods reported as consumed into the corresponding nutrient intakes.

In particular, the following are normally prepared and in place before a dietary survey begins:

[3] The "pre-survey work" refers to the databases and enumerator job aids that should be compiled before collecting data for a quantitative 24-hour dietary recall survey. See Vossenaar et al., 2020.
[4] For a description of the multiple pass 24-hour recall method that is typically used for collection of population-based, quantitative 24-hour dietary recall data in LMICs, see Gibson and Ferguson, 2008.

- comprehensive food, recipe and ingredient listing (FRIL)[5];
- list of standard recipes to collect, and a standard recipe database[6];
- portion size estimation method (PSEM) conversion factor database, and a list of allowed PSEMs;[8]
- probe list[9] for foods, mixed dishes and standard recipes; and
- food composition database.[10]

The time required to complete these pre-survey tasks in the context of a large-scale dietary survey may range from several months to years, depending on the starting point for the work (for example, the existence, quality and completeness of any relevant databases) and the complexity of the diet among the demographic groups of focus for the survey. The number of key personnel who are technically skilled and fully committed to carrying out the pre-survey work also has a direct impact on the time required. Some meeting participants recommended that the same technical team be used for all pre-survey work, given the different tools, job aids and databases that need to be developed, harmonized and/or aligned in both organization and output.

While it is technically possible to delay the completion of some pre-survey tasks until after data collection (for example, the PSEM conversion factor database and the food composition database), meeting participants strongly recommended that all pre-survey work be completed as fully as possible before beginning data collection, in order to ensure usable dietary data are collected. Carrying out extensive pre-survey work before starting data collection can be especially helpful for standardizing the probes that enumerators will use during the 24-hour recall data collection, and for facilitating the collection of appropriately detailed data on the foods reported as consumed. Data processing and analysis are also greatly expedited when all pre-survey tasks are completed to the greatest extent possible before data collection, rather than allowing for some portion of these tasks to be completed after data collection[11].

Other key decisions that can impact the duration of pre-survey work involve how the data collection activities are managed and implemented. Ideally, the FRIL will have been finalized before other tasks are undertaken. The other pre-survey tasks can be undertaken simultaneously or sequentially. Simultaneous work offers the clear advantage of reducing the time required for pre-survey activities and could even result in some cost savings due

[5] "The FRIL is a comprehensive list of foods, mixed dishes, and ingredients and their respective details – that are likely to be encountered during the 24-hour dietary recall survey" (Deitchler et al., 2020). The FRIL must be compiled before data collection to ensure that enumerators collect the necessary and relevant details about the food items consumed, to allow for matching of the food item to the correct nutrient composition, and to ensure that a standardized method is used across enumerators to collect data on the portion size of each food item reported as consumed.

[6] "A standard recipe database is a set of standard recipes — with details on ingredients and their average proportions — for commonly consumed mixed dishes that have been identified to be prepared similarly across a geographic area of focus for the survey" (Deitchler et al., 2020). Survey planners must decide in advance which mixed dishes in the survey area are appropriate to collect "average" recipes for before data collection. In some surveys, planners may decide not to collect any standard recipes before data collection; in these cases, non-standard recipe data are collected for each mixed dish reported as consumed during the survey. For some mixed dishes reported as consumed during data collection, survey planners may decide after data collection is complete, to collect additional standard recipes to use for processing and analysis of the data (e.g. for mixed dishes consumed that were prepared outside the home, for instance by vendors or restaurants).

[7] For each item listed in the FRIL and standard recipe database, an appropriate PSEM should be assigned before data collection, in order to ensure that data collection methods are standardized across enumerators, and that an appropriate PSEM is used for each respective food item when collecting data on the portion size consumed by respondents.

[8] The PSEM conversion factor database "provide[s] the conversion factors needed to translate the quantity of each item reported as consumed into grams, given the assigned PSEM for that item and the corresponding edible portion factor for the item" (Deitchler et al., 2020). To prevent delays with data processing and data analysis, the PSEM conversion factor database is ideally compiled before survey data collection, but the data collection for the survey does not actually depend on the PSEM conversion factor database being complete.

[9] The probe list is a job aid that should be used by enumerators during data collection, to ensure the necessary prompts are used to collect the level of detail needed about the food items reported as consumed by the respondent. To facilitate the collection of high-quality dietary data that can be correctly linked to nutrient composition values, the probe list should be completed before survey data collection.

[10] The "food composition database for the survey provid[es] the energy content and nutrient composition for each item included in the FRIL" (Deitchler et al., 2020). To prevent delays with data processing and data analysis, the food composition database is ideally compiled before survey data collection, but the data collection for the survey does not actually depend on the food composition database being complete.

[11] Even when all possible pre-survey work is completed before starting data collection, additional work is almost always required on the pre-survey databases before data analysis. For example, additional standard recipe data collection may be required, and new food items may need to be added to the food composition database and the PSEM conversion factor database, based on the food items actually reported in the survey. It is rare that every food item reported by respondents as having been consumed is included in the FRIL compiled before data collection.

to reduced field costs; however, this approach can create challenges for staff allocation and for coordination in harmonizing and aligning the structure and coding of the various databases.

1.3. Survey team training and composition, and data collection

Ensuring high-quality data collection can be especially challenging in the context of a large-scale dietary survey. Meeting presentations and discussions on this topic focused on the optimal size of field teams for collecting dietary data, the criteria for selecting high-quality enumerators for data collection, the design of enumerator training in the context of a large-scale dietary survey in a low- or middle-income country, and recommended quality assurance procedures during data collection.

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The number of teams assigned to collect dietary data for a survey was cited as a factor impacting the extent to which standardized data collection procedures can be ensured; data quality is generally easier to maintain with a smaller number of teams. But in the context of a large-scale or national dietary survey where the seasonality of data collection matters, it is often impossible to make do with a small number of teams for data collection. Other quality assurance procedures for ensuring standardization therefore need to be put in place.

In determining the number of teams necessary for a dietary survey, meeting participants highlighted several factors requiring consideration: the setting for data collection (for example, urban vs rural); the demographic group(s) of focus; the geography of the survey area (including difficulty of travel, access to communities and distance between households); the complexity of the diet among the target population; and the extent to which non-standard recipes are expected to be encountered during data collection.[12]

In addition, the number of teams necessary for a dietary survey should be informed by the total sample size to be collected, the number of repeat recalls needed, how many recalls an enumerator can be expected to complete per day without compromising data quality (all the while allowing for days of rest for enumerators throughout the data collection period), considerations of survey language (which need to be met by enumerators), field team logistics (for example, available equipment vehicles), and the time available for data collection (including any concerns about seasonality).
Meeting participants emphasized that the data collected will only be as good as those who are trained to collect it, and that a high level of skill is therefore needed for the collection of high-quality dietary data. Recommended

[12] When standard recipes are not used for mixed dishes reported as consumed, more time will be required to complete a 24-hour dietary recall interview with a respondent. Collecting unique or non-standard recipes from a respondent is much more time-consuming than collecting the data required in relation to the consumption of a mixed dish for which a standard recipe can be applied.

criteria for selecting enumerators to collect dietary data for a survey included education credentials, previous survey experience, local language ability, analytic ability, and a confident and engaging personality. Participants reported that in many dietary surveys in LMICs, enumerators were selected for training only after having passed a qualifying exam. Those enumerators who completed training were then required to complete an additional post-training assessment, before being selected to collect data for the survey. In some cases, enumerators were required to pass both a practical and an oral test before being selected.

Meeting participants also discussed different approaches for organizing effective enumerator training. The complexity of organizing such training for a large-scale survey, where the number of enumerators is likely very high, was a point of special emphasis. A "cascade" training model was noted to be a commonly used approach to address the challenge of effectively training a large group of enumerators. This model relies on highly trained survey staff at the national level to provide training to enumerators at a central level, after which lower-level training is organized. The lower-level training sessions are led by the enumerators who were trained at the central level, under the supervision (including for quality assurance) of the national-level trainers. Participants indicated that the cascade model is a useful approach to consider and, when implemented well, can help to ensure the successful transfer of knowledge and skills, especially as the size of the training groups at each level can be better managed.

To ensure the quality of the data collected, meeting participants noted the need to assess inter- and intra-individual variation in data collection, and to put in place a series of internal and external mechanisms for quality control. Multilevel quality checks and procedures were cited as important features to have in place before starting data collection. Daily review by supervisors of the data collected by enumerators, along with checks of all data collected before they are sent to the central collection point, were both highlighted as essential to the quality assurance process.

Specific approaches that have proved useful for ensuring standardized data collection procedures during survey implementation include the use of a WhatsApp group for enumerators, supervisors and team leaders; as well as a separate WhatsApp group exclusively for supervisors and team leaders. These WhatsApp groups provide an effective mechanism for the active flow of information between centralized survey staff and field teams, as well as among field teams in different locations. In this way it is possible to provide and share standardized answers to questions in real time, and address issues as they arise across the different points and locations of field work.

1.4. Collecting data on processed, packaged and fortified foods consumed

Changing dietary patterns in LMICs have presented new challenges for the collection of dietary data. Meeting discussions focused in particular on issues related to the collection of accurate and reliable dietary data on processed and packaged foods[13] and on fortified foods[14] consumed, as well as the downstream challenges of identifying the correct nutrient content of such foods. A summary of the key challenges discussed is provided below.

In most LMICs, the information and listing of processed foods that are likely to be encountered during a dietary survey are often incomplete and outdated. Very few packaged foods are included in food composition tables (FCTs) in LMICs. Where FCTs exist for countries, they usually include mostly unprocessed or minimally processed raw and cooked foods. Even when commonly consumed processed/packaged foods can be identified before data collection (for inclusion in the FRIL), identifying their nutrient composition is challenging, because very little reliable food composition information is typically available for such foods in LMICs. Many LMICs lack legislation

[13] Processed and packaged foods were defined operationally during the meeting to include the following: branded ready-to-eat or ready-to-cook foods, non-branded ready-to-eat or ready-to-cook foods bought from informal vendors and retailers, and foods purchased and consumed from restaurants.

[14] Fortified foods were defined operationally during the meeting as any food vehicle (including condiments) that has been fortified with one or more micronutrients.

requiring mandatory labelling of foods and even when there are food labels to list the ingredients and nutrient composition, the extent to which the information is complete or accurate is questionable, and may vary from food to food. In this context it is difficult, if not impossible, to know the true and full nutrient content of the processed/packaged foods reported as consumed by respondents in a dietary survey.

As a further complicating factor, the commercial food market in any country is dynamic and ever-changing, and the processed foods available and consumed are therefore constantly in flux. As a result, the FRIL and food composition database necessary for a dietary survey requires constant updating. This is a significant challenge, especially considering food reformulation, voluntary fortification and the growing number of different food brands available in LMICs. Meeting participants noted that it would be useful to have information on the market share of different commercial products, but unfortunately this information is not usually available.

Similar challenges exist for collecting information on the consumption of fortified foods. In particular, meeting participants highlighted the difficulty of distinguishing between fortified and non-fortified foods, noting that even when a food product is known to be fortified, information is usually lacking on actual fortification levels, because compliance can vary. In addition, contextual factors such as storage conditions, shelf life, oxidation and exposure to light, can all impact the actual nutrient composition of a fortified food.

Another issue involves the increasing consumption of vendor- and restaurant-prepared foods in LMICs. Identifying and obtaining the recipes for such prepared foods is essential to the compilation of the food composition database for a dietary survey, but doing so can be difficult.

Meeting participants then shared their experiences with regard to promising practices and approaches for addressing these challenges during pre-survey activities. From these, a set of key recommendations emerged:

- When developing the FRIL for a dietary survey, facilitated group discussions and market surveys can help to identify and describe commonly consumed processed/packaged and fortified foods. (Market surveys can be particularly useful in urban areas.)
- For ready-to-eat foods that are commonly available for sale, it may be useful to collect standard recipes in collaboration with street vendors and restaurants.
- Enumerator training needs to explicitly address the issue of processed/packaged foods, in order to ensure that, during data collection, enumerators can not only identify and obtain relevant details about the processed/packaged and fortified foods consumed, but also account for and address the possibility that a processed/packaged food item reported as consumed is not included the FRIL.
- During data collection, the use of photos can help to identify and catalogue commercial foods reported by the respondent as consumed.

Participants also highlighted the advantages of complementary data sources in helping to inform post-survey work. For example, the International Network for Food and Obesity/NCDs Research, Monitoring and Action Support (INFORMAS)[15] gathers food labelling data that can be useful for identification of food composition. Similarly, many food companies provide information on their websites that can be used to determine the composition of packaged foods. More generally, meeting participants described collaborating with different entities across different parts of the country and forming coalitions to generate regional information – all of which they cited as relevant and useful for obtaining food composition data for commercially processed/packaged foods.

[15] INFORMAS is a "global network of public-interest organizations and researchers that aims to monitor, benchmark and support public and private sector actions to increase healthy food environments and reduce obesity and NCDs and their inequalities" (INFORMAS, 2020).

1.5. Data analysis and use

Throughout meeting discussions on data use, participants emphasized the need to fully exploit the many ways in which dietary data can advance evidence-based policy and programming. They also stressed the importance of such data for contextually appropriate consumer education and dietary guidance in a country, noting that dietary data collection is not useful unless the data collected are actually used.

Ideally, data use plans should be outlined during the survey planning period, in order to secure the necessary budget and time for work to be carried out. The following additional action points emerged as recommendations for supporting the effective use of dietary data in a country:

- engage country stakeholders in the dietary survey from the earliest planning stages;
- illustrate the potential use of dietary data for decision making with clear and concrete examples;
- share experiences from other LMICs of how dietary data have been used effectively for decision making;
- partner with researchers to support data quality, innovation, documentation and dissemination;
- partner with policy engagement specialists to help translate policy problems into research questions and to translate analytical and modelling results into useful information for decision making; and
- document the cost of relevant nutrition interventions in the country to facilitate cost-effectiveness research and advocacy for greater impacts and sustainable investments in nutrition.

Participants shared several ways in which dietary data collected as part of a large-scale or national survey in a low- or middle-income country have been put to use. These included problem assessment; programme and policy design and evaluation; development of national dietary guidelines; and advocacy for food reformulation, food taxation and regulatory food packaging labels. Each of these specific uses is described below.

1.5.1. Problem assessment

Data on dietary intake and nutritional status are central to defining the specific nutrition and dietary situation in a country and highlighting those areas that may require attention. With dietary data it is possible to identify which micronutrients are not being consumed to adequate levels, which demographic groups are most at risk of inadequate micronutrient intakes, and which geographic areas are most at risk of micronutrient inadequacy. Similarly, dietary data can provide information on the demographic groups most at risk of excessive energy intakes or on the geographic areas where diets high in ultra-processed foods are most common.

In addition, using dietary data in problem assessment can allow for the mapping of food and nutrition security in a country, the measurement of access to healthy and unhealthy foods, and the identification of food deserts and food swamps. In at least one middle-income country, this information was used to provide evidence for social protection and food policies, and to inform the design of subsidy policies for food procurement, popular restaurants and fresh food markets.

1.5.2. Programme and policy design and evaluation

Meeting participants strongly emphasized the importance of dietary data for designing evidence-based programmes and for ensuring that the programme implemented is designed to respond most directly to the problem at hand. Experiences shared at the meeting indicated that dietary data have been especially critical

for informing and contributing to food fortification programmes, for example in relation to confirming the need for a fortification programme (based on the presence of inadequate micronutrient intakes); to selecting the most appropriate food vehicles for fortification; and to setting the appropriate levels of fortification so as to address inadequate micronutrient intakes (while at the same time avoiding the risk for unsafe, excessive micronutrient intakes). One example shared at the meeting reflected a case related to inadequate iron intakes among a particular population: thanks to dietary data, it was discovered that members of the population tended to consume either cornflour or wheat flour, but not both, and that therefore, it was necessary to fortify more than one food to effectively address the issue. This conclusion could not have been reached in the absence of dietary data showing who was consuming what, where and how much.

Meeting participants also reported having used dietary data effectively in conjunction with different types of modelling tools. One example described the use of a tool known as MINIMOD[16] in combination with national dietary data, to model the effects of a broad range of micronutrient interventions (including fortification, supplementation and biofortification) both independently and jointly, and to predict the prevalence of inadequate micronutrient intakes for different demographic groups (i.e. women and children) in different parts of the country. By combining information on the benefits and costs of intervention programmes, dietary data in this country was then used to identify a cost-effective set of programmes targeted to specific geographic areas. Complementing cost data with dietary data in this way has the potential to produce valuable information to support advocacy for government to earmark funds to direct to specific intervention programmes, based on an expected nutrition benefit.

1.5.3. Development of national dietary guidelines

Several meeting participants reported having used dietary data to develop national dietary guidelines that are realistic, feasible, and associated with a diet that has appropriate levels of macronutrients and micronutrients. In some cases, dietary guidelines were developed by identifying healthy food patterns by country region and for different demographic groups. In one example, the level of processing of foods was also considered in the modelling work, in order to better identify an appropriate and healthy dietary pattern for the country's dietary guidelines.

1.5.4. Advocacy for food reformulation, food taxation and food packaging labels

Meeting participants also gave examples of using dietary data to advocate for food reformulation, food taxation and regulation on food packaging labels. For example, dietary data in at least one country have been used to identify those foods contributing most to sodium, sugar and trans fatty acid intake among the population. These data were then used to model the potential impact of a reduction in sodium intake on the prevalence of cardiovascular disease, and the associated reduction in health expenditures and in cardiovascular disease-related deaths. The results were used to advocate for voluntary targets for sodium reduction in food formulation. Using dietary data in this way, to simulate and predict the effects of food reformulation on public health, can be a powerful advocacy tool. A similar modelling approach can be used to advocate for regulation on food packaging labels for consumers.

[16] MINIMOD is a tool developed by the University of California, Davis to provide input for the planning and management of micronutrient intervention programmes in LMICs. MINIMOD uses a set of three interconnected models (a nutrition benefits model that links to the "Lives Saved Tool", a cost model and an economic optimization model) to identify the most cost-effective set of micronutrient intervention programmes in a particular country, across space and time. For more information about MINIMOD, see https://minimod.ucdavis.edu/models/.

1.6. Additional points discussed

Beyond dietary data collection and use, meeting participants stressed that moving forward, data dissemination also requires greater emphasis in LMICs. In addition to using dietary data for policy and programme design, participants highlighted the importance of sharing the information collected with local communities, to reflect what was learned and to begin to discuss the need to change dietary behaviours for improved health and nutrition across the population.

Several meeting discussions also touched on the importance of food composition data for dietary assessment. In many LMICs, the institutions that currently collect and analyse dietary data are often the same institutions that compile the food composition table. Participants mentioned different challenges related to the generation, compilation and harmonization of food composition data, as well as the use of food composition data for dietary data analysis. For example, the lack of regional- and country-specific yield factors and nutrient retention factors was cited as a key challenge for dietary data analysis in LMICs.

To conclude, meeting participants proposed establishing a mechanism (such as a networking platform and/or mailing list) to enable continued contact, dialogue, learning and experience sharing on promising practices for quantitative 24-hour dietary recall surveys in LMICs. Participants agreed that such a mechanism would be helpful for encouraging and maintaining active engagement and sharing across countries for the long term.

PART 2: Technical presentations by international partners

2.1. Innovations in dietary assessment and worldwide efforts for data harmonization

The harmonization of data is essential to the enhanced consistency and scientific robustness of nutrition assessments, allowing comparisons across location, time period and season. Different projects and initiatives at global and regional level have been working towards increased harmonization in the way dietary data are collected, analysed and used.

2.1.1. Intake: technical assistance and capacity building for dietary data collection, analysis and use

For government entities planning dietary surveys in LMICs, Intake offers a range of no-cost services and support for high-quality dietary data collection, analysis and use, across all phases of dietary survey-related activities. These include technical assistance and capacity building for statistical services related to survey design and sampling; pre-survey work; training for survey implementation; dietary data cleaning and processing; and statistical analysis, interpretation, presentation and use of dietary data.

When responding to country requests for capacity building and technical assistance with dietary surveys, Intake works in collaboration with country partners to find solutions that support high-quality dietary data collection, analysis and use, given the geographic context of the survey, its specific objectives, and the time and resources available. As of December 2019, Intake was providing technical assistance for large-scale or national surveys in six LMICs: Jordan, Kenya, the Niger, Nigeria, Viet Nam and Zambia.

To ensure that best practices related to dietary data collection, analysis and use in LMICs are easily accessible and widely available for the long term, Intake is also developing a set of written technical assistance resources (including survey guidance documents and planning tools) to support dietary surveys in LMICs. For more information, see https://www.intake.org/.

Guiding principles of Intake's work centre on the desire to build meaningful, collaborative working partnerships for increasing the availability and use of dietary data for policy and programme design; a commitment to providing pragmatic and effective technical assistance in response to expressed country needs; and an appreciation for the opportunities for shared learning in its work with partners at both country and global level.

2.1.2. INDDEX24: a digital solution for streamlining dietary assessment in LMICs

The International Dietary Data Expansion (INDDEX) Project is a collaborative effort between Tufts University's Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy, FAO, the International Food Policy Research Institute (IFPRI) and other international experts. The project works to facilitate increased acquisition and use of timely and high-quality food consumption and nutrient intake data in LMICs. Such data have traditionally been scarce and underused, due to the perceived high cost and complexity of data collection and analysis. The INDDEX Project addresses these challenges through the development of global architecture for dietary data assessment; this includes leveraging existing data, strengthening institutions, developing innovative technologies and demonstrating the policy relevance of improved food consumption data.

Developed as part of the INDDEX Project, the INDDEX24 dietary assessment platform consists of a web application that manages and stores context-specific input databases; this is linked to a tablet-based mobile application which is used to conduct interviewer-administered 24-hour dietary recalls. The mobile app, in turn, is equipped with an analytical reporting tool that facilitates data processing, along with the production of food and nutrient intake variables.

The web application is a cloud-based data repository that can be populated by users with context-specific input databases, including food composition tables, standard recipes, tag (food descriptor) lists and portion size conversion factors. Users may also search the web app for existing context-specific data, so as not to start from scratch when planning a 24-hour dietary recall survey. The integrated mobile application uses the multiple-pass method to guide respondents through the recall of foods and amounts consumed, including recipe ingredients.

The initial development phase of INDDEX24 included field testing in two countries, Burkina Faso and Viet Nam, where the INDDEX team collaborated with the Institut National de la Statistique et Demographie (Burkina Faso) and the National Institute of Nutrition (Viet Nam) to test the feasibility, validity and cost-effectiveness of using INDDEX24 in the field. INDDEX expects that the platform will be made available to a small set of early adopters by June 2020, and released publicly by the end of 2020.

2.1.3. Harmonization of dietary data at the European level: the EU Menu framework project

Since 2005, the European Food Safety Authority (EFSA) has worked in close cooperation with organizations operating in the field towards harmonizing dietary survey methodology and building a common European Union food consumption database. Harmonized food consumption data are fundamental to improving the accuracy of European Union-wide exposure assessments, and can also assist in serving the needs of nutrition surveillance and further diet- and health-related studies. Improved risk assessments can assure more targeted risk management and permit more accurate risk communication, resulting in increased consumer confidence.

In 2011, EFSA launched the “What’s on the Menu in Europe? (EU Menu)” project, with the aim of providing financial and technical support to carry out national dietary surveys in the European Union. The methodology used in the national food consumption surveys is expected to follow the principles described in the EFSA Guidance on the EU Menu methodology, published in 2009 and updated in 2014 (EFSA, 2014). It focuses on collecting data from six population groups, ranging in age from three months to 74 years, using a harmonized methodology that has been endorsed by the European Union country institutions through the EFSA Network on Food Consumption Data.

EFSA is currently supporting 36 dietary surveys on children and/or adults from 18 European Union Member States and 4 pre-accession countries. All projects are expected to be finalized by 2023.

2.1.4. Scaling up the harmonization of dietary data to the global level: development of the FAO/WHO GIFT platform

Building on EFSA’s work at the European level, FAO and WHO have developed the FAO/WHO Global Individual Food consumption data Tool (FAO/WHO GIFT), an open-access platform which collates, harmonizes and disseminates existing dietary data from different countries at a global level. In 2018, FAO received a four-year grant from the Bill & Melinda Gates Foundation for a range of activities, including expansion of the platform with an additional 50 harmonized food consumption datasets, with a focus on LMICs.

To be inserted in the FAO/WHO GIFT platform, dietary data undergo a process of post-harmonization. The process comprises several steps, including the identification of existing data, validation of the data quality criteria, and the harmonization of the food list using the FoodEx2 classification and description system (EFSA, 2015). The system was first developed by EFSA for both food safety and nutrition purposes, but with more attention to

food safety needs. In order to use the FoodEx2 system in the harmonization process for dietary data collected in countries outside Europe (while ensuring equal attention to nutrition needs), FAO and WHO worked with EFSA at scaling FoodEx2 up to the global level. The use of the same classification and description system in datasets from different countries is aimed at increasing harmonization on dietary data analysis and use.

2.2. Use of dietary data beyond the nutrition assessment domain

The use of dietary data in different fields can generate more demand, and function as an entry point for convincing political decision makers to invest in dietary surveys. The different domains discussed here represent a way to maximize the potential uses of data collected through dietary surveys.

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2.2.1. Using dietary data to assess dietary exposure to human health hazards

Besides their importance for nutrition assessments, dietary data are essential in the area of food safety. Risk assessments follow a four-step method: hazard identification, hazard characterization, exposure assessment and risk characterization (FAO and WHO, 2004). In particular, harmonized dietary data are needed to improve the consistency and reliability of dietary exposure assessments, a critical step in establishing suitably protective limits for microbiological or chemical agents in food (EFSA, 2008).

A multi-centre Total Diet Study in sub-Saharan Africa[17] was presented during the meeting, to showcase the unique benefits of dietary data in understanding person-to-person variations in food consumption, and in allowing for the estimation of risk across different sex and age population groups, and of risk in "high consumers" (i.e. the consumer group that habitually or temporally consumes much more of a specific food than the average consumer).

The use of dietary data for food safety purposes has also been supported by FAO and WHO. In 2013, the two organizations together developed the FAO/WHO Chronic Individual Food Consumption Database – Summary Statistics (CIFOCOss), which shares summary statistics on food consumption covering all age groups, with harmonized categories. In 2019, the CIFOCOss database was incorporated into FOSCOLLAB: the Global platform for food safety data and information. FOSCOLLAB is a WHO tool that integrates multiple sources of reliable data

[17] The study assessed the chronic exposure of eight population groups in sub-Saharan Africa to aflatoxin B1, and identified maize, peanut and peanut oil as the main contributors to exposure through diet. Considering the prevalence of hepatitis B in the region of North Cameroon for example, this could potentially lead to 23.9 additional cases of liver cancer per 100 000 inhabitants per year (Ingenbleek, *et al.,* 2020).

to support food safety professionals as well as the FAO/WHO risk assessment process. The chemical occurrence data that are shared through FOSCOLLAB are also mapped with the FoodEx2 system. Therefore, experts interested in using a probabilistic or deterministic model to perform a dietary exposure assessment for which microdata are needed, can easily combine the chemical occurrence data available on FOSCOLLAB with the microdata on dietary intakes shared through the FAO/WHO GIFT platform.

2.2.2. Using dietary data to assess the environmental impact of diets

Dietary data can also be used to assess the environmental impact of diets, and to identify less resource-intensive food consumption patterns, which are key to mitigating climate change. Food systems, including food production, play a substantial role in global environmental change – contributing to climate change, biodiversity loss, freshwater depletion, interference with the global nitrogen and phosphorus cycles, and land-system change. It is therefore essential to understand and assess the environmental impact of current food consumption patterns and to promote changes towards more sustainable diets.

Dietary data can be matched with data related to the environmental impact of foods, such as datasets of foods and their carbon footprints, in order to assess the environmental impact of diets and to help identify sustainable food consumption patterns. This process is similar to matching dietary data to food composition data, and choosing the most appropriate carbon footprint values among those that are available entails the same type of careful work.

This matching process is facilitated when the dietary datasets and the datasets on carbon footprints are harmonized with the same food classification system. For example, FoodEx2 can be used to classify and describe foods reported in different types of data, including data on carbon footprints. If datasets of foods and their carbon footprints are harmonized with FoodEx2, they can then be matched with the dietary data available in FAO/WHO GIFT. This would also allow the development of indicators in the FAO/WHO GIFT platform related to the environmental impact of diets.

Currently, there are no environmental indicators in the FAO/WHO GIFT platform, but some potential indicators have been identified; for example, the ratio between the consumption levels of bovine meat and that of other meats, or the percentage of proteins deriving from plant-source foods. The potential of creating such indicators in the platform and the possibility of developing country- or region-specific indicators are being analysed. In the meantime, interested users are encouraged to download the dietary microdata in the FAO/WHO GIFT platform and match it with carbon footprint datasets for their own analysis.

2.2.3. Using dietary data to inform food-based dietary guidelines development

Food-based dietary guidelines (FBDGs) represent what a healthy diet means for a country or region. They are commonly based on the classification of foods into groups, and their development involves an evidence-based, multistakeholder, systematic approach.

Dietary data comes in at two stages of the FBDGs development process. The first is during the situation analysis and evidence review stage, where the country situation is analysed using a food systems approach, and the global scientific evidence on the relationship between dietary patterns, foods, nutrition and health is reviewed. Dietary data are then used in the diet modelling step, where nutrient recommendations are “translated” into concrete, quantified recommendations that are easy for people to understand and follow.

Diet modelling is used in FBDGs to a) calculate food consumption patterns at various calorie levels to meet the nutritional needs of various population groups; b) determine the proportions of food groups to depict in the FBDGs food graphic; and c) assess the feasibility of the FBDGs’ technical recommendations and provide guidance on numerical limits to include in their messages, if necessary (for example, “Eat between 2–3 cups of vegetables a day”). Developing models where the optimized diet is as similar as possible to current dietary practices may increase the

chances of adherence by the target population. Dietary data are used to identify representative foods in each food group and set their relative percentage contribution weights for the food group, as well as to set "acceptability constraints" that are close to observed portion size values.

There are some considerations to keep in mind when using dietary data for diet modelling. For example, there may be underutilized foods that are nutrient-dense, that can be encouraged in the FBDGs. Conversely, there may be energy-dense, nutrient-poor foods that are frequently consumed, or for which common food preparation methods may be unhealthy. In these cases, the FBDGs will aim to promote healthier options. Food group classifications may also change. For example, fruit juices are sometimes classified under fruits in food consumption surveys, while being considered "sugars and sweets" in FBDGs. If mixed dishes are frequently consumed (and have not been disaggregated in the dietary data), care must be taken to ensure that the main ingredients are included as representative foods in the food groups they belong to.

FAO has been assisting countries to develop, revise and implement FBDGs for over 25 years, and maintains a global repository of national FBDGs from more than 90 countries around the world.[18]

2.2.4. Using dietary data to inform agriculture policies

Assessing the nature of food environments in various settings, as well as existing food consumption patterns and drivers of food choices, is crucial to a better understanding of food systems (FAO, 2018). The global food system is changing rapidly, with dire consequences for diets. Policy makers therefore need to ensure that all parts of the food system work together to deliver healthy diets that are also economically, environmentally and socioculturally sustainable.

This calls for a better understanding of what people eat, what is over- or under-represented in diets, and how food systems contribute to dietary patterns in terms of challenges and potential solutions. It calls for policy coherence across sectors and the balancing of potential trade-offs across different decisions. Each step requires the involvement of key stakeholders beyond government institutions, such as civil society organizations, academia and the private sector.

Data on the actual food consumption of a population can be part of the situation analysis of a country, and can contribute to the understanding of how the food system operates in the country. Dietary data can effectively inform various context-specific policy actions, such as the setting of agricultural production targets. For example, there may be local foods rich in key nutrients in a given area, but these may not be produced and/or consumed in sufficient amounts by some population subgroups. Information on the consumption of these foods – disaggregated by age and sex – and on their food composition is essential for setting realistic targets in terms of their production, distribution and consumption, in order to tackle nutrient deficiencies in a highly sustainable way — that is, through diversified diets based on local and biodiverse foods.

Dietary data may also support course corrections during policy implementation. For example, in a country where there is an unexpectedly high level of aflatoxin in tree nuts and peanuts consumed, dietary data may help to understand the programmatic implications of using peanut-based supplementary foods to tackle malnutrition, considering the risks related to food safety.

Finally, dietary data may support the evaluation of national food and nutrition security programmes included in the agriculture policy. Their use can help to monitor the performance of implemented services and interventions, and assess the efficiency and effectiveness of the programme in terms of dietary impact.

[18] See http://www.fao.org/nutrition/education/food-dietary-guidelines/en/.

The use of dietary data is only one piece of the information puzzle in policy making, but it is a crucial one for guiding decisions across food systems in terms of what is produced, processed, distributed and promoted for consumption. Food systems affect dietary intakes, but dietary choices can also influence transformations in food systems, presenting an opportunity that should not be overlooked by policy makers.

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Annex A: Meeting agenda

WEDNESDAY, 11 DECEMBER

TIME	SESSION TITLE	PERSON(S) RESPONSIBLE
9.00–10.30	**Who We Are and Why We Are Here**	
	Welcome Remarks	FAO: Anna Lartey Intake: Megan Deitchler
	Introduction of Participants	Moderator: Nadra Franklin
	Review of Agenda and Objectives of Meeting	Moderator: Nadra Franklin
	How Can WHO and FAO Better Serve Countries Through Nationwide Individual Quantitative Food Consumption Data?	FAO: Anna Lartey WHO: Francesco Branca
	Intake Global Dietary Data Video	Moderator: Nadra Franklin
	An Overview of the Intake Center for Dietary Assessment	Intake: Megan Deitchler
	An Overview of the FAO/WHO GIFT Platform	FAO: Catherine Leclercq FAO: Victoria Padula de Quadros
10.30–10.45	**Break**	
10.45–12.30	**Large-Scale Dietary Surveys: How to Start** Survey Initiation, Planning and Design	
	Considerations Related to the Initiation, Planning and Design of Large-Scale Dietary Surveys	Intake: Megan Deitchler
	Viet Nam General Nutrition Survey 2019	NIN, Vietnam: Tuan Thi Mai Phuong
	Experiences from the Nigerian National Food Consumption and Micronutrient Survey	IITA, Nigeria: Busie Maziya-Dixon
	Q&A and Discussion	Moderator: Nadra Franklin
	Open Sharing of Country Experiences	Moderator: Nadra Franklin
12.30–13.30	**Lunch**	
13.30–14.15	**FAO/WHO GIFT Platform – How to Contribute?**	
	FAO/WHO GIFT: Data Harmonization and Legal Considerations for Data Sharing	FAO: Rita Ferreira de Sousa
	Q&A and Discussion	Moderator: Nadra Franklin
14.15–14.45	**Cross-Country Networking**	
14.45–15.00	**Break**	
15.00–16.45	**Preparation: Which Tools Do We Need to Conduct Dietary Surveys?** Pre-survey work for a dietary survey	
	Considerations Related to the Pre-Survey Work Required for Large-Scale Dietary Surveys	Intake: Marieke Vossenaar
	Zambia Food Consumption and Micronutrient Status Survey 2020: An Overview of Survey Design and Pre-Survey Activities	NFNC, Zambia: Raider Habulembe Mugode
	24-Hour Recalls Collected in Dietary Surveys: Experiences from the Mexican National Nutrition Surveys	INSP, Mexico: Tania Aburto
	Q&A and Discussion	Moderator: Nadra Franklin
	Open Sharing of Country Experiences	Moderator: Nadra Franklin
16.45–17.00	**Wrap-Up of Day 1**	Moderator: Nadra Franklin

THURSDAY, 12 DECEMBER

TIME	SESSION TITLE	PERSON(S) RESPONSIBLE
9.30–9.45	Welcome and Review of Agenda for Day 2	Moderator: Nadra Franklin
9.45–11.00	**Implementation** Survey Team Training and Composition, and Data Collection	
	Considerations related to Survey Team Training and Composition, and Data Collection for Large-Scale Dietary and Multi-Topic Surveys	Intake: Abdelrahman Lubowa
	Dietary Survey in China – Practice and Challenge	CDC, China: Zhihong Wang
	The Conduct of the Philippine National Nutrition Survey with Emphasis on Food Consumption	FNRI, Philippines: Imelda Angeles-Agdeppa
	Open Sharing of Country Experiences	Moderator: Nadra Franklin
11.00–11.15	**Break**	
11.15–12.15	**Special Topics related to Dietary Data Collection – Break Out Session**	
Topic A	**Collecting Dietary Data among Adolescents**	
	National Nutrition Monitoring Bureau (NNMB): Methodologies for Diet Surveys	NIN, India: Avula Laxmaiah
	Validation of 24-hr Dietary Recall for Estimating Nutrient Intake and Adequacy in Adolescents 10–11 and 12–14 Years of Age in Burkina Faso	Intake: Mourad Moursi
	Open Sharing of Country Experiences	Moderator: Rita Ferreira de Sousa
Topic B	**Collecting Dietary Data where Shared Plate Eating is Common**	
	Overview of Dietary Patterns in Ethiopia	EPHI, Ethiopia: Aregash Samuel
	Enquête sur les apports nutritionnels des groupes vulnérables et l'identification d'aliments véhicules pour l'enrichissement en micronutriments au Niger avec la méthodologie FRAT et le rappel quantitatif de 24 heures	INS, Niger: Issiak Balarabe Mahamane
	Open Sharing of Country Experiences	Moderator: Nadra Franklin
12.15–12.30	**Group Photo**	
12.30–14.00	**Lunch**	
14.00–15.15	**How Can Dietary Data Be Used Beyond the Nutritional Assessment Domain and Why Data Harmonization Improves Its Usability – Part I**	
	Using Dietary Data to Assess the Environmental Impact of Diets	FAO: Victoria Padula de Quadros
	Using Dietary Data in Dietary Exposure Assessment to Human Health Hazards	FAO: Luc Ingenbleek WHO: Philippe Verger
	What's on the Menu in Europe? The EU Menu Framework Project: Highlights, Challenges and Lessons Learned	EFSA: Davide Arcella
	Q&A and Discussion	Moderator: Nadra Franklin
15.15–15.30	**Break**	
15.30–17.00	**Dietary Data Collection Challenges related to the Nutrition Transition** Collecting data on processed, packaged and fortified foods consumed	
	Considerations related to Collecting Data on Processed, Packaged and Fortified Foods Consumed in Large-Scale Surveys in LMICs	Intake: Mourad Moursi
	Development and Testing of a Feasible Food Listing Tool for Processed Foods for Use in Urban Areas	KEMRI, Kenya: Zipporah Bukania
	National Dietary Surveys in Brazil	MOH, Brazil: Eduardo Nilson
	Open Sharing of Country Experiences	Moderator: Nadra Franklin
17.00–17.15	**Wrap Up of Day 2**	Moderator: Nadra Franklin

FRIDAY, 13 DECEMBER

TIME	SESSION TITLE	PERSON(S) RESPONSIBLE
9.00–9.15	Welcome and Review of Agenda for Day 3	Moderator: Nadra Franklin
9.15–10.00	**Innovations for Dietary Data Collection in LMICs**	
	INDDEX24, a Global Digital Solution for Streamlining Dietary Assessment	INDDEX: Jennifer Coates INDDEX: Jerome Some
	Q&A and Discussion	Moderator: Nadra Franklin
10.00–13.00	**After the Survey: How to Make the Best Use of the Data? Data Analysis and Use**	
	Brainstorming from Dietary Data to Better Diets, New Ideas to Make It Happen!	FAO: Catherine Leclercq
11.00–11.15	**Break**	
	National Dietary Survey in Cameroon (2009): Data Collection, Analysis, Modelling and Use for Decision Making	HKI, Cameroon: Alex Ndjebayi
	Use of Dietary Surveys for Food and Nutrition Policies in Brazil	MOH, Brazil: Eduardo Nilson
	Intake Video: Mexico Dietary Data Case Study	Moderator: Nadra Franklin
	Open Sharing of Country Experiences	Moderator: Nadra Franklin
13.00–14.00	**Lunch**	
14.00–15.00	**How Can Dietary Data Be Used Beyond the Nutritional Assessment Domain and Why Data Harmonization Improves Its Usability– Part II**	
	Using Dietary Data to Inform Food-Based Dietary Guidelines Development	FAO: Ramani Wijesinha-Bettoni
	Using Dietary Data to Inform Agriculture Policy	FAO: Patrizia Fracassi
	Q&A and Discussion	Moderator: Nadra Franklin
15.00–15.15	**Break**	
15.15–16.45	**Looking Forward: How Can Intake and FAO/WHO GIFT Support You**	
	Break-Out Group Discussions	
	Report Back and Discussion	Moderator: Nadra Franklin
16.45–17.00	**Wrap Up Day 3**	Moderator: Nadra Franklin
17.00–17.15	Next Steps from Intake and FAO/WHO GIFT	Intake: Megan Deitchler FAO: Victoria Padula de Quadros
17.15–17.30	**Closing**	**FAO: Anna Lartey**

Annex B: List of participants

NAME	AFFILIATION*
Nazma Shaheen	Professor, Institute of Nutrition and Food Science, University of Dhaka, Bangladesh
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Ella Compaore	Technical Secretary, Food and Nutrition, Ministry of Health, Burkina Faso
Alex Ndjebayi	Programme Advisor, Helen Keller International, Cameroon
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Catherine Leclercq	Nutrition Officer, FAO, Italy
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Patrizia Fracassi	Senior Nutrition and Food Systems Officer, FAO, Italy
Ramani Wijesinha-Bettoni	Nutrition Officer, FAO, Italy
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Teresa Bevere	Project Support Consultant, FAO, Italy
Victoria Padula de Quadros	International Nutrition Consultant, FAO, Italy
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Philippe Verger**	Advisor Food Safety, WHO/EMRO/CEHA, Jordan
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Jack McLaughlin	Program Officer, Intake, United States of America
Marieke Vossenaar	Senior Dietary Survey Consultant, Intake, Switzerland
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* Title and affiliation at time of the meeting

** Joined through videoconference

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