Guidance for monitoring healthy diets globally

World Health Organization

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unicef

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Contents

Acknowledgements iv
Abbreviations and acronyms v
Glossary vi

1. Background 1
1.1 Objectives 2
1.2 Target audience 2
1.3 Approach for content development 2
1.4 The properties of a healthy diet 2

2. Why measure the healthiness of diets? 5
2.1 Population-level purposes for measuring the healthiness of diets 5
2.2 Why prioritize monitoring? 6
2.3 Considerations when measuring the healthiness of diets 6

3. How to measure the healthiness of diets 7
3.1 Dietary assessment methods 7
3.2 Types of dietary intake data 8
3.3 Surveys for dietary data collection 9
3.3.1 Integrating modules on dietary intake within a multitopic large-scale survey 9
3.3.2 Stand-alone national health, nutrition and dietary surveys 9
3.4 Measures and indicators of the healthiness of diets 10

4. Selecting methods and healthy diet metrics according to purpose 13

5. Research gaps 17

6. Conclusion 19

References 21

Annex 1
The Healthy Diets Monitoring Initiative 25

Annex 2
Healthy diet metrics 27

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The document was conceptualized, led and reviewed by the Core Group of the HDMI: Elaine Borghi, Unit Head, Monitoring Nutritional Status and Food Safety Events, Department of Nutrition and Food Safety, WHO headquarters, Geneva, Switzerland; Francesco Branca, Director, Department of Nutrition and Food Safety, WHO, Geneva, Switzerland; Jennifer Coates, Associate Professor, Food and Nutrition Policy and Programs, Tufts University Friedman School of Nutrition Science and Policy, Boston, United States of America (USA); Isabela Fleury Sattamini, Project Manager for the Healthy Diets Monitoring Initiative, Monitoring Nutritional Status and Food Safety Events, Department of Nutrition and Food Safety, WHO, Geneva, Switzerland; Edward Frongillo, Director, Global Health Initiatives, Arnold School of Public Health, University of South Carolina, Columbia, USA; Giles Hanley-Cook, Nutrition Statistics Specialist, Nutrition Assessment Team, Food and Nutrition Division, FAO, Rome, Italy; Chika Hayashi, Senior Advisor, Monitoring and Statistics and Unit Chief, Nutrition Data, UNICEF, New York, USA; Bridget Holmes, Nutrition and Food Systems Officer, Nutrition Assessment Team Leader, Food and Nutrition Division, FAO, Rome, Italy; Vrinda Mehra, Statistics Specialist, Nutrition Data, UNICEF, New York, USA; Lynnette Neufeld, Director, Food and Nutrition Division, FAO, Rome, Italy; Kuntal Saha, Technical Officer, Monitoring Nutritional Status and Food Safety Events, Department of Nutrition and Food Safety, WHO, Geneva, Switzerland and Chris Vogliano, Technical Advisor, Food Systems, USAID Advancing Nutrition, Arlington, USA.

The document was prepared by Isabela Fleury Sattamini, Project Manager for the Healthy Diets Monitoring Initiative, Monitoring Nutritional Status and Food Safety Events, Department of Nutrition and Food Safety, WHO, Geneva, Switzerland; Jennifer Coates, Associate Professor, Food and Nutrition Policy and Programs, Tufts University Friedman School of Nutrition Science and Policy, Boston, USA; Edward Frongillo, Director, Global Health Initiatives, Arnold School of Public Health, University of South Carolina, Columbia, USA; Vrinda Mehra, Statistics Specialist, Nutrition Data, UNICEF, New York, USA; Giles Hanley-Cook, Nutrition Statistics Specialist, Nutrition Assessment Team, Food and Nutrition Division, FAO, Rome, Italy; and Kuntal Saha, Technical Officer, Monitoring Nutritional Status and Food Safety Events, Department of Nutrition and Food Safety, WHO, Geneva, Switzerland.

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Abbreviations and acronyms

DHS	Demographic and Health Survey
DQQ	Diet Quality Questionnaire
FAO	Food and Agriculture Organization of the United Nations
FFQ	Food Frequency Questionnaire
FGDS	Food Group Diversity Score
GDQS	Global Diet Quality Score
GDR	Global Dietary Recommendations
GWP	Gallup World Poll
HCES	Household Consumption and Expenditure Survey
HDMI	Healthy Diets Monitoring Initiative
MDD-W	Minimum Dietary Diversity for Women
MICS	Multiple Indicator Cluster Survey
NCD	Noncommunicable diseases
NDNS	National Diet and Nutrition Survey
NPNL	Non-pregnant non-lactating
SDG	Sustainable Development Goals
UNICEF	United Nations Children's Fund
UPF	Ultra-processed foods
WHO	World Health Organization
WRA	Women of reproductive age

Glossary

Healthiness	Healthiness is a term used to describe a status of good health or promoting a high degree of physical, mental and social well-being. It encompasses a range of factors that contribute to overall health and well-being. The concept of healthiness can vary from person to person and may be influenced by cultural, societal, and individual perspectives.
Malnutrition	Malnutrition refers to deficiencies or excesses in nutrient intake, imbalance of essential nutrients or impaired nutrient utilization. The term malnutrition covers two broad groups of conditions. One is 'undernutrition'—which includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies or insufficiencies (a lack of important vitamins and minerals). The other is overweight, obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes, and cancer).
Assessment	Determining the magnitude of a situation or problem, e.g. burden or prevalence.
Monitoring	Determining how a situation is changing.
Indicator	Demonstrates the presence or absence of a specific construct.
Measure	Assigns numbers to people or things to represent the relations among them to reflect the relative amounts of a specific construct.
Metric	A measure or indicator.
Instrument or tool	A device for measuring the value of a construct under observation, e.g. a questionnaire.
Survey	A mechanism to collect data from a sample of individuals, households or other entities.
Psychometrics	Psychometrics in nutrition refers to the application of psychological measurement and assessment techniques to evaluate various aspects of individuals' dietary behaviors, eating habits, attitudes and beliefs related to food and nutrition. This field combines principles from psychology and measurement to gather quantitative data about individuals' nutritional behaviors, preferences and psychological factors that may influence their dietary choices.
Biometrics	In the context of nutrition, biometrics typically refers to the use of various biological measurements and data to assess an individual's nutritional status, metabolism and health.

Construct	Phenomenon of theoretical interest that is real but may be observable or unobservable (i.e. latent). In psychometrics, a construct refers to an abstract, hypothetical concept or attribute that is not directly observable but is inferred from observable behaviours, responses or test scores. Constructs are used to represent complex psychological traits, characteristics or abilities that cannot be directly measured.
Subconstruct	Characteristics or properties of a construct that together describe a construct or the phenomenon. Many constructs are multidimensional, meaning that they encompass multiple facets or dimensions. For instance, the construct of healthy diets includes dimensions like nutrient adequacy, macronutrient balance, diversity, moderation, food safety and nutrient density. These are called subconstructs of the construct of healthy diets.
Attributes	Attributes in biometrics refer to the measurable characteristics or traits of an individual that are used for identification or verification purposes. The concept is similar to the concept of construct in the field of psychometrics.
Properties	Properties, in the context of biometrics, refer to specific characteristics or qualities associated with biometric attributes. The concept of properties, in biometrics, is equivalent to the concept of sub-constructs in psychometrics.
Validity	Whether a measure or indicator is suitable for providing useful analytical measurement for a given purpose and context.
Cross-context equivalence	A measure or indicator that performs consistently across contexts, enabling assessment that is comparable across contexts.
Framework	Basic conceptual structure of purposes, constructs or sub-constructs, instruments, indicators, etc.
Reliability	The reliability of a metric is constituted by its dependability (the extent to which differences in a measure consistently reflect actual differences in the construct) and precision (the extent to which repeated measurements yield the same value)

1. Background

Healthy diets are essential for good nutrition and health. They help protect against all forms of malnutrition and many noncommunicable diseases (NCDs), such as heart disease, diabetes mellitus and diet-related cancers *(1–7)*. Access to a healthy diet is a fundamental human right *(8)*.

Unhealthy diets are responsible for the highest burden of morbidity and mortality globally when considering all known risk factors. Many countries, particularly low- and middle-income countries, are facing nutrition and health issues caused by the co-existence of undernutrition, micronutrient deficiencies, and overweight and obesity. In 2017, one in five deaths globally – equivalent to 11 million deaths – were associated with poor diets, and diet-related chronic diseases *(9, 10)*. According to WHO's estimates, the total annual number of deaths attributable to NCDs will increase from 36 million in 2008 to 55 million by 2030 if effective preventive measures are not taken *(3)*. In addition to affecting human health, dietary choices have significant implications for planetary health, as consumer demand is a major driver of food system trends that are – from a historical perspective – resource depleting, inefficient and contribute significantly to greenhouse gas emissions *(7)*.

It is vital for countries to monitor their population's diets to inform actions toward improving the health of people and planet. The healthiness of diets must be tracked in global frameworks, such as the Sustainable Development Goals (SDGs), to help monitor how the world's population is faring. Currently, few countries regularly assess diets and there are no dietary indicators in global monitoring frameworks.

Recognizing the importance of diets for health and the lack of consensus on how to measure and monitor healthy diets at scale, FAO, UNICEF and WHO joined forces to chart a way forward via the Healthy Diets Monitoring Initiative (HDMI) *(11–15)*. The joint mission of HDMI is "to enable national and global decision-makers and stakeholders to monitor and achieve healthy diets for people and the planet". See Annex 1 for more information on HDMI.

Considering the broad scope of the mission statement, HDMI intends to first establish guidance for measuring healthy diets for public health. The current guidance document is focused on healthy diets for healthy people. This version of the document provides an overview of the range of purposes for measuring the healthiness of diets and offers examples of the dietary assessment methods and types of dietary intake data, surveys and metrics that are currently available to monitor healthy diets. A subsequent version will offer more detailed recommendations regarding the selection and operationalization of metrics for healthy diet monitoring for healthy people.

In a later phase, HDMI intends to issue guidance on how to monitor healthy diets for both public and planetary health (i.e. including environmental sustainability considerations).

1.1 Objectives

The objectives of this guidance document are to provide an overview of:

1. the purposes for which dietary intake data can be used;
2. dietary assessment methods, types of dietary intake data and surveys to collect data on the healthiness of diets;
3. currently available healthy diet metrics and the core properties of healthy diets captured by them, according to the current body of evidence; and
4. choices on dietary assessment methods and metrics for healthy diet monitoring.

1.2 Target audience

The target audience of this guidance document is persons involved in using and interpreting dietary metrics. More specifically, the document is intended for:

- national governments:
  - national statistics offices (reporting to government on Sustainable Development Goals and World Health Assembly nutrition targets); and
  - ministries of health and agriculture;
- international and national organizations with an interest in diets and nutrition;
- researchers and academia;
- public health nutritionists and registered dietitians;
- technical advisors on nutrition or dietary intake to policy makers; and
- survey designers, managers and implementers

1.3. Approach for content development

The Core Group of the Healthy Diets Monitoring Initiative (HDMI) conceptualized and led the production of this document. This document was prepared by a working group of experts who undertook its development, writing and revision. Detailed information related to the purposes of measuring healthy diets, types of dietary intake data, surveys for dietary data collection, dietary assessment methods, metric characteristics, and recommendations on choices was derived from previous HDMI technical expert consultation reports and other publications.

The draft versions of the document were reviewed by all members of the Core group. The final draft was also reviewed by experts in this subject matter.

1.4 The properties of a healthy diet

The exact make-up of a healthy diet will vary depending on age, sex, physiological status, lifestyle and degree of physical activity, cultural context, availability and affordability of local foods and dietary customs, among other factors. However, the basic properties[1] of a healthy diet remain the same *(16)*.

Based on a thorough review of the evidence, the HDMI *(13,15)* identified the following four properties which best reflect healthy diets for the purposes of monitoring.

1. **Nutrient adequacy**: sufficient quantity and quality of nutrient (micronutrient, macronutrients, energy) intake to cover nutrient requirements, without excess.
2. **Macronutrient balance**: balance of energy-yielding macronutrients: carbohydrates, proteins and fats.
3. **Diversity**: diets composed of diverse range of foods derived from distinct healthy food groups. Dietary diversity between and within food groups reflects a greater probability of meeting nutrient requirements.
4. **Moderation**: limited intake of foods and nutrients that are associated with risks of NCDs when consumed in excess (e.g., processed meat, sugar-sweetened beverages, salt, trans fats).

[1] The properties of healthy diets are also called subconstructs in other publications by HDMI and in their references. The terms are synonyms and the choice of "properties" in this guidance document was based on simplicity and to facilitate understanding. See glossary of terms for more information.

Monitoring these priority properties provides information on the healthiness of diets relevant to all forms of malnutrition: stunting, wasting and underweight; micronutrient deficiencies; overweight, obesity and other diet-related NCDs.

By expert consensus *(13,15)* two additional properties of healthy diets, i.e. food safety and nutrient density, were considered[2] but not selected as a priority for this document because they are usually properties of foods rather than diets.

1. **Food safety**: it is critical to ensure that food is safe for human consumption, in other words, free of microbial pathogens, food-borne macroparasites, toxins and harmful residues and chemical contaminants. It is however difficult to assess dietary exposure to these hazards concurrently with healthiness of diets, since such assessments require detailed multiple-day quantitative dietary data and data on microorganism and chemical contaminant and residue levels in foods. As a consequence, it is recommended to measure food safety using separate metrics that assess adequate levels of protection, acceptable exposure levels or conformity with international food standards *(17).*
2. **Nutrient density**: nutrient density is a property of individual foods. Although nutrient density can be measured in a composite diet, the process of measuring this property across a diet can be difficult. Additionally, greater nutrient density is not always desirable (e.g. sugar, salt, trans fats). Finally, nutrient adequacy and nutrient density, although distinct properties, are closely related.

[2] Environmental sustainability was not considered as a property of healthy diets because it does not relate to the human biology of nutrition, which is the current focus of this guidance document.

2. Why measure the healthiness of diets?

Whether a healthy diet metric is suitable for providing actionable information is tied to a particular purpose. Possible purposes may be related to either the population or individual level. This guidance document is concerned with purposes for populations (i.e. groups) only.

2.1 Population-level purposes for measuring the healthiness of diets

There are several possible purposes for measuring the healthiness of diets in populations and metrics suitable for these purposes display different characteristics.

- Estimating the magnitude of a phenomenon (i.e. population prevalence or burden):
  - to estimate the magnitude of a phenomenon (e.g. micronutrient inadequacy), metrics that provide accurate estimates for a population and that clearly differentiate one population from another are paramount.
- Monitoring how situations change over time:
  - to monitor how a situation is changing, the key priorities are accuracy, precision and responsiveness to changes as they occur.
- Early warning about when action is needed:
  - early warning requires metrics that respond quickly to disruptions in populations and their environments and are predictive of a targeted population's well-being.
- Targeting populations that should receive action:
  - targeting requires metrics that differentiate subpopulations which are in need (i.e. have a gap between their current state and the ideal or desired state) and can benefit from a proposed action to alleviate their degree of need.
- Determining the causes and consequences to understand why people are affected and what the effects are:
  - determining the causes and consequences of a phenomenon can improve understanding and identify options for action, but requires metrics of the phenomenon itself as well as of its intrinsic drivers and related outcomes.
- Designing actions:
  - designing actions requires metrics that underpin decisions related to policies and programmes, establishing population-based standards, regulations or targets, and preparing communication messages and actions to improve the situation.
- Impact evaluation to judge whether actions have made a difference:
  - estimating the effectiveness of actions requires metrics appropriate for the theory of change[3] that underpins them and that are responsive to changes brought about by them during the timeframe of the evaluation.

[3] Theory of change defines long-term goals and then maps backwards to identify changes that need to happen earlier (i.e. preconditions) *(18,19)*. Theory of change provides a working model against which to test hypotheses and assumptions about which actions are most likely to bring about the intended outcomes. A given theory of change also identifies measurable indicators of success for use as a monitoring and evaluation roadmap.

Countries may want to have specific measures and indicators that underpin each of these seven possible group or population purposes. This guidance document, however, focuses on monitoring, a process which typically requires standardized methods that are simple, rapid and feasible, and allows for comparability over geography and time. Nevertheless, information in this document will be helpful for making decisions about measures and indicators related to the other six purposes. Those measures and indicators most useful for monitoring may also be adaptable for other purposes.

2.2 Why prioritize monitoring?

There are three main reasons why this guidance document focuses on healthy diet metrics for monitoring purposes. First, from a global perspective, valid universal metrics are needed to track countries' commitments and progress towards improving the diets of their populations. To track progress, robust data on what people eat and drink and how these patterns change over time are needed. Second, from a national perspective, such monitoring data are needed to justify and describe the context in which tailored actions (e.g. policies, programmes, regulations) are designed to achieve healthy diets for the population. Third, from both global and national perspectives, dietary data are needed for advocacy purposes and to generate attention and political commitment to improve healthy diets and nutrition.

In many countries, timely information about what people are eating within the population is still limited. More frequent monitoring is crucial because it allows countries to meet this requirement in an evidence-informed way.

Monitoring is the first step towards understanding and addressing dietary challenges within a population. Other measurement purposes may require different types of dietary intake data than those provided by at-scale monitoring of healthy diets.

2.3 Considerations when measuring the healthiness of diets

To be suitable for the population-level purposes discussed in Section 2.1, healthy diet metrics must reflect one or more of the four properties of healthy diets discussed in Section 1.3. Suitable metrics must have been validated and demonstrate cross-context equivalence and responsiveness to change.

Validity means that the metrics are accurate proxies for one or more properties (i.e. yield unbiased estimates) and are reliable (i.e. repeatable). Cross-context equivalence means that the metrics yield information that is conceptually and empirically comparable (i.e. interpretable) across contexts, such as countries or subpopulations of countries. Responsiveness to change means that the metric changes in relation to the underlying phenomenon (i.e. the metric will capture true changes in the healthiness of diets).

Instruments must be able to obtain viable data to construct such metrics, and data systems must exist in which the instruments can be applied. Given the priority purpose of monitoring, metrics should be representative of populations and subpopulations. Information produced (i.e. statistics) should be actionable by programme managers, policy-makers and other decision-makers: information should be credible, understandable and interpretable, clearly conveying the implications of a shift to a higher or lower value and changes over time. To be applied sustainably, metrics must have reasonable relative and absolute costs, and the burden of data collection must match the resources and infrastructure available.

3. How to measure the healthiness of diets

For the purposes of healthy diet monitoring, this section provides an overview of relevant dietary assessment methods, types of dietary intake data, surveys to collect data on the healthiness of diets and currently available healthy diet metrics. Depending on the available resources and information systems and level of detail required, countries must select how to measure the healthiness of diets most aptly for their purposes.

3.1 Dietary assessment methods

The most widely used dietary assessment methods (i.e. data collection methods) are listed below.

- **24-hour dietary recall.** A retrospective, short-term method in which comprehensive details (time of day, amounts, preparation method, brand names) of all foods, drinks and, possibly, dietary supplements consumed over the previous 24 hours are recalled by the respondent (most commonly, from midnight to midnight of the previous day). A 24-hour recall can be administered by an interviewer (face-to-face or by telephone) or self-reported online (web-based version and applications), following standardized protocols. Food models, pictures and other visual aids are often used to help respondents judge and report portion sizes since they can improve accuracy of the dietary intake estimate.[4] A 24-hour recall can be collected for a single day (for population-level averages) or repeated across multiple days (week and weekend days) and seasons. Repeated 24-hour recalls are required to capture the natural (day-to-day and seasonal) variability of an individual's dietary intake in order to estimate usual intake distributions among population groups (i.e. of food group, food or nutrient intakes).

- **Food frequency questionnaire (FFQ).** A retrospective method with questions relating to how often a finite list of foods and drinks has been consumed over a longer time-period (e.g. week, month or year). FFQs can be qualitative (frequency only, e.g. 3 times a week), semi-quantitative (estimated portion size is pre-assigned, e.g. small, average, large bowl) or quantitative (exact portion size queried). FFQs can be long (a comprehensive questionnaire will involve about 80–120 items or more) or short. FFQs can be interviewer- or self-administered and completed on paper, by telephone or online.

- **Food record** (also known as food diary). A prospective, short-term method in which comprehensive details (time of day, amounts, preparation method, brand names) of all foods, drinks and, possibly, dietary supplements are recorded by the participant as they are consumed ("real-time" accounting), usually over three-to-seven days including both week and weekend days. Amounts of food eaten can be either estimated using household measures, food models or food photographs (estimated food record), or weighed by the respondent or research assistant in the home (weighed food record). Food records can be used to estimate usual intake distributions of population groups if carried out multiple times (repeated records) and can also be completed online.

- **Brief dietary assessment instruments** (also known as diet screeners). A retrospective method in which a limited number of specified food and drinks (often expressed in groupings such as "sugar-sweetened products") are ticked from a list as they are consumed over the previous 24 hours. Brief instruments can be qualitative ("yes" or

[4] In the literature, 24-hour recall is often defined as a method for obtaining quantitative data. Note that this is not the case when respondents are asked to recall in a non-quantitative manner what they consumed in a 24-hour period, e.g. data on infant and young child feeding (IYCF) and Minimum Dietary Diversity for Women (MDD-W) in surveys usually requires recalling consumption over a 24-hour period but questions asked concern non-quantitative data.

"no" answers) or semi-quantitative (estimated portion size is pre-assigned, e.g. small, average, large). The questionnaire is usually self-administered (online) but can be interviewer-administered (face-to-face or by telephone).

- **Nutritional biomarkers.** Biological specimens that reflect dietary intake, absorption or metabolism of dietary constituents (nutrients, non-nutritive components, foods, food groups), or function as indicators of nutritional status.

The above list is a brief overview and is not intended to be exhaustive of the various available methods for dietary assessment. Traditional, detailed dietary assessment methods such as 24-hour recall, FFQs, food records and nutritional biomarkers involve higher costs, while simpler methods such as semi-quantitative or qualitative brief dietary assessment instruments significantly reduce costs, enabling more frequent data collection, which is crucial for national and global monitoring of healthy diets.

For more details on the suitability of each dietary assessment method for specific purposes (strengths, weaknesses) the following resources can be consulted:

- Dietary Assessment Primer (https://dietassessmentprimer.cancer.gov)
- DAPA Measurement Toolkit (https://www.measurement-toolkit.org)
- Nutritools (https://www.nutritools.org)
- ACAORN method selector (https://www.anzos.com/food-nutrition)
- Data4Diets (https://inddex.nutrition.tufts.edu/data4diets)
- Diet Assessment Decision Tool (https://www.advancingnutrition.org/resources/diet-assessment-tool)

3.2 Types of dietary intake data

Dietary assessment methods are conventionally divided into three broad categories, based on the types of dietary intake data they provide.

- **Methods that produce quantitative data:** instruments that query amounts of foods, beverages and, possibly, dietary supplements consumed by an individual (ideally dietary intakes are weighed and measured but in practice more often estimated before or after consumption by the individual concerned).
- **Methods that produce semi-quantitative data:** instruments that query standardized portions of foods consumed (e.g. small, medium or large).
- **Methods that produce non-quantitative or qualitative data:** instruments that query whether foods (or broader food groups) have been consumed ("yes" or "no" answers), but do not assess amounts consumed.

In quantitative analysis, to calculate absolute intakes of food groups, food items, macronutrients (e.g. carbohydrates and lipids), micronutrients (e.g. vitamin C, zinc) or other bioactive compounds (e.g. polyphenols, flavonoids), researchers often use nutrient retention factors (i.e. the proportion of nutrients retained after preparation), yield factors (i.e. the proportion of food weight retained after preparation) and/or food composition tables or databases (i.e. the nutrient values of food items, e.g. calcium content per 100g edible portion of feta cheese).

To reduce the burden of data analysis semi-quantitative dietary intake methods utilize pre-defined categories (e.g. small, medium or large) based on established evidence relating such dietary intake quantities to health.

For further burden reduction, non-quantitative (or qualitative) dietary intake methods for healthy diets metrics are used to assess the intake of specific food groups (e.g. fruits, seafood) or even, where possible, individual food items (e.g. papaya, tilapia). These methods usually register only "yes" or "no" answers and do not ask about quantities.

3.3 Surveys for dietary data collection

Data on dietary intake are typically collected through surveys in which representativeness and the level of information collected are determined by intended use, data needs and available resources. Surveys that are statistically representative of the national population are crucial for global and national monitoring purposes, whereas those conducted in a specific geographic location or small population subsample may be relevant when responding to local needs or informing policies or research on subpopulations most at risk of malnutrition.

This guidance document focuses on nationally representative surveys that allow for stratification by age, sex, geographical area or other socioeconomic characteristics.

3.3.1 Integrating modules on dietary intake within a multitopic large-scale survey

Brief dietary intake questionnaires allow for integration into existing multitopic large-scale surveys. Demographic and Health Surveys (DHS) and UNICEF Multiple Indicator Cluster Surveys (MICS) are designed to be nationally representative, have large sample sizes (ranging between 5000 to 30 000 households), and provide data for a wide range of indicators in relation to population, health and nutrition. The survey design of these large-scale survey programmes involves sampling households, whereby individuals within the households serve as respondents for the questionnaires. DHS and MICS are usually conducted every three to five years and routinely collect non-quantitative dietary intake data for children under 2 years of age. Since 2019, DHS has also included a non-quantitative questionnaire on the diets of women of reproductive age (15-49 years of age).

Also relevant to the monitoring of healthy diets is the Gallup World Poll (GWP), which frequently surveys samples of 1000–3500 individuals in more than 140 countries – representing 95% of the world's adult population – using randomly selected, nationally representative samples and a standard set of core questions that has been translated into the major languages of the countries involved. In many countries, surveys are conducted once yearly. GWP has initiated a short, non-quantitative dietary intake questionnaire (Diet Quality Questionnaire or DQQ) in over 50 countries.

Other examples of nationally representative large-scale surveys with the potential to include an individual-level dietary intake questionnaire are the Household Consumption and Expenditure Surveys (HCES)[5], which collect information on household socioeconomic conditions. For example, in Brazil, since 2008, quantitative food record data have been collected using the national HCES from individuals over 10 years of age, allowing analyses of dietary intake trends over time, as well as informing, monitoring and evaluating food and nutrition policies.

When survey designers are faced with resource or time constraints, they have the option of collecting non-quantitative (or semi-quantitative) data using brief dietary assessment instruments. Integrating dietary modules within an upcoming survey can result in a significant reduction in operational costs when compared to a standalone survey.

3.3.2 Stand-alone national health, nutrition and dietary surveys

National health and nutrition surveys may include modules to obtain in-depth data on food (or food group) intake, nutrient intake and nutritional status and have an important role in assessing dietary patterns in the whole population. For example, the United Kingdom's of Great Britain and Northern Ireland National Diet and Nutrition Survey (NDNS) rolling programme, introduced in 2008, is a continuous, cross-sectional survey. It is designed to obtain detailed, quantitative information on food and nutrient intakes and on the nutritional status of the general population aged 1.5 years and older living in private households in the United Kingdom. The survey covers a representative sample of around 1000 people per year. Like the United Kingdom, some other countries *(20)* routinely collect quantitative dietary intake data.

[5] Also referred to by a variety of other names including Household Income and Expenditure Surveys (HIES), Household Budget Surveys (HBS), or Living Standards Measurement Surveys (LSMS).

3.4 Measures and indicators of the healthiness of diets

In this document, the term metric is used to refer broadly to measures and indicators, although it is important to differentiate between a measure and an indicator. Measures assign numbers to people or things to represent the relative amounts of a property whereas indicators reflect the presence or absence of a given property. For example, blood haemoglobin concentration is a measure, whereas whether a woman is anaemic is an indicator (i.e. anemia in non-pregnant women is defined as a hemoglobin concentration <120 g/L). An indicator is often a threshold applied to a measure to establish the presence or absence of a given property.

This guidance document builds on the findings of the report entitled "Healthy diet metrics: a suitability assessment of indicators for global and national monitoring purposes" *(15)*, which identified the following four healthy diet metrics to be considered for global monitoring[6]:

- Global Diet Quality Score (GDQS);
- Global Dietary Recommendations (GDR) score;
- Minimum Dietary Diversity for Women (MDD-W), and underlying food group diversity score (FGDS); and
- Nova Ultra-processed food score (Nova-UPF score).

Though evidence gaps remain, particularly related to cross-context equivalence and the relative validity of these four healthy diet metrics in diverse population groups, current evidence suggests that they have several common features, since all four metrics:

- provide a simple metric of healthy diets for populations which is easy to measure, analyse, interpret and report;
- are reported and used at the population or subgroup level, not the individual level;
- are designed for population-based assessments, target-setting, programme/policy design, cross- or within-country comparisons, which are able to assess population-level changes in diets, and monitor and evaluate programmes/policies to improve diets;
- do not require food composition data, only semi-quantitative or non-quantitative dietary data;
- have purposely been abridged into semi-quantitative or non-quantitative brief dietary assessment instruments to reduce the burden of data collection and analysis, which may also be country-specific; and
- measure dietary intake at the individual level across a period of 24 hours.

There are, however, differences among them (see Table 1), which include:

- properties of the healthy diets for which they currently stand proxy;
- the rationale for their design and the properties of the healthy diets they are meant to measure (and, consequently, the type of validation applied);
- types of dietary data (e.g. non-quantitative or semi-quantitative data) required to compute the metrics and, consequently, the dietary assessment intruments required;
- the population groups for which they were designed and validated;
- the body of evidence on validity and cross-context equivalence, and subsequent knowledge gaps;
- availability of a validated indicator threshold to establish whether a given property of healthy diets is present or not (rather than making interpretations such as "the higher/lower the better the diet quality" or using percentiles to establish high and low scores;
- the cognitive burden for interviewer and respondent, based on the purposively developed brief dietary assessment instruments; and
- costs related to data collection and analysis.

While the GDQS and GDR score[7] are composite measures capturing both healthy (nutrient adequacy, diversity) and unhealthy (lack of moderation) properties of diets, MDD-W is an indicator capturing only healthy properties (nutrient adequacy and diversity) and Nova-UPF score a measure solely of unhealthy properties (lack of moderation)[8].

[6] Other metrics aside from these four may be suitable for national monitoring when the objective is not to compare across countries *(15,21)*.

[7] GDQS developers propose separate metrics named GDQS+ and GDQS-, while GDR score developers propose separate metrics named NCD-Protect and NCD-Risk. See Annex 2.

[8] The attribution of properties of healthy diets to each of the metrics was based on HDMI assessment, and not provided by metric developers.

The choice of dietary assessment method or instrument used determines which metrics can be calculated. Each of the four metrics has its own semi-quantitative or non-quantitative brief dietary assessment instrument.

- GDQS data may be collected using the GDQS application *(22)*. The GDQS application uses a 24-hour recall to collect a full list of all foods consumed during the previous day or night, and automatically classifies them into corresponding GDQS food groups. Respondents use a set of 10 cubes in a range of predetermined sizes to determine if the volume consumed per GDQS food group was below, equal to or above the food group-specific cut-offs.
- GDR score data is ideally collected using the Diet Quality Questionnaire (DQQ) *(23,24)*. The DQQ gathers information on the consumption of 29 food groups, collected by means of the sentinel foods which are the most frequently consumed items within a food group in a given population. DQQ-collected data allows the computation of several additional metrics.
- MDD-W data may be collected using a country-adapted brief dietary assessment method, known as the food-list recall *(25,26)*.
- Nova-UPF score data collection is facilitated when using the previously country-adapted Nova-UPF screener *(27–29)*.

See Annex 2 for more information on the four metrics.

Table 1

Healthy diet metrics' characteristics: intended measurement purposes, properties, types of data, cost and time of data collection, population and interpretation

Metric	What does it measure?	Property of healthy diet measured[a]	Type of data required	Cost and time of data collection	Population for which validated	Interpretation
Global Diet Quality Score (GDQS)	Consumption of food groups that contribute to nutrient adequacy and NCD risk reduction	Nutrient adequacy Dietary diversity Moderation	Semi-quantitative	Medium	Non-pregnant non-lactating women of reproductive age	Range of 0 to 49 (higher score, better diet quality). High NCD risk (GDQS < 15) and low NCD risk (GDQS ≥ 23).
Global Dietary Recommendations (GDR) score	Dietary alignment with the WHO global recommendations for healthy diets	Nutrient adequacy Dietary diversity Moderation	Non-quantitative	Low	Men and women aged ≥ 15 years	Range of 0 to 18 (higher score, better diet quality). Cut-off of 10: more likely to meet at least 6 out of the 11 global dietary recommendations.
Minimum Dietary Diversity for Women (MDD-W)	Proxy for the micronutrient adequacy of women's diets	Nutrient adequacy Dietary diversity	Non-quantitative	Low	Women of reproductive age (15–49 years).	Range of 0 to 10 (higher score, better diet quality). ≥ 5 food groups meets minimum dietary diversity, higher probability of micronutrient adequacy.
Nova-UPF score	Number of subgroups of ultra-processed foods consumed as a proxy for dietary share of UPFs	Moderation	Non-quantitative	Low	Men and women aged ≥ 18 years	Range of 0 to 23. Higher score, lower diet quality.

[a] The attribution of properties of healthy diets to each of the metrics was based on HDMI assessment, and not provided by metric developers.

4. Selecting methods and healthy diet metrics according to purpose

Availability and allocation of resources for national diet information systems vary widely across countries and are influenced by a complex interplay of economic, political and social factors. Some countries may already have established systems such as regular surveys to collect quantitative dietary intake data, and therefore be interested in guidance on how to analyse existing data in a manner that is simpler, easier to communicate and more actionable. Other countries, however, may be preparing to start their first national dietary intake survey, redesigning existing (multitopic) surveys or in the early stages of survey design, and therefore seeking guidance on brief dietary assessment instruments and their associated healthy diet metrics.

Cost-effective survey design and implementation strategies can help maximize the benefit (fitness for purpose) of data while minimizing expenses. This section summarizes key considerations to guide the choice of dietary assessment methods, surveys and healthy diet metrics in relation to the purposes of healthy diet monitoring.

Quantitative data

- Quantitative dietary intake data collected through 24-hour recall or food records yields the most complete and informative dietary data for the widest range of purposes, such as identification, policy and programme design, evaluation and research.
- Countries should consider routinely collecting quantitative dietary intake data through nationally representative health, nutrition or dietary surveys.
- Countries should consider further investment in national capacities for quantitative dietary intake data collection, analysis, interpretation and use. Although needs, strengths and gaps differ by country, many countries will find that an upfront investment in robust dietary reference data – i.e. food lists, food composition tables and associated conversion factors in operable digitized formats linked to survey tools – will offer a big payoff in facilitating the future collection, processing, analysis and use of quantitative dietary intake data.[9]
- Groups such as Intake, Center for Dietary Assessment (https://www.intake.org) offer technical support to countries in designing, implementing, and analysing quantitative dietary surveys.
- Nevertheless, it is important for countries to monitor dietary trends more frequently, ideally every two to three years if not annually. For routine surveillance (i.e. monitoring), countries should consider using a brief dietary assessment instrument.

[9] Dietary reference data can also be very useful for deriving diet-relevant information from household consumption and expenditure surveys, food balance data and brief dietary assessment instruments.

- Results from these brief dietary assessment instruments can be interpreted in the light of richer quantitative data when both are available. For instance, insights from monitoring data using brief instruments can be flagged for further exploration through analysis of more comprehensive quantitative data.

Semi quantitative or non-quantitative data from brief dietary assessment instruments

- Brief dietary assessment instruments tend to be quicker, easier and less expensive to implement than quantitative dietary intake surveys, making them well suited for monitoring the healthiness of diets at frequent intervals. Calculating healthy diet metrics from such instruments is more straightforward, when compared with quantitative dietary assessment methods (e.g., 24-HR or food records), since the instruments are purpose-built to yield one or more healthy diet metrics.
- There are trade-offs in using brief dietary survey instruments: the information yielded may be less detailed, robust and accurate than quantitative dietary survey data. Several of the instruments in this category yield non-quantitative data about whether particular food groups are consumed, rather than quantified estimates of how much food and nutrients are consumed. Other instruments such as the GDQS, capture semi-quantitative data, offering an estimate of how much of each food group was consumed.
- Brief instruments can be integrated into existing multitopic large-scale surveys. The Gallup World Poll collects data using the DQQ in multiple countries, with the aim of collecting data in 140 countries by 2024 (see more information in https://www.dietquality.org/countries).

Metrics of healthy diets

- Both quantitative dietary survey data and brief dietary assessment instruments can yield a range of useful metrics of healthy diets.
- Each of the metrics described in this guidance document captures different properties of the healthiness of diets: the MDD-W measures the diversity needed to achieve nutrient adequacy, the Nova-UPF score measures moderation, and the GDQS and GDR score measure nutrient adequacy and moderation, notably those dietary elements that are protective and risk factors for non-communicable diseases. When choosing a metric, properties that are priorities for monitoring in any given context should be considered. Wherever possible, all four of the healthy diet properties discussed in this guidance document should be monitored to offer the most complete picture of diet-related trends.

- Although a single measure or indicator that summarizes multiple properties of healthy diets may seem attractive for ease of interpretation and communication purposes, mounting evidence *(30)* and experts' opinion have shown that single scores that combine measures of different properties are not clearly interpretable and can be inaccurate and unreliable. For instance, the GDQS and GDR score are ideally reported as subscores (GDQS+ and GDQS- and NCD-Protect, NCD-Risk, respectively). This is because the effects of unhealthy characteristics of diets cannot be balanced out by consuming healthy ones (abundance), nor does abstaining from unhealthy food consumption compensate for the lack of healthy foods (scarcity). The multiple properties of diets and the complex phenomenon of their health effects call for metrics that can distinguish between the different properties of healthy diets. Communication messages should be tailored accordingly.
- All four metrics described in this guidance document [GDQS (GDQS+ and GDQS-), GDR score (NCD-Protect, NCD-Risk), MDD-W or Nova-UPF score] can be computed from quantitative dietary intake data. Even though this may involve losing some detailed information, these metrics condense complex and lengthy dietary intake information into a more manageable and easily understandable form. This is especially important in policy-making and advocacy, where time or attention is limited, and there is a need to convey the key points quickly.[10]
- All four of the metrics can be collected using brief dietary assessment instruments that, in all cases except the Nova-UPF, have been pre-adapted to a wide range of country contexts, making them a pratical option.
- Use of any of the four metrics is supported by a growing body of evidence suggesting that they are reasonably valid indicators of the dietary properties they seek to measure.
- Among the purpose-built tools and methods developed to collect the data to compute these metrics, there are potential trade-offs in terms of time and effort required for data collection. The GDQS, for instance, requires an open 24-hour recall (a free listing of everything eaten and drunk over the previous day) during which participants estimate quantities consumed using a series of differently sized cubes. Although future research needs to confirm the comparative accuracy of different data collection methods, a potential benefit of this more intensive method may be its greater accuracy and responsiveness to change, despite the additional time involved. The GDR score, on the other hand, is collected via a list of food groups defined through sentinel foods tailored to different country contexts. Administering the questionnaire is more rapid than sourcing the GDQS app, but dietary intake may be comparatively less accurate because of how respondents interpret the sentinel food question, owing to the aggregation of results in food groupings. Selection of the metric (and tool used to generate the metric) will therefore probably need to consider how to balance resources required and accuracy achieved, and potential need to change the sentinel foods based on rapidly changing food environments, among other factors.
- There is little evidence about the relative validity of these metrics for monitoring (i.e. which is more accurate, more comparable in cross-country terms or more responsive to change). Future work by the HDMI aims to fill these evidence gaps. A second document will be released to reflect forthcoming evidence and offer further guidance for choosing and implementing the various metrics for monitoring and other purposes.

[10] It is important to point out that data obtained using different dietary assessment methods or instruments may not be directly comparable.

5. Research gaps

Considering remaining evidence gaps on validity, reliability and the cross-context equivalence of healthy diet metrics, HDMI will continue to foster collaboration and evidence generation targeted at answering the main research questions relevant to the monitoring of healthy diets.

More evidence is necessary (i) to clarify how to establish validity and cross-context equivalence for researchers and users of dietary metrics; (ii) to enhance understanding of how to interpret and apply validation results for healthy diet metrics; and (iii) to strengthen knowledge of the validity and equivalence of healthy diet metrics and their underlying data collection methods. The goal is to reveal each metric's strengths, weaknesses and continuing to fill evidence gaps in terms of different population groups, locations and applications.

It is also essential to assess the relevance and validity of these healthy diet properties, metrics and brief dietary assessment instruments for children and adolescents. The evidence base for key properties of the healthiness of diets in children two years and older and adolescents needs to be synthesized in order to derive recommendations that can measure the healthiness of their diets as part of any whole-population dietary monitoring that includes these critical subgroups.

Evidence of validity and cross-context equivalence is necessary, but not sufficient, to determine the suitability of metrics and instruments for different contexts. Validation evidence must be weighed with other considerations, including feasibility and cost of data collection, ease of computation and simplicity of communication.

6. Conclusion

This guidance document provides an overview of the range of purposes for measuring the healthiness of diets and explains the dietary assessment methods and types of dietary intake data, surveys and metrics that are currently available to monitor healthy diets.

This document is a first step, as ongoing evidence reviews and validation research to clarify remaining knowledge gaps are soon to be published. HDMI thus intends to update and expand this document in the next two years.

HDMI aims to create a collaborative community of countries interested in developing and implementing its technical guidance by providing opportunities for countries to participate in guidance development while discussing their specific needs and capabilities, and the challenges thrown up by healthy diets monitoring. The strategy is to develop a series of iterative and consultative steps involving various stakeholders. These consultations will primarily involve data experts from ministries of health and agriculture, and national statistics offices.

FAO, UNICEF and WHO urge countries to start planning, securing investments and prioritizing the collection of dietary intake data, to help governments, policy-makers, researchers and public health professionals make informed decisions and take appropriate actions to improve the health and well-being of their populations.

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Annex 1
The Healthy Diets Monitoring Initiative

Recognizing the importance of diets for health, and the lack of consensus on how to measure and monitor healthy diets at scale, WHO and UNICEF's Technical Expert Advisory Group on Nutrition Monitoring (TEAM) undertook a landscape assessment on global monitoring of diet quality in 2020 to understand how to define diet quality, learn about current initiatives and identify improvements needed in the global monitoring of diet quality *(11).* The exercise resulted in a recommendation to convene actors working on methods and metrics for healthy diets to become aware of each other's work and collaborate towards identifying common elements and areas of harmony in definitions and metrics.

In response to this need, TEAM and FAO, with support from USAID Advancing Nutrition, convened a technical consultation on measuring healthy diets in 2021 *(12)*.

Building on the outputs of the landscape exercise and technical consultation, WHO, UNICEF and FAO joined forces to chart a way forward via the Healthy Diets Monitoring Initiative (HDMI). The joint mission of HDMI is "to enable national and global decision-makers and stakeholders to monitor and achieve healthy diets for people and the planet".

As HDMI's first step, a technical expert meeting on "Harmonizing and Mainstreaming Measurements of Healthy Diets Globally" was convened to engage with key stakeholders who work on the assessment and monitoring of healthy diets, as well as expert users of such metrics, at both national and global level. The meeting was hosted by The Rockefeller Foundation at its Bellagio Center in Italy from 28 November to 2 December 2022. The meeting resulted in a report *(13)* and Call to Action *(14).*

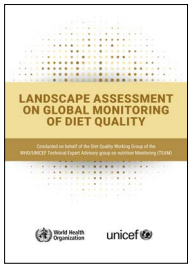
A background document was developed by the Institut de Recherche pour le Développement (IRD) for the Bellagio meeting that scientifically assessed the usefulness, fitness for purpose and validity of existing healthy diet metrics for global and national monitoring purposes *(15).* The background report, alongside the most recent evidence on monitoring healthy diets, was the basis for the overview provided in this guidance document.

See Fig. A1.1 below for HDMI's timeline, including past achievements and future developments.

Fig. A1.1
The Healthy Diets Monitoring Initiative timeline

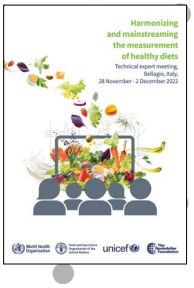
2020

TEAM Diet Quality Working group - Landscape Assessment on Global Monitoring of Diet Quality



2021

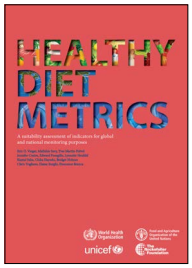
Techical Consultation on Measuring Healthy Diets



2022

Establishment of the Healthy Diets Monitoring Initiative

Technical Consultation on Healthy Diet Metrics



2023

Healthy Diet Metrics:a suitability assessment of indicators for global and national monitoring purposes

Healthy Diet Metrics: Monitoring of Healthy Diets Globally: A Call to Action

2024

Guidance for Monitoring Healthy Diets Globally

Version 1

2025

Evidence review of healthy diet metrics

Validation analyses of healthy diet metrics

Stakeholder engagement

UN Member State consultations

Dissemination and communication

Technical support to countries

Annex 2
Healthy diet metrics

Global Diet Quality Score

The Global Diet Quality Score (GDQS) includes categorical information about the quantities of healthy and unhealthy food groups consumed *(31–34).* GDQS is composed of 25 food groups which are considered to be important contributors to nutrient intake and/or NCD risk. Points are assigned based on three or four categories of consumed amounts, defined in grams per day (g/d), specific to each food group (see Table A2.1). There are 16 healthy food groups (more points for higher intake), seven unhealthy food groups (more points for lower intake), and two food groups classified as unhealthy when consumed in excessive amounts. GDQS is obtained by summing points across all 25 food groups, and ranges from 0 to 49.

The GDQS+ submetric includes the 16 healthy food groups included in the GDQS, and is scored with the same categories of consumed amounts used in the GDQS; it ranges from 0 to 32.

The GDQS- submetric includes 9 food groups classified as unhealthy or unhealthy in excessive amounts, and is scored with the same categories of consumed amounts used in the GDQS; it ranges from 0 to 17. GDQS+ and GDQS- quantify the collective contribution of healthy foods (those that should be consumed in higher amounts) and unhealthy foods (those that should be consumed in lower amounts), respectively.

Data requirements. GDQS computation requires semi-quantitative data (intake volume of a food group converted to grams), to be classified into categories (low, middle and high)

Interpretation. GDQS can be interpreted by applying a possible range of 0 to 49 (the higher the score the better the diet quality) and population-based cut-offs of 15 and 23 to report the percentage of the population at high risk for poor diet quality outcomes (GDQS < 15) and percentage at low risk for poor diet quality outcomes (GDQS ≥ 23).

Data collection methods or instruments. GDQS data can be collected using quantitative 24-h dietary recall; an app has also been developed to facilitate the collection of semi-quantitative GDQS data in population-based surveys *(22).*

Data collection time. Standard quantitative 24-hour recall takes 20 to 30 minutes to complete. When using the GDQS app, which relies on a simplified quantification method, completion time is estimated to be 10 to 20 minutes.

Table A2.1
GQDS food groups, categories and point values

	Categories of consumed amounts (g/d)				Point values			
Food groups	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Food groups included in the GDQS and GDQS+								
Healthy								
Citrus fruits	<24	24–69	>69		0	1	2	
Deep orange fruits	<25	25–123	>123		0	1	2	
Other fruits	<27	27–107	>107		0	1	2	
Dark green leafy vegetables	<13	13–37	>37		0	2	4	
Cruciferous vegetables	<13	13–36	>36		0	0.25	0.5	
Deep orange vegetables	<9	9–45	>45		0	0.25	0.5	
Other vegetables	<23	23–114	>114		0	0.25	0.5	
Legumes	<9	9–42	>42		0	2	4	
Deep orange tubers	<12	12–63	>63		0	0.25	0.5	
Nuts and seeds	<7	7–13	>13		0	2	4	
Whole grains	<8	8–13	>13		0	1	2	
Liquid oils	<2	2–7.5	>7.5		0	1	2	
Fish and shellfish	<14	14–71	>71		0	1	2	
Poultry and game meat	<16	16–44	>44		0	1	2	
Low fat dairy	<33	33–132	>132		0	1	2	
Eggs	<6	6–32	>32		0	1	2	
Foods included in the GQDS and GDQS-								
Unhealthy in excessive amounts								
High fat dairy[a] (in milk equivalents)	<35	35–142	142–734	>734	0	1	2	0
Red meat	<9	9–46	>46		0	1	0	
Unhealthy								
Processed meat	<9	9–30	>30		2	1	0	
Refined grains and baked goods	<7	7–33	>33		2	1	0	
Sweets and ice cream	<13	13–37	>37		2	1	0	
Sugar sweetened beverages	<57	57–180	>180		2	1	0	
Juice	<36	36–144	>144		2	1	0	
White roots and tubers	<27	27–107	>107		2	1	0	
Purchased deep fried foods	<9	9–45	>45		2	1	0	

[a] Hard cheese should be converted to milk equivalents using a conversion factor of 6.1 when calculating total consumption of high-fat dairy for the purpose of assigning a GDQS consumption category.

Source: Bromage S, Batis C, Bhupathiraju SN, Fawzi WW, Fung TT, Li Y et al. Development and Validation of a Novel Food-Based Global Diet Quality Score (GDQS). J Nutr. 2021;151(Suppl 2):75S–92S.

Global Dietary Recommendations score

The Global Dietary Recommendations (GDR) score is a measure of the adherence to 11 global dietary recommendations (mostly originating from the WHO Healthy Diet fact sheet 2018), which include dietary factors protective against NCDs. The metric reflects adherence to individual global recommendations for 1) fruits and vegetables, 2) dietary fibre, 3) free sugars, 4) saturated fat, 5) legumes, 6) nuts and seeds, 7) whole grains, and 8) processed meats *(35)*.

The NCD-Protect score is a score with a range from 0 to 9. It is a subcomponent of the GDR score and reflects adherence to global dietary recommendations on healthy components of the diet. The NCD-Protect score is based on food consumption from nine healthy food groups during the previous day and night. A higher score indicates inclusion of more health-promoting foods in the diet, and correlates positively with meeting global dietary recommendations. It is expressed as the average score for the population.

The NCD-Risk score is a score with a range from 0 to 9. It is a subcomponent of the GDR score and reflects adherence to global dietary recommendations on components of the diet to limit or avoid. A higher score indicates higher consumption of these foods and drinks, and correlates negatively with meeting global dietary recommendations. The NCD-Risk score is based on food consumption from eight food groups to be limited or avoided during the previous day and night (one food group, processed meat, is double weighted). This is a negative indicator and is expressed as the average score for the population. A higher NCD-Risk score has been correlated to higher ultra-processed food consumption.

These metrics are designed to be highly practical to collect and calculate and can be used to monitor adherence to dietary recommendations at the population level.

Data requirements. The GDR score requires non-quantitative dietary data, dichotomous ("yes" or "no") responses to questions about food groups.

Interpretation. The GDR score can be interpreted by applying a possible range of 0 to 18 (the higher the score, the more recommendations are likely to be met and the better the diet quality), and a population-based cut-off of 10 to report the percentage of the population more likely to meet at least six of the 11 global dietary recommendations.

Data collection methods or instruments. The Diet Quality Questionnaire (DQQ) is used to derive the NCD-Protect, NCD-Risk and Global Dietary Recommendations (GDR) score *(23,24,36)*. It can also be used to derive the Minimum Dietary Diversity for Women (MDD-W) indicator and others. For complete information on calculating indicators, see DQQ Indicator Guide 2023 at www.globaldietquality.com. DQQ gathers information about consumption ("yes"/"no") of 29 food groups in the previous 24 hours. Food groups are not asked about directly but are represented by those sentinel foods that are the most frequently consumed items within a food group for a given population. While the DQQ was developed as a tool to rapidly assess diet quality, it does not gather information on all aspects of diet. It has been adapted for use in over 100 countries (https://www.dietquality.org).

Data collection time. DQQ takes approximately 5 minutes to complete.

Table A2.2

Diet Quality Questionnaire food groups and point values for NCD-Protect and NCD-Risk metrics

Food groups		Point values	
		NCD-Protect (SUM 0–9)	NCD-Risk (SUM 0–9)
1.	Foods made from grain		
2.	Whole grains	1	
3.	White roots, tubers and plantains		
4.	Pulses	1	
5.	Vitamin A-rich orange vegetables	1	
6.	Dark green leafy vegetables	1	
7.	Other vegetables	1	
8.	Vitamin A-rich fruit	1	
9.	Citrus	1	
10.	Other fruits	1	
11.	Baked/ grain-based sweets		1
12.	Other sweets		1
13.	Eggs		
14.	Cheese		
15.	Yogurt		
16.	Processed meat		2
17.	Unprocessed red meat (ruminant)		1[a]
18.	Unprocessed red meat (non-ruminant)		1[a]
19.	Poultry		
20.	Fish and seafood		
21.	Nuts and seeds	1	
22.	Ultra-processed salty snacks		
23.	Instant noodles		1[b]
24.	Deep fried foods		1
25.	Fluid milk		
26.	Sweetened tea/ coffee/ cocoa		
27.	Fruit juice and fruit-flavored drinks		
28.	Soft drinks (sodas, energy drinks, sports drinks)		1
29.	Fast food		1[b]

[a] Unprocessed red meat ruminant and non-ruminant are considered the same food group and are therefore not summed in the score, although a "yes" answer to either "Unprocessed red meat (ruminant)" or "Unprocessed red meat (non-ruminant)" confers 1 point.
[b] Fast foods and instant noodles are considered the same food group and are therefore not summed in the score, although a "yes" answer to "Fast foods" or "Instant noodles" confers 1 point.
Note 1: The GDR score is calculated as follows: NCD-Protect - NCD-Risk + 9 = GDR score
Note 2: Food groups that do not count for either NCD-Protect or NCD-Protect, left empty on the columns for categories and point values, are recorded on the DDQ for the purpose of completing other indicators such as the MDD-W.
Source: DQQ Indicator Guide 2023 at www.globaldietquality.com, where complete information on calculating indicators can be found.

Minimum Dietary Diversity for Women

Minimum Dietary Diversity for Women (MDD-W) is a population-level dichotomous indicator of dietary diversity among women of reproductive age (15 to 49 years of age). It is based on the reported intake of 10 food groups, reflecting dietary diversity, and is a proxy of better micronutrient adequacy *(25,37).* It is a simple, easy-to-use indicator that was designed to impose a minimal burden on data collection, and can therefore be integrated in large-scale surveys.

Data requirements. MDD-W requires non-quantitative dietary data, dichotomous ("yes" or "no") responses to questions about food groups.

Interpretation. MDD-W is a dichotomous indicator of whether women of reproductive age (WRA) have consumed at least five out of 10 defined food groups during the previous 24-hours and can be used as a proxy indicator for higher micronutrient adequacy *(25,26)*. The basic interpretation of the indicator is "X% of women achieved minimum dietary diversity, and they are more likely to have higher (more adequate) micronutrient intakes than X% of women who did not".

Data collection methods or instruments. The data collection method used to derive data for the MDD-W is a non-quantitative recall of food groups. Two approaches to administer such a questionnaire can be used: the open recall and the list-based recall *(25,26)*. Both approaches require preparatory work to identify the most frequently consumed local/national foods and common dishes, and to classify each food into the correct food groups.

Data collection time. Depends on data collection method. The open recall completion time is estimated to be 10 to 20 minutes, and list-based recall around 5 minutes.

Table A2.3

The MDD-W food groups and point values

Food groups	Point values
Grains, white roots and tubers, and plantains	1
Pulses (beans, peas and lentils)	1
Nuts and seeds	1
Milk and milk products	1
Meat, poultry and fish	1
Eggs	1
Dark green leafy vegetables	1
Other vitamin A-rich fruits and vegetables	1
Other vegetables	1
Other fruits	1

Source: FAO. 2021. Minimum dietary diversity for women: https://doi.org/10.4060/cb3434en

Nova Ultra-Processed Food score

The Nova-UPF score, or the number of subgroups of ultra-processed foods[11] *(28)* consumed during the previous 24 hours, is calculated by using the Nova-UPF screener and was designed to be a proxy measurement of the dietary share of ultra-processed foods (UPF) *(28).* The Nova-UPF score is composed of 23 UPF subgroups: six subgroups of beverages, 10 subgroups of products that replace or accompany meals and seven subgroups of products often consumed as snacks. The 23 UPF subgroups are summed into a score ranging from 0 to 23, beginning with a score of 0 and adding one point if any food in the group was consumed during the previous 24-hours.

Data requirements. The Nova-UPF score requires non-quantitative dietary data, dichotomous ("yes" or "no") responses to questions about UPF subgroups.

Interpretation. The higher the Nova-UPF score, the lower the diet quality and higher the risk of NCDs.

Data collection methods or instruments. The Nova-UPF screener is a self-reporting electronic questionnaire that contains questions about intake on the previous day ("yes" or "no" responses) of a list of commonly consumed subgroups of ultra-processed foods, developed and adapted for each country.

Data collection time. Completion time is estimated to last 2 to 3 minutes.

Table A2.4

The Nova-UPF score and point values, in the Brazilian instrument

Food groups	Point values
Regular or diet soda	1
Canned or bottled fruit juice	1
Powdered drink mix	1
Chocolate drink	1
Tea-based drink (ice-tea type)	1
Fruit or chocolate flavoured yogurt	1
Sausage, hamburger or nuggets	1
Ham, salami or mortadella	1
Loaf, hot dog or hamburger bread	1
Margarine	1
French fries, either frozen or from restaurant chains	1
Mayonnaise, ketchup or mustard	1
Ready-made salad sauce	1
Instant noodles or packaged soup	1
Pizza, either frozen or from restaurant chains	1
Frozen lasagna or other ready-made meals	1
Packaged snacks, shoestring, potatoes or crackers	1
Biscuits, with or without filling	1
Packaged cake	1
Cereal bar	1
Ice cream or popsicle	1
Chocolate bar or bonbon	1
Breakfast cereal	1

Source: Costa CDS, Faria FR, Gabe KT, Sattamini IF, Khandpur N, Leite FHM, Steele EM, Louzada MLDC, Levy RB, Monteiro CA. Nova score for the consumption of ultra-processed foods: description and performance evaluation in Brazil. Rev Saude Publica. 2021;55:13. doi: 10.11606/s1518-8787.2021055003588. PMID: 33886951; PMCID: PMC8023324.

[11] Analyses of national dietary intake surveys in more than 15 countries *(38)* and meta-analyses of large cohort studies *(39,40)* have demonstrated that the dietary share of ultra-processed foods, expressed as the percentage of total energy intake, is an important measure of the overall quality of contemporaneous diets (including nutrient adequacy and other health-relevant dietary attributes) and is associated with a higher risk of most diet-related NCDs, as well as all-cause mortality.

FAO

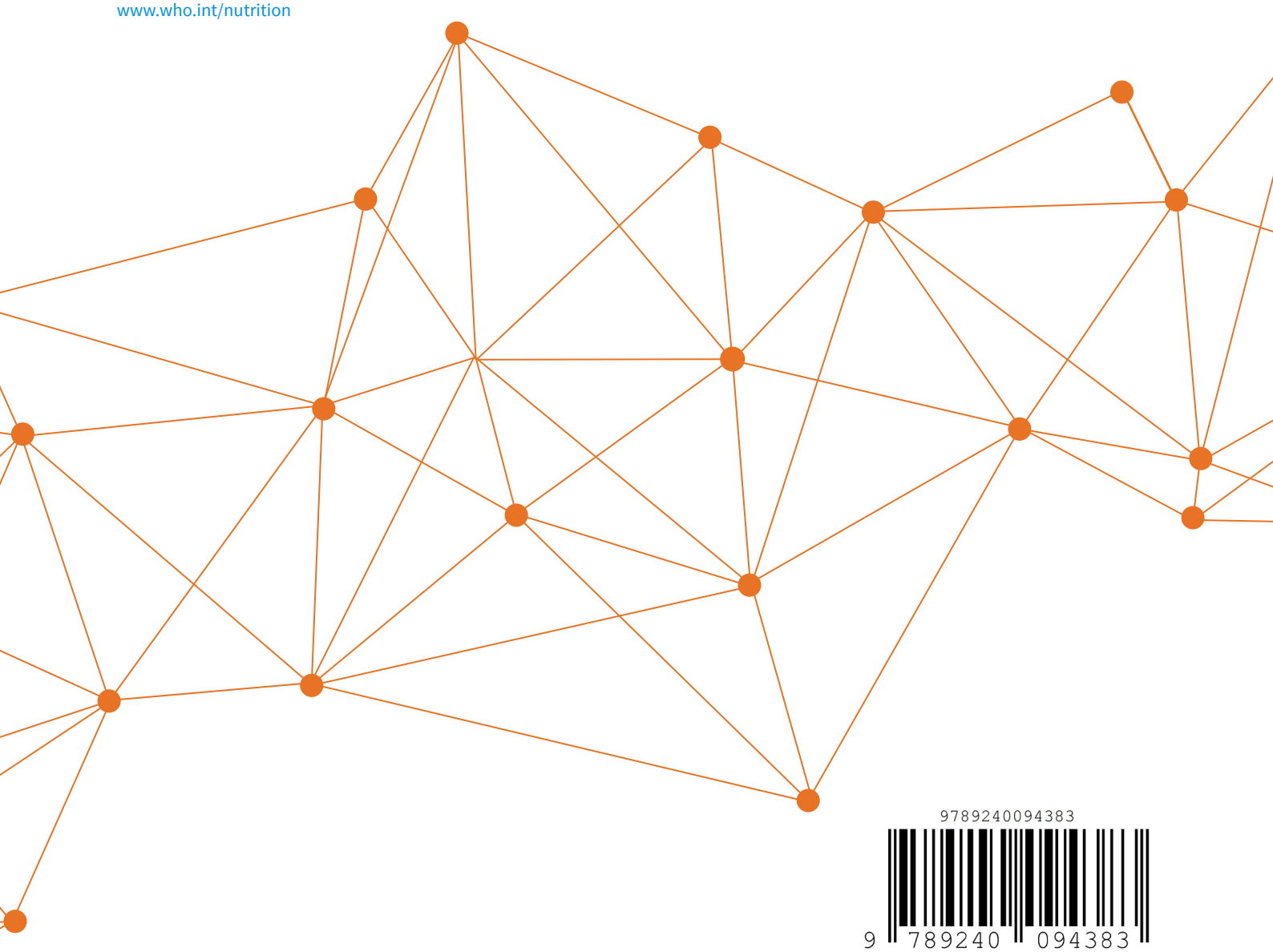
Food and Nutrition Division
Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla, 00153 Rome, Italy
Email: nutrition@fao.org
www.fao.org/nutrition

UNICEF

Division of Data, Analytics, Planning and Monitoring
UNICEF
3 UN Plaza, New York, NY, 10017, USA
Email: data@unicef.org
www.data.unicef.org/nutrition

WHO

Department of Nutrition and Food Safety
World Health Organization
20 Avenue Appia, 1211 Geneva 27, Switzerland
Email: nutrition@who.int
www.who.int/nutrition



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