



**Food and Agriculture
Organization of the
United Nations**

Minimum Dietary Diversity for Women (MDD-W)

Frequently Asked Questions

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Output for the project GCP/GLO/1027/GER: Advancing and Expanding the Uptake of Minimum Dietary Diversity for Women Indicator: Capacity Development on collection, interpretation and its use to inform food system transformative policies and programmes.

Prepared by

Simone M. Gie, Giles Hanley-Cook, Sara Hoogerwerf, Juan Pablo Parraguez & Bridget Holmes,
Nutrition Assessment Team, Food and Nutrition Division

Food and Agriculture Organization of the United Nations

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Minimum Dietary Diversity for Women (MDD-W) is a population-level food group-based indicator that captures dietary diversity, a core construct of healthy diets. MDD-W is used to estimate the proportion of non-pregnant women aged 15-49 years who consumed at least five out of ten defined food groups over the previous 24 hours, signalling better micronutrient intake.

This list of Frequently Asked Questions (FAQs) is intended as a supplement to the technical guide, *Minimum Dietary Diversity for Women – An updated guide for measurement: from collection to action* (FAO, 2021). It does not repeat the core information about the indicator but does address *additional* issues and new evidence that are not covered in the guide. The MDD-W guide should therefore be consulted first before visiting the FAQs.

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1 HOW WAS THE MDD-W INDICATOR VALIDATED?

MDD-W was first validated among non-pregnant women of reproductive age (15 to 49 years) to assess the probability of adequacy (i.e. the probability that a given nutrient intake is above the average requirement) of 11 micronutrients with public health relevance: calcium, folate, iron, zinc, vitamin A, thiamine, riboflavin, niacin, vitamin B6, vitamin B12, and vitamin C.

Two documents authored by Martin-Prével et al. (2015 and 2017) are considered the key reference materials for the initial MDD-W validation. In brief, the authors analysed quantitative dietary intake data from nine data sets that included women aged 15-49 years from resource-poor settings in six low-income countries in Africa and Asia. Several candidate food group scores and indicators were constructed and considered, but the analyses favoured a ten-point food group score with a cutoff of ≥ 5 food groups.

Gomez et al. (2020) further assessed the relationship between MDD-W and nutrient adequacy among women aged 15-49 years in eight Latin American countries. In that study, MDD-W was significantly associated with more adequate intakes of 18 micronutrients (i.e. additionally including copper, magnesium, phosphorus, pyridoxine, selenium, sodium, and vitamin E).

2 CAN MDD-W BE USED FOR GROUPS OTHER THAN NON-PREGNANT WOMEN (E.G. PREGNANT WOMEN, CHILDREN AND ADOLESCENTS)?

Initially, MDD-W was validated only for non-pregnant women of reproductive age (see question 1). However, recent studies have shown that MDD-W might be applicable to additional population groups, in particular adolescent girls and boys, and pregnant women.

Adolescent girls and boys

In 2023, researchers from FAO's Food and Nutrition Division (Nutrition Assessment team)¹ validated a food group indicator among adolescent boys and non-pregnant, non-lactating adolescent girls aged 10-19 years across countries in different World Bank income categories. Results showed that a ≥ 5 food groups cut-off (i.e. equivalent to MDD-W) best predicted a minimally acceptable level of dietary adequacy of micronutrients in upper-middle and high-income countries.

¹ Giles T. Hanley-Cook, Sara Hoogerwerf, Juan Pablo Parraguez, Simone M. Gie, & Bridget A. Holmes

Pregnant women

Verger et al. (2024) validated a food group indicator among pregnant women aged 15-49 years from several low- and middle-income countries and showed that a ≥ 5 food groups cut-off (equivalent to MDD-W) also best predicted more micronutrient adequate diets.

Groups not yet validated for MDD-W

For **children aged 6–23 months**, the Minimum Dietary Diversity (MDD) indicator (i.e. 5 out of 8 food groups, which include breastmilk) and the related Minimum Acceptable Diet (MAD) indicator have been developed to capture dietary diversity among children and should be used instead of MDD-W (WHO & UNICEF, 2021). Researchers recently showed that MDD-W also performed well in predicting acceptable levels of micronutrient adequacy among **children aged 24-59 months** (Diop et al., 2021). However, further multi-country validation studies among young children are required before MDD-W can be considered for this age group.

Additional studies are needed to test the validity of MDD-W (or other food group thresholds) among men, elderly people, and other population groups before the indicator can be applied for monitoring in these groups.

3 HOW CAN MDD-W BE USED TO INFORM POLICIES AND INTERVENTIONS?

MDD-W provides actionable dietary data for use by country-level decision-makers, programme implementers, non-governmental organizations, bilateral organizations, researchers and advocacy bodies. MDD-W results can:

- ✓ **provide a baseline understanding** of the dietary diversity of population groups;
- ✓ **shed light on potential drivers** of dietary diversity (for example, when analysed together with other data such as on social and economic factors);
- ✓ **allow disaggregated analysis** and comparisons across regions and agri-food systems, allowing identification of regions or groups at high risk of micronutrient inadequate diets;
- ✓ **rapidly assess women's diets** in crisis situations. For example, the World Food Programme regularly uses MDD-W in emergencies (WFP, 2015);
- ✓ **allow for analysis of food groups** consumed (for example, to check for low consumption of certain food groups);
- ✓ **inform the design of programmes and policies** to improve nutrition, for example, by aiding the selection of food groups to promote in behaviour change strategies or in nutrition-sensitive agricultural interventions;

- ✓ **monitor nutrition progress** at national and regional levels;
- ✓ **assess the impact** and effectiveness of nutrition-sensitive policies and programmes; and
- ✓ **provide evidence** for advocacy and communication.

Some examples of where MDD-W has been used in practice:

- In large-scale multi-topic surveys such as the Demographic and Health Surveys (DHS) and the Gallup® World Poll, household budget surveys such as the Tajikistan Household Budget Survey (FAO & AoS, 2015), and national nutrition and health surveys.
- As a corporate indicator of organizations delivering food and nutrition programmes, such as the World Food Programme, the African Union, Program of the United States Agency for International Development, International Fund for Agricultural Development, and the European Commission.
- In research studies and analyses, such as assessing the relationship between MDD-W and household food security in rural Mali (Adubra et al., 2019), and measuring the fluctuation of dietary diversity across seasons in rural Burkina Faso (Hanley-Cook et al., 2022).

For more examples and information:

- [*Minimum Dietary Diversity: An updated guide for measurement, from collection to action*](#) (FAO, 2021), pages 81-8.
- [*Integrating Minimum Dietary Diversity for Women \(MDD-W\) into multitopic surveys*](#) (FAO, 2024a)

4 HOW IS MDD-W DATA COLLECTED?

MDD-W data can be collected through two possible qualitative 24-hour dietary recall methods (Hanley-Cook et al., 2020):

- **List-based method:** The enumerator uses a predefined list to ask each respondent whether she consumed specific food and beverage items in the preceding 24 hours.
- **Open recall method:** The enumerator asks questions to help the respondent recall every food she consumed over the preceding 24 hours. A trained enumerator, supervisor or data analyst must then categorize the foods recalled into their respective food groups or subgroups.

For more information on these data collection methods:

- [*Minimum Dietary Diversity: An updated guide for measurement, from collection to action*](#) (FAO, 2021), pages 51-66.
- [*Integrating Minimum Dietary Diversity for Women \(MDD-W\) into multitopic surveys*](#) (FAO, 2024a)

MDD-W data can be collected using various modalities. The traditional **Pen-and-Paper Interviewing (PAPI)** involves face-to-face recording on paper, offering simplicity and accessibility in technology-limited areas. However, recent technological advancements offer potential for cost and time efficiencies, reducing interviewer cognitive load and enhancing data quality. Technology-supported approaches for collecting MDD-W data include:

- **Computer-Assisted Personal Interviewing (CAPI)**, where the interviewer uses handheld devices like tablets to read questions to respondents (Hanley-Cook et al., 2020);
- **Computer-Assisted Telephone Interviewing (CATI)**, where the interviewer reads questions to the respondent during a telephone interview and records the answers on a computer using a software application (Lamanna et al., 2019); and
- **Computer-Assisted Website Interviewing (CAWI)**, where surveys or questionnaires are delivered through links, eliminating the need for in-person enumerators (Koeryaman et al., 2023).

Each method presents strengths and weaknesses depending on the research objectives, available resources, and contextual factors.

For a comprehensive review of these data collection modalities for MDD-W:

- [*Narrative review of data collection modalities for Minimum Dietary Diversity for Women: strengths, limitations and mechanisms*](#) (FAO, 2023a).
- [*CAPI-based MDD-W data collection templates from three software solutions*](#) (FAO, 2023b).

5 WHICH FOOD GROUPS ARE USED TO CALCULATE MDD-W?

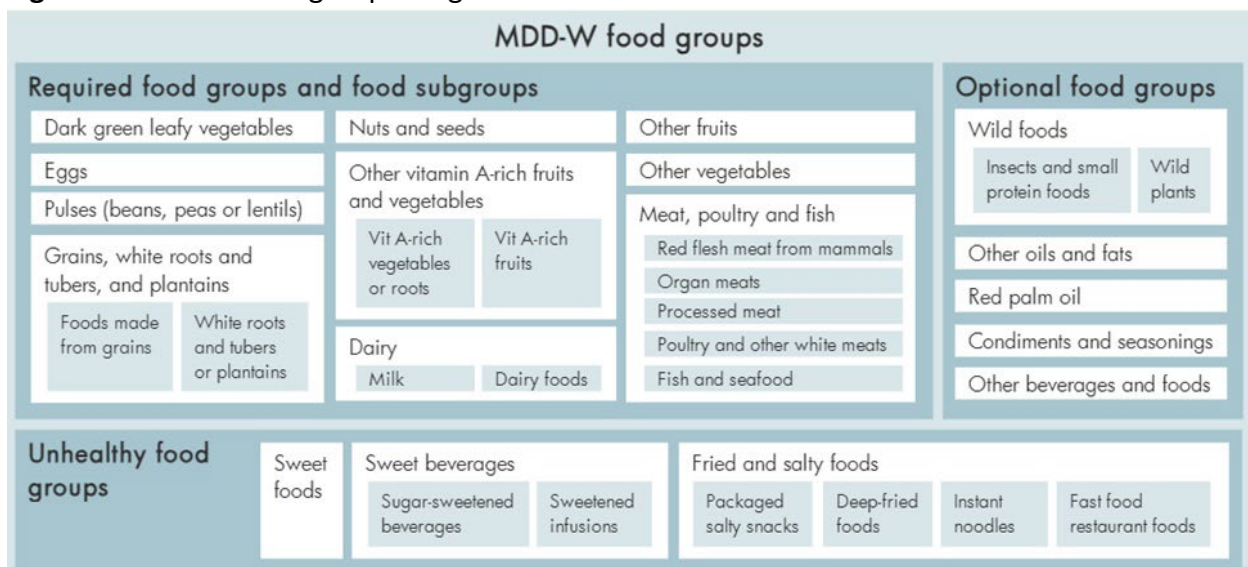
The ten food groups used to calculate MDD-W are:

1. grains, white roots and tubers, and plantains;
2. pulses (beans, peas or lentils);
3. nuts and seeds;
4. dairy;

5. flesh foods;
6. eggs;
7. dark green leafy vegetables;
8. vitamin A-rich fruits and vegetables;
9. other fruits; and
10. other vegetables.

Optional food groups may also be included. As their name suggests, these are not required to calculate MDD-W but are recommended as they offer additional descriptive insights into diets. Optional food groups include **unhealthy food groups**, which have been linked to diet-related non-communicable diseases.

Figure 1. MDD-W food group categorization



Source: **FAO**. 2023c. Minimum Dietary Diversity for Women [e-learning course](#).

For additional details regarding MDD-W food groups:

- [Minimum Dietary Diversity: An updated guide for measurement, from collection to action](#) (FAO, 2021) Section 2, pages 13-40; and
- Chapter 2 of the [MDD-W e-learning course](#). (FAO, 2023c).

6 WHY DOES MDD-W EXCLUDE FOODS CONSUMED IN VERY SMALL QUANTITIES (LESS THAN 15 G/DAY)?

Foods consumed in very small quantities are not counted towards MDD-W. Incorrectly counting such foods (e.g. parsley as a 'dark green leafy vegetable') may falsely inflate the 10-point food group diversity score and, subsequently, the MDD-W prevalence. A threshold of 15 g/day (around 1 tablespoon) has been shown to improve the association between higher diet diversity scores and micronutrient adequacy (Arimond et al., 2010; Gewa et al., 2014; Martin-Prevel et al., 2017), and is therefore recommended for MDD-W.

During MDD-W data collection, the enumerator should never ask about the quantities of food consumed, nor themselves decide whether a food has been consumed in less than 15 g/day. Rather, the 15 g/day minimum intake threshold should be considered during the context-specific adaptation of the food list and questionnaire (before data collection begins). In this phase, foods that are usually consumed in quantities under 15 g/day should be excluded from food lists or allocated to the 'condiments and seasonings' food group, which does not count towards MDD-W (see question 4).

For more guidance:

- [*Minimum Dietary Diversity: An updated guide for measurement, from collection to action*](#) (FAO, 2021), page 21.

7 HOW DO I DETERMINE IF A FRUIT OR VEGETABLE IS VITAMIN-A RICH?

Two MDD-W food groups ('dark green leafy vegetables' and 'vitamin A-rich fruits and vegetables') include vitamin A-rich fruits and vegetables.

Determining whether foods are vitamin A-rich relies on determining their vitamin A density. Foods providing **at least 120 µg retinol equivalents (RE) per 100 g** (roughly equivalent to **60 retinol activity equivalents (RAE)**) are considered rich sources of vitamin A, as per the Codex Alimentarius (FAO & WHO, 2017). Nutrient densities can be derived from food composition tables or databases (FCT/FCDB), which typically provide nutrient values per 100 g of the edible portion of the food.

For further guidance on how to determine rich sources of vitamin A:

- [*Minimum Dietary Diversity: An updated guide for measurement, from collection to action*](#) (FAO, 2021), page 27, Box 4.

The nutrient composition of foods can vary widely, depending on cultivars, growing conditions and preparation methods. To address this issue, locally adapted FCT/FCDB have been developed. When choosing an appropriate FCT/FCDB, it is the responsibility of the survey planner or nutrition expert to determine which FCT/FCDB is most suitable, especially if multiple options are available. As a general guideline, it is recommended to prioritize national followed by regional FCT/FCDB. When food composition data are unavailable, certain leafy greens with medium-to-dark green colouring (e.g. wild vegetables), may be considered vitamin A-rich.

To freely access FCT/FCDB visit the [International Network of Food Data Systems \(INFOODS\) platform](#).

For more examples on vitamin A-rich fruit and vegetables:

- [Minimum Dietary Diversity: An updated guide for measurement, from collection to action](#) (FAO, 2021), Appendix 1, page 129.

8 HOW SHOULD MIXED DISHES SUCH AS SOUPS AND STEWS BE HANDLED FOR MDD-W?

Mixed dishes such as curries, stir-fries, soups and stews present a challenge when collecting MDD-W data. Mixed dishes may contain some ingredients in large quantities and others in smaller quantities to add flavour. The guiding principle for mixed dishes is to err on the side of not counting ingredients that are potentially consumed in very small quantities, in order to avoid inflating the food group diversity score, and thus MDD-W prevalence.

For **open recall**, enumerators must receive clear instructions and training on probing for details of mixed dishes and on recording ingredients in the correct food groups. This includes recording foods in the 'condiments and seasonings' group for ingredients consumed in very small quantities, (i.e. <15 g/day. See question 5).

For example, if a respondent reports eating *githeri* (a one-pot meal of corn and beans), the enumerator should probe the ingredients and assign these to the relevant food groups. Ideally, a food list and guidance sheet should be developed before data collection begins, outlining which foods and ingredients should count towards MDD-W. This way the enumerator knows exactly which food groups to count for each commonly eaten mixed dish.

For **list-based recall**, commonly consumed local mixed dishes should be broken down to ingredients during adaptation of the food list and questionnaire, and individual ingredients added to the food list. For example, *githeri* may be included in the food list by ensuring the listing of corn under the ‘grains, white roots and tubers, and plantains’ food group, and beans under the ‘pulses (beans, peas or lentils)’ food group. One of the disadvantages of this method is that it requires the respondent to mentally take apart mixed dishes themselves. Alternatively, *githeri* itself may be listed twice, appearing under both the grains and pulses food group.

A particular challenge arises when a respondent reports consuming a mixed dish away from home or from a communal plate, which she did not prepare herself (i.e. the ingredients are unknown). In this case, the standard recipe and portion approaches are recommended.

For more information on mixed dishes and on the standard recipe and portion approaches:

- [*Minimum Dietary Diversity: An updated guide for measurement, from collection to action*](#) (FAO, 2021), pages 36-39. Section 3 provides detailed instructions on how to handle mixed dishes for both methods, and pages 43-49 contain further guidance on locally adapted food lists.
- [*Mixed dishes consumed away from home or from communal plates: Standard recipe and portion approaches for MDD-W data collection*](#) (FAO, 2024b)

9 DOES MDD-W CAPTURE THE CONSUMPTION OF UNHEALTHY FOODS?

The MDD-W indicator itself does not capture the consumption of unhealthy foods. However, the indicator includes three ‘unhealthy food groups’ (‘fried and salty snacks’, ‘sweet foods’, and ‘sweet beverages’), which are optional food groups to include during MDD-W data collection. These unhealthy food groups are not required to calculate MDD-W but can offer additional descriptive insights into diets.

Alcoholic beverages, which also do not contribute towards the indicator, are considered under the ‘other beverages and foods’.

Recent analyses by FAO's Food and Nutrition Division (Nutrition Assessment team)² (2023, unpublished) indicate that consuming certain MDD-W food groups may be predictive of higher or lower likelihoods of consuming unhealthy food groups.

For example, in low- and middle-income- countries, non-pregnant women consuming the 'nuts and seeds' food group were three to five times less likely to have consumed 'fried and salty snacks'.

For more information on MDD-W's unhealthy food groups:

- See question 5 for MDD-W food groups.
- [*Minimum Dietary Diversity: An updated guide for measurement, from collection to action*](#) (FAO, 2021), pages 29-32

10 HOW TO MINIMIZE ERROR IN MDD-W?

Like all dietary assessment methods, MDD-W is susceptible to error. Qualitative list-based and open 24-hour recalls, as used for collecting MDD-W, have been shown to potentially misclassify food group consumption, sometimes leading to an overestimate of women achieving MDD-W as compared to objectively measured intakes (e.g. weighed food records) (Hanley-Cook et al., 2020).

For MDD-W, sources of error may be:

- Respondent biases:
 - Recall biases, such as memory lapse, social desirability or social approval bias (e.g. respondents answering untruthfully, but in way they think will please the enumerator).
- Random misestimation:
 - Foods that are usually consumed in sufficient amounts (at least 15 g/day), and are added to the food list, are occasionally consumed in trivial amounts (less than 15 g/day) but are still counted towards MDD-W for those individuals.
- Systematic misestimation:
 - Erroneous food lists, which include food item examples usually consumed in trivial amounts (less than 15 g/day);
 - Incomplete food lists, which exclude food item examples usually consumed in sufficient amounts (at least 15 g/day).

² Giles T. Hanley-Cook, Simone M. Gie, Juan-Pablo Parraguez, Sara Hoogerwerf, & Bridget A. Holmes.

A recent study led by researchers from FAO's Food and Nutrition Division (Nutrition Assessment team)³ (2023, under review), indicated that overreporting of food group consumption in Ethiopia, by both open recall and list-based methods, was predominantly due to respondent biases (i.e. reporting foods that count towards food group consumption, but were not actually consumed), rather than the suboptimal development of the food list (e.g. inclusion of food items usually consumed in trivial quantities (<15 g/day)).

To obtain precise, accurate, and subsequently reliable MDD-W estimates, context-specific food list development with local nutrition experts, questionnaire pretesting, and rigorous enumerator training are recommended.

11 WHERE CAN I FIND MDD-W RESULTS?

FAO publishes MDD-W results on two online platforms:

- [FAOSTAT Food and Diet Domain](#): centralizes the dissemination of MDD-W statistics from various sources, focusing on nationally representative surveys.
- [FAO/WHO GIFT](#): visually presents MDD-W statistics, offering the option to access and download individual-level microdata, whether from nationally representative or non-representative local surveys.

Other valuable resources for MDD-W results include:

- ➔ Demographic and Healthy Surveys including the [Phase-8 Woman's Questionnaire](#)
- ➔ Gallup® World Poll, as part of the [Global Diet Quality Project](#)

12 WHAT IS A HIGH OR LOW MDD-W PREVALENCE?

Dietary diversity is a core component of healthy diets. Therefore, the higher the MDD-W prevalence in a population, the better.

³ Giles T. Hanley-Cook, Sara Hoogerwerf, Juan Pablo Parraguez, Simone M. Gie, Bridget A. Holmes, and (all FAO).

While other nutrition-related indicators have cut-off values signalling different levels of public health significance, there is no standardized cut-off for a ‘high’ or ‘low’ prevalence of MDD-W. MDD-W is rather used for setting targets within a country or region, assessing the dietary impacts of nutrition-sensitive interventions, or comparing groups, for example, among rural and urban areas (Nguyen et al., 2017).

To illustrate, an MDD-W prevalence change of 20 percent following a nutrition intervention may be considered a large effect (baseline 10 percent), but the MDD-W prevalence of 30 percent at endline might still be considered low as compared to other settings.

13 IS MDD-W USED FOR MONITORING DIETS GLOBALLY, SUCH AS THROUGH THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)?

Global monitoring of diets can evaluate and track progress towards commitments such as the Sustainable Development Goals (SDGs). While MDD-W and other healthy diet metrics possess characteristics that make them suitable for at-scale global monitoring, at the present time, the SDG framework does not include any indicators that capture healthy diets. For SDG 2 (Zero Hunger), hunger and food insecurity are monitored by Prevalence of Undernourishment and the Food Insecurity Experience Scale, respectively (Target 2.1), and nutrition outcomes are monitored through child stunting and wasting, and anaemia among women (Target 2.2). However, the critical link between these—healthy diets—remains unmonitored (FAO, 2023d). This is a major gap as healthy diets are recognized to be fundamental to achieving SDG 2 and are prerequisites for reaching many other goals. FAO and other organizations are working to build evidence and scale up promising healthy diet metrics for global monitoring, such as through the Healthy Diets Monitoring Initiative (Verger et al., 2023; WHO, 2023).

14 WHERE CAN I FIND OUT MORE ABOUT MDD-W?

Learn more about MDD-W with the following resources:

- [MDD-W webpage](#) on FAO.org.

- [Minimum Dietary Diversity for Women: An updated guide for measurement: from collection to action](#). (FAO, 2021). FAO's official guide to the use of MDD-W.
- [MDD-W: Data collection, analysis, interpretation and use of the indicator](#). (FAO, 2023c). A two-hour open access e-learning course on the FAO e-learning Academy platform.
- [Mixed dishes consumed away from home or from communal plates: Standard recipe and portion approaches for MDD-W data collection](#). An annex to Minimum Dietary Diversity for Women – An updated guide for measurement: from collection to action. (FAO, 2024b)
- [Integrating Minimum Dietary Diversity for Women \(MDD-W\) into Multi-topic Surveys. A short brief](#). (FAO, 2024a)
- [Narrative review of data collection modalities for Minimum Dietary Diversity for Women: strengths, limitations and mechanisms](#). (FAO, 2023a). A review of the use of PAPI, CATI, CAPI, and CAWI for MDD-W data collection.
- [Data for Infant and Young Child Feeding and Minimum Dietary Diversity for Women: Understanding New Guidelines, Evidence, and Survey Tools Webinar](#). USAID hosted webinar on MDD-W (minutes 17:50-28:20).
- For specific questions, email nutrition-assessment@fao.org.

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