NATIONAL NUTRITION INFORMATION SYSTEM

The Fundamentals Series

Modules 1–5

unicef

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PDF versions of each module can be downloaded from the following website:
https://data.unicef.org/resources/nutrition-nnis-guides/

Module 1: What is a national nutrition information system?
Module 2: How does a national nutrition information system support a country's nutrition programmes?
Module 3: What is needed to build a useful national nutrition information system?
Module 4: What are the main attributes of a national nutrition information system?
Module 5: What are the main types of data used in a national nutrition information system?

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Contents

Module 01

What is a national nutrition information system?

Countries continuously generate data relevant to their national and subnational nutrition programmes. In addition to vital data generated by the nutrition programmes themselves, data can also come from other sources across different sectors, including agriculture, education, environment, finance, health, industry and social welfare. One of the most important ways to ensure nutrition-related data are collected, integrated and used by decision makers is to build and maintain a strong national nutrition information system (NNIS).

Question:

What is a national nutrition information system?

Answer: An NNIS is an integrated set of principles, practices and processes guiding the prioritization, collection, storage, organization, analysis and dissemination of essential nutrition-related data drawn from multiple sectors and sources. The core function of the system is to provide data to monitor the status of nutrition priorities and the performance of nutrition-related programmes and projects linked to those priorities at national and subnational levels. Its primary value is to provide accurate and timely information to support informed, evidence-based decision-making that will help countries improve nutrition outcomes.

Question:

What is the strategic value of better information on nutrition?

Answer: Better information can strengthen the ability of nutrition to contribute to the health and wellbeing of individuals, families and communities. Historically, many countries have limited data on critical nutrition issues, especially on activities to improve nutrition in different sectors. This undermines the ability of countries to track progress on nutrition and to strengthen coverage, quality and continuity of nutrition programmes. It also makes it difficult to increase the resources available for nutrition in all the relevant sectors. A robust NNIS gives advocates and decision makers the information needed to expand and strengthen nutrition programmes within and across multiple sectors.

KEY COMPONENTS
OF A NATIONAL NUTRITION INFORMATION SYSTEM

People. The most important component of an NNIS is the human element. It is the people who build, run and use the system that ensure it a valuable asset for the country. These people range from the nurses and community workers who collect primary data to the programmers and analysts who process the data to the implementers and decision makers who use the data. Their diverse knowledge, skills and perspectives should be carefully considered in the design and operation of the NNIS. They should also receive the necessary support (e.g., training, supervision and equipment) to ensure they contribute to and benefit from the system.

Data. At the heart of a nutrition information system are the facts and figures that are collected and processed. These facts and figures can range from specific (e.g., number of stunted children, disaggregated by age and gender) to aggregate (e.g., national coverage of antenatal iron supplementation). A mix of quantitative and qualitative data are needed to provide valuable insights on the state of nutrition in the country and the performance of its nutrition programmes. However, these data are only part of an integrated data infrastructure, which includes vital issues related to their collection, sources, ethics, quality, organization, analysis, dissemination, visualization and use.

Processes and procedures. The operation of a nutrition information system depends on having a basic set of processes and procedures to ensure the quality and consistency of the system and its contents. Basically, processes address the 'what' (i.e., what do you want to do) versus procedures, which address the 'how' (i.e., how are we going to do it). Processes tend to be higher level: ensure the integrity of the data collection process, maintain the flow and quality of the data, give users easy access to the information system. Procedures are more precise descriptions of how each process will be done and who is responsible for doing it. Processes and procedures should be aligned with the overarching principles and practices of a solid nutrition information system (see below).

Technology. Three core technologies drive electronic information systems: hardware, software and telecommunications. Hardware includes a range of equipment, from smart phones to personal computers to cloud-based data storage systems. Software tells the hardware to perform the different tasks required by the information system; one of the most fundamental software tasks is database management (i.e., integrating the capture and processing of data). Telecommunications technologies (e.g., local area networks and mobile networks) connect the different hardware included in the information system and connect the system to the people building, running and using it

CORE PRINCIPLES AND GOOD PRACTICES
OF A NATIONAL NUTRITION INFORMATION SYSTEM

There are a small number of **core principles** and **good practices** that should be considered when thinking about an NNIS. The purpose of these principles and practices is to provide a solid framework for designing, building, reviewing and/or refining the information system.

CORE PRINCIPLES

1. Pay attention to priorities. The data included in the NNIS should align with the priorities in the national, subnational and sectoral nutrition plans that are being implemented, analysed and monitored.

2. Use well-defined indicators. A set of well-defined indicators, which correspond to the priorities in the nutrition plan, will help guide the selection and analysis of data used in the NNIS.

3. Focus on practical, high-quality data. Data in the information system must be accurate, relevant, understandable and timely if they are going to be useful. Disaggregation of the data can help in analysing and understanding the data. Any disaggregation (e.g., by age, gender, economic status/income or geographic location) should be factored into how data are collected and captured in the system.

4. Design and build a flexible system. The nutrition information system should be sufficiently flexible to adapt to changing circumstances and requirements, including new priorities, new indicators, new data sources, new technologies to collect data and new ways to analyse and present the data.

5. Ensure the system is cost-effective. The level of investment in the NNIS must correspond to its value; the system is a tool to strengthen nutrition programmes, not an end unto itself.

BASIC INSIGHTS ABOUT INFORMATION SYSTEMS

When thinking about a national nutrition information system, it is important to **keep in mind a few basic insights about information systems more broadly:**

- **Information systems are typically structured around a set of indicators that capture data on essential issues.** Where appropriate, the data in the system are disaggregated to make them more relevant and useful (e.g., by age, gender, economic status/income, geographic location).

- **Information systems are a collection of data stored in one or more databases.** It is a common misconception that an information system consolidates all relevant data in a single database. Most information systems use multiple, unlinked databases to generate an integrated or comprehensive perspective on the issues, indicators and performance being tracked.

- **A robust information system addresses how users will work with the data.** Easy access is essential if data are going to be used regularly and effectively. Simple, intuitive interfaces enable a wide range of users to analyse, synthesize and present the data in meaningful ways. In recent years, *dashboards* and *scorecards* have been a popular way to present key data points. Dashboard and scorecards typically include a defined subset of data points and use different visualizations (e.g., charts, graphs and maps) to highlight current status and trends. Currently, there is a move to use interactive *data notebooks*, which allow for more flexible and exploratory data analysis and visualization.

- **Information systems are increasingly dependent on technology,** specifically computer hardware and database software. However, many information systems around the world continue to use paper-based data. For example, keeping track of patient information in healthcare settings often relies on paper records and registers stored in elaborate filing systems. Paper-based systems are practical in some settings, but there are many advantages to electronic information systems, including the ability to more easily access, back-up, aggregate, configure, analyse and present data. In addition, electronic systems have become simpler and more affordable to acquire, implement and maintain.

- **Most electronic information systems are straightforward to set up and operate.** They are built to run on various devices (e.g., personal computers, tablets and smart phones) using widely available database and/or spreadsheet software. There is an extensive global infrastructure to support the development and maintenance of these systems, including hardware and software companies, developers, data storage options, training courses and technical experts.

GOOD PRACTICES

1. Think about who is involved has what connection they have with the information system.

It is useful to have an up-to-date understanding of which institutional and individual stakeholders have a role in the operation of the NNIS to ensure it is aligned with their issues and perspectives. Stakeholders can come from many different sectors or institutions, including government, civil society, multilateral organizations, private sector, philanthropic organizations, academia and research institutions. Given the range of stakeholders, it can be useful to categorize them by their specific roles in the information system, knowing that some of them may have multiple and/or cross-cutting roles.

Most stakeholders in an information system fall into four categories:

- *Governance and management.* A core set of stakeholders, including policymakers and programme managers, are involved in the overarching decision-making related to the information system. Their responsibilities may include strategic planning, budgeting, multisectoral coordination, national and subnational coordination, data agreements and accountability. Governance and management can include various structures and/or assignments, including a steering committee, a technical advisory committee, a senior management team and dedicated line managers.

- *Technology.* There are a wide range of technical experts required to build and maintain an electronic nutrition information system, including engineers, programmers, database administrators, security experts, systems operators and project managers. Specific personnel needs will be determined by the parameters of the design and operation of the country's nutrition information system. It is important to recognize that the various roles are often filled by a combination of permanent/in-house staff and specialized external service providers.

- *Data sourcing.* Because data are at the heart of a nutrition information system, the people and organizations that collect and aggregate data have an essential role in its operation and ultimate value. Data sources can range from government ministries to community-based organizations to international organizations to private sector companies; typically, most data sources provide both quantitative and qualitative data.

- *Data use.* The people who use an NNIS are the largest and most diverse group of stakeholders. The primary users tend to be from government, civil society, private sector, academia and donor organizations as well as designers and implementers of nutrition programmes and projects. Depending on how access to the system is granted, the number and diversity of users can be large. However, the common denominator is their interest in using the data to get a better understanding of the nutrition situation in the country.

2. Leverage existing systems and resources.

In most countries, there are existing systems and resources that should be leveraged to contribute to the content and operations of the NNIS. Many of the systems and resources are likely to be associated with stakeholders in various sectors who have an interest in the NNIS (e.g., agriculture, education, health and social welfare). Identifying and collaborating with these stakeholders can be a cost-effective way to build on existing knowledge and skills to strengthen the NNIS. This collaboration is also an opportunity to mobilize the resources required to build and operate a robust information system.

3. Maintain productive relationships with data sources.

The individuals and organizations providing data are essential partners in the nutrition information system and it is important to maintain strong and productive relationships with them. These organizations are likely to include national statistical offices, sectoral planning departments, research institutes, implementing organizations and information management offices in different sectors.

One of the primary reasons to partner with reliable data sources is to have access to current and accurate data to ensure the continuing relevance of the information system. In addition, the sources have a detailed understanding of the data they collect, including its different strengths and weaknesses (e.g., representativeness, precision and quality). They can also provide practical insights on the opportunities and challenges of interpreting the data, identify how these data might link with data from other sources and suggest additional data that could be collected through their systems. The partnership with data sources can also be enhanced by making technical assistance available to them as needed to support the ongoing development of their systems, including issues related to the quality, scope and availability of the data.

4. Regularly assess the content of the NNIS to ensure it captures existing and emerging issues.

A national nutrition information system can and should track priority issues over time. Longitudinal data provide perspective on different trends, including the status of a particular issue (e.g., anaemia status among pregnant women) and the performance of a particular programme (e.g., increasing/decreasing coverage of vitamin A supplementation). It is also important to regularly assess the content of the information system itself to ensure it includes the right data on the right issues. For example, collaborating with different analysts and user groups can yield critical insights on the function and value of the data and the system. In addition, it is important to ensure the information system is aligned with any new national and international nutrition priorities (e.g., rising rates of overweight and obesity).

5. Use technology that is practical, adaptable and affordable.

Steady improvements in technology make it increasingly easy to build and maintain a robust and cost-effective nutrition information system. Consequently, as a country's level of digitization and connectivity improves, it is important to think carefully about the technology being used and/or proposed for the information system. A good nutrition information system is highly practical; it must be designed for use in the real world. A good system is also adaptable; it must be able to be modified and expanded without being completely rebuilt. And a good system is affordable; it should not require expensive, cutting-edge technology to be valuable.

6. Ensure the NNIS is widely and readily available to users.

A national nutrition information system is only valuable if and when the information in it is used. Making the system widely and readily available to users should therefore be a priority. While there may be security issues and/or information-sharing concerns to address, experience in the health sector, for example, shows that open access to data generally leads to better analysis, better decisions and better outcomes. Practical and affordable technology options are available to protect the system while providing good access to users.

7. Maintain strong quality controls for the data and the system.

The quality of the data and the information system are directly linked to the trust that stakeholders have in the system and its outputs. Without this trust, the value of the information system will be undermined. A serious commitment to data quality is essential in building and maintaining the necessary credibility; this commitment should be an integral part of productive relationships with data sources, including ongoing feedback on and investment in activities such as training, mentoring and supportive supervision. There should also be an equivalent commitment to the quality of other critical NNIS components, including the technology and the team supporting the information system.

8. Communicate regularly with the NNIS stakeholders.

Building and maintaining a dialogue with stakeholders about the NNIS can have a direct impact on its visibility, viability and value. This dialogue should be structured as a two-way communication to ensure it provides stakeholders with useful and up-to-date information about the system, its contents and its operation as well as providing them with the ability to provide input on how they engage with the system and how it can be improved. The communications tools used to facilitate the dialogue should be simple, straightforward and easy to manage (e.g., an email feedback system, a quarterly e-bulletin, notifications to registered users of software and/or content updates or periodic surveys for key stakeholder groups). If possible, the communications loop should include both existing and prospective stakeholders.

MAIN TYPES OF DATA
FOR A NATIONAL NUTRITION INFORMATION SYSTEM

More detailed information about data sources is available in Module 5 of the NNIS Fundamentals series.

An NNIS relies on three main types of data: **1) routine data; 2) survey data and 3) surveillance data.** Using different types of data collected by multiple sources across sectors helps provide a comprehensive and integrated picture of the situation, enabling stakeholders to track the status of nutrition priorities and the performance of nutrition-related programmes and projects linked to those priorities.

Health facilities are a primary source of **routine data** (i.e., data that are collected on a regular or recurrent basis). Programmes implementing nutrition-related interventions are another important source of these data. Health facilities typically report both individual patient data and aggregate data on critical issues. Routine health-facility data are captured in various ways, including on patient cards, in registers and in health management information systems (HMIS), such as the District Health Information Software 2 (DHIS2). Data from nutrition-related programmes and projects, including those implemented by government and development partners, reflect their activities (e.g., breastfeeding counselling, treatment of anaemia, treatment of acute malnutrition, micronutrient supplementation, dietary diversity programmes, food fortification, food distribution) and can be captured using different paper or electronic methods. Other sectors, such as education and social welfare, may also collect and report routine data about the populations they serve.

Survey data are the most varied type of data used in an NNIS. Data can be generated using a wide range of instruments, from periodic, large-scale population-based surveys to one-off, targeted surveys designed to collect specific information at a specific point in time. Two examples of well-established household survey programmes used in countries around the world to collect nutrition data are the Demographic and Health Survey (DHS), which collects data on nutrition as one part of a larger survey on various health-related issues, and the Multiple Indicator Cluster Surveys (MICS), which collect household-level data on various issues affecting mothers and children, including nutrition. In addition, the SMART methodology (Standardized Monitoring and Assessment of Relief and Transitions) is increasingly used for national and subnational nutrition surveys to collect data for development and emergency/humanitarian purposes.

Surveillance data are collected and reviewed at specific time intervals as part of an ongoing process in a country to track trends and identify actual or potential changes in priority indicators. The ongoing or repeated nature of the data collection — typically at the same location over time — is the cornerstone of an effective surveillance system. Many countries have surveillance systems in place to monitor food security and/or emergency nutrition in 'hot spots'. In general, surveillance data are collected using two methods: 1) repeated cross-sectional representative surveys; and 2) recurrent monitoring at selected locations (e.g., health facilities, schools and demographic surveillance sites).

Question:
Which type of data are more important: quantitative or qualitative?
Answer: Both are important. Most data collected for and used by an NNIS are quantitative (i.e., data that can be measured and quantified with numbers). However, qualitative data provide valuable context and help explain what the numbers mean. For example, quantitative data may show that a high percentage of mothers stop exclusive breastfeeding earlier then recommended, with the qualitative data capturing the reasons why this happens. Qualitative data may also capture the status of policy development or the functioning of coordination mechanisms in ways that quantitative data cannot.

Question:
How does the multisectoral nature of nutrition affect an NNIS?
Answer: Nutrition is intrinsically multisectoral. The causes and determinants of malnutrition as well as the pathways to better nutrition are always linked to multiple sectors, including agriculture, education, food processing, health, social welfare, water and sanitation.

Although the multisectoral nature of nutrition is widely acknowledged and agreed by stakeholders, many of the programmes to address malnutrition — both undernutrition and overnutrition — remain narrowly focused within individual sectors.

On a practical level, including data from multiple sectors in an NNIS is productive way to promote an integrated approach to analysis and problem-solving. For example, core data on the prevalence of anaemia in women of childbearing age could be supplemented with relevant data on key causes and determinants such as the birth size of the child, quality of diets, sanitation, access to clean water, access to healthcare, mother's schooling and household economic status.

Additional programmatic data on the reach and quality of interventions such as counselling on breastfeeding practices, efforts to increase the availability and affordability of nutrient-rich foods, access to

clean water and social safety nets strengthens the ability of the NNIS to produce more and better insights.

One of main challenges with including multisectoral data in an NNIS is securing them from different sectors. Some sectors can be tightly protective of their data, preferring not to share it widely. Other sectors will have their own information systems and may not see the value of including their data in an NNIS. And in some sectors, there may be a lack of relevant and/or quality data. But whenever possible, integrating data from multiple sectors in an NNIS is likely to provide decision makers with a better picture of both the situation and the opportunities to improve nutrition outcomes.

Question:
What nutrition data should be included in an NNIS?
Answer: The data included in the NNIS should align with the country's nutrition priorities, which are typically captured in joint and sector-specific nutrition policies, strategies and plans. In many countries, the nutrition priorities may also reflect issues being monitored at a global level. The goal is to incorporate data that will give key stakeholders a better understanding of priority issues and to help them identify opportunities to improve nutrition-related policies, programmes and ultimately outcomes.

A critical challenge is to identify the various data that are relevant to a given issue and to access the sources from which they are currently – or potentially – available. One of the primary benefits of an NNIS is its ability to bring together multiple data points from different sectors to give all stakeholders — from frontline implementers to national policymakers — a more thorough and integrated perspective on the situation.

For example, if it is a priority in a country to reduce stunting in children under 5 years of age — by improving pregnancy outcomes, ensuring appropriate infant and young child feeding practices and addressing related environmental, health and poverty factors — relevant data points can be brought together in the NNIS to help understand and address the situation. *Possible data in the NNIS could include:*

Nutritional status
- Low birthweight (ideally with rates of preterm/small for gestational age)
- Stunting
- Wasting

Access to food and child diet quality
- Household food security
- Infant and young child feeding practice indicators (e.g., minimum dietary diversity, exclusive breastfeeding)
- Food fortification indicators (e.g., Availability of age-appropriate fortified foods)

Underlying determinants
- Household socioeconomic status
- Access to appropriate sanitation
- Access to safe water

Coverage of services related to maternal nutrition
- Antenatal care and associated nutrition interventions (supplementation with iron and folic acid or multiple micronutrients; balanced energy supplementation)

Early childhood nutrition
- Growth monitoring programmes
- Infant and young child feeding counselling for caregivers
- Micronutrient supplementation (e.g., vitamin A)

Coverage of interventions from other sectors
- Participation of pregnant women and/or children in social protection programmes (food/cash transfer)
- Agriculture sector programmes (e.g., home gardening)

Budget and financing data for priority programmes by sector

Functionality of coordination bodies
(e.g., district-level committees for nutrition)

EXISTING INFORMATION SYSTEMS WITH NUTRITION DATA

The multisectoral nature of nutrition means that relevant data may be captured in other information systems used in different sectors and by various government ministries and departments. Drawing on the data in these other systems can be an efficient way to help build and maintain a robust NNIS.

As mentioned above, the health sector will be a primary source of data for the NNIS. Within this sector, a country's electronic HMIS will supply much of these data. An increasing number of countries have routine information systems in other sectors, which can be tapped as sources of data for the nutrition information system. In some countries, sectors have their own information systems (e.g., AIS: Agricultural Information System; EMIS/EIS: Education Management Information System or Education Information System).

There are also many different global information systems that can provide supplemental data for an NNIS. These systems can also be a source of indicators to use in an NNIS.

Examples of these other systems include *(in alphabetical order)*:

- *FEWS NET: Famine Early Warning Systems Network (United States Agency for International Development).* The system brings together a range of data on acute food security, particularly related to food emergencies (e.g., famine). It uses data on climate, agriculture production, prices, trade, nutrition and other factors, as well as information on local livelihoods, to make 6–12-month forecasts on outcomes and changes in the situation at regional level and in specific countries.
  Link: https://fews.net

- *GDD: Global Dietary Database (Tufts University).* The system compiles data on food and nutrient consumption levels from countries around the world. It collects, validates and disseminates data on the dietary intakes of major foods and nutrients for children and adults by age, sex, pregnancy/nursing status, location/residence, and level of education.
  Link: https://www.globaldietarydatabase.org

- *Joint Malnutrition Estimates (UNICEF, WHO, World Bank Group).* This system includes regularly updated estimates of global and regional child malnutrition (stunting, overweight, wasting and severe wasting), including prevalence and numbers affected. Estimates are produced by an inter-agency team and are based on national survey data, which are reviewed for quality as part of the process.
  Link: https://www.who.int/nutgrowthdb/estimates/en/

- *NutriDash (UNICEF).* This system captures, stores, analyses and visualizes information on key nutrition interventions and programmes at the country, regional and global levels, including data on the coverage of maternal and child nutrition interventions. Data are available from over 100 countries.
  Link: https://www.unicefnutridash.org

- *NLiS: Nutrition Landscape Information System (WHO).* The system uses country profiles to provide nutrition and nutrition-related health and development data. Data in the country profiles are structured around the UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition (2020) and are designed to give an overview snapshot of nutrition, health and development at the national level.
  Link: https://www.who.int/nutrition/nlis/en/

- *UNICEF Data & Analytics.* The system includes extensive data sets on multiple issues related to children. Data are available by both topic and country. The core data are supplemented with data analysis, data visualizations, references, notes and links to other relevant resources. The analysis generates disaggregated estimates for nutrition indicators by gender and age of the child, wealth status, maternal education, geographic location and residence. In addition, users can build their own customized data sets, including the ability to disaggregate by key factors.
  Links: https://data.unicef.org/about-us/ https://data.unicef.org/topic/nutrition/child-nutrition/

- *VMNIS: Vitamin and Mineral Nutrition Information System (WHO).* The system tracks data on vitamin and mineral status of populations and provides countries with current national, regional and global assessments on the scale and scope of vitamin and mineral deficiencies.
  Link: https://www.who.int/vmnis/en/

KEY TERMINOLOGY

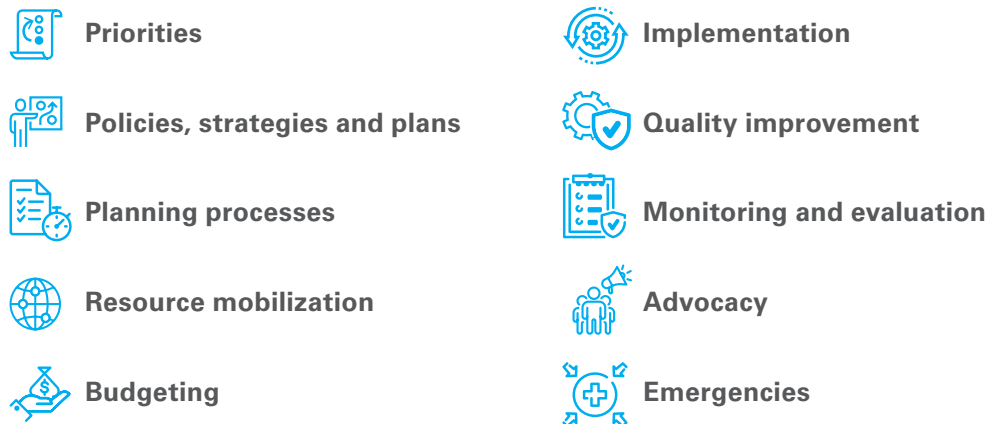|	
Data	Facts and/or figures; pieces of quantitative or qualitative information
Database	An organized collection of data stored electronically for rapid search and retrieval
Data provider	An organization that produces data; may be referred to as a data generator; see also data source
Data source	Type of data and/or modality of data collection (e.g., routine data, survey data); can also be synonymous with data provider
Data value chain	A framework used to guide the transformation of raw data into a valuable resource to better understand situations and improve decision-making
Disaggregated data	Data that have been broken down into detailed sub-categories (e.g., by age, gender)
Indicator	Indicators make collected data understandable and useful for monitoring performance, assessing achievement and determining accountability. They can be used to determine a proportion (e.g., prevalence) and are often designed to track inputs, outputs, outcomes and impact.
National data	Data that are common to or characteristic of a whole nation; see also subnational data
Qualitative data	Data collected using qualitative methods, such as interviews, focus groups, observation and key informant interviews; generally expressed in narrative form, pictures or objects (i.e., not numerically)
Quantitative data	Data that are measured on a numerical scale, can be analysed using statistical methods and can be displayed using tables, charts, histograms and graphs
Routine data	Data continuously collected as part of a regular activity/procedure
Sentinel site	A dedicated location (e.g., facility, community) where surveillance data are collected
Subnational data	Data disaggregated by administrative units below the national level (e.g., provinces, districts, counties); may also include other breakdowns below the national level (e.g., urban, peri-urban, rural)
Surveillance data	Data collected on a recurring basis from designated locations (see sentinel sites) to provide insights on trends into a broader area and/or larger population

Module 02

How does a national nutrition information system support a country's nutrition programmes?

An NNIS built around relevant and reliable data provides tangible support for every aspect of a country's overall nutrition programme, ranging from policies and planning to implementation and assessment. The consistent collection, analysis and use of these data will give stakeholders a better picture of the nutrition situation and enable them to make informed decisions about the country's nutrition programmes.

The ongoing challenge is to align the data in the NNIS with the priorities and realities of the nutrition situation at national and subnational levels and to ensure valid data are drawn from multiple and representative sources reflective of those priorities and realities.

In addition to the overall value of an NNIS as an accessible repository of valuable data about a country's nutrition programmes, the data can also be used to support specific aspects of nutrition programming, including:

- Priorities
- Policies, strategies and plans
- Planning processes
- Resource mobilization
- Budgeting
- Implementation
- Quality improvement
- Monitoring and evaluation
- Advocacy
- Emergencies

THE PRIORITY PARADOX

The NNIS should include various data on the nutrition priorities in a country (i.e., the most important issues; the ones that should be addressed with the greatest urgency and/or effort). In most cases, these priorities will be identified in existing nutrition strategies, policies and plans, which are typically updated on multi-year cycles (e.g., 5–10 years). However, priorities can evolve faster than strategies are updated, and it is possible that some of the priorities in these documents may not reflect the current understanding on the situation and/or the current political climate, which means that the NNIS may not include data on some critical issues. In these cases, it will be important to implement a rapid and/or interim process to ensure sufficient data are available for stakeholders to use to support existing and/or planned nutrition programmes. These data may not be fully or formally included in the NNIS from the outset, but that does not diminish their value. If they have value, they can and should be added to the NNIS.

PRIORITIES

Data in an NNIS can be used to demonstrate how well the country is doing in addressing its designated nutrition priorities. For example, if micronutrient deficiencies are identified as a priority, the information system should show the status of the situation, including data on micronutrient status and related risk factors, as well as the coverage and effectiveness of different interventions. In this context, the NNIS is a useful way to monitor key aspects of the country's nutrition programmes *(see 'Monitoring and evaluation' below).*

NNIS data can also be used to determine if designated priorities are, in fact, the most important nutrition issues facing the country. For example, if the data show a priority in the national strategy is not actually a problem or that changes or improvements in the situation have made it significantly less of a problem, there may be a need to adjust or refine the strategy. The adjustment may mean the issue is no longer identified as a priority and that other more pressing nutrition issues should be highlighted. In addition, NNIS data can be used to identify nutrition issues that could or should be priorities. For example, as improvements are made on some priorities *(e.g., declines in micronutrient deficiencies),* it is likely other issues are becoming more significant *(e.g., food insecurity during times of crisis).* As mentioned in **Module 1**, it is important to regularly assess the content of the NNIS to ensure it includes the right data on the right issues.

POLICIES, STRATEGIES AND PLANS

An NNIS is a powerful tool to support the development of evidence-based nutrition policies, strategies and plans at national and subnational levels. Access to the NNIS gives stakeholders the ability to make data-driven decisions about what is included and what is prioritized in these types of documents, making them more realistic, more credible and more likely to succeed.

In addition to helping identify and confirm the importance of big-picture issues and/or concerns (e.g., micronutrient deficiencies, food security, overweight/obesity), NNIS data can also be used to highlight more specific challenges that can and should inform policies, strategies and plans *(e.g., gaps in service availability and quality, coverage and unmet need).*

Data-driven decision-making — particularly around high-level agreements, such as nutrition policies and strategies — can be a challenge to implement because it requires stakeholders to think and work based on what the data in the NNIS and from supplemental sources are telling them. It also requires stakeholders to move away from decision-making based on instinct or gut feelings, which are unsupported by evidence.

The use of the NNIS for data-driven decision-making also has the potential to make the development and monitoring of nutrition policies, strategies and plans a more inclusive and transparent process. The data in the NNIS are a validated and objective resource designed to be used by the full range of stakeholders involved in the development of policies, strategies and plans. In addition, the NNIS data can help hold officials accountable for the contents and integrity of their plans, including limiting the influence of vested interests.

PLANNING PROCESSES

One of the most important uses of NNIS data is to support and strengthen planning processes at different levels *(e.g., from national level to district level).* Specifically, making the NNIS an integral part of nutrition planning is a way to promote data-driven thinking and decision-making throughout the process, including using data to help determine programmatic targets. The use of the NNIS in planning is also a way to identify data that should be added to the information system.

Planning can be influenced by a number of challenging factors, including a lack of consensus on priorities, political agendas, entrenched interests and historical approaches. Ensuring the planning process is data-driven can help mitigate the influence of these factors and, as mentioned above, make the process more inclusive and transparent.

Countries already using evidence-based planning will recognize the importance of

NNIS data when making their nutrition plans. A key strength of evidence-based planning is its underlying premise that achieving good outcomes requires using objective information to decide how best to address a problem.

RESOURCE MOBILIZATION

The ability to mobilize funds for nutrition is increasingly linked to results. When allocating financial resources, domestic and international funders want to know that support for nutrition is a good investment for the country. They want to see the data that makes the financial case for nutrition. The NNIS can and should be a source of data to help make this case, potentially providing insights on issues ranging from resource allocation and spending efficiencies to coverage and outcomes.

Stakeholders in nutrition can also use NNIS data to take a more proactive stance on resource mobilization by proposing programmes beyond the types historically implemented in the country. For example, data show that nutrition can both prevent and treat non-communicable diseases (NCDs) such as heart disease and diabetes. With the growing burden of NCDs, this creates an opportunity to mobilize funds by making a data-driven case to invest in nutrition interventions to address NCD risks, disease burden and health sector costs and capacity.

BUDGETING

The data in an NNIS should input directly into the development of national and subnational nutrition budgets. For example, it can support critical decisions about the target population size, service-delivery costs, coverage gaps, commodity needs and other budget parameters. The value of a strong data-based budget is that it demonstrates to decision makers that the programme is carefully planned, managed and implemented.

Good data also play an important role in improving knowledge and awareness about nutrition issues among the individuals and organizations responsible for developing budgets for nutrition programmes in a country. In many countries, people with these responsibilities (e.g., officers in the Ministry of Finance) may have limited knowledge of the issues. Consequently, NNIS data, along with other supporting data, can be an effective way to educate these decision makers and make the case for allocating funds for nutrition.

With ongoing decentralization in many countries, critical budget decisions are often made at local levels (e.g., districts, counties), which increases the value of including local data in the NNIS, if it is available. In some cases, local data may not be part of the NNIS, but the aggregated data in the information system can still provide vital context for budget decisions.

IMPLEMENTATION

Access to an NNIS is essential for implementers *(e.g., health facilities, schools and community organizations)* because it gives them ready access to data relevant to their nutrition activities. For example, the NNIS can give them a better understanding of what is happening locally and nationally. It can be used to compare performance across implementers and/or geographic areas. In addition, the NNIS data can be used by implementers to better understand and leverage the multisectoral nature and effects of nutrition programmes, including the connections between different issues *(e.g., the link between food security and social protection).* NNIS data are also an effective tool for the individuals and organizations responsible for the management and oversight of programme implementation, including government ministries and departments at national and subnational levels, as well as donors and technical assistance partners. The data can be used to track specific types of programmes *(e.g., micronutrient supplementation, infant and young child feeding counselling)* or they can be used to create an integrated picture of the implementation of different programmes and projects in a country.

NNIS data on implementation are also essential for monitoring the performance and progress of different programmes and projects *(see 'Monitoring and evaluation' below).*

QUALITY IMPROVEMENT

Every quality improvement initiative is driven by the use of data, both to identify opportunities for quality improvement and to test possible improvements. For example, the basic PDSA cycle (Plan-Do-Study-Act), which is at the core of many quality improvement initiatives, uses data throughout the process. Data are used to develop the plan for what changes will be tested, and they are collected while the change is being tested. Data are then studied to assess the effects of the change and used to determine if and how additional modifications should be

made to further improve the effectiveness of the change.

An NNIS should be a rich source of data for quality improvement initiatives, particularly at the subnational/local level. The ability to use different types of data from multiple sources enables quality improvement teams to take a more integrated and inclusive approach to their work, increasing the likelihood that they will identify practical ways to improve quality and outcomes.

MONITORING AND EVALUATION

Monitoring and evaluation (M&E) are inherently data-driven activities. Consequently, the availability of relevant data in an NNIS is an invaluable resource for the full range of M&E activities, including performance tracking, accountability, evaluation and reporting. For example, the core of an NNIS should include a set of indicators selected to capture data relevant to the country's nutrition priorities. These indicators are vital for monitoring the performance of programmes and projects at national and subnational levels, including progress towards targets and goals.

Additional and/or contextual data in the NNIS on multiple issues can be used to explain and understand the 'how' and 'why' of the performance of nutrition programmes. Data on inputs, outputs, coverage and key factors/determinants are examples of the types of data that can be used by M&E professionals and programme implementers to assess what is and

is not working and to identify ways to improve performance *(see 'Quality improvement' above)*. NNIS data can also be used to support internal and external evaluations of nutrition programmes at national and subnational levels. Providing evaluators with access to the integrated data in an NNIS will strengthen their ability to plan and conduct constructive evaluations, including baseline, midterm, final and impact evaluations.

In many settings, a significant component of monitoring and evaluation is reporting results to key stakeholders, especially funding partners. Data in the NNIS can likely be used to meet various reporting requirements, while also being used for planning, implementation and quality improvement, among other purposes. In addition, the development and use of an NNIS can be an opportunity to work with different stakeholders to harmonize reporting requirements around key data included in the system.

ADVOCACY

As mentioned above, an NNIS is a powerful tool for developing evidence-based nutrition policies, strategies and plans. The data in the NNIS are an equally powerful tool to use for advocacy on behalf of nutrition. Evidence-based advocacy is a highly effective way to make a strong case for action.

A challenge of evidence-based advocacy is to ensure the right data are presented in ways that are relevant and compelling to the target audience. For example, officials in the

Ministry of Finance, the senior management of a food processing company and a hospital administrator are likely to be influenced by very different messages. The range of data in an NNIS makes it possible to tailor evidence-based messages to specific audiences, which significantly enhances their value as an advocacy tool. In general, the ability to efficiently pull different data from the NNIS makes it possible to build a more integrated and credible story about the nutrition situation.

EMERGENCY PREPAREDNESS AND RESPONSE

An NNIS can be a valuable resource during emergency situations. It can provide vital baseline data that can be used to help determine the nutrition effects and impacts of an emergency *(e.g., increased food insecurity linked to the COVID-19 epidemic).* NNIS data can also be triangulated with data collected as part of an emergency response, including data from rapid assessments, household surveys and emergency interventions.

In many emergencies, the most affected people and communities already face various nutrition challenges. Existing NNIS data about these individuals/communities and the programmes that serve them can be leveraged to both prepare for and respond to emergencies. For example, in countries facing severe drought conditions, nutrition status and programme data for vulnerable communities can be combined with location, weather and crop data to help determine what assistance may be required in coming months.

The diverse effects and impacts of emergencies require a multisectoral response *(see 'Implementation'),* and NNIS data can be used to better understand and leverage the multisectoral nature of nutrition programmes, including the connections between different issues.

An NNIS should become a repository for nutrition data from past and/or current emergencies to improve the availability and access to relevant data for planning, implementation, monitoring and evaluation. Long-standing gaps in nutrition data from emergency situations, combined with the increasing frequency and scale of emergencies — both natural and human-made — has increased the need for data to improve preparedness and response. Country commitments to use their NNIS to collect and analyse these data can contribute to better emergency preparedness and response.

Module 03

What is needed to build a useful national nutrition information system?

Whether a country is building a new NNIS, or maintaining or strengthening an existing one, there are several key issues to keep in mind as the work progresses. Individually, these issues are critical checks and balances or reference points to ensure the viability and integrity of the NNIS as it evolves. Collectively, these issues create a guiding framework that can help keep the information system relevant, focused and energized.

PURPOSE

One of the most important *checks and balances* when building, maintaining or strengthening an NNIS is its main purpose: **Collect, analyse and make available critical data that can be used by stakeholders at national and subnational levels to support informed, evidence-based decision-making to help the country improve its nutrition programmes and outcomes.** While individual countries may have additional reasons for building and maintaining an NNIS — for example, it can be an effective way to aggregate data required for reporting to an external donor — the main purpose *(i.e., credible data for decision-making)* should remain the focus.

Thinking about the purpose can help guide various decisions about the development and evolution of the system. For example, it can be useful when: making decisions about what data are included in the NNIS *(e.g., how these data will affect decision-making);* assessing and improving the quality of the data included in the system *(e.g., data of poor or questionable quality can negatively influence the analysis);* and determining how data are made available to users *(e.g., data and analysis should be accessible and understandable).* Considering the purpose can even be useful when considering resource allocation for an NNIS *(e.g., if a single aspect of the system consumes an inordinate amount of the resources, will the overall system be able to provide the needed functionality for users?).*

In many ways, the purpose is the most significant benchmark when making decisions about an NNIS.

Questions to consider…

- **Is there general agreement on the main purpose of the NNIS among the key stakeholders?**
- **Are there other reasons or sub-purposes for the NNIS? If yes, how well do they harmonize with the main purpose and with each other?**

SCOPE

A well-defined and well-understood scope for the NNIS is another important *check and balance.* In most cases, the scope —defined primarily by the content and the associated analysis — should coincide with the country's nutrition priorities *(see 'Principles').* Discussions about the scope should carefully consider both multisectoral and cross-cutting issues that should be included in the final version. The multisectoral nature of nutrition responsibilities and programmes in a country *(e.g., agriculture, education, environment, finance, health, industry and social welfare)* should be captured in the scope. Similarly, relevant cross-cutting issues (e.g., gender, inequality, civic engagement and climate resilience) in a country should also be included.

A scope that is focused on collecting and analysing data to monitor the status of nutrition priorities and the performance of nutrition-related programmes and

projects linked to those priorities should be broadly useful for stakeholders who are positioned to contribute to better decision-making at national and subnational levels. If an information system becomes bloated with too much secondary or superfluous data, its value can easily get diluted. In addition, an extensive but underused system may not be worth the cost.

Questions to consider...
- **Are the country's nutrition priorities clearly defined? Do the priorities reflect the multisectoral nature of nutrition? Are there key cross-cutting issues that are linked to the priorities? How do these issues influence the scope of the NNIS?**
- **Are accurate data available to support decisions on the key issues included in the scope? If not, how can the NNIS address these issues?**

POLICIES, STRATEGIES AND PLANS

There is a bi-directional relationship between an NNIS and a country's nutrition policy, strategy and/or plans. On one hand, existing policies, strategies and plans influence what data are included in the NNIS *(e.g., data on national nutrition priorities should be at the core of the NNIS).* On the other hand, the data in an NNIS should influence the formulation and evolution of evidence-based nutrition policies, strategies and plans. This intrinsic and interconnected relationship is a major consideration when building, maintaining and strengthening an NNIS.

There may be times when the data in the NNIS are ahead of the policy, strategy or plan. The multi-year cycle of these types of documents means they may not accurately reflect the current situation (e.g., the emergence of overweight and obesity in countries historically dealing only with undernutrition). Conversely, there may be times when a policy requires adding new types of data to the NNIS *(e.g., status of regulations on the marketing of ultra-processed foods).*

As countries continue to develop comprehensive and/or topic-specific nutrition policies, strategies and plans,[1] the data in the NNIS must be regularly assessed to ensure they are as aligned as much as possible.

Questions to consider...
- **Are the country's existing nutrition policies, strategies and plans relevant and up-to-date? If not, what is the timetable to review and revise them? Are there indications of how they might change?**
- **Are data available on the priorities outlined in the existing policies, strategies and plans? Are data available on emerging issues?**

INSTITUTIONAL HOME

An NNIS needs an institutional 'home' in an organization, that can take primary responsibility for its day-to-day operation. In multiple countries, the national Bureau of Statistics or its equivalent is a natural home for the NNIS. In other countries, the responsibility is given to specialized institutes or secretariats *(e.g., nutrition, public health)* with the capacity to manage the system. In all countries, the organization that houses the NNIS needs to have the ability to work across the various sectors involved with nutrition at national and subnational levels. It also needs to build and maintain productive relationships the different data sources (see below) as well as any multilateral or international partners *(e.g., United Nations organizations and bilateral donors).*

The organization that houses the NNIS should have a proven track record in working with data and information systems. The organization should also provide a stable and supportive environment for the core team working on the NNIS (see below). In addition, the organization should be equipped to work productively with external technical partners that can help build, maintain or improve aspects of the NNIS.

Questions to consider...
- **What organizations have the mandate and the ability to serve as the institutional home for the NNIS? Are there one or more organizations well suited to provide this home?**
- **Do the potential institutional homes for the NNIS have the ability to coordinate and collaborate with the multiple stakeholders in nutrition programmes, ranging from sectoral ministries to data sources to international partners?**

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1   According to the WHO Global Nutrition Policy Review 2016–2017, 149 countries have comprehensive or topic-specific national nutrition policies, strategies and/or plans.

CORE TEAM

A core team should be assigned to the development and operation of the NNIS; this team should work under the auspices of the organization serving as the institutional home. The core team should include members who collectively have the essential knowledge and skills needed to build and maintain the information system. It should be a focused, hands-on team, with each member bringing something meaningful to its work. It is also possible that core team members will be staff members at the institutional home.

While existing capacity to work with data and information systems should be a key consideration when selecting the host organization, it is likely that additional people will still be needed – either as members of the core team or as affiliated partners – particularly those with specialized knowledge and skills. The time commitment required from members of the core team will depend on the scope of the NNIS and their specific role on the team; for example, smaller, more limited systems will not require the same level of effort as larger, more comprehensive systems.

When thinking about the make-up of the core team, it is important to consider the *system requirements* to help identify what expertise will be needed (see below). In addition, it can be worthwhile to balance the membership of the core team against broader *technical support* needs (see below). The core team must also coordinate closely with the members of the NNIS *governance* structure to ensure the system is delivering on its purpose (see below). And the team should have strong working relationships with the various data sources involved in the NNIS.

Questions to consider...
- **What are the primary roles and responsibilities of the members of the core team? Are there capable people to fill those roles?**
- **How can the core team be supported to ensure they have productive relationships with other key stakeholders in the NNIS, including the steering committee, advisers, data sources, consultants and outside vendors?**

DATA AND DATA SOURCES

Without credible data on nutrition, there is no basis for an NNIS. Consequently, when building, maintaining or improving the information system, it is essential to know what data are available and whether they are relevant, accurate, understandable, usable and timely. And while countries are continuously generating data related to their various national and subnational nutrition programmes, not all data that are available may be appropriate for an NNIS. Consequently, it important to consider what value the available data will bring to the overall information system.

Nutrition and nutrition-related data come from a range of sources that generate and collect raw data that can be used in an NNIS. These data can come from many different organizations *(e.g., government agencies, civil society organizations, universities, research institutes and community programmes)* working in many different sectors *(e.g., agriculture, education, environment, finance, health, industry and social welfare).*

A comprehensive data mapping or landscaping exercise can be a valuable way to identify and assess the capacity, quality and reliability of various data sources in the country. It is also an opportunity to identify and assess the data produced to determine if they should be included in the NNIS. Regularly updating the data mapping is an effective way to confirm the ongoing availability and quality of data and an opportunity to assess new types and new sources of data. For example, if a country's nutrition priorities change, additional and/or different data may be required to monitor and assess the situation.

An appropriate *data use agreement* will likely be needed with each source whose data are included in the NNIS. Typically, this type of agreement covers issues of data privacy and security, as well as addressing how data can be used.

When thinking about nutrition data and the sources of these data, it is important to think creatively and expansively about which data could be used for understanding and improving nutrition programmes and outcomes and what could be a source for these data. Further, if critical data are not available, a creative and expansive approach can help identify ways to work with existing or new sources to generate and collect these data.

Questions to consider...
- **What nutrition data are generated and collected in the country? What is the quality and availability of data? How credible and reliable are the data sources?**
- **Are there useful data from the different sectors involved with nutrition? Are there useful data for both national and subnational levels?**

SYSTEM REQUIREMENTS

Multiple factors, including purpose, priorities, data and budget, are critical reference points when **defining what an NNIS is expected to do and what systems are required for that to happen**. The challenge is to determine how the various factors influence the practical issues and decisions involved in building and maintaining an NNIS. For example, if the initial goal is to have an NNIS that gives key national and subnational stakeholders data for decision-making on the top five nutrition priorities in the country, it is essential to plot out what is needed *(e.g., expertise, technology and resources),* what exists, what can be leveraged, what needs to be procured, who can handle what task *(e.g., core team, consultants, outside vendors),* what it will cost, how long it will take and how the process and the outcomes will be monitored.

These types of issues and decisions will be familiar to experienced project managers, particularly those who have worked on information systems previously. However, the multisectoral nature of nutrition, the number and diversity of stakeholders, the wide range of data sources, the various types of data and the limitations of these data complicate the process of laying out the system requirements.

In the context of an electronic NNIS, system requirements also have very specific connotations related to decisions about hardware, software and functionality, including compatibility with other information systems in the country.

Questions to consider...
- **Will different stakeholders collaborate to decide what the NNIS will do and what systems are required? Is it possible to build a consensus among these stakeholders?**
- **Is the intention to build an electronic NNIS? If an electronic system already exists, is it doing what was expected of it? How could it be improved?**

GOVERNANCE

Good governance is essential to build, maintain and strengthen an NNIS. While the specific structures and practices will vary by country, good governance is typically seen as **participatory, consensus-oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive.** Good governance is also careful to follow the rule of law.

Typically, the core of the governance structure is a steering committee or board of directors, which works closely with the management and implementation structure responsible for the day-to-day operation of the NNIS *(i.e., the institutional home and the core team).* The committee or board has primary responsibility for the overarching oversight and decision-making related to the information system (e.g., strategic planning, finance and coordination). The structure and operation of the committee or board *(e.g., the number of members, affiliation of members, roles and responsibilities of members)* will need to be determined based on the allowable options in a country. But a commitment to the key characteristics of good governance should guide these decisions.

The diverse nature of an NNIS, with multiple stakeholders from multiple sectors, places a premium on an **inclusive and participatory** approach to governance. This does not mean every stakeholder or group of stakeholders must be a member of the governance structure. However, it does mean the committee or board respects and values the range of stakeholders who contribute to the successful operation of the NNIS; it actively encourages input from stakeholders; and it seeks out relevant advice and counsel from multiple sources.

The governance of an NNIS should also place a high value on **transparency**. For example, information about the governance, management and implementation of the NNIS, including financial information, should be readily available and easily understandable. Stakeholders should know how and why decisions were made, and transparency should be used to build trust in the NNIS and its data.

Questions to consider...
- **Who has the knowledge and skill to actively participate in the governance of the NNIS?**
- **What is the best way to balance the various stakeholders and interests in nutrition (e.g., involvement of multiple sectors) while ensuring the governance is fair and representative? How does the composition of the board effect decisions made about the NNIS?**

PRINCIPLES

The five core principles listed in Module 1 are constructive benchmarks when building, maintaining and strengthening an NNIS. As key decisions about an NNIS are made, the possible implications of each of the core principles should be considered:

1. Pay attention to priorities. The data included in the NNIS should align with the priorities in the national, subnational and sectoral nutrition plans that are being implemented, analysed and monitored.

2. Use well-defined indicators. A set of well-defined indicators that correspond to the priorities in the nutrition plans will help guide the selection and analysis of data used in the NNIS.

3. Focus on practical, high-quality data. Data in the information system must be accurate, relevant, understandable and timely if they are going to be useful (see 'Data', above).

4. Design and build a flexible system. The nutrition information system should be sufficiently flexible to adapt to changing circumstances and requirements, including new priorities, new indicators, new data sources, new technologies for collecting data and new ways to analyse and present the data.

5. Ensure the system is cost-effective. The level of investment in the NNIS must correspond to its value; the system is a tool to strengthen nutrition programmes, not an end unto itself.

Questions to consider...
- **Is there a consensus among the key stakeholders, including those involved with governance and those on the core team, on the purpose and value of the principles? Will they use them when making decisions about the NNIS?**
- **Are there certain principles that may be challenging to follow? If so, why and how can these challenges be addressed?**

USERS

As mentioned above, the main purpose of an NNIS should be to collect, analyse and make available critical data that can be **used by stakeholders at national and subnational levels** to support informed, evidence-based decision-making. Decisions about the NNIS should **carefully consider users and their needs**, including who they are, how they work with the system, how they use the data and what opportunities there are to improve both the system and its contents.

If an NNIS is not meeting the needs of its users, it raises serious questions about the value of the system.

Understanding users and their needs requires active and sustained engagement with them. Consequently, formal and informal consultations *(e.g., surveys, workshops and interviews)* should be an integral part of building, maintaining and strengthening an NNIS. These consultations are also a good tool for helping users identify gaps or misunderstandings in their perspectives and perceived needs; they can also be used to identify unforeseen opportunities to strengthen or expand the NNIS.

Questions to consider...
- **What steps can be taken to ensure the NNIS remains focused on users and their needs? Should users be included in the governance structure of the NNIS?**
- **Will the parties responsible for the NNIS (e.g., governance members, the institutional home and core team) be willing to listen to and act on input from users?**

CHAMPIONS

Within the larger group of stakeholders in an NNIS, there will be champions in government and civil society who can and should play an active role in launching and sustaining the system. In most cases, they will be people who value nutrition and its contributions to the health and wellbeing of individuals, families and communities in the country.

The exact role that different champions play will vary based on who they are, but every champion is an indispensable resource for building support for an NNIS. Champions are strong, well-informed supporters, who can help make the case for a robust information system. For example, well-placed champions can be particularly effective in conducting advocacy with decision makers about developing and maintaining an NNIS; establishing and/or leveraging relationships with key stakeholders, including data sources; and mobilizing resources for the NNIS.

Questions to consider...
- **Who are the effective champions for nutrition in the country? Why are they effective? Do they recognize the value of a robust NNIS? Are they willing to get involved?**
- **What issues facing an NNIS would benefit most from the involvement of champions?**

TECHNICAL ASSISTANCE

The steps required to build and operate an NNIS are influenced by multiple factors, ranging from its scope to its specific system requirements to the capacity of its core team. The diversity and potential complexity of the different factors are likely to require technical assistance at various points in the initial and ongoing processes. For example, an NNIS that includes data from a greater number of sectors *(e.g., agriculture, education, health and social welfare)* may need additional technical assistance to process and analyse the various types of data.

In countries with an existing electronic NNIS or plans to develop one, information technology is likely to be an area that will benefit from technical assistance. The improving capacity and increasing sophistication of information technology, including data harvesting, automated data quality checks, geographic location mapping, data visualizations and report generation, can require specialized knowledge, skills and training to set up and maintain the system.

The core team — in coordination with key stakeholders — should regularly assess where and how technical assistance can improve NNIS processes and performance. The findings from these assessments should be the basis for updating plans and budgets to procure technical assistance from qualified consultants and organizations.

Questions to consider...
- **Are there areas where technical assistance will likely be needed to build, maintain and/or strengthen the NNIS?**
- **What resources for technical assistance are available in the country? Will there be a need to secure assistance from international sources?**

FINANCIAL RESOURCES

As mentioned above, without credible data on nutrition, there is no basis for a national nutrition information system. Similarly, without a realistic and funded budget, it is not feasible to build or sustain an NNIS that will provide valuable decision-making support to users. The budget should include a multi-year funding envelope to ensure the stability of the NNIS and allow it to demonstrate its value over a longer term.

One of the most efficient ways to develop a budget for an NNIS is to use one from another information system in the country as a template *(e.g., management information systems in health, education and agriculture).* Although the content of an NNIS will be different, the basic structure and budget categories will be similar; for example, governance, general administration, staff *(recruitment, training, compensation),* external/contract services, surveys, technology *(hardware, software)* and reviews/compliance. One advantage of having an institutional home for an NNIS in an organization accustomed to working with data is that they should have a good sense of how to develop a budget and manage the financial resources for an information system.

The budget should be aligned with the purpose, scope and principles of the NNIS, which are, in turn, aligned with the nutrition priorities in the country. This alignment should position the NNIS as an essential component in the country's larger commitment to improve nutrition and nutrition outcomes. For countries with an investment framework for nutrition, resources for the NNIS should be reflected in the national plan to mobilize and allocate financial resources for nutrition programmes.

Questions to consider...
- **Are decision makers prepared to provide the financial resources for an NNIS? If they have reservations, what role can a budget play in convincing them to approve the funding?**
- **Are there other information systems in the country that may have a budget template for the NNIS?**

A well-designed and well-implemented NNIS has the potential to make a significant contribution to a country's nutrition efforts. It can be a reliable and respected source of sound and compelling evidence that can help raise the profile of nutrition at a time when it is consistently undervalued. It can help all stakeholders, from politicians and policymakers to practitioners and people in the community, to better understand the critical issues and be more willing to support — and participate in —effective nutrition programmes.
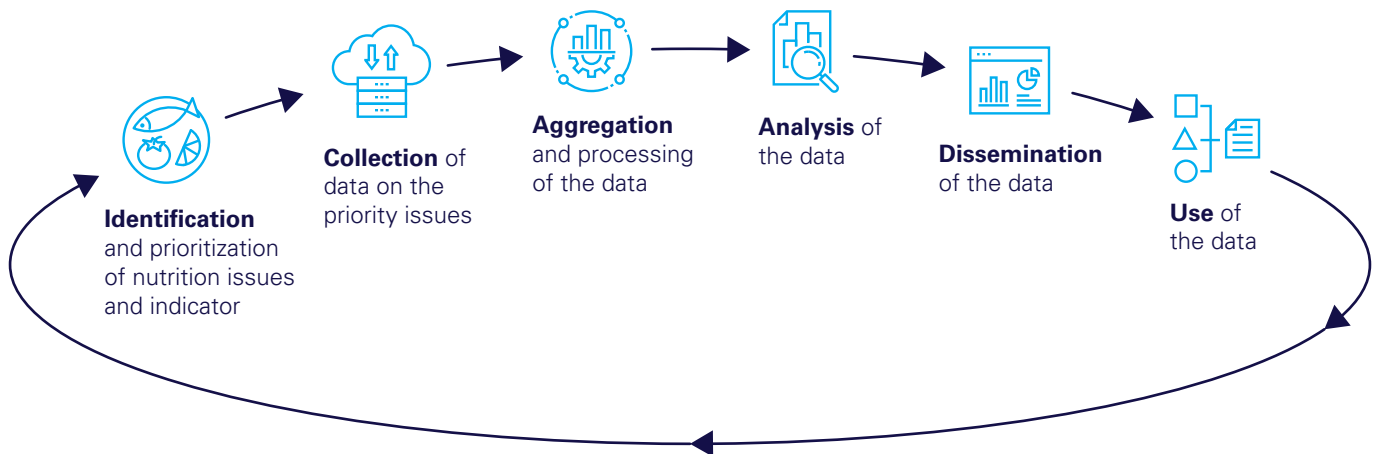
What are the
main attributes
of a national
nutrition
information
system?

The main attributes of an NNIS are a mix of processes and data. An NNIS uses this mix to identify and extract value from data to support national nutrition policies and programmes:

- Identification and prioritization of nutrition issues and indicators

- Collection of data on the priority issues

- Aggregation and processing of the data

- Analysis of the data

- Dissemination of the data

- Use of the data

The progression of the main attributes creates a data value chain for nutrition. This value chain is a framework used to guide the transformation of raw data into a vital resource, which can give stakeholders (government, civil society, academia, etc.) a better understanding of what is happening with nutrition and can help them make better decisions to improve specific programmes.

Information systems evolve over time. New data become available; better ways to collect and process data are implemented; and the analysis and use of data becomes more sophisticated. However, the main attributes of an NNIS are flexible enough to adapt to this evolution while maintaining the overall integrity of the data value chain.

Identification
and prioritization
of nutrition issues
and indicator

Collection of
data on the
priority issues

Aggregation
and processing
of the data

Analysis of
the data

Dissemination
of the data

Use of
the data

Main attributes of a national nutrition information system: Nutrition data value chain

IDENTIFICATION AND PRIORITIZATION OF NUTRITION ISSUES AND INDICATORS

The issues included in the NNIS should align with the country's nutrition priorities, which are typically captured in a multisectoral national nutrition policy, strategy and/or plans. The corresponding indicators should be selected because they capture relevant data on key aspects of the activities, outcomes and/or targets associated with the nutrition priorities. It is also important to confirm data are available for the selected indicators; this information may be available in monitoring and evaluation frameworks and/or plans.

It can be a challenge to identify and agree on a manageable number of priority issues and indicators to incorporate in an NNIS. It is important that these decisions be taken through an inclusive process. For example, a representative working group of stakeholders, led by government, can be an effective way to manage the process of determining which national nutrition priorities should be included in the system.

There can be pressure from different sectors, stakeholders and partners to monitor a large and diverse set of issues and indicators, some of which may not be national priorities. However, international experience has shown that efforts to monitor an extensive set of issues and indicators can be impractical because the capacity to implement the necessary data collection, processing and analysis is limited. The resulting burden undermines the quantity, quality and utility of the system.

Questions to consider...
- **Does the country have clear national nutrition priorities? Are the priorities identified in order of importance? In other words, are the priorities "prioritized"?**
- **Is there a consensus on the nutrition priorities among key stakeholders? If not, what can be done to secure agreement on the priorities that will be included in the NNIS?**
- **Are there systems in place that can be used to collect accurate and timely data on the priorities? Are key indicators part of a national nutrition monitoring and evaluation framework?**

COLLECTION OF DATA ON THE PRIORITY ISSUES

Once the issues and indicators to be included in the NNIS have been selected, the next step is to identify the sources of data for these issues and indicators and work with them to ensure timely access to quality data.

There are three main sources of data on core nutrition indicators: 1) routine data (e.g., facility data and programme/project monitoring data); 2) survey data; and 3) surveillance data. In general, collecting data from multiple sources can provide a more comprehensive picture of the situation, with data from various sources complementing each other. Every country needs to identify the most appropriate data sources to meet its nutrition information needs and determine what data are available from those sources that align with the selected indicators. The process of reviewing the data and data sources is also an opportunity to reconfirm whether the selected indicators actually reflect the nutrition priorities in the country.

Routine data typically come from health facilities and nutrition-related programmes and projects.

Health facilities are a source for patient data entered in a health management information system (HMIS), such as the District Health Information Software 2 (DHIS2). They are also a source for aggregate data on critical issues (e.g., growth monitoring) taken from registers and reported upward at regular intervals. Data from nutrition-related programmes and projects reflect their activities (e.g., counselling on breastfeeding, counselling on dietary diversity, food fortification, micronutrient supplementation, treatment of acute malnutrition and treatment of anaemia). Ideally, these data also reflect the link between the activities and nutrition priorities being monitored in the NNIS.

Survey data can be generated using a wide range of instruments, including periodic, large-scale population-based surveys, recurrent facility surveys, and one-off targeted surveys designed to collect specific information about a specific population at a specific point in time. Two examples of well-established instruments used to collect nutrition data are the

Demographic and Health Survey (DHS), which collects data on nutrition as one part of a larger survey on various health-related issues, and the Multiple Indicator Cluster Surveys (MICS), which collect household-level data on various issues, including nutrition, that are relevant to women and children. In addition, the SMART methodology (Standardized Monitoring and Assessment of Relief and Transitions) is often used for national and subnational nutrition surveys to collect data for development and emergency/humanitarian purposes.

Surveillance data are collected at specific time intervals as part of an ongoing process to monitor trends and identify signs of current and/or potential changes in nutrition programmes and the nutrition status of a selected population.

The ongoing or repeated nature of the data collection is the cornerstone of an effective surveillance system. In general, surveillance data are collected using two approaches: 1) repeated representative or cross-sectional surveys; and 2) recurrent monitoring at selected locations (e.g., health facilities and schools).

Questions to consider…
- **What are the reliable sources of nutrition data? Do these sources have data for the priority issues and indicators? What are the strengths, weaknesses and gaps in the data that are available?**
- **What checks and balances are in place to ensure the quality of the data being generated and collected?**

AGGREGATION AND PROCESSING OF THE DATA

There are a number of critical activities to prepare data for analysis, including data cleaning, classification, coordination, quality, storage, privacy and security. These activities may be carried out by data sources and/or the core team responsible for the NNIS. All of these activities are standard procedures for individuals and organizations with experience working with data.

Data cleaning. Identify inaccurate, incomplete and/or questionable data and correct any errors or omissions. The process also removes major errors and inconsistencies that are inevitable when multiple sources of data are being aggregated in one data set. Data cleaning is an integral part of ensuring the quality of the data and the quality of the analysis.

Data classification. Organize data by relevant categories so they can be used more efficiently and effectively. The process of data classification is to tag data to make them more searchable and easier to retrieve. It also enables better cross-referencing. Data classification can be considered a component of data coordination.

Data coordination. Bring together data from different sources to prepare it for analysis. This process is also referred to as data curation or data collation. Data coordination is a way to manage data in order to make them more useful, including improving the interoperability of

data and data systems to ensure that users are getting a well-rounded picture of the situation.

Data quality. Ensure consistently high-quality data are collected and used. There are many different frameworks and tools for assessing and improving data quality. In general, these frameworks and tools address issues such as the completeness, consistency and timeliness of the data. Many countries have data quality systems in place that can be adapted for use with nutrition data.

Data storage. Establish and maintain a secure and accessible way to store the data that are collected. The storage system must take into account who needs access to the data and how these data are being used. There are advantages to a centralized storage system, but it is also possible to have a distributed system where different data sets are stored and accessed in different places.

Data privacy and security. Ensure the NNIS is in compliance with the relevant laws and policies for data privacy and security. Data privacy focuses on how data are collected, processed, shared, stored and deleted. Data security is the policies and procedures in place to prevent any unauthorized access to and use of data.

Questions to consider…
- **Is the technical expertise required to complete the various tasks related to aggregating and processing the data**

generally available in the country? Are mechanisms in place to hire and/or retain staff or consultants with this expertise?

- Are the systems, tools and equipment need for the work in place? If not, what needs to be developed and/or sourced?

- Do the managers who would oversee implementation of the various tasks have the knowledge and skills to do the job?

ANALYSIS OF THE DATA

Analysis is the opportunity to extract useful knowledge and insights from the aggregated data. There are many different variations of analysis that can be done with data in an NNIS. The main types of analysis are:

Descriptive analysis. Uses data to show *what is happening and/or what happened*. It is the most straightforward type of data analysis. Its ability to assess performance also makes it a widely used type of analysis. Findings are often displayed on data dashboards. For example, the DHIS2 health management information system supports basic descriptive analysis and data visualizations such as dashboards.

Diagnostic analysis. Uses findings from descriptive analysis as the basis for a more in-depth analysis of *why something happened.* This type of analysis looks for connections between different data points and data sets, including possible trends. It is also useful for considering factors and events that help explain the outcome.

Predictive analysis. Uses findings from descriptive and diagnostic analysis to understand *what is likely to happen*. This type of analysis produces estimates, the accuracy of which depends on the quality of both the available data and the analysis. Predictive analysis is a more difficult type of analysis to undertake.

Prescriptive analysis. Organizations with sophisticated skills and technology may also be able use this advanced type of analysis, which attempts to determine *what is the best course of action to take.*

Data analysis is most effective when it follows a clear and thoughtful plan. A good data analysis plan is a road map to guide and focus the process, ensuring it aligns with the national nutrition priorities and making sure the analysis

is providing stakeholders in the NNIS with the knowledge and insights needed to make well-informed decisions. The plan can consider where triangulation of data from different sources may be necessary and/or beneficial to fully understand a situation. A good analysis plan does not have to be complicated. It can be very effective to start with the basics and refine the plan — and the analysis — over time.

Data analysis is increasingly using graphics or **data visualization** to make the findings more understandable and useful. Charts, graphs and maps are some of the most frequently used visualizations, but there are dozens of options that can bring data to life in ways that spreadsheets and data tables cannot. For example, communicating data visually can allow trends and patterns to be more easily recognized.

Questions to consider...

- Is it feasible to build consensus among key stakeholders around the practical priorities for analysing the data? Is the expertise to conduct the data analysis generally available in the country (i.e., within government, academia, civil society organizations, multilateral organizations, donor organizations or programme implementers)?

- What types of data visualizations would best highlight the status of nutrition priorities and programmes? Who could be involved in developing effective data visualizations?

DISSEMINATION OF DATA

The contributions of an NNIS to nutrition programmes depends on the active and ongoing dissemination of the findings from the data analysis. These findings are a valuable resource that play an essential role in improving the understanding and use of the nutrition data. Consequently, a good dissemination plan is as important to the success of an NNIS as a good data analysis plan.

The importance of active dissemination must be emphasized. In an era of vast quantities of information, a passive approach that simply makes the findings and supporting data available is inadequate. Active dissemination uses a focused plan and specific steps to ensure key audiences receive relevant information on a regular basis. It uses the dissemination process to engage stakeholders with the information.

In addition to active dissemination, it is equally important to provide open access to the findings and data to the full range of stakeholders and interested parties, from the general public to politicians. The combination of active dissemination and open access is an effective way to ensure the findings and data in the NNIS are an integral part of efforts to strengthen nutrition programmes and improve nutrition outcomes.

Different stakeholders have different information needs and an NNIS needs to be able to present and disseminate information in a range of formats that are appropriate for different groups and types of stakeholders. Many countries use scorecards to present information on core nutrition indicators in an accessible way to policymakers and decision makers; others are data visualization tools to build nutrition dashboards. In recent years, social media has become a powerful way to bring key data points to the attention of decision makers. Traditional approaches such as workshops, meetings, journal articles and the mainstream media also continue to be valuable channels for dissemination.

Questions to consider...
- **How widely are nutrition-related data circulated currently? What obstacles must be overcome to ensure open access to the NNIS data and findings?**
- **How could better dissemination of nutrition-related data be a useful tool for advocacy and awareness?**

USE OF THE DATA

While every attribute of an NNIS is individually important, the integrated use of data to improve decision-making should be the driving force behind the system. Specifically, the NNIS can enable stakeholders to take an evidence-based approach to assessing, planning, developing and implementing programmes.

In general, the use of data generates demand for more and better use of the data, as well as demand for more and better data. These demands are the reason why it is so important to understand how and why data are being used and to feed that information back into the NNIS processes. This information can influence the NNIS in multiple ways, ranging from the indicators used to collect data to the sources of data to the types of analysis and visualizations.

The combined challenge and opportunity is to build a culture of data use around nutrition, to encourage stakeholders at every level — frontline workers to policymakers — to consider the data when thinking about nutrition. The data generated by the NNIS may not lead to a single conclusion or an obvious course of action, but they will provide stakeholders with a strong foundation for realistic discussions about the current situation and possible ways forward. Ultimately, a commitment to data use and evidence-based decision-making has the potential to transform how nutrition issues are understood and addressed in a country.

Questions to consider...
- **Are there sectors in the country where there is a strong culture of data use? What can be learned from these sectors about building a culture of data use around nutrition?**
- **How would an evidence-based approach to nutrition change how decisions are made? Would managers be willing to take an evidence-based approach to their work?**

Module
05

What are the main types of data used in a national nutrition information system?

The various attributes of an NNIS come together to create a data value chain for nutrition (see Module 4). While each of the attributes is an integral part of the value chain, the information system only works because of the data at its core. Without good data, there cannot be a functional NNIS.

Nutrition-related data come from many different sources. They are collected in various ways and come in many different forms and formats. However, a high percentage of the data fall into one of five general categories:

Routine data

Contextual data

Survey data

Financial data

Surveillance data

ROUTINE DATA

Routine data are collected on a regular or recurrent basis. The primary sources of routine data for an NNIS are health facilities and nutrition-related programmes and projects. Most routine data are individual-level data on clients or patients who are being reached with services *(e.g., individual demographic data, service provided and diagnosis).* Routine data can also include data on how and how often clients or patients access services *(e.g., facility versus community outreach, number and frequency of visits)* as well as data on client or patient reactions to the experience *(e.g., feedback on outcomes or quality).*

Depending on the country, data from health facilities are collected and reported in various ways, including via paper-based systems *(e.g., patient cards and registers),* with direct data entry into an electronic health management information system (HMIS) such as the District Health Information Software 2 (DHIS2). Routine data are also collected by nutrition-related programmes and projects from their clients with different paper-based and electronic methods, including the use of DHIS2 to capture health-related data collected by community outreach workers.

Routine data can align directly with the country's priority indicators and be easily factored into monitoring national performance. Routine data can also be used for triangulation with core data in the NNIS; for example, data on the coverage of growth monitoring interventions can be useful in assessing the accuracy and representativeness of data on stunting, wasting and overweight in children under 5 years of age.

Examples of routine data collected at health facilities or by programmes and projects:

- Child screened using weight-for-height or mid-upper arm circumference (MUAC)

- Low birthweight

- Exclusive breastfeeding for the first six months

- Counselling on infant and young child feeding

- Children or women enrolled in supplementary feeding programmes

- Quantity of ready-to-use therapeutic food distributed

- Children released from acute malnutrition treatment programmes

- Women provided with iron and folic acid supplements

- Quantity of iron and folic acid supplements distributed

- Weight and height of children, adolescents and adult women

- Raised blood glucose/diabetes among persons aged 18+ years

- Raised blood pressure among persons aged 18+ years

- Number and coverage of facilities and/or programmes providing different types of nutrition services *(e.g., community-based management of acute malnutrition treatment sites, food distribution points, mass screening sites)*

- Number and distribution of nutrition-related human resources *(e.g., nutritionists, counsellors, outreach workers or extension workers)*

- Staff time spent delivering nutrition services

Routine data can and should be a reliable and robust source of information for monitoring the status of a situation and the scope and effectiveness of activities and interventions at all levels *(i.e., individual to national).* These data are so valuable that supporting new and/or ongoing efforts to improve their quality, collection and analysis should be an important part of an NNIS.

SURVEY DATA

There are many different types of surveys that can be used to collect data on vital nutrition and nutrition-related issues, including nutrition status, diet, risk factors, programme performance and policy implications. Survey types range from large-scale, periodic, population-based surveys designed to collect nutrition data, to targeted one-off surveys designed to collect information about a specific population at a specific time. Surveys can be used to collect data about nutrition-related issues in multiple sectors, including agriculture and the food industry *(e.g., agricultural censuses, farm business surveys or food processing surveys),* education *(e.g., school nutrition surveys, farm-to-school censuses),* health *(e.g., facility surveys, patient surveys)* and social welfare *(e.g., standard of living surveys).*

Two large-scale survey instruments are used in many countries to collect nutrition data as part of a broader mandate: the Demographic and Health Survey (DHS) and the Multiple Indicator Cluster Surveys (MICS). DHS is a periodic, population-based survey that collects data on nutrition as one part of a larger survey on various health-related issues. MICS also collect household-level data on multiple issues, including nutrition. The DHS and MICS are both designed to be nationally representative, with sample sizes ranging between 5,000 to 30,000 households. These surveys are typically conducted every three to five years.

Many countries also use the SMART methodology (Standardized Monitoring and Assessment of Relief and Transitions) for national and subnational nutrition surveys.[1] Unlike large-scale surveys such as DHS and MICS, which cover a wide range of topics, SMART surveys are focused on nutrition indicators, particularly anthropometry *(e.g., infant/child weight, height/length, MUAC).*

SMART incorporates key elements from different survey approaches in a way that balances simplicity with technical proficiency. The methodology has been effective because it is a straightforward and adaptable approach to implementing cross-sectional field surveys that collect timely, high-quality data in development and emergency/humanitarian contexts. SMART surveys are also scalable; with careful planning and preparation, they can be implemented at all levels, from national to district and even sub-district levels.

As mentioned above, there are many different types of surveys that can be developed and implemented to collect data using many different parameters. Other examples include:

- National food consumption and dietary intake surveys collect data on issues such as food consumption, nutrient intake and nutrition status.

- National micronutrient surveys collect biomarker data to measure the status of select micronutrients in key populations.

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1   SMART methodology: https://smartmethodology.org

- The Fortification Assessment Coverage Toolkit uses surveys to assess national food fortification programmes.

- Link NAC (Nutrition Causal Analysis) surveys use a participatory, quantitative and qualitative method to identify the causes of undernourishment.

- Knowledge, Attitudes and Practices surveys can be designed to capture various data on nutrition (e.g., infant and young child feeding practices).

- Comprehensive Food Security & Vulnerability Analysis uses a survey to collect data on food security and the vulnerability conditions of population groups and communities.

- Living Standards Measurement Study Integrated Surveys on Agriculture collect data on the links between agriculture, socioeconomic status and non-farm income activities.

Surveys of all types — from one-time special surveys to periodic population-based surveys — can be rich sources of data for understanding and improving a national nutrition programme. However, it is important that the investment in nutrition surveys is aligned with national priorities and available resources.

SURVEILLANCE DATA

Surveillance data depend on the consistent collection of data from designated locations to monitor trends and identify signs of current and/or potential changes in nutrition-related issues and factors. There are various ways to structure and conduct nutrition surveillance. Common methods include: 1) repeated cross-sectional or representative surveys; and 2) recurrent monitoring at selected locations *(e.g., health facilities, schools or refugee camps).*

No single way is appropriate for all situations or settings. Some surveillance programmes are national in scale, while others are designed for subnational implementation; some are designed to be a permanent part of the public health infrastructure, while others are designed to respond to specific issues or circumstances, such as an emergency situation. Regardless of the approach, nutrition surveillance should be built around a set of relevant indicators that can be collected with reasonable frequency. The repeated or recurrent nature of the collection of surveillance data can provide a useful time-course perspective on the relevant indicators.

Typically, a surveillance system is either *active* or *passive*. An active system is built around a close collaboration between the surveillance oversight organization and selected facilities to periodically collect and directly report quality data on specific conditions *(e.g., stunting, severe acute malnutrition, moderate acute malnutrition).* Passive surveillance relies on facilities to generate data on the selected conditions using their regular reporting mechanisms.

Active surveillance yields the most accurate and timely information; however, it can be labour-intensive and may be expensive. Passive surveillance is a lower-cost approach, but its dependence on multiple facilities for data can pose challenges, including issues with data quality and reporting delays.

A structured *sentinel surveillance system* is a variation of active surveillance, which leverages long-term relationships between the oversight organization and specific facilities and/or community sites *(e.g., sentinel sites)* to ensure the consistent collection and reporting of high-quality data. When properly implemented, a well-designed sentinel surveillance system for nutrition can be an effective way to generate timely, high-quality data on priority issues. A potential shortcoming of a sentinel system is that collected data may not be representative of the overall population.

Ultimately, the size and scope of nutrition surveillance should be aligned with national needs and available resources. For example, it should focus on issues and indicators that require or benefit from close monitoring; collect data with reasonable frequency; use a manageable number of data sources; and focus on geographic areas or specific populations facing nutrition risks or challenges.

CONTEXTUAL DATA

Contextual data, including both quantitative and qualitative data, are the various facts and conditions that have an effect on — or are affected by — the nutrition situation in the country. Including these data in the NNIS can yield a broader perspective and a deeper insight on both the challenges and opportunities facing nutrition programmes.

The range of contextual data are vast, as are the sources of these data *(e.g., national strategies, policies and plans; implementation guidelines; programme and project reports; special studies; operational research; and evaluations).* It is important that any contextual data included in an NNIS reflect the country's specific priorities and circumstances. These are data that can help explain how and why different factors influence nutrition status, programmes, projects and outcomes.

Examples of contextual data points include:

- Availability of nutrition-related commodities *(e.g., vitamin A supplements, micronutrient powders, deworming medication)*

- Prevalence of moderate and severe food insecurity in the population

- Psychosocial barriers to food assistance

- Psychosocial barriers to healthy eating

- Availability of fruits and vegetables

- Availability of fortified foods

- Food labelling requirements

- Nutrition knowledge

- Proportion of population using safely managed drinking water services

- Number and coverage of community and/or household gardens

- Proportion of the population covered by social protection systems

- Historic weather patterns and long-range weather predictions *(e.g., drought, flooding)*

Data on the existence and implementation of regulations on key nutrition issues can also provide important context in an NNIS. For example, regulations on breastmilk substitutes, food marketing to children, salt/sodium content and the use of trans-fatty acids in processed foods can be useful correlates with other data in the information system.

FINANCIAL DATA

Understanding the financial implications of nutrition priorities, programmes and projects is a critical component of decision-making. It can be particularly useful when looking at trends over time; for example, how increases or decreases in funding affect programme performance and nutrition outcomes. As is the case with other data in the NNIS, when determining what financial data to include, it is important to focus on data relevant to priority issues.

Ministries of finance or their equivalent will be a primary source of financial data – specifically, data from the government's national budget, including detailed budgets for individual ministries. Supplemental data on cost estimates used in the development of budgets are also useful. In countries with decentralized governments, valuable data may come from local finance departments *(e.g., state or county level).* In addition, financial data on activities funded and/or implemented by multilateral

organizations, bilateral donors and philanthropic organizations can be important to include in an NNIS.

Financial data can be more complicated to collect than other types of data. For example, extracting relevant data from a national budget may require going through individual line items to identify expenditures linked to nutrition programmes. Another complication is that nutrition activities are often integrated into broader programmes *(such as reproductive, maternal, newborn and child health),* making it difficult to determine how much of the budget was spent on nutrition. And in many cases, different funders use inconsistent taxonomies or terminologies in their financial systems, which can make it difficult to track the flow of funds. However, the importance of understanding financial context makes the effort worthwhile.

Understanding the connection between cost estimates, budgeting and expenditures can be particularly useful when assessing and planning when, where and how nutrition funds are spent. For example, comparing the cost estimate for a given activity with the budget allocated for that activity and then comparing the budget allocation with the actual expenditure can

give critical insights into the implementation, coverage, outcomes and effectiveness of the activity. This type of analysis can also highlight issues related to how and why financial decisions are made and the impact of those decisions on nutrition status, programmes and projects.

KEY TERMINOLOGY

Data	Facts and/or figures; pieces of quantitative or qualitative information
Database	An organized collection of data stored electronically for rapid search and retrieval
Data provider	An organization that produces data; may be referred to as a data generator; see also data source
Data source	Type of data and/or modality of data collection (e.g., routine data, survey data); can also be synonymous with data provider
Data value chain	A framework used to guide the transformation of raw data into a valuable resource to better understand situations and improve decision-making
Disaggregated data	Data that have been broken down into detailed sub-categories (e.g., by age, gender)
Indicator	Indicators make collected data understandable and useful for monitoring performance, assessing achievement and determining accountability. They can be used to determine a proportion (e.g., prevalence) and are often designed to track inputs, outputs, outcomes and impact.
National data	Data that are common to or characteristic of a whole nation; see also subnational data
Qualitative data	Data collected using qualitative methods, such as interviews, focus groups, observation and key informant interviews; generally expressed in narrative form, pictures or objects (i.e., not numerically)
Quantitative data	Data that are measured on a numerical scale, can be analysed using statistical methods and can be displayed using tables, charts, histograms and graphs
Routine data	Data continuously collected as part of a regular activity/procedure
Sentinel site	A dedicated location (e.g., facility, community) where surveillance data are collected
Subnational data	Data disaggregated by administrative units below the national level (e.g., provinces, districts, counties); may also include other breakdowns below the national level (e.g., urban, peri-urban, rural)
Surveillance data	Data collected on a recurring basis from designated locations (see sentinel sites) to provide insights on trends into a broader area and/or larger population