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Review of National Nutrition Surveillance Systems

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January 2014

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Contents

1	Introduction.....	1
2	Research Methods.....	3
3	Findings.....	4
	3.1 Key Objectives of Surveillance Systems.....	4
	3.2 Indicators.....	4
	3.3 Comparability.....	4
	3.4 Data Collection Methods Used by Surveillance Systems.....	5
	3.5 Characteristics of Repeated Sample Surveys.....	5
	3.6 Characteristics of Community-Based Sentinel Sites and Public Health Clinics.....	6
	3.7 Reporting.....	7
	3.8 Strengths and Weaknesses.....	7
	3.9 Country Context.....	8
4	Matrix of Characteristics of Nutrition Surveillance Systems.....	9
5	Surveillance System Descriptions.....	10
6	Sources Used for the Review of Nutrition Surveillance Systems.....	26

LIST OF TABLES

Table 1. National Nutrition Surveillance Systems Identified during Research.....	2
Table 2. Data Collection Methods Used by National Nutrition Surveillance Systems.....	5

Abbreviations and Acronyms

ACF	Action for Children
CDC	U.S. Centers for Disease Control and Prevention
DRC	Democratic Republic of Congo
FANTA	Food and Nutrition Technical Assistance III Project
FAO	Food and Agriculture Organization of the United Nations
HKI	Helen Keller International
INCAP	Instituto de Nutrición de Centro América y Panamá
PPS	probability-proportional-to-size
SMART	Standardized Monitoring and Assessment of Relief and Transitions
U.N.	United Nations
U.S.	United States
USAID	U.S. Agency for International Development
WFP	World Food Programme
WHO	World Health Organization

1 Introduction

Timely, reliable data are crucial to enable routine monitoring of the well-being of a population and to facilitate the detection of deleterious trends in the status of nutrition and health in a given country or specific region of a country. Ideally, a surveillance system for nutrition and health monitoring should include a broad suite of appropriate indicators that are collected with reasonable frequency, and should focus on geographic areas of a country that are prone to food insecurity and/or other nutrition and health issues. Such monitoring can allow decision makers to identify seasonal as well as geographic trends in the deterioration of the nutrition, health, or food security situation well before the onset of a crisis, and can facilitate the timely initiation of response and mitigation efforts.

The development of a robust nutrition surveillance monitoring system is relatively straightforward in the absence of resource constraints or other feasibility considerations. The lack of availability of human and monetary resources, problems of geographic inaccessibility, and security issues, however, often constrain the design of a nutrition surveillance system, making it less feasible to implement and less sustainable over time. Often, compromises must be made in the selection of indicators included in the surveillance system, the geographic coverage of the system, the frequency of the data collected, the extent to which the data collected represents the intended population, and the precision of the results.

While a variety of surveillance systems have been developed, no one standard model is appropriate for all contexts. Some are national in scale, while others target subnational geographic areas of particular vulnerability to food insecurity or other health and nutrition issues. There are systems that are a permanent part of a government's public health infrastructure, while other systems are set up in response to an emergency situation and fall into disuse once the emergency subsides.

Although nutrition surveillance is more typically associated with acute crises, it can also be an extremely valuable tool in a development context. Surveillance systems can identify specific geographic areas vulnerable to deterioration in nutritional status using indicators such as those relating to micronutrient status. These systems can also shed light on seasonal fluctuations in nutritional status and track patterns in anthropometric and biochemical indicators of micronutrient status in relation to other health and food security indicators. This information can help guide appropriate interventions to both sustain and improve the nutritional status of a population.

While nutrition surveillance systems have been studied for decades—the classic document describing such systems is the World Health Organization's (WHO) 1984 *Nutrition Surveillance*¹—relatively little attention has been given to cataloguing existing national nutrition surveillance systems and their key characteristics. This information could be useful to public health officials and experts interested in designing a new nutrition surveillance system or in evaluating current systems.

This document provides results from a review of existing surveillance systems in developing countries and presents information on the approaches currently used for national nutrition surveillance, as well as preliminary analysis of the strengths, weaknesses, and applicability of the various approaches.

The focus of this document is on developing country surveillance systems that are run under the auspices of government public health authorities and that collect data on key anthropometric indicators. The

¹ Available at <http://whqlibdoc.who.int/publications/9241560789.pdf>.

surveillance systems included in the review use one or several of the following methodologies to collect data²:

- Repeated nutrition surveys
- Community-based sentinel sites³
- Data from mass screenings⁴
- Data from feeding program admissions
- Data reported from health clinics

A total of 31 national nutrition surveillance systems were identified (see Table 1). Information was collected on each system regarding key stakeholders, design, status, and examples of reports. Complete information was available for 16 of the systems; only these systems were included in the review. One system with complete information (Indonesia) was discontinued in 2007 and another in 2010 (China); one system was designed and proposed in 2013, but eventually cancelled that same year (Uganda); and one system with complete information (Zambia) was not functioning, but plans were in place to restart the system. All four of these systems were included in the analysis. All other included systems were functioning.

Table 1. National Nutrition Surveillance Systems Identified

Systems with complete information	16 total
Americas	2 (Guatemala, Nicaragua)
Asia	4 (Bangladesh, China, Indonesia, Vietnam)
Central Africa	1 (Democratic Republic of Congo)
East Africa	5 (Djibouti, Ethiopia, Somalia, Sudan, Uganda)
Middle East	2 (Kuwait, Palestinian Territories)
Southern Africa	2 (Mozambique, Zambia)
West Africa	0
Systems with partial information	15 total
Americas	0
Asia	4 (Afghanistan, Kyrgyzstan, Pakistan, Sri Lanka)
Central Africa	1 (Burundi)
East Africa	1 (Kenya)
Middle East	1 (Jordan)
Southern Africa	4 (Botswana, Madagascar, Malawi, Namibia)
West Africa	4 (Guinea-Conakry, Mali, Niger, Senegal)

² An overview of these methods for collecting nutrition-related data can be found in: Bilukha et al. 2012. “Measuring anthropometric indicators through nutrition surveillance in humanitarian settings: Options, issues, and ways forward.” *Food and Nutrition Bulletin*. Vol. 33, No. 2. Available at <https://www.ncbi.nlm.nih.gov/pubmed/22908699>.

³ Defined as “a nutrition surveillance design whereby periodic cross-sectional data collection rounds take place in preselected settlements” (Bilukha et al. 2012).

⁴ Defined as “exhaustive mass screenings of children of target age [that] are conducted periodically, usually every 1 to 6 months. This is usually done to identify children eligible for admission to feeding programs or to monitor growth through Road-to-Health or similar cards” (Bilukha et al. 2012).

2 Research Methods

Key informant interviews and a literature review were the main approaches used to collect information on national nutrition surveillance systems in developing countries. Key informants were identified using a “snowball” approach, starting with relevant people known to Food and Nutrition Technical Assistance III Project (FANTA) staff who were asked in turn to identify other relevant key informants. A total of 116 key informants were interviewed from January to May 2013. The informants came from nongovernmental organizations working in food security and nutrition, United Nations (U.N.) agencies, government ministries, universities, and other research organizations.

The literature review covered research papers and programmatic and policy documents and reports from research databases, U.N. agency and nongovernmental organization databases, and open-source Internet content. Key informants also provided a large number of relevant documents. The documents used as a reference for this report—specifically, documents pertaining to surveillance system design and surveillance system reports—are indexed by country and are found in Section 6 in this report.

3 Findings

3.1 Key Objectives of Surveillance Systems

The key objectives of the identified national nutrition surveillance systems are similar across countries. The systems focus on identifying trends in key nutrition-related health indicators for their populations, with particular attention given to pregnant women 15–49 years of age and children 0–59 months of age. The systems strive to provide this information to relevant government officials—as well as to international partners—in a timely fashion to help mitigate and respond to nutrition-related shocks. Identified systems are closely split between those that operate in a development setting and those that operate in emergency or insecure settings.

The following key objectives of the Kuwait Nutrition Surveillance System⁵ are good examples of what these systems try to accomplish:

- Monitor health and nutritional status of the population
- Supply reliable and sustainable data on the nutritional status of people at the national and international levels
- Show trends, and enable local comparisons
- Raise awareness about nutritional problems
- Provide guidance to health-related local intervention programs

The tables in Section 5 provide descriptions of each surveillance system, including their objectives.

3.2 Indicators

All identified surveillance systems collect data to track indicators on the micronutrient status of children and pregnant women, infant and child feeding practices, and the anthropometric status of children 0–59 months of age (namely underweight, stunting, and wasting, which were collected across all systems). A minority of systems (e.g., Ethiopia and Somalia) track the following indicators for children 0–59 months of age: mortality, major causes of mortality, morbidity, measles and Baccille Calmette Guérin (BCG) vaccine coverage, and vitamin A supplementation in past 6 months. Systems in places with smaller geographies and strong coverage (e.g., Kuwait and Palestinian Territories) track a diverse range of nutrition-related indicators, including biochemical data (anemia, blood sugar for diabetes, and cholesterol for hypercholesterolemia in adults), obesity rates, physical activity, and TV and computer habits.

3.3 Comparability

One of the main objectives of the identified nutrition surveillance systems is to track changes over time in key nutrition-related indicators. This generally implies that data are collected from the same population on the same indicators using the same methods at different points in time. Ideally, statistical tests of differences are then run on data to ascertain whether noted differences are statistically significant and warrant further attention.

While all identified surveillance systems stated a goal of comparability over time of collected data, it was not possible to evaluate comparability, as not enough information was available on how populations,

⁵ AlSumaie, Mona. March 28–29, 2011. “The Kuwait nutrition surveillance system (KNSS): an example for the region.” First Regional Nutrition Conference – Nutrition Challenges in the East Mediterranean Region. Doha, Qatar.

designs, and methods changed over time, or on what could be done to minimize the impact of such changes.

3.4 Data Collection Methods Used by Surveillance Systems

The majority of national nutrition surveillance systems covered in this review use repeated probabilistic sample surveys as a primary source of data (13 out of 16). Nearly half of all systems (7 out of 16) rely solely on repeated probabilistic sample surveys. More than a third of all systems (6 out of 16) combine repeated probabilistic surveys with data collected from one or more other sources: feeding program admissions, public health clinics, or community-based sentinel sites. Finally, three systems rely solely on data collected from community-based sentinel sites and public health clinics. The following table provides an overview of data collection methods used by existing surveillance systems.

Table 2. Data Collection Methods Used by National Nutrition Surveillance Systems

	Repeated probabilistic sample surveys only	Surveys + community-based sentinel sites	Surveys + feeding program admissions	Surveys + public health clinics	Surveys + feeding program admissions + public health clinics	Community-based sentinel sites + public health clinics
Number of systems	7	2	1	1	2	3
Countries	Bangladesh Djibouti Guatemala Indonesia Nicaragua Uganda Zambia	China Vietnam	Sudan	Democratic Republic of Congo	Ethiopia Somalia	Kuwait Mozambique Palestinian Territories

3.5 Characteristics of Repeated Sample Surveys

Frequency of data collection. The frequency of data collection of repeated sample surveys varies greatly among the surveillance systems. In the Democratic Republic of Congo (DRC), Nicaragua, and Uganda (and in Guatemala in 2014), the surveys occur on a rolling basis throughout the year. Survey data collection occurred every 3 months in Indonesia, while collection occurs every 4 months in Bangladesh and Djibouti, every 6 months in Ethiopia and Somalia, on an annual basis in Guatemala (in 2013) and Zambia, every 2–5 years in China, and every 10 years in Vietnam. Information on the frequency of data collection was not available for Sudan.

Geographic coverage. Geographic coverage of the surveys also varies to some extent. While these systems are purported to be national in scale, only 9 of the 13 systems (Bangladesh, China, Djibouti, Indonesia, Nicaragua, Somalia, Sudan, Uganda, and Vietnam) collect data in all/nearly all subnational regions. Other systems target subnational areas of heightened vulnerability to food insecurity (Ethiopia) or are subnational at the moment with future plans to expand to national coverage (DRC, Guatemala, and Zambia).

Sample size. Sample size varies greatly across the systems. Data are collected on children 0–59 months of age in all surveys, and sample sizes are given in number of households for some systems and number of children 0–59 months of age for others. Sample sizes range from several hundred households (540 in Nicaragua) to thousands of households (1,250 households in DRC; 3,420 in Uganda; 9,024 in Bangladesh; 9,600 in Zambia; and 44,400 in Indonesia). For systems giving sample size in number of children 0–59 months of age, sample sizes range from hundreds (200 children in Sudan) to thousands (1,194 children in Guatemala; 1,500 in Vietnam; and 3,267 in Djibouti) and tens of thousands (16,000 children in China). Sample sizes for surveys in Somalia were variable, ranging from hundreds to thousands. Information on sample size was not available for Ethiopia.

Sample design. The sample design of the surveys shows less variation. All sample designs are stratified by some higher-level administrative unit and sample among clusters of geographic units (villages, urban segments, or statistical enumeration areas). The designs have either two stages (cluster–household) or three stages (cluster–household–respondent) of sampling. Probability-proportional-to-size (PPS) sampling is the primary methodology for selecting clusters, while systematic selection (with or without prior listing operations to count the number of households) is used at the household level. When listing operations are not done before household selection, the usual approach is to estimate the total number of households in the cluster and then apply systematic selection rules based on that estimate.

Selection of survey respondents. Two main methods are used for selection of survey respondents: “take-all” approaches in which all eligible respondents in a household (e.g., children 0–59 months of age) are selected and random selection from among all potential respondents in a household. For the second method, a Kish grid is often used to determine selection.

SMART methodology. Five systems (Djibouti, DRC, Ethiopia, Somalia, and Sudan) use the SMART survey methodology. SMART (Standardized Monitoring and Assessment of Relief and Transitions) is an interagency initiative launched in 2002 by a network of organizations and humanitarian practitioners. The methodology is “an improved survey method for the assessment of severity of a humanitarian crisis based on the two most vital public health indicators: nutritional status of children under-five and mortality rate of the population.”⁶

3.6 Characteristics of Community-Based Sentinel Sites and Public Health Clinics

Three nutrition surveillance systems (Kuwait, Mozambique, and Palestinian Territories) collect data through community-based sentinel sites, which are housed primarily in schools, and through public health clinics. In Mozambique and the Palestinian Territories, data are collected on all potential respondents (pregnant women 15–49 years of age and children 0–59 months of age) who visit sentinel sites and health clinics, while in Kuwait, convenience (i.e., non-probabilistic) sampling is used to select respondents. Detailed information on sentinel sites used in China and Vietnam (which had repeated probabilistic surveys as part of their surveillance systems) was not available.

Sample sizes are quite large, with a sample of nearly 20,000 persons (including 4,200 children) in Kuwait, and a sample of more than 19,000 women, 25,000 children under 12 months, and nearly 70,000 schoolchildren in the Palestinian Territories. Information on sample sizes was not available for

⁶ See <http://smartmethodology.org/>.

Mozambique. Data coverage is national in scope in Kuwait⁷ and the Palestinian Territories, and subnational in scope in Mozambique (with plans for national-level data coverage in the future). All three systems receive technical assistance from a range of national and international stakeholders, including strong support from WHO, UNICEF, and the U.S. Centers for Disease Control and Prevention (CDC).

3.7 Reporting

Reports are produced by nearly all surveillance systems on an annual basis. Some systems complement annual reports with monthly updates (DRC, Ethiopia, Indonesia, and Nicaragua), quarterly reports (Somalia and Sudan), trimestral reports (Bangladesh, Djibouti), and seasonal reports (Somalia). Other systems issue reports after each round of surveillance (China). Many reports are available to the public for download.⁸

3.8 Strengths and Weaknesses

Systems using repeated sample surveys. Systems using repeated sample surveys demonstrate real strengths. Their technical designs are generally quite strong, and collected data (if analyzed correctly) are representative on a national scale (with the ability for analysis at the subnational level as well). Technical assistance in survey design and data analysis is also available from a variety of international actors, foremost among them, WHO, UNICEF, and CDC.

Repeated surveys can also be subject to a number of challenges. For example, systems must have staff with expertise in survey design and survey data analysis, and the ability to harness external expertise is often critical to success. Surveys are difficult to implement at all times, and more so in countries with poor infrastructure, geographically dispersed populations, or pockets of insecurity. They also generally cost more than other data collection methods.

Systems using sentinel sites and public health clinics. Systems based on data collected at sentinel sites and public health clinics avoid many of these problems. Data are easier to collect and analyze, since sampling is not an issue, and there is less need for experienced statistical staff. Costs are less than those of surveys, since additional staff is not needed for design and analysis and staff already located at the sentinel sites collect the data.

The weaknesses of systems using sentinel sites most cited by key informants were those that cut across all data collection methods: poorly trained or demotivated staff, difficulty sending data from sites to central locations in a timely and reliable manner, lack of data quality procedures to ensure proper input and analysis of data, reports not produced in a timely manner, and stakeholders not acting on information generated by the systems. One major weakness of systems using sentinel sites is that sentinel site data may be representative of the population visiting the sites, but are not generally representative of the population at large in the country, as not everyone will access the sites.

All systems. Two other major challenges encountered in the majority of surveillance systems were weak national government capacity and ownership, and the uncertainty and instability of funding. These problems have led to surveillance systems becoming nonfunctional for certain periods of time (such as in Zambia), as well as to systems ceasing operations altogether (such as in Indonesia).

⁷ In Kuwait, data are collected from Kuwaiti nationals only; non-Kuwaiti nationals, who represent 67% of the total population of the country, are excluded from data coverage.

⁸ See Section 5 on surveillance system descriptions for links to websites.

3.9 Country Context

Some of the surveillance systems operate in countries with insecurity and issues with access to services (DRC, Somalia, and Sudan), some operate in countries with isolated pockets of instability (Ethiopia, Indonesia, Mozambique, Palestinian Territories, and Uganda), and others operate in countries in various stages of development (Bangladesh, China, Djibouti, Guatemala, Kuwait, Nicaragua, Vietnam, and Zambia). No single data collection method was associated with any particular country context. In fact, countries with some of the most serious security and access issues (Ethiopia and Somalia) used a wide variety of data collection methods to inform their surveillance systems, with Somalia being an example of a very effective surveillance system operating in a difficult context.

4 Matrix of Characteristics of Nutrition Surveillance Systems

Countries	Data Collection Methodologies				Geographic coverage	Frequency of data collection	Frequency of reporting	Sample sizes	Insecurity and/or access issues*
	Repeated nutrition surveys	Community-based sentinel sites	Feeding program admissions	Health clinics					
Bangladesh	✓				National	4 months	Three times per year, annually	9,024 households	
China	✓	✓			National	> 12 months	After each round of surveillance	16,000 children 0–59 months	
Democratic Republic of Congo	✓			✓	Subnational (to be expanded in future)	Continual	Monthly, annually	655 rural households and 595 urban households	✓
Djibouti	✓				National	4 months	Three times per year	3,267 children 0–59 months	
Ethiopia	✓		✓	✓	Subnational	6 months	Monthly, annually	N/A	✓
Guatemala	✓				Subnational (to be expanded in future)	12 months (in 2013); continual (in 2014)	Annually	3,000 households; 1,194 children 0–59 months; 2,295 non-pregnant and 143 pregnant women 15–49 years	
Indonesia	✓				National	3 months	Monthly, annually	44,400 households (33,600 rural; 10,800 urban)	✓
Kuwait		✓		✓	Subnational (only Kuwaiti nationals covered)	Continual	Annually, multiyear	4,200 children 0–59 months; 12,967 students 5–18 years; 2,615 adults 20+ years	
Mozambique		✓		✓	Subnational	Continual	Quarterly	N/A	✓
Nicaragua	✓				National	Continual	Monthly, annually	540 households in 45 clusters	
Palestinian Territories		✓		✓	National	Continual	Annually	19,267 pregnant women; 25,110 children (9–12 months); 69,731 schoolchildren from 457 schools; 62 sentinel sites	✓
Somalia	✓		✓	✓	National	6 months (surveys); monthly (health and feeding centers)	Quarterly, seasonal, ad hoc (survey-related)	Variable	✓
Sudan	✓		✓		National	N/A for surveys; Continual for feeding programs	Quarterly, annually	200 children 0–59 months per livelihood zone (20 per 10 sites)	✓
Uganda	✓				National	Continual	Annually	3,420 households each year (in 114 clusters); 17,100 households (in 570 clusters) after 5 years	✓
Vietnam	✓	✓			National	> 12 months	N/A	1,500 children 0–59 months	
Zambia	✓				Subnational (to be expanded in future)	12 months	Annually	9,600 households (32 districts, 300 households per district)	

* These include countries that reported suffering from insecurity and access-related issues on a scale important enough to affect the design and implementation of the surveillance system.

5 Surveillance System Descriptions

Country	Bangladesh
Name of nutrition surveillance system	The Food Security Nutrition Surveillance Project
Government agency	Bangladesh Bureau of Statistics
Other stakeholders	Helen Keller International; James P. Grant School of Public Health; BRAC University
Years of activity	2010–present
Key objectives of system	<p>Strengthen and institutionalize past nutritional surveillance efforts in Bangladesh in order to improve the information available to planners and decision makers that will allow them to make better decisions that lead to improved nutrition</p> <p>Track progress in health and nutrition status</p> <p>Provide a system to identify vulnerable households and children before, during, and after disasters and assess impact</p> <p>Establish linkages with other policy support projects</p> <p>Strengthen capacity of the national implementing partner</p>
Data collection methods	Repeated nutrition surveys
Geographic area covered	Whole country is included in the sampling frame; additional sample taken from six zones based on 8 of the 30 agro-ecological zones on the Bangladesh Agricultural Research Council map
Sampling approach used	Varied (in 2010 district-based, while in 2011 and after based on the agro-ecological zones); stratified, clustered, cross-sectional four-stage survey with two round rotation of <i>upazila</i>
Sample size	9,024 households with a woman 10–49 years of age or a child 0–4 years of age per round in 362 communities (around 40% of households have children)
Frequency of data collection	Three times per year
Frequency of reporting	Three times per year, annually
Website	www.fsnsnp.net

Country	China
Name of nutrition surveillance system	China Food Nutrition Surveillance System
Government agency	China Center for Disease Control and Prevention; State Statistics Bureau of China; Ministry of Health
Other stakeholders	UNICEF Representative Office in China; International Life Science Institute Focal Point in China
Years of activity	1990–2010
Key objectives of system	<p>Identify the nutritional status of children under 5 years of age, along with the rapid economic development in the country in 20 years (1990–2010), and track the trend/progress of child nutrition</p> <p>Provide scientific evidence for the government on the populations and regions to focus on and to facilitate policy making</p> <p>Identify problems on child nutrition from the global economic crisis and emergencies and bring to the attention of the government</p>
Data collection methods	Repeated nutrition surveys; community-based sentinel sites
Geographic area covered	Country representative sample with 40 sites, including urban, general rural, and poor rural sites
Sampling approach used	Stratified (rural/urban), clustered, 40 sites in 26 provinces, 400 children 0–59 months of age per site
Sample size	16,000 children 0–59 months of age
Frequency of data collection	Eight rounds in 20 years (year 0, year 5, year 8, year 10, year 15, year 18, year 19, and year 20)
Frequency of reporting	Once every round of surveillance and a 20-year report
Website	N/A

Country	Democratic Republic of Congo
Name of nutrition surveillance system	Surveillance Nutritionnelle, Sécurité Alimentaire et Alerte Précoce
Government agency	Le Programme National de Nutrition; L'Institut National de Statistique; Le Service National de Surveillance Agricole
Other stakeholders	UNICEF; World Food Programme (WFP); WHO; Food and Agriculture Organization of the United Nations (FAO); Cordaid
Years of activity	2010–present
Key objectives of system	<p>Early warning for the prevention of food and nutrition crises</p> <p>Help in the planning and development of food and nutrition policies</p> <p>Monitor and evaluate programs, projects, specific activities, and policies</p> <p>Identify nutrition problems for advocacy (decision makers, public opinion)</p> <p>Mobilize and prioritize local activities (community-based nutrition security)</p> <p>Analyze and research the causes of nutritional problems</p>
Data collection methods	Repeated nutrition surveys; reported from health clinics
Geographic area covered	5 (of 11) provinces; to be expanded to all provinces
Sampling approach used	Stratified, clustered two-stage design using SMART methodology
Sample size	655 households (rural strata) and 595 households (urban strata)
Frequency of data collection	Continual
Frequency of reporting	Monthly, annually
Website	http://rdc-humanitaire.net/index.php/clusters/nutrition/systeme-d-information/231-cn-surveillance-nutritionnelle

Country	Djibouti
Name of nutrition surveillance system	Système National de Surveillance Nutritionnelle à Base Communautaire
Government agency	Ministère de la Santé
Other stakeholders	UNICEF
Years of activity	2010–present
Key objectives of system	<p>Provide data for the analysis of the food and nutrition situation on a continuous basis and using a cross-sectorial approach</p> <p>Reinforce collaboration across sectors</p> <p>Contribute to decision making on the planning of activities</p> <p>Reinforce the monitoring and evaluation of food and nutrition activities</p> <p>Have on hand pertinent and precise information on the nature, scope, and severity of nutrition problems and the monitoring of their evolution</p> <p>Contribute to the achievement of the Millennium Development Goal to reduce malnutrition by 50% by 2015</p>
Data collection methods	Repeated nutrition surveys
Geographic area covered	National
Sampling approach used	SMART methodology
Sample size	3,267 children 0–59 months of age
Frequency of data collection	Every four months
Frequency of reporting	Three times per year
Website	N/A

Country	Ethiopia
Name of nutrition surveillance system	N/A
Government agency	Emergency Nutrition Coordination Unit, Disaster Risk Management and Food Security Sector (Ministry of Agriculture); Ministry of Health
Other stakeholders	UNICEF
Years of activity	2000–present
Key objectives of system	Analysis of the nutrition situation
Data collection methods	Repeated nutrition surveys; feeding program admissions; reported from health clinics
Geographic area covered	Surveys: 24 <i>woredas</i> in 6 regions CMAM admission data: 11,000 sites in 600 <i>woredas</i>
Sampling approach used	SMART methodology Choice of <i>woredas</i> based on vulnerability and livelihood type
Sample size	N/A
Frequency of data collection	Survey: twice per year CMAM admissions data: monthly
Frequency of reporting	Monthly, annually
Website	http://www.dppc.gov.et/

Country	Guatemala
Name of nutrition surveillance system	Sistema de Vigilancia de la Malnutrición en Guatemala
Government agency	Ministry of Health
Other stakeholders	CDC; USAID Health Care Improvement Project; Instituto de Nutrición de Centro América y Panamá
Years of activity	2011–present
Key objectives of system	Collect nutritional information to inform national decision making on policy and strategy
Data collection methods	Repeated nutrition surveys
Geographic area covered	Pilot survey in five departments in 2011; annual survey with condensed national data collection in 2013; continuous monthly data collection to start in 2014
Sampling approach used	Three-stage clustered design (village, household, respondent), with Kish grid used at final stage
Sample size	3,000 households 1,194 children 0–59 months of age 2,295 non-pregnant women 15–49 years of age 143 pregnant women 15–49 years of age
Frequency of data collection	Annually
Frequency of reporting	Annually
Website	http://www.incap.int/index.php/es/publicaciones/doc_view/287-presentacion-sivim-slan-final

Country	Indonesia
Name of nutrition surveillance system	National Socio-Economic Household Survey
Government agency	Ministry of Health
Other stakeholders	Helen Keller International
Years of activity	1995–2007
Key objectives of system	Monitor nutritional status over time Evaluate the nutrition and health impact of national or subnational events, such as economic crises and natural disasters Monitor development projects and conduct special surveys
Data collection methods	Repeated nutrition surveys
Geographic area covered	Nine provinces and four large cities (over 70% of population)
Sampling approach used	Stratified, clustered, three-stage (rural) or four-stage (urban) cross-sectional design
Sample size	44,400 households (33,600 rural; 10,800 urban)
Frequency of data collection	Quarterly
Frequency of reporting	Monthly, annually
Website	http://www.rand.org/labor/bps/susenas.html

Country	Kuwait
Name of nutrition surveillance system	The Kuwait Nutrition Surveillance System
Government agency	Food & Nutrition Administration (Ministry of Health)
Other stakeholders	CDC; WHO
Years of activity	1995–present
Key objectives of system	<p>Monitor health and nutritional status of the Kuwaiti population</p> <p>Supply reliable and sustainable data on the nutritional status of people at the national and international levels</p> <p>Show trends, to enable local comparisons between the governorates</p> <p>Raise awareness about nutritional problems</p> <p>Provide guidance to health-related local intervention programs</p>
Data collection methods	Community-based sentinel sites; public health clinics
Geographic area covered	National (Kuwaiti nationals only, i.e., 33% of population)
Sampling approach used	All eligible respondents coming to sites asked to participate
Sample size	<p>4,200 children 0–59 months of age</p> <p>12,967 students 5–18 years of age</p> <p>2,615 adults 20+ years of age</p>
Frequency of data collection	Continual
Frequency of reporting	Annually, multiyear
Website	www.foodnutritionkw.org

Country	Mozambique
Name of nutrition surveillance system	Nutrition Surveillance National Program
Government agency	Technical Secretariat for Food Security and Nutrition; Ministry of Health
Other stakeholders	CDC; WHO
Years of activity	2009–present
Key objectives of system	Regularly provide more reliable information on the nutritional situation in the most vulnerable age group (6–59 months of age) to allow or realign timely interventions with the objective to control or improve the nutritional status of populations at local levels
Data collection methods	Community-based sentinel sites; public health clinics
Geographic area covered	38 districts (out of 128 districts), with plans to expand to 64 districts
Sampling approach used	All eligible respondents coming to sites asked to participate
Sample size	N/A
Frequency of data collection	Continual
Frequency of reporting	Quarterly
Website	N/A

Country	Nicaragua
Name of nutrition surveillance system	Sistema Integrado de Vigilancia de Intervenciones Nutricionales en Nicaragua
Government agency	Ministry of Health
Other stakeholders	CDC; Instituto Nicaragüense de Información para el Desarrollo
Years of activity	2001–present
Key objectives of system	Help improve the health and nutrition of women and children, through regular collection and use of information about the process and results of nutrition programs
Data collection methods	Repeated nutrition surveys
Geographic area covered	National
Sampling approach used	Continuous population-based cross-sectional clustered two-stage design (segments and households); in third stage of sampling, one child 6–59 months of age randomly selected, along with his/her mother/caretaker
Sample size	540 households in 45 clusters per year
Frequency of data collection	Continual
Frequency of reporting	Monthly, annually
Website	http://www.incap.org.gt/sisvan/index.php/es/areas-tematicas/metodologias-de-apoyo/sistema-integrado-de-vigilancia-de-intervenciones-nutricionales-sivin

Country	Palestinian Territories
Name of nutrition surveillance system	National Nutrition Surveillance System
Government agency	Ministry of Health
Other stakeholders	UNICEF; WHO; Palestinian Medical Relief Society; Palestinian Red Crescent Society and Health Working Committees; U.N. Relief and Works Agency for Palestine Refugees in the Near East
Years of activity	2006–present
Key objectives of system	Describe nutritional status accurately Detect changes in nutritional status over time Provide timely warning system for intervention Identify groups at greatest risk Provide data for policies and decisions Plan health, nutrition, and development programs Assess the impact and coverage of programs
Data collection methods	Community-based sentinel sites; public health clinics
Geographic area covered	National
Sampling approach used	All eligible respondents coming to sites asked to participate
Sample size	19,267 pregnant women 25,110 children (9–12 months of age) 69,731 schoolchildren from 457 schools 62 sentinel sites
Frequency of data collection	Continual
Frequency of reporting	Annually
Website	N/A

Country	Somalia
Name of nutrition surveillance system	Food Security and Nutrition Analysis Unit Food Security Analysis System
Government agency	N/A
Other stakeholders	Donors: Office of U.S. Foreign Disaster Assistance/USAID; European Commission Implementer: FAO Partners: Famine Early Warning Systems Network, UNICEF, WFP, FAO, Save the Children UK, U.N. Office for the Coordination of Humanitarian Affairs, CARE
Years of activity	1994–present
Key objectives of system	Provide a broad range of information users with timely and relevant information and analysis for better decision making relating to short-term food insecurity and malnutrition, as well as inform development planning to address underlying causes of food and livelihood insecurity and malnutrition
Data collection methods	Repeated nutrition surveys; feeding program admissions; reported from health clinics
Geographic area covered	National
Sampling approach used	SMART methodology (for surveys)
Sample size	Variable
Frequency of data collection	Surveys: semiannually Health and feeding centers: monthly
Frequency of reporting	Quarterly, seasonal, ad-hoc (survey-related)
Website	www.fsnau.org

Country	Sudan
Name of nutrition surveillance system	National Nutrition Surveillance System
Government agency	Ministry of Health
Other stakeholders	UNICEF; WHO
Years of activity	2007–present
Key objectives of system	Inform nutrition program design Inform nutrition program management (monitoring and evaluation) Inform policy making Use information for advocacy and fundraising Inform crisis management
Data collection methods	Repeated nutrition surveys; feeding program admissions
Geographic area covered	National
Sampling approach used	SMART methodology (community nutrition surveillance surveys collect data on a restricted set of indicators); also an area sampling approach called simple spatial survey methodology (S3M) has been extensively piloted on a national scale
Sample size	200 children 0–59 months of age per livelihood zone (20 per 10 sites)
Frequency of data collection	N/A for surveys Continual for feeding program
Frequency of reporting	Quarterly, annually
Website	N/A

Country	Uganda
Name of nutrition surveillance system	Integrated Maternal and Child Health and Nutrition Surveillance System
Government agency	Ministry of Health
Other stakeholders	CDC; WFP; Action ° = ° ° #7@
Years of activity	2013 (proposed system that was cancelled)
Key objectives of system	Provide nationally representative data on process and impact indicators for maternal and child health/nutrition interventions in Uganda so that decision makers can use the information for planning and implementing interventions and monitoring the intervention processes and impacts on the target populations
Data collection methods	Repeated nutrition surveys
Geographic area covered	National
Sampling approach used	Continuous, population-based, cross-sectional household survey with three-stage, clustered, stratified sample design
Sample size	3,420 households each year (in 114 clusters), with a different nationally-representative set of 114 clusters selected each year 17,100 households (in 570 clusters) after 5 years
Frequency of data collection	Continual
Frequency of reporting	Annually
Website	N/A

Country	Vietnam
Name of nutrition surveillance system	General Nutrition Survey
Government agency	National Institute of Nutrition (Ministry of Health)
Other stakeholders	UNICEF, FAO, WHO
Years of activity	N/A
Key objectives of system	Monitor nutrition level of children 0–59 months of age
Data collection methods	Repeated nutrition surveys, community-based sentinel sites
Geographic area covered	National
Sampling approach used	Stratified, clustered, three-stage sample design
Sample size	1,500 children 0–59 months of age
Frequency of data collection	Every 10 years
Frequency of reporting	N/A
Website	N/A

Country	Zambia
Name of nutrition surveillance system	National Nutrition Surveillance System
Government agency	National Food and Nutrition Commission; Ministry of Health
Other stakeholders	UNICEF; WFP; Consortium for Food Security, Agriculture and Nutrition, AIDS, Resiliency and Markets
Years of activity	2007–2009
Key objectives of system	<p>Monitor and provide information on key nutrition indicators at the district level for program planning and interventions</p> <p>Monitor the nutritional status of vulnerable groups, especially children under 5 years of age and women of reproductive age, over time</p> <p>Assess existing dietary diversity patterns at the district level</p> <p>Monitor and evaluate key national nutrition interventions at the district level</p> <p>Provide information for advocacy for nutrition program support and resource mobilization</p> <p>Monitor household access to safe drinking water and sanitation</p> <p>Develop a national database on nutrition in Zambia</p> <p>Examine linkages between nutrition status and household food security</p>
Data collection methods	Repeated nutrition surveys
Geographic area covered	32 (of 74) districts in all nine provinces, with goal to expand to all districts
Sampling approach used	Two-stage, stratified, cluster sample design
Sample size	9,600 households
Frequency of data collection	Annually
Frequency of reporting	Annually
Website	http://nfnc.org.zm/

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