Improving Nutrition Information Systems: lessons from Kenya

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Location: *Kenya*

What we know: Strong nutrition information systems (NIS) are critical for timely, effective nutrition emergency response.

What this article adds: Though a Government-led Nutritional Technical Forum had been established during the 2006 drought and a Nutrition Information Technical Working Group (NITWG) initiated, key lessons post 2008 emergency in Kenya prompted a concerted effort to ensure quality nutrition information is available to guide a coordinated programme response. Challenges identified included non-standard indicator use, duplicative and inconsistent data collection mechanisms, and inconsistent results from infant and young child feeding (IYCF) data. Recommendations from a detailed evaluation by the US Centers for Disease Control and Prevention (CDC) were adopted and implemented. These included streamlining indicators and processes in district NIS, aligning anthropometric data with global guidance, capacity development of the drought early warning surveillance system, standardising indicators and survey schedules, and improving data quality of large-scale surveys. Three data clinics were held to critically review and triangulate data, standardise tools and methods and provide stakeholder guidance. A user-friendly, accessible, web-based centralised database was developed. NIS developments improved timely response in 2016 to drought-related emergency. Technical support and capacity accessed and coordinated through the NITWG was instrumental to a successful Kenya Demographic Health Survey (DHS) in 2014. Key components of success were strong government leadership and stakeholder commitment, a strong coordination mechanism, inter-sector linkages, mapping of partner capacity, integration within existing systems, and regular capacity-strengthening. A committed team and structures to follow through recommendations and actions is key.

Background

In Kenya pre-2012, nutrition information for children was mainly collected by the Kenya National Bureau of Statistics (KNBS) through national surveys to inform higher-level planning, while the main government nutrition information system (NIS), the Child Health and Nutrition Information System (CHANIS), collected nutrition indicators at health facilities for monitoring purposes. The health facility's main role was hard-copy data collection (tally sheets) for consolidation at district level; data analysis, review and utilisation at facility level was uncommon. In highly vulnerable areas, small-scale nutrition surveys, mainly at district or lower level, were led and funded by United Nations (UN) agencies or non-governmental organisations (NGOs). Although an integrated SMART survey guideline was available, data collection tools and analysis of non-anthropometric indicators varied across organisations and objectives and data needs were often donor-driven. Typically, raw data and reports were not centrally available or managed by the Ministry of Health (MoH) and served internal programme needs.

National Nutrition Information Technical Working Group (NITWG)

After reviewing lessons learnt, the nutrition sector agreed to strengthen the Kenya Nutrition Technical Forum (NTF) and the National Nutrition Information Technical Working Group (NITWG), which had been formed during the 2006 drought in Kenya and, led by the MoH, and mainly largely focused on emergency nutrition programmes and information in arid and semi-arid areas. The role of the NITWG waswaswas to mainly to review and validate NIS in the sector and to ensure timely, quality nutrition information wais available to guide programme response. The functions of the NITWG have since expanded to ensuring the establishment and sus-

Moderately malnourished children under the age of 3, pregnant women and nursing mothers receive specialised nutritional support, in Turkana district in north-western Kenya

tainability of a functional NIS through the actualization of strategic objectives 9 and 10[1] of the National Nutrition Action Plan (NNAP) 2012-2017. This aims to strengthen nutrition surveillance, monitoring and evaluation systems and to enhance evidence-based decision-making.

NIS challenges

In 2012/2013, the NITWG identified several key NIS challenges during working group review meetings:

- Indicator definitions and collection methods used were not standardised despite global guidance, especially for non-anthropometric indicators such as infant and young child feeding (IYCF), food security, micronutrient deficiencies and water and sanitation. This severely limited trend/meta-analysis across regions.

- Some monthly health facility indicators reported in the District Health Information Systems (DHIS), such as on breastfeeding and stunting, were difficult to interpret. The stunting indicator from health facilities significantly underestimated the burden of stunting, mainly due to low reporting rates, limited access to equipment, poor quality of height measurements due to limited staff, and age bias (younger children visit facilities more frequently). The indicator on exclusive breastfeeding (EBF) overestimated EBF rates due to self-reporting bias; data were only collected from mothers who visited the health facility and were therefore not representative of the population and there was likelihood of the same mother responding multiple times, depending on how often she visited the clinic. When these indicators were compared to representative, population-based surveys, the results from health facilities were always significantly different, making it difficult to inform programmes on progress.

- IYCF indicators integrated into SMART

surveys had wide confidence intervals, erratic results and were difficult to compare over time.

To address these concerns, in 2013 the NITWG called for an evaluation of the Kenya nutrition surveillance system by the US Centres for Disease Control and Prevention (CDC) with support from UNICEF. The team from CDC Atlanta[2] evaluated NIS and made several recommendations to improve the system. One of the key recommendations was to support government-led information systems that already routinely collect nutrition data (the DHIS, the National Drought Management Authority (NDMA) early warning system and the national surveys conducted by the KNBS) because they have the widest coverage, enjoy received have government leadership and ownership (therefore constituting a more sustainable approach) and are more likely to be supported by multiple partners. Additional recommendations focused on data quality improvement initiatives across all nutrition information sources and on strengthening inter-sector linkages. The NITWG adopted the evaluation report and prioritised planning and implementation of actions related to improving data quality and reporting across all nutrition information sources. This article shares the experiences of the NITWG in delivering on this remit.

Review of the Nutrition Information System

The regular, twice-monthly NITWG meetings provided inadequate time to address the evaluation recommendations, so a 'data clinic' workshop was held 3-5 September 2013 to review with key partners the indicators, methodologies and timing/frequency of surveys and assessments. The MoH, with technical and financial support from UNICEF and Action Against Hunger (NITWG chair), led the clinic; participants included the World Food Programme (WFP), Food and Agriculture Organization (FAO), NGO partners,

NDMA and food security technical experts. To date there have been three data clinics each tackling key issues of indicator definition, quality, reporting and methodologies (see later), and reviewing the progress and challenges observed since the previous clinic. The following summarises the evaluation findings, recommendations and subsequent actions taken.

District Health Information Systems

The CDC evaluation reviewed 11 key nutrition indicators routinely collected through the DHIS system: underweight, stunting, vitamin A supplementation, iron folate supplementation, treatment of severe acute malnutrition (SAM), treatment of moderate acute malnutrition (MAM), deworming, growth monitoring, early breastfeeding initiation, exclusive breastfeeding and micronutrient powder supplementation. Key challenges highlighted were as follows:

The same indicator was collected in more than one form (e.g. MoH 711 for Child Health and MoH 713 Nutrition Monthly Monitoring) which each used different age categorisations, classifications, and had different reporting rates.

Health facility stunting data were significantly different from survey data. An estimated 10% of the facilities[3] had information on stunting at the time of the review; low reporting/poor data quality was mainly linked to limited access to height boards, lack of time and staff for measurement, and skewed age distribution of children presenting at the health centre (majority under one year of age).

Key recommendations and actions taken to address these issues were:

- Standardise reporting where there was more than one form collecting the same information. It was agreed that all nutrition indicators will be reported in one form. To help ensure health facilities had adequate supplies of the required DHIS tools, printing and distribution were supported by UNICEF and WFP.

- Two indicators – stunting and exclusive breastfeeding rate – cannot be accurately reported using the DHIS; these indicators should be collected in population-based surveys only and the NITWG should work closely with the KNBS to ensure accurate collection (including training and developing systems for quality checks on indicators). The NITWG has since offered committed technical support and guidance to ensure quality of nutrition indicator measurements in large-scale surveys conducted by the KNBS, such as the 2014 Demographic Health Survey (DHS) and the Kenya Integrated Household Budget Survey (KIHBS).

1 Strategic objective 9: Strengthen nutrition surveillance, monitoring and evaluation systems. Strategic objective 10: Enhance evidence-based decision-making through operations research.
2 Dr Oleg Bilukha, Associate Director of Science, and Eva Leidman, Epidemiologist – Emergency Response and Recovery Branch, Center for Global Health, US Centers for Disease Control and Prevention.
3 CDC Evaluation Report 2013

Box 1   Nutrition situational analysis to improve emergency response in Kenya

The NITWG worked closely with the DISK to improve the nutrition data collection and analysis process and harmonise data from different sources/times in the seasonal assessments. The critical steps the NITWG took were firstly, to ensure that all nutrition surveys were planned and conducted during the start of hunger season and that the information collected also fed into the long and short rains seasonal analysis. Secondly, the NITWG worked closely with the DISK to review the data collection, quality and analysis of early warning indicators, such as the prevalence of acute malnutrition based on MUAC data collected from sentinel sites. Lastly, the NIWG adapted the nutrition IPC process for analysis in 2014. This was conducted during the seasonal

analysis that takes place in February and August every year.

In 2016, the short rains assessment conducted in February indicated a deteriorating nutrition situation; by the following seasonal assessment in August 2016 it was clear that the nutrition situation was deteriorating further based on the detailed analysis conducted by the NIWG. A detailed nutrition sector response plan was subsequently developed for current and projected needs. Although the government declared a state of emergency as a result of due to the deteriorating food security and nutrition situation in February 2017, the nutrition sector already had a nutrition sector response plan in place and was responding to the situation based

on the information provided earlier from the NITWG.

At county level, the information from the nutrition IPC was also used to help counties access the county drought contingency funding, used to expand outreach services to increase coverage of services for children. The systematic review of nutrition information using the IPC process helped provide a standard and systematic way of reviewing the nutrition indicators for appropriateness and quality. The process allows for comparison across different locations and over time. It clearly articulates the factors likely to be affecting the nutrition situation; this makes it easier to develop appropriate nutrition response plans for the short and long term.

- The NITWG should work closely with counties to support the capacity-building of staff to improve the analysis and quality of data and provide guidance to staff on simple data quality checks, discussing findings in the in-charge facility meetings. Through the support of UNICEF, a nutrition information officer was made available to visit the county health facilities and provide on-the-job training, guidance and support on nutrition indicators in the Health Management Information System (HMIS) system.

National Drought Management Authority early warning surveillance system

The NDMA collects monthly information from sentinel sites in the arid and semi-arid areas (ASAL) of the country. Indicators include food security indicators such as rainfall, vegetation coverage index (VCI), market prices (food and livestock), livestock body condition, water availability and cost, milk production and availability, mid-upper arm circumference (MUAC) in children aged 12-59 months, and health and morbidity data. The evaluation found that MUAC data were reported as the prevalence of children with MUAC < 135 mm, which was referred to as children at risk of acute malnutrition, and not further disaggregated in the categories (1) <135 mm to ≥125mm (at risk), (2) <125 to > 115 mm (MAM) and (3) <115mm (severe acute malnutrition (SAM)) as internationally accepted. It was agreed that applying the standard thresholds for acute malnutrition and improving data quality would help realise the potential of the NDMA early warning system.

To address this, the NITWG linked with the NDMA to review the current data and discuss avenues of improving data quality through joint data quality assurance visits and agreed on capacity-building plans for NDMA information officers. In 2013, UNICEF supported a two-day training for country nutrition officers on nutrition information analysis and reporting. Focus areas were proper measurement technique for MUAC; nutrition indicator analysis, including DHIS information review; and the use

of emergency nutrition assessment software (ENA) for SMART to check the quality of MUAC data sets.

In late 2014 and 2015, with the support of the UNICEF regional office, the NDMA information officers from all ASAL areas were trained on SMART surveys. This enabled them to participate and take ownership of nutritional surveys in their counties and be better placed to report on county nutrition surveillance. The Kenya Food Security Steering Group (KFSSG) Data and Information Subcommittee members and the chairperson of the KFSSG were also trained on SMART and nutrition surveillance methods to better interpret nutrition information. This training was crucial to help the KFSSG key members understand the rigour and processes involved in nutrition surveys and how this information can be used for better programming.

On review, the NDMA early warning system, in consultation with the NIWG, agreed to report the number of acutely malnourished children using the global standards of <125mm and <115mm. For purposes of trends and continuity, children less than <135 mm continued to be reported.

Standardising indicators and timing of nutrition surveys

Surveys that collect nutrition information in Kenya included SMART surveys at a county level in the most affected locations, DHS and special nutrition studies and research. To track progress and allow development of a central database of raw data and reports, standardised core nutrition indicators and variables were agreed; during data clinics, minimum indicators and required data were determined for each sector and for maternal and infant and young child nutrition (MIYCN) assessments. Guidance on key technical issues was provided. IYCF surveys should no longer be combined with SMART surveys, . as the SMART sample size for children under two years of age is too small for IYCF indicator data collection and IYCF behavioural changes are likely to happen over a longer period, requiring less frequent surveying than is typical for SMART surveys. A coordinated
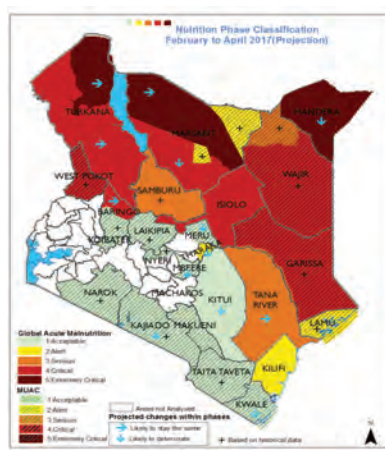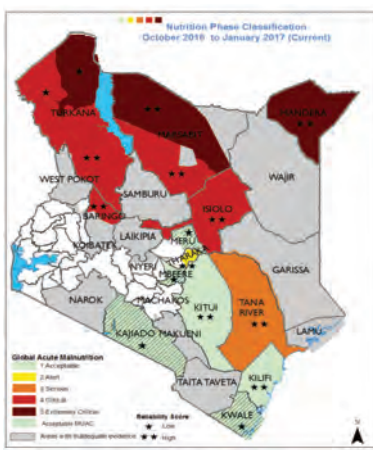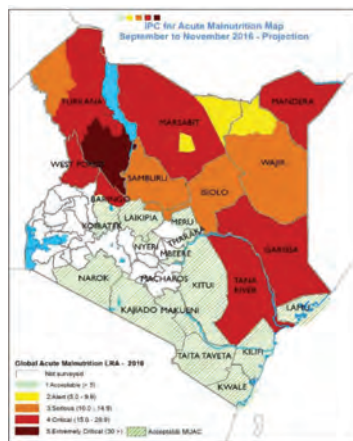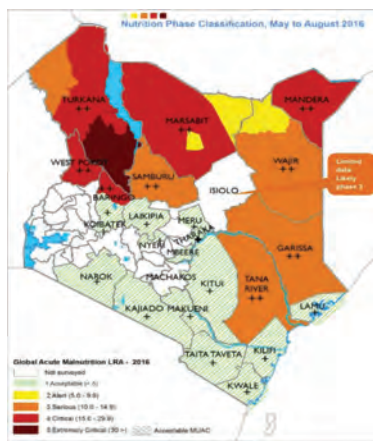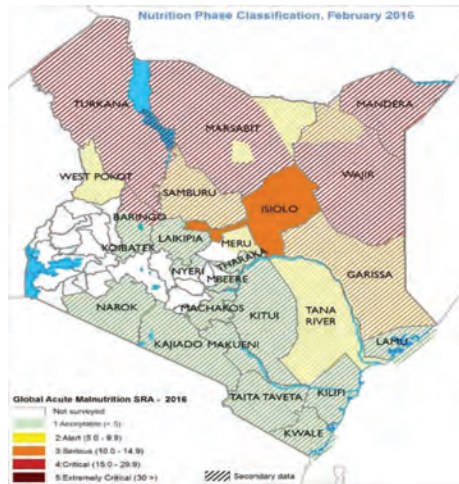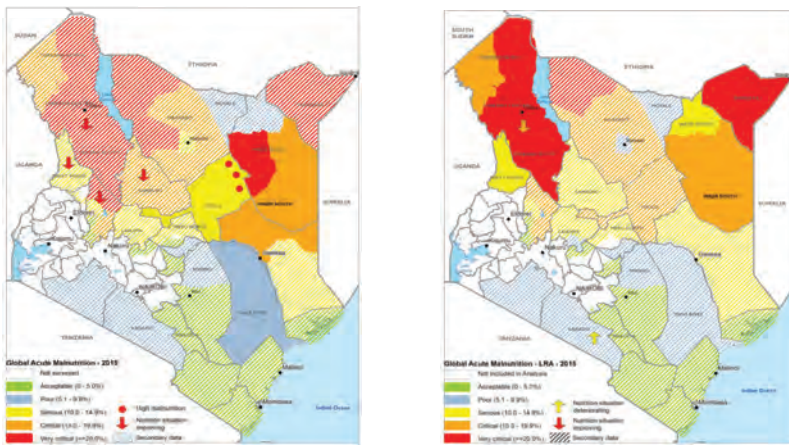
and standardised survey schedule was also agreed upon. Surveys should be conducted at the start of the hunger season and aligned to food security assessments to allow for complementary analyses. A detailed survey plan, based on consultations with the KFSSG and DISK members, was developed for the drought-prone areas to ensure timely nutrition information collection to feed into overall food security and nutrition seasonal assessments.

These developments enabled the NITWG to more easily conduct Integrated Phase Classification (IPC) analysis for food security and nutrition in most ASAL areas (less information was available for semi-arid parts of the country where surveys were less frequent). For example, the existence of a central database ensured that all data to inform the analysis were available and clearly organised, allowing all partners to review information. This helped the NITWG to monitor data quality and availability across the ASAL areas and work closely with NDMA to improve data quality. In addition, seasonal assessment findings and IPC analysis were released at the Kenya Food Security Meeting (KFSM), a high-level food security and nutrition forum, ensuring that nutrition information was shared with key stakeholders in the country for immediate action. IPC analysis products (IPC maps, showing the most affected areas, (see Figure 1 for examples) the caseloads of children affected with malnutrition and key recommendations) were shared in a one-page infographic. This quickly highlighted the nutrition situation, the number affected and the immediate assistance required. Released alongside the food security analysis, this report forms the basis for the sector emergency response plan that is produced both at national and county level, which is used to plan for interventions and mobilise required resources. An example of how timely, integrated assessment has informed emergency response is shared in Box 1.

National surveys: DHS and micronutrient surveys

The NITWG also committed to work very closely with the KNBS and take an active role in their

Figure 1 — Examples of maps produced as part of nutrition situational analyses

training, standardisation tests and field supervision during national surveys to improve the quality of nutrition indicators collected in large-scale surveys. The NITWG worked closely with KNBS during the Kenya DHS in 2014 to improve the quality of nutrition indicators (see Box 2).

Data quality assurance activities

Data clinics

The main objective of the nutrition data clinics was to critically review all nutrition indicators across every source of nutrition information (surveys, DHIS, sentinel sites) to standardise tools and methods and provide guidance to all key partners and stakeholders. Linkages with the Water, Environment and Sanitation Coordination sub-sector coordination group (WESCORD), KFSM and the HMIS were strengthened, making it easy to improve data collection, analysis and dissemination. A second data clinic (the first was in 2013; see above) was held in 2015, informed by a prior technical meeting between the NITWG and the micronutrient working group. The meeting reviewed micronutrient programme monitoring. The specific aims were to streamline micronutrient indicators in both routine and population-based data sources and to ensure that information collected is what is required to improve micronutrient programmes. The subsequent data clinic exercise focused on programme monitoring and coverage and linking information to action.

The NITWG identified measuring coverage and establishing strong linkages with other sectors as two of the main challenges to ensuring the proper use of integrated nutrition information. The recommendations from both data clinics held in 2015 have been adapted and have proved useful in improving overall reporting of nutrition indicators. The NITWG is in the process of finalising a manual that consolidates guidance on conducting coverage assessments using various coverage assessment methods such as SQUEAC, LQAS and KPC[4].

Joint data quality assurance activities

The NITWG partners drew up plans to support joint data quality review visits to health facilities, working with county government staff and county partners to review data at facility and county levels. The visits were supported by the national HMIS officer and UNICEF information officer. Partners also worked closely with NDMA county information officers to review data collected at sentinel sites and provided training to the field enumerators on MUAC measurements. These activities supported the improvement of data quality at the county level. NDMA information officers used ENA software to discuss quality issues with field enumerators.

Data access

There was a need for central storage of data, accessible to all stakeholders in a user-friendly format. This led to the development of the Stat Planet web-based database with spatial features and an online interactive dashboard (www.nutritionhealth.or.ke). Both anthropometric and non-anthropometric indicators from 2009 forward are included.

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4 Semi-Quantitative Evaluation of Access and Coverage (SQUEAC); Lot quality assurance sampling (LQAS); Knowledge, Practice and Coverage (KPC)

Discussion and conclusions

Several key facilitating factors have helped enable improvements in the Kenya NIS. The first relates to a strong policy environment, the existence of a common results framework and government leadership, which have all of which have greatly aided its improvement. The Government's commitment to strong a NIS is reflected in the Kenya Food and Nutrition Security Policy (FSNP) and the Kenya NNAP 2012-2017. Key priorities stipulated in the FSNP and that which are further unpacked in the NNAP 2012-2017 include:

- Strengthen networking and coordination of relevant sectoral and integrated databases of all stakeholders and their applications to enhance all aspects of food security and nutrition analysis, understanding and activities in Kenya;
- Enhance the collection and use of knowledge and information at the national, county and community levels;
- Encourage monitoring of food consumption and dietary indicators;
- Support systems to enable feedback of information effectively in appropriate formats on food security and nutrition to priority audiences, including national, sub-national and community levels, using appropriate media;
- Strengthen nutrition surveillance, data collection, analysis and dissemination; and
- Promote use of technologies to enhance cost-effectiveness, timeliness in reporting and user-friendliness.

A system for monitoring and evaluation (M&E) has further been identified as a critical component of the implementation of the FSNP and NNAP

and a National Nutrition Monitoring and Evaluation Framework has been developed. The Framework aims to meet the information needs of different stakeholders. The principles that guide nutrition monitoring and evaluation are:

- 'Three ones' principle: One national coordinating authority; one agreed comprehensive national nutrition plan of action; and one agreed country-level nutrition monitoring and evaluation framework;
- Mainstreaming of M&E in all nutrition interventions at all levels;
- Integration of nutrition data elements and indicators in the existing information systems, such as the DHIS (no parallel/vertical systems); and
- Decentralisation, analysis and storage of data at the operational level.

Improvement in the Kenya NIS has been further facilitated by the existence of a centralised NIS with the MoH acting as secretariat of the NITWG. All data files and reports for nutrition surveys and assessments are submitted to the MoH for storage in a central repository.

Finally, a strong coordination mechanism, inter-sector linkages, mapping of partner capacity, integration within existing systems and regular capacity-strengthening have all been key ingredients of success. Kenya has a functional and vibrant NITWG with clear terms of reference and considerable capacity to offer guidance and support to the NIS. Task forces such as the SMART surveys task force, HMIS taskforce and coverage assessment task force have been formed, taking technical needs and current capacities into consideration. This has increased rigour and enhanced achievement of tasks. Member

focal points who have subject interests/expertise have represented the NITWG in respective sector or intra-sector working groups. This allows the group to be aware of the proceedings of other groups/sectors, to understand information needs and to identify opportunities for integration and resource leverage.

Even with an advanced NIS, there are areas that require improvement. Matters for attention in Kenya include:

- Capacity-strengthening in nutrition IPC, indicator definitions, data triangulation and nutrition information management at county level and qualitative data analysis;
- Continuous data quality improvement;
- Standardising coverage assessment methodologies; and
- Advocacy for data utilisation, evidence-based planning and decision-making.

In conclusion, the Kenya case highlights that the establishment of a functional and sustainable NIS requires strong government leadership and commitment from all stakeholders, building institutional capacities and structures; identification of key facilitating factors/opportunities to leverage; and identification of gaps and areas requiring improvement and the key strategies to address them. A committed team and the structures to follow through recommendations and actions are key. It is hoped that other countries will find this article useful in providing practical measures for setting up a functional information system.

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