INNOVATIONS IN NUTRITION INFORMATION SYSTEMS
SUMMARY
Information systems in nutrition are systems designed to continuously collect, analyse, interpret and share nutrition-related data¹. Nutrition information systems play a key role for targeted action in population, nutritional health and food insecurity. Useful for advocacy, planning, budgeting, program design, and monitoring and evaluation, nutrition information systems serve many purposes. In more detail, nutrition information supports measuring changes in the nutrition status of vulnerable people, namely women and children, tracking progress in the implementation of actions, helping the prioritisation of responses². Nutrition information assists in decision-making on policy and nutrition programme design, legislation, channelling of resources and implementation. Above all, the functioning of nutrition information systems determine how and what nutrition programmes are prioritised³. In order to make these decisions, actors must understand why people are deprived. Such understanding requires timely and accurate evidence based information. Whereby, the availability of reliable data, statistics and information, adequate capacity to analyse the available information and good communication skills to inform decision-makers are paramount (3). Therefore, well-organised and functioning nutrition information systems and tools are critical for timely, effective nutrition responses.

Nutrition information systems should ideally respect a continuous or cyclic process, following the principle of the triple A.

- **ASSESSMENT** Service generated data recording and timely reporting
- **ANALYSIS** Analysis and interpretation of the data based on the national guidelines and procedure
- **ACTION** Decision making, dissemination and implementation using the information, followed by further assessment.

This analysis reviews nutrition information tools used in the field, with a particular emphasis on innovations in nutrition information systems that support collection, analysis and dissemination of nutrition data to assist decision making in nutrition programmes. This report mainly focuses on nutrition and health specific tools, branching out to general tools that are also used in the context of nutrition.

Disclaimer: The information collected on the tools were only collected online except for the Action Against Hunger ones.

INTRODUCTION
TRIPLE A CYCLE: HOW EACH ELEMENT OF THE CYCLE IS CONNECTED TO THE OTHER

---

WHAT THE TOOL IS
CommCare is an open-source (albeit not free) mobile health platform, provided by Dimagi Inc., which provides both a mobile phone app and a web interface for data collection.

USES OF THE TOOL
Non-governmental organisations, public health organisations, research institutions and governments mostly are the targeted audience of this tool, whereby health programs can store and access patient information and perform case management for at-risk patients. Featured in the Health Compendium Volume 5 of USAID, CommCare also contains checklists and educational prompts to aid health workers in the promotion of preventative ill-health measures, nonetheless the tool requires training for Community Health Workers (CHWs) and Health Programme (HP) coordinator.

EXAMPLE OF WHEN USED
The platform is used by MSF as a data collection tool for Community Health Workers (CHWs) in supporting non-communicable disease (NCD) patients. The CommCare mobile platform was used to create the Integrated eDiagnostic Approach (IeDA), implemented by Terre des hommes (TDH). IeDA is a suite of diagnostic support and mobile data collection tools to support nurses in the Integrated Management of Childhood Illnesses (IMCI) in Burkina Faso, in order to reduce diagnostic error through the automation of assessments. The tool is deployed in 30% of all health clinics (over 620) in Burkina Faso, with the aim of reducing under-5 child mortality. Most recently, a consortium between TDH, World Vision and Action contre la Faim was launched to include the management
Acute Malnutrition (CMAM) and Positive Growth Monitoring Promotion (GMP), Community-based Management of such as Growth Monitoring Promotion support a variety of nutrition programmes. Dimagi Inc. advertises that CommCare can be a solution to improve quality of health services and reduce childhood mortality in low resource settings. The tool includes e-learning and capacity building and real-time data collection.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

Dimagi Inc. advertises that CommCare can support a variety of nutrition programmes such as Growth Monitoring Promotion (GMP), Community-based Management of Acute Malnutrition (CMAM) and Positive of malnutrition. This collaboration has led to development of Alliance for integrated e-DataAgro (AnAgro), which is in its designing phase. It is an adaptable digital solution to improve quality of health services and reduce childhood mortality in low resource settings. The tool includes e-diagnosis and clinical decision support, e-learning and capacity building and real-time data collection.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

Dimagi Inc. advertises that CommCare can support a variety of nutrition programmes such as Growth Monitoring Promotion (GMP), Community-based Management of Acute Malnutrition (CMAM) and Positive consuming tasks and enhance protocol adherence, data completeness, and timely referrals. Finally, the platform enables the tracking of beneficiaries throughout visits, notifies them regarding the availability of nutrition programs locally, and engages them about positive health practices with behaviour change messaging.

EXAMPLE OF WHEN USED

CommCare is used in projects run by various nutrition organizations. For example, World Vision implemented CommCare applications in nine countries in Africa, Southeast Asia and the Middle East to support CHWs in the screening of children for nutrition status and related illnesses.


WHAT THE TOOL IS

Devinfo is a powerful integrated desktop and web-enabled database system for monitoring human development indicators. This database is an interagency initiative, developed under the support of United Nations (UN) System, and managed in its behalf by United Nations International Children’s Emergency Fund’s (UNICEF) Data, Research and Policy with the support of United Nations Development Group (UNDO). The database compiles Nutrition Country Profiles, presenting indicators to monitor the implementation of the multi-sectoral District Plans to Eliminate Malnutrition (DEPEM) at the sub-national level after declaring the fight against malnutrition a national emergency. Devinfo allows tracking of all major indicators, plans and activities, allowing districts to generate quarterly progress reports, drawing information from the health management information system and community sanitation information system, community-based nutrition programmes, and rapid SMS messages from community health workers. District hospitals are in charge of analyzing and disseminating the data for their health centres, sectors and communities.

USES OF THE TOOL

Devinfo was designed for the collection, dissemination and presentation of human development indicators (9). Originally developed as Childinfo to monitor the World Summit for Children, and later upgraded with the purpose of monitoring the progress to the Millennium Development Goals (MDGs), the data has been used to feed into the Sustainable Development Goals (SDGs). Devinfo can be used as a data entry tool, to support CHWs in the screening of children for nutrition status and related illnesses.

EXAMPLE OF WHEN USED

The ministry of Health in Rwanda created a database in Devinfo to support and monitor the implementation of the Nutrition Information System. The database compiles Nutrition Country Profiles, presenting indicators to monitor the implementation of the multi-sectoral District Plans to Eliminate Malnutrition (DEPEM) at the sub-national level after declaring the fight against malnutrition a national emergency. Devinfo allows tracking of all major indicators, plans and activities, allowing districts to generate quarterly progress reports, drawing information from the health management information system and community sanitation information system, community-based nutrition programmes, and rapid SMS messages from community health workers. District hospitals are in charge of analyzing and disseminating the data for their health centres, sectors and communities.

WHAT THE TOOL BRINGS TO NUTRITION INFORMATION

Devinfo was designed for the collection, dissemination and presentation of human development indicators (9). Originally developed as Childinfo to monitor the World Summit for Children, and later upgraded with the purpose of monitoring the progress to the Millennium Development Goals (MDGs), the data has been used to feed into the Sustainable Development Goals (SDGs). Devinfo can be used as a data entry tool, to support CHWs in the screening of children for nutrition status and related illnesses.
WHAT THE TOOL IS

The Dharma tool, co-founded by Jesse Berns and Michael Roytman, and owned by Dharma Platform Inc., is a data management platform designed to manage all activities at once (i.e. all-in-one platform), with the objective of supporting data driven decisions in the health, logistic and research sectors. Epidemiologists, scientists and field practitioners developed the platform during the West Africa Ebola epidemic.

USES OF THE TOOL

The Dharma application integrates with collection, management, secure storage, analysis, and visualisation features to manage projects, staff, identify and collect information, and to analyse and share it in real time. It allows the building of sophisticated forms and workflows, as well as doing sophisticated data analysis, all in one portal. Dharma responds to the needs:

(a) to build different types of surveys (one-shot, repeated data collection overtime/ follow-up of beneficiaries at health facilities, follow-up food distribution, water ponds etc.),
(b) for a data collection tool and
(c) for advanced data analysis.

EXAMPLE OF WHEN USED

MSF have used the software platform Dharma in their Health Surveillance Programme (HSP), in response to their need for a mobile data collection tool in difficult settings (e.g conflict affected zone) with no regular surveillance program in place. A review of the MSF HSP in crisis affected areas of the Middle East found that using Dharma improved decision-making, resource allocation, and operations targeting compared to anecdotal data models (often paper-based methods) due to timeliness and accuracy of information enabling staff to better understand conditions in real-time.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

The Dharma software can be used to support food security and nutrition-related programs, such as nutrition needs assessments, clinical trials, and electronic nutritional health records.
DISTRICT HEALTH INFORMATION SYSTEM 2 (DHIS2)

WHAT THE TOOL IS

DHIS2 is a free, open-source, web-based Health Management Information System developed by the Health Information Systems Program (HISP) at the University of Oslo (UiO)14. It was firstly implemented in 2006 in India15 and is a tool for collection, storage, validation, analysis, visualization and presentation of health information data16. Various mobile solutions are available such as SMS-functions and Android and low-end Java -apps for offline data collection14.

HOW IT WORKS

Each country has its own platform and owns the application and data with guidance from the HISP (14). The tool enables real-time data visualization through dashboards, scorecards, pivot tables, maps and charts. A Dashboard App allows users to customize these features, analyse data and easily share it and communicate with others. The DHIS2 Tracker facilitates individual-level data collection over time, e.g. about nutrition, immunization, pregnancies or lab samples, often to establish digital health records with information on patient history, treatment and risks. An Android-App aids frontline workers where initial data is gathered in a simplified version working offline to ensure access in remote areas15. SMS-services can be applied to send reminders to patients about visits, enter health data, contact health workers and more17.

USES OF THE TOOL

DHIS2 is endorsed by WHO as a global public good and is broadly used in more than 100 countries, e.g. in routine reporting for facility, district and community health, education, water, sanitation and agriculture14, and is the national health information system in 67 countries. It is also used by many non-governmental organisations in managing routine data for their own programmes18.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

It brings support to countries in strengthening their national health information systems collecting all data in one place as well as facilitating collaboration across countries, giving more accurate reporting of health data, and aiding in decision-making16.

EMERGENCY NUTRITION ASSESSMENT (ENA) SOFTWARE

WHAT THE TOOL IS

The Emergency Nutrition Assessment (ENA) software is an analytical programme used in Standardized Monitoring and Assessment of Relief and Transitions (SMART) surveys to facilitate survey planning, data collection, analysis and reporting. It was first implemented by SMART in 2007 and most recently updated in 201519.

HOW IT WORKS

The software includes functions for automated sample size calculation and selection, plausibility checking and standardization for anthropometry measures with tables and graphs19. It focuses on anthropometric and mortality indicators and automatically creates analyses and reports19.

USES OF THE TOOL

It is used when conducting SMART surveys, but does have some limitations. Therefore, software has been created combining ENA with Epi Info, providing simple questionnaire and database construction, data entry and analysis, applying epidemiologic statistics, and creation of graphs and maps, with the purpose of making field surveys easier and more reliable. Data is thus entered with Epi Info, evaluated through ENA and further statistically analyzed with Epi Info. Analysis of food security is also available19.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

Easy, reliable data collection and analysis for SMART surveys, focusing on anthropometrics and mortality.
WHAT THE TOOL IS

FEWS NET® was created in 1985 by USAID and offers an evidence-based system for early warning of food insecurity and famine. It was designed to help decision-makers prepare for drought, famine, and other food security issues. There is a website with information and maps on current and projected food insecurity, timely alerts on developing or probable crises, and reports about climate, markets, trade, agriculture, livelihoods, nutrition, and food support.

HOW IT WORKS

FEWS NET works in 38 countries through national and international partnerships with governments and non-governmental organizations. Main activities include monitoring and analyzing data related to food security, food security classification, administrative boundaries, livelihood zones, remote sensing imagery, and price and cross-border trade — provided by the FEWS NET Data Center. In-depth reports are published on the website, where each of the 38 countries has a page with up-to-date information. Productions are made using Scenario Development — an eight-step approach to combine the web of factors influencing food security and describing the scenario most likely to happen as well as classifying expected levels of food insecurity six to twelve months in advance.

USES OF THE TOOL

The tool is used for governmental or relief agency decision-making in early warning and planning responses to humanitarian crises. It is also used in reaching long-term development goals, e.g., poverty reduction and adaptation to climate change as well as anticipating new areas and populations becoming food insecure in the future. Examples of use include assessment of impact of drought on poor farming households in Somalia, estimation of the effect of currency devaluation in Malawi on food security and project impact of extensive flooding in Nigeria on the regional market.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

It provides extensive evidence-based analyses of current and projected food insecurity, and both monthly and specialized reports on its impact on nutritional status of affected populations. This entails obtaining recent, accurate, reliable, and representative data on the current nutrition and mortality status of certain areas, exploring causes, contextualizing data and integrating it in the food insecurity classification.
WHAT THE TOOL IS

The Nutrition Landscape Information System (NLIS) is a web-based tool which brings together WHO Global Nutrition Databases and other food and nutrition-related health and development data from partner agencies. The NLIS was developed as part of the Landscape Analysis on Readiness to Accelerate Action in Nutrition, and is available on the World Health Organization (WHO) website.

HOW IT WORKS

The web tool brings together data in the form of automated country profiles and user-defined downloadable data, structured according to the UNICEF conceptual framework for causes of malnutrition. NLIS currently draws publicly available data from the WHO, UNICEF, the UN Statistics Division, the UN Development Programme (UNDP), the Food and Agriculture Organization of the UN (FAO), Demographic and Health Surveys (DHS), the World Bank, the International Food Policy Research Institute (IFPRI), and the International Labour Organization (ILO).

USES OF THE TOOL

The NLIS was established with the aim to bring together nutrition-related indicators in a standardised form, track changes over time and monitor progress, and generate country-level and regional level profiles that are easy-to-interpret (overview snapshot of a country’s nutrition, health and development landscape). The data and resources from the NLIS can be used to gather information in order to develop country or region level nutrition policies, or baseline data before an emergency to make evidence-based decisions for nutrition interventions.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

The NLIS provides access to comprehensive nutrition information combined from multiple sources leading to more integrated approaches to nutrition interventions and informed decision-making.

SCOPE CONDITIONAL ON-DEMAND ASSISTANCE (COPA)

WHAT THE TOOL IS

SCOPE CODA is a World Food Programme (WFP) platform. It builds upon WFP’s beneficiary management system SCOPE, to replace paper-based health information systems. Records are digitalised and personal smartcards mitigate inefficiencies and enable field staff and global stakeholders to make decisions based on real-time data. SCOPE CODA was implemented in 2018 and developed for Community-based Management of Acute Malnutrition (CMAM), but it can also be used in other programmes where decentralised health monitoring is needed. It is a unified platform for CMAM stakeholders to access and share programme information and potentially improve coordination to develop evidence-based strategies addressing malnutrition.

HOW IT WORKS

Frontline health workers can record and access information on nutrition and health status at individual level, identify recovery and estimate treatment success. It also includes referral systems between programme components, ensuring no one is lost and increasing recovery rates. This is done via an electronic database and personal smartcards that are given to beneficiaries at enrolment, enabling follow-up. Data is shared online; giving stakeholders updated information for decision-making.

USES OF THE TOOL

It is used in South Sudan, Uganda and Tajikistan to assess programme performance in real-time, improve operations and generate daily reports, even where there is low bandwidth, poor connectivity or limited electricity.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

It results in more efficient beneficiary information management as well as coordination between CMAM stakeholders to improve strategies targeting malnutrition. Moving forward, SCOPE CODA aims to improve data and system quality through SCOPE 2.0, use WFP’s expertise in IT projects, capacity build, support country growth and new country implementation, and continue to increase stakeholder partnership building, including evidence generation, improved treatment, system strengthening, and reporting and analytics.
WHAT THE TOOL IS
SMART+ is an integrated digital infrastructure that will combine the use of a mobile 3D diagnostic application for field staff with a synchronized global data dashboard and aggregator for analysts and policy makers. The core innovation of SMART+ is the provision of a complete end-to-end digital infrastructure that incorporates the entire data collection and reporting chain:

HOW IT WORKS
Surveys are first created in the survey management tool, aggregates data into a central database, and visualizes results on a public dashboard down to sub-regional level. Drawn from publicly available databases that apply machine learning for data mapping current studies related to acute malnutrition, the website assembles over 3,000 resources in English, French and Spanish. The ongoing research provides a mapping of current studies related to acute malnutrition, drawn from publicly available research protocols and databases, in an interactive thematic area of research and sub-themes. The site also contains a Community of Practice pages, providing examples and learnings from research and operational programmes focused on topics like FamilyMUAC and simplified approaches to acute malnutrition.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION
SMART+ provides a more accurate, streamlined approach to the previous analogue methods of malnutrition diagnosis and surveillance data collection. It is an innovative approach to addressing many of the gaps that currently exist within the data collection process such as reducing child distress, time, resources, and necessary staff. It automates data aggregation and provides visualization of malnutrition status and mortality rates for large populations using the SMART methodology. There is currently no platform for aggregated data within nutrition assessment at the subnational scale. Although versions of digital dashboards exist, they still require manual entry, lack sub-national data, and are not always publicly available. SMARTplus would address these issues through its automated, streamlined, and standardized approach while feeding into larger, multi-sectoral databases that apply machine learning for data mapping current studies related to acute malnutrition, drawn from publicly available research protocols and databases, in an interactive thematic area of research and sub-themes. The site also contains a Community of Practice pages, providing examples and learnings from research and operational programmes focused on topics like FamilyMUAC and simplified approaches to acute malnutrition.

USE OF THE TOOL
SMART+ is currently being developed and is expected to be ready in 2021. It uses 3D scans to provide fast, cheap and accurate child body measurements, analyzes incoming data and issues quality on a survey management tool, aggregates data into a central database, and visualizes results on a public dashboard down to sub-regional level.

WHAT THIS TOOL BRINGS TO RELIEF AND TRANSITIONS PLUS (SMARTPLUS)
31 Jana Dohor (2019) SMARTplus.

SMART+ is an integrated digital infrastructure that will combine the use of a mobile 3D diagnostic application for field staff with a synchronized global data dashboard and aggregator for analysts and policy makers. The core innovation of SMART+ is the provision of a complete end-to-end digital infrastructure that incorporates the entire data collection and reporting chain. SMART+ is currently being developed and is expected to be ready in 2021. It uses 3D scans to provide fast, cheap and accurate child body measurements, analyzes incoming data and issues quality on a survey management tool, aggregates data into a central database, and visualizes results on a public dashboard down to sub-regional level. It automates data aggregation and provides visualization of malnutrition status and mortality rates for large populations using the SMART methodology. There is currently no platform for aggregated data within nutrition assessment at the subnational scale. Although versions of digital dashboards exist, they still require manual entry, lack sub-national data, and are not always publicly available. SMARTplus would address these issues through its automated, streamlined, and standardized approach while feeding into larger, multi-sectoral databases that apply machine learning for data mapping current studies related to acute malnutrition, drawn from publicly available research protocols and databases, in an interactive thematic area of research and sub-themes. The site also contains a Community of Practice pages, providing examples and learnings from research and operational programmes focused on topics like FamilyMUAC and simplified approaches to acute malnutrition.

WHAT THE TOOL IS
The State of Acute Malnutrition (SoAM) website is a coordination and resource platform supported by the No Wasted Lives (NFL) Coalition, accessible in both English and French. The No Wasted Lives Coalition is an interagency effort between Action Against Hunger, the Children’s Investment Fund Foundation (CIFF), the European Commission Directorate-General for Humanitarian Aid and Civil Protection (ECHO), the Innocent Foundation, the International Rescue Committee (IRC), UNICEF, and World Food Programme (WFP). The aim of the SoAM website is to coordinate data sharing for acute malnutrition with the aim to improve the data quality of programmes, identify gaps in data, and support improved use of data and evidence for programmes and policies for acute malnutrition.

USES OF THE TOOL
The data and resources from the SoAM website provide a single platform for coordinated data sharing for acute malnutrition with the aim to improve the data quality of programmes, identify gaps in data, and support improved use of data and evidence for programmes and policies for acute malnutrition. It brings together information on acute malnutrition from a range of sources, in order to provide a single platform to access the latest available material on the topic.
VITAMIN AND MINERAL NUTRITION INFORMATION SYSTEM (VMNIS) http://www.who.int/vmnis/

WHAT THE TOOL IS
The Vitamin and Mineral Nutrition Information System (VMNIS) is a web-based tool composed of a ‘Micronutrient database’ which summarises data published on the micronutrient status of populations in an interactive platform. The VMNIS was established in 1991 as the Micronutrient Deficiency Information System, in response to the request for a strengthened global surveillance of micronutrient deficiencies from the World Health Assembly. The information system is managed by the Evidence and Programme Guidance Unit of the Department of Nutrition for Health and Development through WHO’s network of regional and country offices.

HOW IT WORKS
The micronutrient database includes 40 indicators of the status of 17 micronutrients or micronutrient-related conditions, which cover both deficiency and excess, in the form of downloadable data, with the option to create maps. The database systematically retrieves and summarises data on vitamin and mineral status of populations representative at the national, regional and first administrative level. The data is downloadable and users can create maps.

USES OF THE TOOL
The VMNIS is useful for the assessment, monitoring and evaluation (surveillance) of micronutrient deficiencies at the global level, and track the progress towards eliminating micronutrient deficiencies. The data and resources from the VMNIS can be used to gather information to develop country or region level nutrition policies, or baseline data before an emergency to make evidence-based decisions specific to micronutrient deficiencies, or evaluate the impact of strategies.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION
The VMNIS provides accurate and timely national, regional, and global data tailored for vitamins and minerals.

WORLD HEALTH ORGANIZATION ANTHRO SURVEY ANALYSER
https://www.who.int/nutgrowthdb/software/en/

WHAT THE TOOL IS
The World Health Organization (WHO) Anthro Survey Analyst is an online tool to carry out analyses of anthropometric survey data for children under five years of age based on weight and height measures. It is developed by the Department of Nutrition for Health and Development through WHO’s network of regional and country offices.

HOW IT WORKS
The tool builds on WHO Child Growth Standards and gives results for four different indexes: height-for-age, weight-for-age, weight-for-height, and body-mass-index-for-age. It includes measures of age, sex, type of residence, sub-regions/districts, wealth quintiles, mother’s education, and other relevant country-specific factors. Calculations of confidence intervals and standard errors in estimates are available, and data quality can be assessed. Graphs and tables for visualization of findings, including z-score distribution and prevalence estimates by the various stratification variables, can be downloaded along with templates for quality assessment and summary reports.

USES OF THE TOOL
- The tool is useful for analysis of anthropometric indicators among children under five years of age. It uses the methodology of the WHO Anthro Software – Nutrition Survey Module, but includes a range of additions.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION
Promotion of best practices on data collection, analysis and reporting of childhood anthropometric indicators.
Mobile Health (mHealth) is a general term involving the support of medical and public health practice through mobile tools, such as mobile phones, patient monitoring devices, personal digital assistants, and other wireless devices. mHealth involves the use of voice or short messaging service (SMS), and other functionalities and applications, such as general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology for the collection of health-related data.

By means of example, Rwanda developed Rapid SMS Rwanda as a system to continuously screen children to detect and treat acute malnutrition, where community health workers are equipped with mobile phones to enable them to collect and use real-time data on key maternal, neonatal and child health indicators.

For this article, we refer to mHealth as all applications that use mobile phones or other portable electronic devices to collect data.

**CHILD GROWTH MONITOR** https://childgrowthmonitor.org/

**WHAT THE TOOL IS**

Child Growth Monitor is a mobile application for diagnosing children under 5 with wasting and stunting, developed by Welthungerhilfe.

**HOW IT WORKS**

The application uses the mobile phone’s camera and infrared functions to scan children, and provide immediate data on height and weight of children in order to identify key malnutrition indicators.


**USES OF THE TOOL**

The Child Growth Monitor is under development to improve diagnosis of different forms of malnutrition. It is open source to encourage wide use, including UN agencies, NGOs and government. The app interfaces allow it to be easily connected to existing software, such as ENA for SMART.

**EXAMPLE OF WHEN USED**

A pilot took place in India in 2018, with a target sample size of 10,000 children, the results of this are currently unavailable. There are also plans to pilot the app in a survey (such as SMART), with an emergency nutrition organisation and with a government partner.

---

**MOBENZI** https://www.mobenzi.com/index.html

**WHAT THE TOOL IS**

Mobenzi is a tool for digitising fieldwork, including a mobile based interface enabling frontline workers to collect streamlined data and web platforms to manage data and generate reports.

**HOW IT WORKS**

Complex forms and survey design is made easy through the Mobenzi Researcher where they can be generated in minutes and published to frontline workers. Offline mobile data collection and real-time data validation is possible, and filtering options allow for the data collected to be charted, mapped and exported in real-time. The frontline workers can search, retrieve and update records from their automatically synchronised caseload, e.g. patients or beneficiaries. Their work can be monitored by managers, and the communication tools enable easy organization and supervision of the teams. The Mobenzi platforms can be integrated with other tools, platforms and applications, e.g. DHIS, to customize to needs of users.


**USES OF THE TOOL**

Mobenzi has been used in hundreds of solutions across over 50 countries in Primary health care, e.g. as a digital solution for community health worker teams; in Education and Early Childhood Development, e.g. to monitor the School Breakfast Feeding Programme in South Africa; and in Field Research and Monitoring & Evaluation. Live reports and dashboards can be shared with stakeholders and be used in decision-making.

**WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION**

Digitalisation of fieldwork in an easy-to-use platform.
MOBILE VULNERABILITY ANALYSIS AND MAPPING (MVAM)

WHAT THE TOOL IS

MVAM is a mobile technology tool to collect and monitor frequent food security data to support humanitarian decision making, launched in 2013 by the WFP.39 An open-source database is available on the website.

HOW IT WORKS

It collects real-time data through phone calls, SMS and Interactive Voice Response calls (IVR). Respondents are contacted by WFP via their phones where a mobile survey is done, data is anonymized, cleaned and stored in a database and analysed by a 'stats engine'. Reports and data are shared as a global public good to help humanitarian decision making. This is a two-way communication system, so respondents can also contact the WFP to hear more about the programme, e.g. food distribution dates and food prices, and provide feedback, which is recorded and used in decision making.40

USES OF THE TOOL

MVAM has been used in over 40 countries with more locations planned. Country-pages are found on the website with country-specific reports and methodology. Automatically updated emergency dashboards for Syria and Yemen are available to be used by policy makers, programme officers, and the public. MVAM has been applied in several humanitarian settings, including areas of conflict and instability, e.g. Sudan, Somalia, Iraq and Yemen; displacement camps, e.g. Rwanda, DRC, Kenya and Niger; and contexts where face to face surveys were not possible, for example during the West African Ebola outbreak.41

A new initiative, Humanitarian High Resolution Mapping, is created to help get a view of the food security situation in areas where no surveys have been done, using machine learning to train models to make predictions on food security and create maps based on the predictions, which eventually will be automated in an app.42

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

A fast, cheap tool for data collection and analysis, which also can be used in remote and dangerous areas at lower costs without field staff. This enables faster planning and response from humanitarian organisations.

SAM PHOTO DIAGNOSIS APP

WHAT THE TOOL IS

The SAM (Severe Acute Malnutrition) photo diagnosis app, is an innovative and easy-to-use smartphone diagnostic tool based on Geometric Morphometric techniques and mobile technology developed by Action Against Hunger Spain and EPINUT.43

HOW IT WORKS

A photo of a child under the age of 5 years is taken, and the app informs the user if the child suffers from acute malnutrition and to what degree. The app uses the parallax effect and geometric morphometric techniques to generate a quantitative comparison of body shapes in documented healthy and marasmic children, permitting the accurate classification of the new photo in one of those groups. After the diagnosis is delivered, the app provides instructions for treatment referral.44

---

39 WFP (n.d.) Mobile Vulnerability Analysis and Mapping (mVAM): Delivering real-time food security data through mobile technology.
40 WFP (n.d.) What is mVAM?
44 Antonio Verges (2018). SAM PHOTO DIAGNOSIS ACF.
The SAM photo diagnosis app is under development to improve screening diagnosis and treatment of SAM, reaching remote settings, speeding and simplifying the diagnosis and treatment of SAM, reaching remote settings, promoting early recognition, prevention, and monitoring of acute malnutrition (43).

Currently the app is under development and further work includes scientific, technological and human-centred design approaches, such as testing the approach on a greater sample size to improve the accuracy of diagnosis, improving automated diagnostics functionalities (image registration processing and classification) and user friendliness, and integrating the functional app into routine health systems as an eHealth tool.

EXAMPLE OF WHEN USED

Kobo Toolbox (2018) Being used in every major humanitarian disaster. By means of example, the tool is used by Action Against Hunger to carry out coverage surveys, most recently in the Cox Bazar refugee camp in Bangladesh. Similarly, MSF is using Kobo Toolbox to collect health and nutrition measurements and data in Borno state, Nigeria to tackle malnutrition.

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION

The SAM photo diagnosis app contributes to speeding and simplifying the diagnosis and treatment of SAM, reaching remote settings, promoting early recognition, prevention, and monitoring of acute malnutrition (43).

WHAT THE TOOL IS

The Kobo Toolbox is an open-source suite of tools for mobile data collection and analysis, adapted for challenging environments (i.e. humanitarian use), which is part of the ODK ecosystem. Kobo Toolbox was developed through a joint initiative between the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Harvard Humanitarian Initiative (HHI) and the International Rescue Committee (IRC).

HOW IT WORKS

The Kobo Toolbox support the whole data collection cycle, whereby form design, data collection and analysis. Kobo Toolbox delivers additional functionality such as an easy-to-use form builder to simply create questionnaires, question libraries (allows the use of prepared questions or the re-use of questions and integrated data management, including rapid analysis of data collected through rapid and reliable information, to enable humanitarian actors to make timely, evidence-based decisions or adapt-on-going interventions). The Kobo Toolbox helps remote management of teams through global positioning system (GPS) data collection (geotag) helps reduce errors in registration processing and classification) and user friendliness, and integrating the functional app into routine health systems as an eHealth tool.

OTHER INFORMATION TOOLS USED OR THAT COULD BE USED IN NUTRITION

KOBO TOOLBOX

https://www.kobotoolbox.org/
WHAT THE TOOL IS
Nomadeec is an integrated, connected and mobile diagnostic and telemedicine tool developed by Exelus, for clinical examination for field practitioners (e.g. emergency doctors, paramedics, rescuers, firefighters, nurses)\(^49\).

HOW IT WORKS
The Nomadeec telemedicine tool is the link between a remote doctor and the field practitioner which can be integrated into the information system of a care structure. Nomadeec is a mobile application on a lightweight tablet interconnected via Bluetooth with medical devices according to practitioner needs, such as a blood pressure monitor, a pulse oximeter, a glucometer, a thermometer, and a digital electrocardiogram (ECG) (49). The tablet can capture emergency reports, which can be communicated in real-time, via the web app T elExpert, to remote medical coordination services\(^50\).

USES OF THE TOOL
Nomadeec is a solution for communication between on-duty staff (nurses, care assistants, night watchmen) and medical care coordination services in an emergency and distant-care context. The tool has mainly been used in collaboration with ambulance services and medical discharge centres (50).

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION
No examples were found of Nomadeec being used in nutrition, nonetheless the platform is innovative in the field of health, which is interlinked with nutrition. Nonetheless, the tablet could eventually be used specifically in the field of nutrition for centralisation of information and surveillance, such as for micronutrient deficiencies or NCDs.

---

WHAT THE TOOL IS
Open Data Kit (ODK) is an ecosystem of open-source software, created by developers at the University of Washington's Computer Science and Engineering and members of Change. There are two suites of software (ODK1 and ODK2) as part of the ecosystem, with the aim that organisations can select and use the complementary tools from the ecosystem that best suit their needs.

HOW IT WORKS
The software/tools in the ODK suites allow data collection using mobile devices and data transmission to an online server, even when offline at the time of collection\(^51\). The ODK1 suite contains simple tools that are most commonly used (e.g. Ona, Enketo, Kobotoolbox, ELMO), whereas the ODK2 supports complex workflows. There are also ODK core tools such as, Build, Collect, Aggregate or Briefcase. ODK build that enables questionnaire creation using drag-and-drop designer or an excel spreadsheet, ODK collect that works as a mobile data collection application (collecting data in the form of text, numeric data, or media), ODK Aggregate for online data aggregation (storage, viewing and export), or ODK briefcase that allows data aggregation on the computer offline (51).

USES OF THE TOOL
This tool can be used for remote data collection using a computer, tablet or phone without internet connection or cell carrier access, data visualisation as a map using Google Fusion Tables and Google Earth\(^52\). The tools provided by ODK can be used and customised by the user and therefore be used in multiple different contexts.

EXAMPLE OF WHEN USED
ODK was used by World Vision Kenya to develop a Standardised Monitoring Assessment for Relief and Transition (SMART) survey generic template. Overall the project found that using ODK was a faster, cost-saving method for collecting and aggregating nutrition survey data\(^53\).

WHAT THIS TOOL BRINGS TO NUTRITION INFORMATION
– The ODK package is a general collection and analysis tool that can be adapted to be used in nutrition; nonetheless, it is not nutrition specific.

---

\(^{50}\) European Emergency Number Association (EENA) (2017) The who is who handbook in the public safety industry – here to connect the dots for you, November. Issue 4.
\(^{51}\) Open Data Kit Community (2018) ODK – Software.
\(^{53}\) Field Exchange (2018) Open Data Kit Software to conduct nutrition surveys: Field experiences from Northern Kenya.
FOR FOOD.
AGAINST HUNGER AND MALNUTRITION.

FOR CLEAN WATER.
AGAINST KILLER DISEASES.

FOR CHILDREN THAT GROW UP STRONG.
AGAINST LIVES CUT SHORT.

FOR CROPS THIS YEAR, AND NEXT.
AGAINST DROUGHT AND DISASTER.

FOR CHANGING MINDS.
AGAINST IGNORANCE AND INDIFFERENCE.

FOR FREEDOM FROM HUNGER.
FOR EVERYONE.
FOR GOOD.

FOR ACTION.
AGAINST HUNGER.