USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM

TECHNICAL ASSISTANCE, NATIONAL SUPPLY CHAIN ASSESSMENT TASK ORDER

Implementation Guide

NSCA 2.0

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Brief Description
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About Axios
Axios is a global healthcare organization with over 20 years of experience in the delivery of sustainable and innovative access to care solutions in low and middle-income countries. Axios provides a broad range of services in the global health sector to help modernize and strengthen health systems and quality of care. For more information, visit: http://axios-group.com/.

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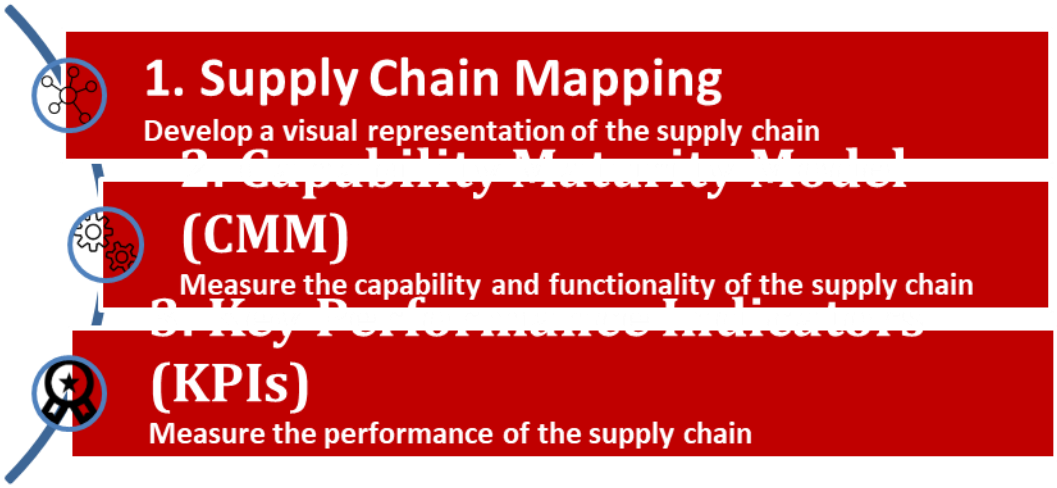
INTRODUCTION

The National Supply Chain Assessment (NSCA 2.0) is an automated tool designed to conduct a point in time assessment of national public health supply chains, or selected components of such supply chains, in a developing country context. NSCA 2.0 provides a structured framework that allows standardized, objective data collection and analysis, allowing for comparison of results across countries and across time. NSCA 2.0 is comprised of three primary elements: public health supply chain mapping; a capability maturity model (CMM) diagnostic tool; and key performance indicators (KPIs). CMM indicators assess the current capability and maturity potential of the system to deliver the required services based on available infrastructure, strategies and governance controls, systems and process and human resource capacity and training. KPI indicators measure the current performance across six functional areas to report actual levels of service being delivered. The assessment provides quantitative scores across supply chain functional areas at all levels of the supply chain from the Ministry of Health (MoH) and central stores to health centers and other service delivery points.

Figure 1, NSCA 2.0 Components



The NSCA 2.0 toolkit comprises a digital data collection tool (SurveyCTO), training materials, an implementation guide, and a comprehensive set of documentation, and additional tools and resources that implementers can use to support implementation of the assessment. The support resources include planning and preparations tools, survey tools, and reporting tools. This Implementation Guide describes the NSCA 2.0 process and supports both the planning and successful implementation of an assessment. This guide explains how to execute all phases of the NSCA 2.0, what resources will be needed, and where to find the resources. This information is presented in five main sections:

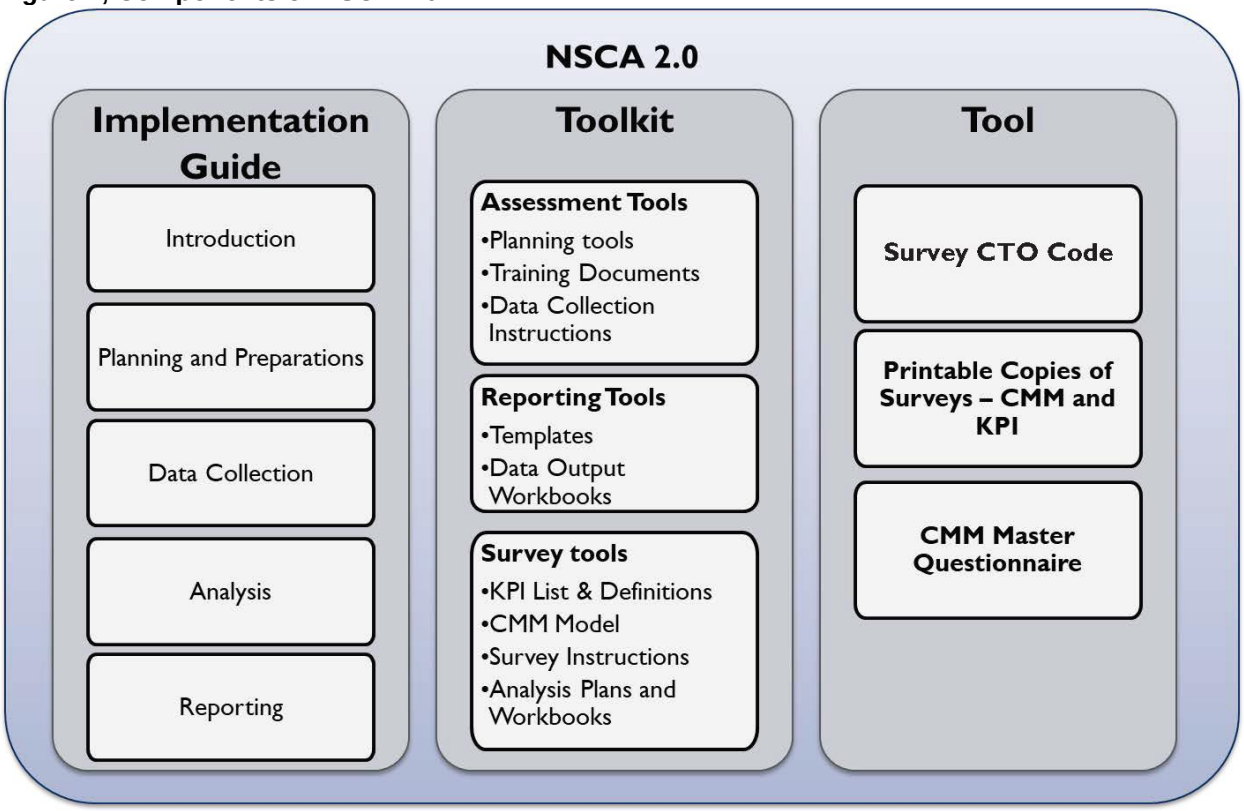
- Introduction
- Planning and Preparations
- Data Collection

- Data Analysis and Interpretation
- Reporting and Dissemination

Each phase is subdivided into subsections or subtopics covering areas such as project management; key processes for sampling, training, data collection, cleaning and analysis; the main vehicles for reporting and disseminating findings; and related tools and resources. The NSCA 2.0 implementation guide and other toolkit materials are available online (NSCA toolkit page) as a structured NSCA 2.0 package that the user can download and use.

The toolkit provides flexibility to adapt and customize language to better reflect the local context.

Figure 2, Components of NSCA 2.0



BACKGROUND

HISTORY OF NSCA 1.0 AND NSCA 2.0

A National Supply Chain Assessment (NSCA) tool was initially developed between 2010 and 2012 at the request of USAID by the PEPFAR-funded Supply Chain Management System (SCMS) project. USAID's objective was to establish a common basis by which to assess the performance of national public health supply chains for health commodities. The concept included developing a methodology that would produce a single score on a set performance scale that delivered the ability 1) for countries to self-assess the status, progress, and future needs within the public health supply chain, 2) to compare results across countries, and 3) to inform USAID investment decisions.

To develop the NSCA 1.0 tool, SCMS first conducted a literature review of Key Performance Indicators (KPIs) in use or recommended by international agencies, countries, and academia. Three issues emerged from this review:

- Though there was a wide range of KPIs, enough commonality existed to support the development of a core set of indicators (<20).
- Creating a meaningful single score outcome would be very difficult and could distract from other findings.
- KPIs alone provide an incomplete picture of a health supply chain. It is also necessary to understand the capabilities and potential capacity of the health supply chain.

After further review of the literature, and with the agreement of USAID, SCMS drew on the SCOR[1] model to create the NSCA 2.0 Capability Maturity Module (CMM) as a complement to the KPI assessment.

This version of the NSCA, now referred to as NSCA 1.0, was piloted in three countries and subsequently deployed in a further 13 assessments over a three-year period.

OVERVIEW OF NSCA 2.0

With the creation of the Global Health Supply Chain architecture at USAID in 2016, USAID awarded a Task Order to Axios International, Inc to build on the achievements and lessons learned from NSCA 1.0 by developing an updated tool, to be known as NSCA 2.0 with the following objectives:

[1] The Supply Chain Operations Reference (SCOR) model is unique in that it links business processes, performance metrics, practices, and people skills into a unified structure. It is hierarchical in nature, interactive and interlinked. http://www.apics.org/apics-for-business/frameworks/scor

PRIMARY OBJECTIVES

- Inform and guide country and donor supply chain investments by, identifying and prioritizing poor performing areas in the [public] health supply chain while monitoring the impact of specific supply chain improvement activities and/or investments.

SECONDARY OBJECTIVES

- Measure supply chain performance and capability. Identify bottlenecks and gaps across the health supply chain. Monitor progress over time and against national performance indicator targets.
- Inform country strategic planning and performance management processes. Inform national supply chain policies and decisions with data on broadly accepted metrics and analytics.

To meet the design objectives, the three basic components of NSCA 1.0 were retained in NSCA 2.0: public health supply chain mapping, a capability maturity model, and KPIs. Extensive consultations with all the relevant stakeholders were carried out and it was agreed to reduce the focus on commercial best practice in favor of increased alignment with other public sector tools. Specific tools targeted for alignment include: 1) EVM[2] tool used by UNICEF in assessing in-country vaccine supply chains, which has a strong emphasis on cold chain capacity and performance, and 2) McKinsey's Supply Chain 360 diagnostic tool[3].

This guidance, combined with key theoretical underpinnings, shaped the NSCA 2.0 redesign. The CMM was redesigned to include 11 functional areas required for a comprehensive and well-functioning public health supply chain, including the environment in which the supply chain operates (i.e. governance, policy, financial sustainability, quality assurance systems, and human resources) as outlined in Table 1. The CMM assesses the maturity of each function as: Basic, Intermediate, Advanced, and State of the Art. To assess the capability maturity, a master questionnaire was created primarily comprised of binary Yes/No type questions to easily collect data in a standardized way, reduce the impact of subjectivity in the assessment, and improve comparability of the results.

Table 1. NSCA 2.0 CMM Functional Areas

- Forecasting & Supply Planning
- Procurement
- Pharmacy & Stores Management
- Distribution
- Strategic Planning & Management
- Policy & Governance
- Quality& Pharmacovigilance
- Logistics Management Information Systems (LMIS
- Human Resources
- Financial Sustainability
- Waste Management

[2] A WHO/UNICEF tool used to assess performance of a country's immunization supply chain, benchmark the performance against best practice standards and develop and implement an improvement plan as part of a continuous quality improvement process (http://www.who.int/immunization/programmes_systems/supply_chain/evm/en/index3.html).

[3] Mckinsey & company supply chain 360 diagnostic tool is a **proprietary** tool that is used to ***diagnose the supply chain***, ***provide an actionable plan for supply chain transformation***, and ***align government, partners and donors behind diagnostic results and action plan.***

The KPI module retains the core indicators established under NSCA 1.0 and adds reference performance levels in the measure definitions. A total of 29 KPIs are divided into 13 core indicators (to be included in all assessment exercises), and a further 16 optional indicators. The core indicators should be used unaltered to allow for consistent comparisons across countries and over time. From within the core indicators, 7 are recommended for regular monitoring by public health supply chain managers to manage performance, and to identify early warning signs of emerging challenges. In assessing KPI results, it is recommended that countries use or establish the level of performance expected or considered 'on target'. The NSCA 2.0 tool does not recommend performance targets. However, reference performance levels (drawn from industry or donor best practice) are included within the KPI definitions to assist countries in setting performance targets; this reference can be found on the NSCA toolkit page online.

Table 2. Key Changes/Benefits of NSCA 2.0

- Tool is modular, customizable to local context and needs
- Clear sampling strategy
- Aligned with other tools and the methodology was standardized to allow for reciprocity
- Emphasizes health supply chain mapping and encourages coordination, engagement, and continuous participation of local counterparts, stakeholders for country ownership, local capacity building, accountability and sustainability
- Simplified outputs
- Added more environmental factors (governance, finance, more HR)
- CMM data collection and scoring is more objective (i.e., less reliant on data collector's subjective judgments)
- Automated data collection and upload to a central data base using tablet PCs
- Templates available for reporting and dissemination
- Recommendations include action-oriented solutions
- Online suite of resources (toolkit) containing User's Guide, NSCA tool (SurveyCTO), data collection tools, 'how to' guides, instructions, analysis workbooks, checklists and templates for deliverables

The capability maturity master questionnaire and KPI questions have been programmed into an automated tool, SurveyCTO, to enable data collection via tablet computers. The data collected is automatically uploaded to a central database that can be accessed online. Available data collected from these assessments will be used to provide insights over time and across countries.

VALUE OF THE NSCA

Governments, health supply chain stakeholders, health care providers, NGOs, and donors alike can commission an NSCA to inform evidence-based decision making. The NSCA 2.0 activities may be funded via internal (e.g., national budget) or external (e.g., USAID, Global Fund, international development agencies, NGOs, public/private partnerships) mechanisms.

The assessment results and recommendations provide the evidence to identify possible bottlenecks and gaps in public health supply chain systems, inform prioritization of government and donor investments in public health supply chain interventions, and improve system performance. Assessment findings may also reveal areas of under-performance where investment or technical intervention may be appropriate. However, the NSCA 2.0 is not designed to be a deep dive analytical tool, and further analysis may be

necessary to establish the root cause(s) of under-performance or reduced capability. The NSCA 2.0 can be used as a baseline, midline, or endline assessment to track performance progress and trends against national targets, as well as to monitor the impact and sustainability of system strengthening investments and efforts over time.

The results can help inform country strategic planning, performance management (through routine tracking of KPIs), and evidence-based decision-making and policy-making. The CMM results inform and educate users on functional capability level when benchmarked against best practices and requirements of more mature health supply chains, thereby indicating opportunities for improvement.

Governments, the MoH, local stakeholders, and partners can collaborate in implementing the assessment to meet shared goals for more effective and efficient health supply chain systems with improved availability, quality, and access to health commodities at Service Delivery Points (SDPs).

EXPECTATIONS OF MOH AND ORGANIZATIONS BEING REVIEWED

The NSCA 2.0 approach promotes ownership and engagement of country leadership early in the preplanning phase. Implementation is designed to be collaborative – incorporating local policy-makers, public health supply chain managers, donors, and other stakeholders. It is expected that the leadership team will collaborate in defining the goals, purpose, and desired outcomes of the assessment based on local needs and plans. This exercise also enables the leadership team to gain a good understanding of the assessment process.

To maximize the value of the NSCA 2.0 assessment, it is imperative that stakeholders provide direct and indirect support as needed to implementing agencies. Types of support required may include but are not limited to financial resources, access to facilities, people, logistics, information systems, data, and data collection teams, among others. Local stakeholders may be called on to facilitate engagement and participation of its staff, sites, and staff of other local stakeholders.

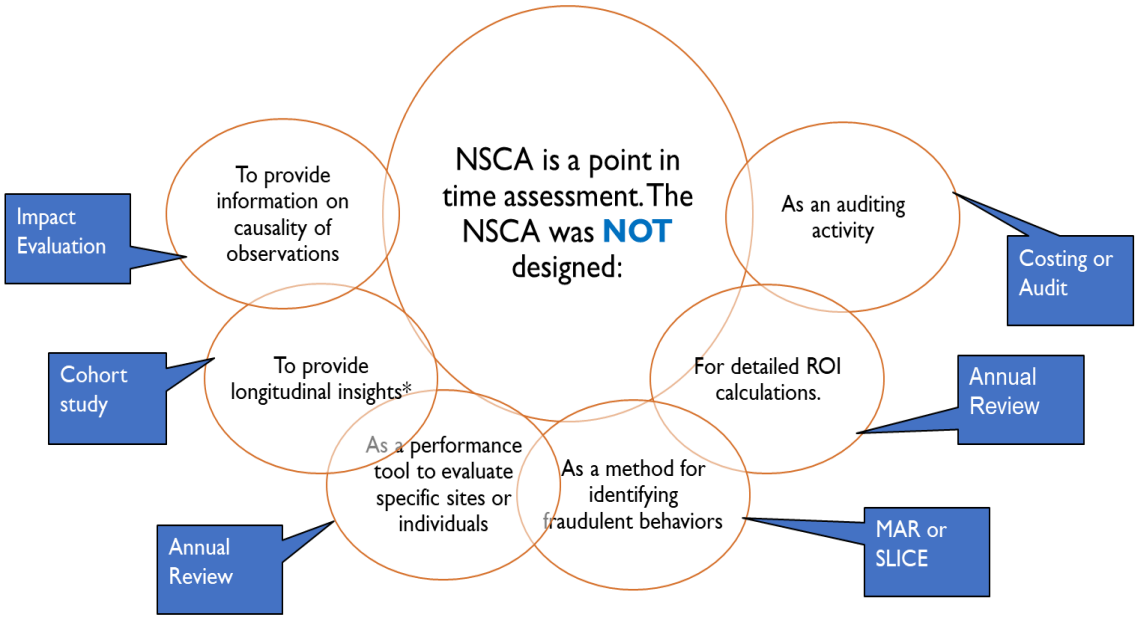
All stakeholders are expected to value the comprehensive assessment findings. An assessment such as the NSCA 2.0 highlights areas of the health supply chain that are functioning well, and areas requiring improvement. The exercise is intended to reveal strengths and weaknesses in order to allow for continuous quality and process improvement within the public health supply chain system. Ignoring weak points in the findings reduces the utility of the assessment as a tool to inform awareness of current status, best practices, and opportunities for improvement. With stakeholder buy-in to the full findings, implementers can use the results and recommendations to inform national strategic planning or other collaborative decision-making processes.

Implementers are expected to prioritize time and resources to conduct the assessment with the least disruption to regularly occurring patient care, and other service delivery activities. In addition to accepting the full breadth of assessment results, it is important to also review, discuss, and utilize the findings in a timely manner (while the results are still valid). It is expected that stakeholder groups who participated in the assessment will have access to the findings, and contribute to the development of action plans that may result from the assessment.

LIMITATIONS OF NSCA

The NSCA 2.0 is a strong resource for assessing national supply chains. However, it also has limitations, outlined in Figure 4. The blue boxes in the graphic suggest tools that would be a better choice for addressing the specific need. The Market Assurance Review (MAR) assesses the extent to which selected commodities may have been diverted toward unintended illicit trade and the extent to which diverted commodities may have been replaced with sub-standard commodities. Supply and Logistics Internal Control Evaluation (SLICE) is a method to identify "weaknesses in supply chain internal controls in sub-Saharan Africa."[4] This tool "is not an audit, but instead identified strengths and vulnerabilitys in the supply chain, quantifies levels of inventory mismanagement, and proposes recommendations to strengthen supply chain controls." The NSCA is not an audit. However, for USG-procured commodities that are damaged, lost, or expired, the assessment implementing partner (if hired by USAID) will need to work with USAID to report this to the USAID Office of Inspector General (OIG).

Figure 4, NSCA Limitations



*While a single NSCA cannot provide longitudinal insights, multiple periodic NSCAs could potentially serve that purpose.

There are also general limitations related to data and data collection. A brief list follows:

- The data collected is self-reported by survey and are subject to errors typical of this type of data collection technique, such as lack of understanding, personal factors (fatigue, etc.), and social desirability, among others.

[4] USAID (2013). Supply & Logistics Internal Control Evaluation: User Manual. url: https://www.pmi.gov/docs/default-source/default-document-library/tools-curricula/usaid_slice_user_manual.pdf

- NSCA 2.0 has no control over the quality of secondary data (i.e. data that was originally collected for other purposes and is now being used to inform the NSCA 2.0); any issues in the data at the time it was collected remain when examined for the assessment activity.

- NSCA 2.0 results are based on a sample, and the findings therefore carry the limitations of sample-based work such as representativeness of the sample drawn, amount of confidence that the findings are not due to error, and challenges of using limited datasets.

- Missing or incomplete data are also possible when conducting a NSCA 2.0 and may impact the findings.

- The NSCA 2.0 is constructed as a generic tool for use in multiple countries, and while adaptation to local contexts is possible, it needs to be limited in scope in order to maintain the integrity of the assessment.

Ultimately, the NSCA 2.0 is only useful to the extent that stakeholders understand, buy into, and use the results.

These limitations indicate that the NSCA 2.0 cannot necessarily derive the root cause for good/poor performance. However, the CMM can help to isolate the inputs and processes that are commonly present or absent at different levels of the health supply chain. Built upon industry best practices, the capability maturity findings can identify areas where investments or actions would lead to improved performance. Actions and recommendations agreed upon after an assessment have to be monitored and sustained over time to assess the extent to which performance has improved. Ultimately, the NSCA 2.0 is only useful to the extent that stakeholders understand, buy into, and use the results. Assessment results should always be used in conjunction with other information, behavioral change, and an in-depth knowledge of the pharmaceutical system.

PHASES OF NSCA 2.0 IMPLEMENTATION

The NCSA is implemented in four phases (see Figure 5):

1. Planning and Preparation – key planning and training activities essential for success.

2. Data Collection - collection, preliminary cleaning and submission of the data for analysis.

3. Analysis and Interpretation - cleaning of the data to ensure quality, followed by analysis and interpretation into findings

4. Reporting and Dissemination - documentation, presentation and dissemination of the NSCA 2.0 results and recommendations.

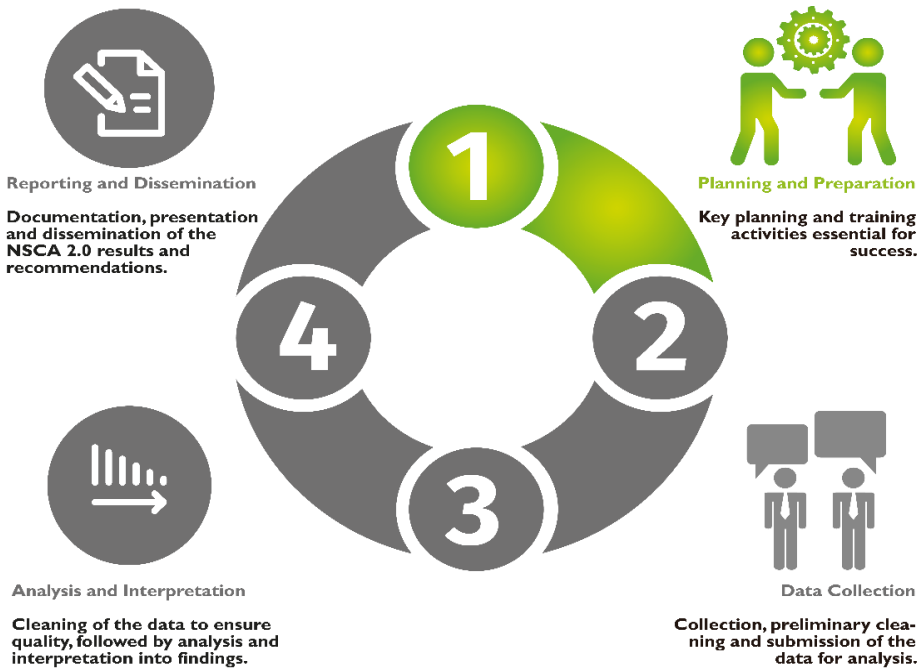
These four phases are described in detail later in the guide.

Figure 5, NSCA 2.0 Phases

PLANNING AND PREPARATION

This section provides guidance on starting an NSCA 2.0 project, project management, and planning for all data collection activities. Overall, the planning and preparation phase is expected to take approximately 8-12 weeks from when the core assessment team is formed until the start of the in-country data collection phase.

Figure 6, NSCA 2.0 Planning and Preparation Phase



It is important to note that, MoH ownership and leadership through all the phases of the assessment is critical to the success and sustainability of the activity beyond the support of any external TA providers and donors. As the owner of the supply chain system and key beneficiary of the assessment, the MoH must be fully engaged and feel ownership in all elements of the assessment.

VALIDATE ASSESSMENT

The first step of the implementation process is to confirm that the MoH is ready to move forward with the assessment as planned, funding is in place to support the activities, and stakeholders are prepared to initiate the project. Several key documents are important to confirm that all the pieces are in place to support the assessment activity:

- Initial Scope of Work (SOW) or Terms of Reference (TOR)
- Confirmation of funding for the assessment
- Information on participating institutions and their roles

OBJECTIVES, SCOPE, AND EXPECTATIONS

The next step of the implementation process is to understand the context and outline the objectives of the assessment. This process should include obtaining background information on why the assessment is being conducted and how the results are going to be used. It may also include gathering information to

inform planning and investment, assess performance, or identify and prioritize areas for improvement. The objectives are directly linked to the context.

If the objectives are not clear, work with the leadership team to create a concise summary of these elements. The general NSCA 2.0 objectives may be used as a resource to guide conversation around tailoring objectives for a specific assessment. Other examples of possible objectives for consideration include: to inform a new MoH supply chain strategic plan, to measure performance against an existing plan or set of targets, to respond to areas of concern/complaint from stakeholders/patients, to identify areas in need of investment and Technical Assistance (TA), to identify the best use of available investment, or to identify causes of a decline in performance. The resulting concise and clear statement of the context and objectives is important for stakeholder engagement.

Table 3. General NSCA 2.0 Objectives

- Inform and guide health supply chain country and donor investments. Identify and prioritize poor performing areas in the [public] health supply chain. Monitor the impact of specific supply chain improvement activities and/or investments.
- Measure health supply chain performance and capability. Identify bottlenecks and gaps across the health supply chain. Monitor progress over time and against national performance indicator targets.
- Inform country strategic planning and performance management processes. Inform national health supply chain policies and decisions with data on broadly accepted metrics and analytics.

Once the objectives are defined, it is necessary to refine the scope of the assessment to ensure it meets the assessment objectives. An initial scope of the assessment was likely developed in the early discussions, including a high-level outline of the initial type of assessment (comprehensive, targeted- see below), implementation timelines, expected outputs, and stakeholder roles and responsibilities. A comprehensive assessment covers the entirety of the national health supply chain. A targeted assessment has a more tailored scope, e.g. geographic range, a smaller set of functional modules, or fewer levels of service. It is important to note that targeted assessments may make it more difficult to identify factors outside the targeted scope that have an impact on the assessment findings. Factors that may impact decisions around scope include human resources, timeline, and available budget.

PROJECT MANAGEMENT

This section provides an overview of key topics related to project management of the assessment activity such as: teams and roles, finalizing workplan and budget, team and stakeholder/partner communication, risk mitigation, stakeholder engagement. Figure 7 provides a general overview of the key activities that must be completed before data collection can begin.

TABLE 4. DATA PREPARATIONS CHECKLIST		
#	TASK	(√)
1	Appoint the key members of the project implementation team	
2	Identify facilities that will be assessed (see Annex 3)	
3	Identify sample sizes for selected facilities (see Annex 3)	
4	Decide if parallel supply chains will be included in the assessment	
5	Determine the list of tracer commodities	
6	Develop the list of optional KPIs that will be assessed with the core KPIs	
7	Program the SurveyCTO data collection tool and upload this tool to the data collection tablets	
8	Train assessment data collectors	
9	Allocate teams to collection areas – avoid conflicts of interests in assignments	
10	Finalize the timetable for the data collection	
11	Advise facilities of the arrangements, necessary document access and any pre-visit preparatory work.	

TEAMS AND ROLES

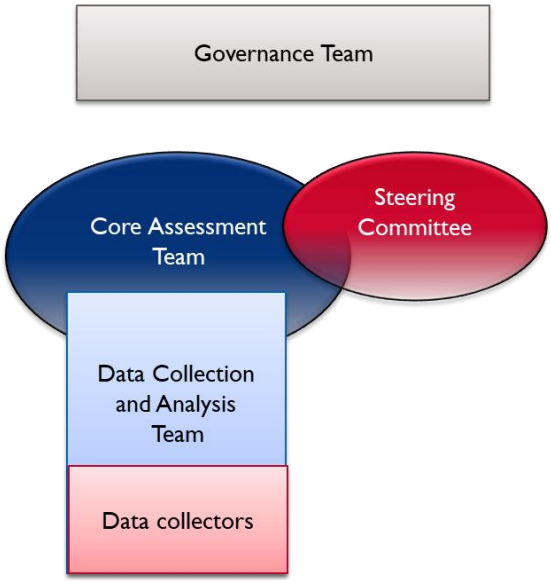
CORE ROLES

As soon as there is an initial scope, the MoH should decide if the assessment will be conducted by an internal team, or will appoint an implementing partner – local or external - to work with on the assessment. The implementing partner should work with the MoH to refine the required scope and associated implementation timelines to agree on deliverables, timelines, and performance expectations.

The MoH team, or implementing partner where used, will designate individuals for core roles prior to initiating assessment activities. The core roles that need to be identified include the project lead, assessment coordinator, logistics coordinator, data manager, data quality associate, subject matter expert adviser(s) (as needed), the governance committee, and the steering committee. A more detailed description of each of these roles is provided below in the project management section.

To implement the assessment activities, it is necessary to set up the appropriate teams.

Figure 7, Overview of NSCA 2.0



GOVERNANCE TEAM

A small governance team is needed to provide high level leadership, oversight, and decision-making. The group, which may also be known as the funders, should include at least one high-level official from key stakeholder organizations that have budget and resource authority such as the MoH, and Donor(s), depending on the local situation and needs. The governance team will not be involved in day-to-day operations, but they will need to be kept updated on progress, to approve changes to scope/roles, and they can also direct resources in-country to support assessment activities.

STEERING COMMITTEE

A steering committee is also required for implementation. This committee directs the operational activities of the core team; it includes team members that are critical to the project and are regularly involved in operations. The steering committee should include at least one high ranking MoH official and other needed high impact stakeholders as determined by the core assessment team to ensure both that decisions carry weight, and that there is timely facilitation and approval of processes. These individuals are involved only in specific management and technical activities of the NSCA 2.0 such as informing technical decisions (e.g., scope, tracer commodities), facilitating planning, requesting and obtaining approvals, executing in-country logistics, and ensuring compliance with local protocol and appropriate channels of communication.

At the first steering committee meeting, key agenda items should include the assessment objectives, scope, process, and expectations. As the work evolves, review and discuss the country assessment workplan to make sure the MoH and other members of the steering committee are in agreement with the "objectives, scope, process, and expectations" materials presented. This committee should also receive regularly scheduled updates from the project lead.

A project lead will be appointed by the governance team and is typically an MoH staff member or staff member of an implementing partner. S/he oversees the full execution of all phases of the assessment from planning and preparation through reporting and dissemination.
The project lead establishes all the teams and is responsible for coordination across teams. Figure 3 and the Tables 4 and 5 below provide an overview of the overlapping teams, along with details on the different teams - purpose, team members, and roles.

CORE ASSESSMENT TEAM

After identifying the project lead, the implementing partner works through the project lead to form the core assessment team. Typically, though not always, the core assessment team is minimally comprised of the following four technical people:

- Project Lead – Focal person for the assessment acts as liaison between stakeholders i.e. MOH, District Officials, Implementing partners etc.
- Assessment Manager – A senior manager with supply chain expertise,
- Data Manager – A proficient statistician/data analyst capable of designing the analysis plan, assessing data quality, collating and analyzing the data collected
- Logistics Coordinator – Serves as the point of contact for services providers e.g. scheduling drivers, lodging, printing, meals and refreshments (during the training workshop), orders supplies, buying airtime for mobile phones and tablets etc.

It is generally expected that the project lead, assessment manager, data manager, and logistics coordinator are selected from existing staff within the MoH, or the implementing partner organization or hired directly by them.

When the full core assessment team has been formed, project lead needs to organize, and lead a series of meetings and conference calls with the team to define and document roles and responsibilities for each team member. These roles and responsibilities will be captured in a scope of work or terms of reference, as appropriate.

KEY DATA COLLECTION PERSONNEL

Before data collection work begins, identify key personnel for data collection and analysis. These personnel will act as the main points of contact for all data collection activities; they will conduct site visits to collect required CMM and KPI data. The key personnel will typically include the assessment manager, data manager, logistics coordinator, data collection supervisors, and data collectors. Data collectors can represent stakeholders, ideally including the MoH and any local partners. Where

possible, data collection team members should be drawn from current actors in the public health supply chain or health system; however, conflicts of interest should be avoided by ensuring individuals do not assess activities in an area where they typically work.

The data collection teams visit the selected sample sites at all levels of the public health supply chain included in the assessment to collect required capability and KPI data. Field teams should be set up to collect data from health facilities/warehouses at all levels of the health supply chain lower than the central level (i.e. referral hospitals, intermediate warehouses, SDPs). Each field team should consist of 2 people and should be able to cover one site per day (depending on travel distances). It is recommended that a separate data collection team should be set up to collect data from central level sites. The central level may require more data collectors to manage the increased volume of work. Collection of all data required at a large or busy central level institution or facilities may require up to double the number of data collectors or teams needed per average lower level facility; for example, up to 60 person-days of data collection or more may be necessary to cover all the central level units. The total number of data collectors will depend on the assessment scope, time frame, volume of data being collected, sample size, budget, and HR capacity.

TABLE 5. OVERVIEW OF ASSESSMENT TEAMS, MEMBERS, AND ROLES

TEAM	ROLE	MEMBERS	LEVEL OF EFFORT
Governance Team	High level leadership, decision-making, and oversight	At least one representative/high-level official from key stakeholder organizations that have budget and resource authority such as MoH (high-level official designated Health Secretary), Donor(s)	3 members, providing leadership and directions, with periodic support as needed
Steering committee	Complements the core assessment team. Providing operational and technical resources to the NSCA 2.0 - planning, communication, requesting and obtaining approvals, complying with country regulations, policies and procedures, logistics	Extended team comprised of MoH staff or technical experts Should include at least one MoH official, one Partner (if appropriate)	8-10 members to direct and monitor operations, providing periodic, as needed support.
Core Assessment Team	Manages implementation of the NSCA 2.0 from planning to dissemination Runs day-to-day project management, planning, and technical activities of the NSCA 2.0	Project Lead, Assessment Manager, Data Manager, Logistics Coordinator, MoH	4-5 members expected to deliver dedicated effort at 50-100%
Key Data Collection Personnel	Travel to sampled sites and collect, clean, and submit the required capability and KPI data	Assessment Manager, Data Manager, Data Collection Supervisor, Data collectors	Up to 25 members - number varies, dependent on assessment scope, total number and size of sampled sites, volume of data to be collected, amount of time available for the assessment, and available budget

TABLE 6. CORE ROLES, TEAM ASSIGNMENT, AND LEVEL OF EFFORT REQUIRED			
TEAM MEMBER/ROLE	ROLE	TEAM/GROUP	RESOURCE LEVEL
Project Lead	• Project lead for the overall execution of the NSCA 2.0 • Ideally has supply chain knowledge/experience (not required) • Leads writing activities	Core assessment Team, Steering Committee, Data Collection Team (oversight),	Project Management 50-100% Varies by stage of project and other data proficient resources on the project
Assessment Manager	• Focal person for the assessment operations • Leads/coordinates all assessment activities in liaison with relevant partner and steering committee • Leads data collection at the central level • Participates in writing the assessment report • Backstop for project lead as needed • Identify training participants	Core assessment Team, Steering Committee, Data Collection Team (central level)	100% time throughout assessment activities
Data Manager	• Sampling, Analysis Plan, Analyzes data, Advanced statistical analyses. • Ensures that good data quality data is captured. • Key role in analysis and interpretation activities	Core assessment Team, Steering Committee	100% time throughout assessment activities
Data Collection Supervisor	• Supervises data collectors and oversees data collection activities in the field	Data Collection Team	100% time during training week and throughout data collection 50% in build-up
Data Collector	• Conducts site visits to collect assessment data.	Data collection team	Data Collection 100% time during training week and throughout data collection)
Logistics Coordinator	• Coordinates logistics for implementing NSCA 2.0: invite training participants, make travel arrangements, set up meeting rooms as needed, and prepare materials for stakeholder events.	Core assessment Team	50-100%

Further information on roles and job descriptions for data collection team members, and on how to estimate the required number of data collection teams can be found in Annexes 4 and 8, respectively.

RECRUIT DATA COLLECTORS

To ensure that skilled, competent, motivated personnel are recruited in compliance with local labor regulations, policies and procedures, consult and collaborate with the MoH and implementing partner (local or external) to develop an appropriate policy for recruiting assessment personnel. This includes both high level assessment team members and data collectors.

RECRUITMENT POLICY

The policy developed should cover the following to ensure the assessment is done in a cost-effective, efficient and timely, unbiased manner:

- The need to use proper contractual or other applicable mechanisms of engagements, that includes TOR with clearly defined necessary qualifications and roles/responsibilities, tasks to be performed, and deliverables for assessment personnel.
- The need to abide by local government statutes, regulations, and policies in developing and implementing personnel contracts and payment procedures for NSCA 2.0-related work.
- Explore with the MoH, stakeholders, and partners (e.g., NGOs/faith-based health care organizations, philanthropic organizations and private sector health care organizations) to leverage their staff to promote collaboration, local ownership of the activity, and local capacity as well as to contain costs.
- The policy should clarify what certain people or people holding certain positions CAN do or SHOULD NOT be allowed to do. While using data collectors already familiar with the public health supply chain or health system (e.g., MoH, stakeholder organizations) may result in faster data collection, this benefit must be balanced with the inclusion of external (i.e., neutral) players to avoid bias (e.g., existing players in the public health supply chain should not be assigned to collect data from health facilities in their own regions).
- Data collectors should speak both English and the host country language.

EXECUTING THE RECRUITMENT POLICY

Once the policy has been developed, it should be deployed via the following steps:

- Using the previously determined number of data collectors/teams that will be recruited, determine how many of the teams will collect data at central level and how many field teams will be needed to collect data at lower levels of the public health supply chain system.
- Working in consultation with the MoH and implementing partner (local or external) and following the personnel recruiting policy, determine the best sources and approach to engaging or recruiting skilled senior assessment personnel.
- Similarly, in consultation with the MoH and implementing partner (local or external) engage or recruit qualified, skilled and motivated data collectors (e.g., data collection supervisors, data collectors).

Required qualifications and skills for assessment personnel and detailed job descriptions can be found in Annex 8.

STAKEHOLDERS

The next step after the scope and objectives are finalized includes identifying, communicating with appropriately, and meeting with stakeholders (including the MoH) to obtain buy-in for the assessment as well as discuss the goals, proposed timelines, implementation plan (what facilities, who, etc.), expected outcome(s), and planning and budgeting for the assessment. The support and collaboration of key local stakeholders is critical to the success of the NSCA 2.0. Therefore, it is important to identify, engage, communicate, coordinate, and collaborate effectively with stakeholders throughout the assessment process. This section describes steps needed to identify and engage stakeholders as well as to maintain their involvement throughout the assessment.

IDENTIFYING STAKEHOLDERS

Possible stakeholders to consider including in the conversation follow: Ministry of Health (MoH), supply chain technical assistance partner (local or external), national policy makers, central medical store staff, intermediate supply chain staff, regulatory and quality assurance, pharmacovigilance authorities, finance, procurement agents, faith-based organizations (especially if they run their own supply chain operations that complement the public sector operations), NGOs, private sector, funder(s), development partners, and external consultants among others. It is important to note that each context is different, and that this list of potential stakeholders is neither exhaustive nor universally applicable.

EARLY STAKEHOLDER ENGAGEMENT

Once stakeholders have been identified and agree to participate, brief them on the project. This effort is important not only for smooth assessment execution, but also to promote country ownership of the assessment. The goal is to engage all participants in collaborative planning activities so all voices are heard and the assessment meets the needs of the country engaging in the assessment process.

Early stakeholder discussion(s) should address the following key areas of the planning process:

- Review the objective(s) of the assessment and the context for why the assessment is being launched
- Describe expected outcomes of the assessment and how they are relevant to the overall health supply chain system
- Overview of the NSCA 2.0 and methods to be used
- Outline the expected role(s)/contributions for each stakeholder or participating organization
- Review timelines and identify dates to complete implementation and data collection activities
- Plan for the stakeholders' workshop (the preceding areas may be addressed in an initial stakeholder workshop)
- Finalize a series of set stakeholder meetings throughout the assessment

MAINTAINING STAKEHOLDER ENGAGEMENT

An important element of the assessment implementation process includes not only identifying stakeholders early on, but also keeping them engaged throughout the assessment process. In the

planning and preparation phase, the stakeholder(s) need to commit to ongoing engagement throughout the assessment. Additional activities, meetings, or requirements may be identified and agreed upon as appropriate for the context. The presence of these intermittent engagement activities ensures that stakeholders participate and contribute to all stages of the assessment process and will feel ownership of the results through their involvement.

TEAM AND STAKEHOLDER/PARTNER COMMUNICATIONS

Good practices for effective team meetings and stakeholder/partner communications are outlined below. It is recommended that the implementing partner consider and utilize these as appropriate for the assessment context.

- Develop a communication and stakeholder engagement strategy; effective communication is critical to enable the assessment personnel to communicate among themselves and with various other stakeholders.

- Keep an up-to-date database of names and contact information (office and mobile phone/WhatsApp numbers, email addresses, office physical addresses) of NSCA 2.0 team staff resources

- Decide with stakeholders on the most feasible means of communication to use. This will typically be via face-to-face meetings, mobile phone, WhatsApp, office phone, and/or via email.

- Agree upon appropriate channels for communicating with government officials at central and peripheral levels: Who contacts or notifies whom? Who approves what? When?

- Identify focal persons with clearly delineated communication roles. Possible roles are outlined for the project lead and implementing partner (local or external): 1) project lead : oversees all communication, and communicates with USAID or other relevant donor, MoH, the implementing partner (local or external), 2) implementing partner: acts as liaison between external consultants, members of the assessment team, and other stakeholders.

- The project lead should lead coordination with the MoH, donor, and other stakeholders support where appropriate by the implementing partner organization (local or external). The lead organization can facilitate virtual or face to face meeting appointments, including with MoH officials, donors, and other key stakeholders.

- The project lead should hold regular telecoms (e.g. group Skype, telephone, WhatsApp) to update assessment team members and relevant stakeholders on progress of preparations or other assessment activities. Notes from these meetings including agreed upon action items should be shared with all assessment team members and stakeholders.

STAKEHOLDER MEETING AND TRAINING LOGISTICS

In the early planning activities, make sure to outline the timing and requirements for the stakeholder meetings, workshops and trainings. When outlining the requirements, it is helpful to consider

Figure 8, Checklist for Stakeholder

SAMPLING

Sampling necessarily serves the objectives of the assessment, but it must also be balanced against the need for holistic and representative data, the budget constraints, and the opportunity costs (e.g., the degree to which normal work patterns may be disrupted by the assessment). The size of the sample is determined depending on the agreed scope of the assessment (i.e. what programs and levels of the public health supply chain will be included in the assessment) and using an appropriate rationale and method.

Selection of assessment sites involves the following four steps:

- Definition of the scope of the assessment.
- Defining the sample frame or population of interest from which the sample will be drawn.
- Determine the minimum required statistically robust sample size, or number of assessment sites, in a rational and standardized manner. The sampling approach and methodology should adhere to certain fundamental statistical principles. However, these principles should be flexible and adaptable to a certain extent to meet local needs and desires. Stakeholders should discuss and reach consensus regarding appropriate balance between the opposing objectives of containing costs and maximizing the statistical representativeness of the assessment results.
- Once the sample size has been computed, the sites are then drawn from the sampling frame in a way that ensures the sample is adequately representative. Typically, sampling is done with the probability of selection proportional to the population size (PPS). This approach is used in many survey sample selection processes and ensures that every health facility has an equal chance of being included in the sample. Thus, if one district has 20 health facilities and another district has 50 health facilities, the district that has 50 health facilities will have a greater probability of being included in the final sample.

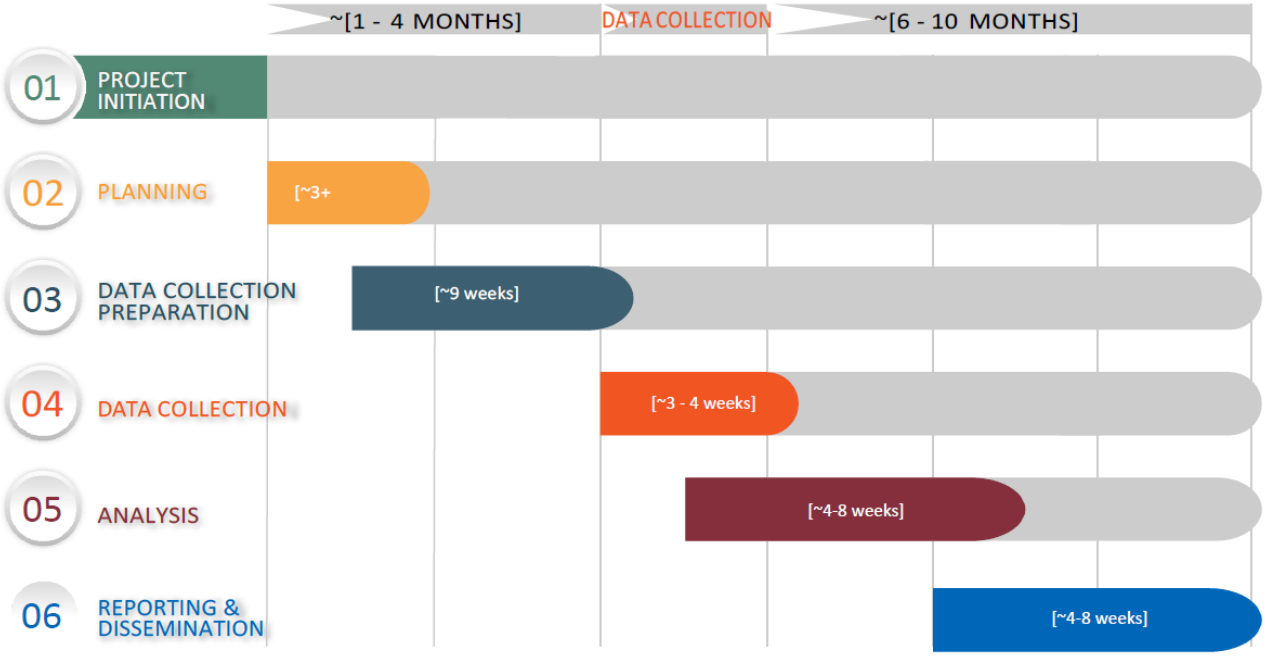
The final sample of sites and key informants is agreed upon and detailed during the stakeholders' planning and public health supply chain mapping training prior to the assessment.

After the assessment sites have been selected, a facility sample list is then completed to designate specific sites and used during data collection. Resources that provide additional information on sampling include Annex 3 (How to Sample) and Annex 10 (Site Visit Schedule Template), and the Sampling/Site Selection Tool which can be found on the NSCA toolkit website.

FINALIZING WORKPLAN AND BUDGET

Once a clear scope has been finalized, the scope should be translated into a workplan and budget. The detailed workplan should correlate to the project phases in the graphic below:

Figure 9, Overview of NSCA 2.0 Timeline



DETAILED WORKPLAN AND ASSOCIATED TIMELINES

The project lead is responsible for determining overall project timelines by laying out key activities and general time estimates. The project start date can be set by either targeting a data collection period and working backwards or setting a start date and planning forward. Typically, the overall NSCA 2.0 implementation process for the assessment from project initiation through site data collection will take 12 or more weeks. This estimate includes the following:

- Planning and Preparation (8-12 weeks): Planning and preparation for data collection prior to the start of intensive data collection in country.
- Team Training/Data Collection (3-4 weeks): Training of data collectors, completion of data collection activities, and delivery of initial feedback to MoH or key in-country stakeholders.
- Data Analysis (4-8 weeks): After the end of in country assessment, data analysis to produce the core analysis tables.
- Report writing and dissemination (1 month to initial draft, review varies): Depends on how long the review process takes (i.e., review, feedback, revision, sign off).

A GANTT chart or other similar planning tool may help to visualize when different elements of the assessment are taking place; this toolkit includes sample GANTT charts and activity schedules:

A detailed workplan for data collection planning and operations is also a helpful tool for implementation. When this detailed workplan is being developed, be sure to account for local holidays (national, public), rainy season delays, and other activities competing for the interviewees' time. In general, it is recommended to plan to visit no more than one site per day (unless they are small sites that are close to each other, in which case it may be feasible to plan to visit two sites). Visiting only one site per day allows for variables such as travel time, waiting time, unforeseen delays due to the site being busy, staff engaged with competing patient care activities, unexpected staff shortages at health facilities, etc.
It can take time to plan travel to the sites in remote rural areas; therefore, planning needs to include time and resources required to prepare for unforeseen delays for these sites. If needed, specific country daily activities can also be charted out. Details of planning sub activities can be found in Annex 13.

BUDGET

The budget should include the resources and expenses needed throughout the life of the project; it is not limited to the data collection phase. If needed, different budget scenarios can be generated using different data collection team sizes and/or number of days in the field. A budget checklist and template can be found in Annexes 5 and 6, respectively; these annexes summarize the types of items that should be included in a budget projection and provide a template to build the budget out.

It is important to include the MoH, implementing partner (local or external), and other stakeholders as needed during the entire budgeting process. They contribute valuable inputs, based on their knowledge and experience of the local context, that help ensure that the plan and budget are accurate, realistic, and reasonable to implement.

MEMORANDUM OF UNDERSTANDING

Prior to starting the assessment, it is necessary for the implementing partner to ensure that a memorandum of understanding (MOU) agreement is signed with the MoH indicating that the MoH supports and authorizes the assessment team to conduct the assessment (include requesting and collecting data). It should also specify the terms of the agreement that should be complied with during the assessment, including information related to data sharing, use, and maintenance. Once the MOU is executed, be sure to comply with these terms (e.g. only collecting data that is on the list that is attached to the agreement, transmitting by agreed upon electronic transfer method). The MOU should include an annex describing the data to be collected. A sample MOU can be found on the NSCA toolkit webpage.

APPOINTMENT SETTING WITH THE MOH

As the team works with the MoH to finalize the memorandum of understanding, it is also advantageous to discuss appointment setting for central data collection. During the pilot activities, it was difficult to complete central level data collection because appointment setting conversations were initiated later in the process. By setting appointments early in the process, the assessment team can ensure there is a shared vision of timelines and it is expected this shared expectation will allow for easier and more complete data collection at the central level.

REVIEW AND FINALIZE THE SURVEYCTO CODE

The process for finalizing the list of tracer commodities, CMM master questionnaire, data collection tools, and preparing the SurveyCTO Code are described in this section.

TRACER COMMODITIES

Based on the objectives and the scope of the assessment, a list of tracer commodities should be developed for use in measuring KPIs. As necessary, stakeholders should prepare a preliminary list of tracer commodities in consultation with staff from key MoH programs, health supply chain managers, donors, etc. The preliminary list should be circulated for comments (see Table 7. below for an indicative list of tracer commodities that may be used as a base for this discussion). To ensure that the final list of tracer commodities is representative of key requirements, stakeholders will review and finalize the list of tracer commodities at the stakeholders/public health supply chain mapping training.

Be sure to also include stakeholders and products from "vertical" (i.e., separate) public health supply chains that might store commodities in different locations if these vertical supply chains are included in the scope of the assessment. Agree upon the most feasible approach and related logistics to ensure these products are included during data collection.

In general, try to keep the number of tracer commodities low so that data collection is not cumbersome or too time-consuming. While the implementers of the assessment could include as many tracer commodities as they would like, they should be mindful that adding more than 12-15 will slow down data collection and could impact the ability of the team to finish data collection at larger sites in one day.

Tracer commodities should generally reflect a good mix of both major program specific drugs (e.g., ARVs, ACTs, and rapid diagnostic test kits), some essential drugs that may not necessarily be considered "priority program drugs" (e.g., critical antibiotics, MCH drugs), other important non-program products (e.g, oral rehydration solution (ORS), pain relief medicines), and also key commodities that significantly impact the budget/expenditure (e.g., products with high cost/high unit, high turnover resulting in overall high total budget, etc.)

The number of tracer commodities may vary, depending on what local stakeholders consider appropriate to the disease patterns, health system, disease programs, and patient demand. The tracer commodities workbook of SurveyCTO should be updated during tool preparation to reflect the list of tracer commodities that will be used for the assessment. See Table 7. below for an illustrative list of tracer commodities.

TABLE 7. ILLUSTRATIVE LIST OF TRACER COMMODITIES FOR NSCA*

ITEM #	PRODUCT NAME	PRODUCT DOSAGE	PRODUCT CATEGORY
1	Amoxicillin Capsule	250mg	Essential Drug
2	Arthemether/Lumefantrine 6x1**	20/120mg	Anti-malarial
3	Malaria RDT	Test	Diagnostic test kit
4	Cotrimoxazole	960mg	Drugs against Opportunistic Infection
5	Depo Provera	Injection	Family Planning
6	Oxytocin Injection	10ui/ml	Emergency Obstetrical Care/MCH
7	Determine RTK	Test	Diagnostic test kit (HIV)
8	Magnesium Sulphate 50%	Injection	Emergency Obstetrical Care
9	TDF+3TC+EFV	300mg+300mg+600mg	ARV
10	Gentamycin 80mg/2ml	Injection	Essential Drug
11	Oral Rehydration Solution (ORS)	Sachet	Essential Drug

*Note: Rapid tests are usually done at health centers, other patient facilities, and now via in-home testing. Lab supplies, reagents, etc. (excepting rapid diagnostic items) should only be included if medical labs are part of the NSCA 2.0, and in that case the lab manager(s) would have to develop a separate appropriate tracer commodity list.

**Note: Although one ACT weight band should be selected as a tracer commodity, preferably AL 6x1, the assessment team should also consider collecting stock data on all 4 weight bands (AL 6x1, 6x2, 6x3, 6x4) to calculate if there is a stockout of all AL (i.e., inability to treat malaria). Countries that carry AS/AQ as the first-line antimalarial should consider ASAQ 25/67.5 mg 3 tab and ASAQ 50/135mg instead of AL 6x1 as the tracer commodities and collect information on all 4 AS/AQ weight bands. The pediatric presentations of the ACTs are preferred as tracer commodities because children are at greater risk of malaria morbidity and mortality than older age groups.

KPI SELECTION

KPIs provide a comprehensive picture of supply chain performance. As such, measurement of KPIs is a key element of the NSCA 2.0. Country public health supply chain managers can also use KPIs in ongoing strategic and tactical management. A list of core and optional KPIs are outline below:

TABLE 8. CORE AND OPTIONAL KPIS BY FUNCTIONAL MODULE

MODULE	CORE KPI	OPTIONAL KPI
Forecasting	• Forecast accuracy • Source of funds	• Supply plan accuracy
Procurement	• Vendor on-time and in full delivery rate • Percent of international reference price paid	• Percentage of orders place as emergency orders • Supplier fill rate • Procurement methods employed • Percentage of health products procured listed on the National Essential Medicines List or similar document for other health products • Customs clearance time
Warehousing and Inventory Management	• Stocked according to plan • Stockout rate by tracer commodity by level in the system • Stock accuracy • Order fill rate • Wastage from damage, theft and expiry	• Stock turn per annum • Number and duration of temperature excursions in cold storage facility • Stockout rates of one or more tracer products by facility • Cost of warehousing operation • Order turnaround time • Percentage of incoming batches tested for quality • Percentage of product batches tested that meet quality standards
Distribution	• On-time delivery to facility • Percentage of orders placed by health facilities as emergency orders	• Cost of distribution operation

HR	• Staff turnover rate	• Percent of supply chain positions vacant
Data and Information	• Facility reporting rates on time	• Facility reporting rates – complete reports

In selecting and interpreting KPIs, the priority should be on country specific targets, based on country goals and annual/strategic plans. Core KPIs should be used unchanged for all NSCA 2.0 assessments to support cross-country and over time comparison. Optional KPIs complement core KPIs. They may be appropriate for the assessment of more developed public health supply chain systems, or to provide more detailed analysis of specific performance areas. If needed, optional KPIs may be adapted to country custom and practice.

For reference, the KPIs are listed in the indicator reference sheet that provides detailed information on supply chain functional area, definition, formula, required data, data sources, collection and analysis tips, reference performance level, related indicators, and where to implement the KPI. See the NSCA toolkit webpage for the detailed indicator reference sheets.

FINALIZE MASTER QUESTIONNAIRE

All tools and training materials need to be reviewed and customized as needed and allowable for the country context. The assessment team/steering committee works with the MoH to identify a select group of individuals – from the core assessment team and tool implementers – to review and provide feedback regarding optional KPIs, finalize tracer commodity selection, and make recommendations on any small adjustments as allowed within the CMM survey. See both Table 8 below and the NSCA toolkit webpage (Instructions for Adapting SurveyCTO) for additional information. It is helpful to identify reviewers early and solicit feedback about adaptations as soon as possible to allow maximum time for coding and testing the SurveyCTO program that houses the final assessment questionnaires. Once the reviewers are selected, the panel will be provided with assessment specific information to help contextualize and inform any subsequent recommendations. Information provided will include: information on the levels of the public health supply chain included in the assessment (e.g., health centers, referral hospitals, etc.), the specific CMM modules that are applied at each level of the

Table 9. DO's and DON'Ts FOR MASTER QUESTIONNNAIRE ADJUSTMENT

What you **CAN DO**:

- Change the tracer commodities and number of months for which to collect the data
- Change the number of different entities and their names (e.g., Health Center, District Pharmacy, Central stores)
- Change other facility names
- Add descriptive questions
- Add optional KPIs selected

What you **CANNOT** do:

- Do not remove questions from the CMM survey
- Do not alter CMM questions or responses
- Do not alter or remove core KPIs

supply chain, and an overview of how the data will be analyzed. It is important to note that at each level, the CMM module questions will potentially differ in nature and number. Reviewers should also be given an overview of how the data will be analyzed and the expected results. Details of the analysis plan can be found on the NSCA toolkit webpage.

For KPIs, reviewers are asked to provide input on the selection of optional KPIs for inclusion in the assessment. The Core KPIs should not be eliminated or changed in any way. Reviewers may also give input on selecting tracer commodities, and the number of months for which historical data will be collected. Reviewers will also be asked to deliver recommendations on allowed adaptations to the CMM survey. The parameters described below (see Table 8.) should be presented prior to soliciting feedback on how to appropriately adapt the NSCA 2.0.

For the CMM survey, it is important to note that the survey is designed with particular scoring parameters in mind. As such, it is important to ensure that changes are limited to the following: 1) changing names for the levels of service and the titles of default supply chain positions, 2) adding levels of service to reflect the supply chain reality, 3) adding some descriptive questions. It is imperative that none of the questions are removed and none of the scoring is changed. If these guidelines are followed, analysis worksheets (i.e., templates) should continue to function accurately. Changes outside these parameters, as well as any changes made after data collection has started, could adversely compromise the validity of the scoring and results.

TECHNICAL UPDATE OF THE DATA COLLECTION TOOLS AND SURVEYCTO CODE

When the selections (optional KPIs, tracer commodities) and adaptations (CMM) have been finalized, the SurveyCTO data collection tools should be updated to reflect these decisions. Once the SurveyCTO has been programmed (updated) with the final selection, no further changes should be made. See the NSCA toolkit webpage for instructions on programming/updating SurveyCTO. The data analysis plan should also be finalized at this time. Remember to remove any optional KPIs deemed unnecessary. It is better to remove the KPIs before data collection than to have to note "data are not available" in the questionnaire during data collection. Explain the data analysis plan and rationale for the approach to local stakeholders before sharing the plan.

The data manager can then use the instructions for programming SurveyCTO noted in the link above to program the customized CMM and KPI tools in SurveyCTO. Customization requires some familiarity with the SurveyCTO environment and programming techniques. (Note that SurveyCTO has a staffed and responsive help line should the team encounter any problems.)

After any changes, the assessment team will need to spend some time going through the final data collection instruments to ensure that there are no remaining 'glitches' or 'bugs' in the programming, and that the questions are presented in a suitable manner. For example, the team will need to make sure the data collection tool works well: skips are well aligned, grammar and editorial aspects are correct, language and terms are appropriate for the country being assessed, the right modules are covered, the identified staff to be interviewed at sampled sites at the different health supply chain levels are correct, and the list of tracer commodities is correct.

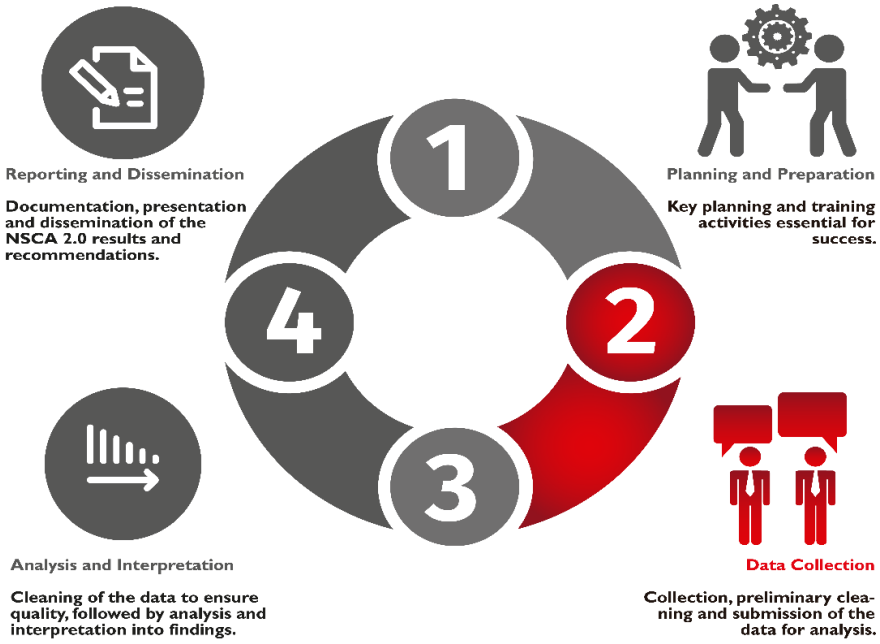
Finally, download the customized tool instruments to the tablets to be used for data collection, test them by inputting mock data on a couple of tablets, and make corrections as needed. If test results are positive and satisfactory, load the tool onto all training tablets.

The paper-based tools will serve as a backup in the event that the tablets are not working. These should be updated accordingly in line with the SurveyCTO updates.

DATA COLLECTION

When launch-related activities have been completed (e.g., team development, planning, budgeting, etc.), the assessment team moves into data collection activities. This section reviews the multiple ways that data will be collected in the assessment: (i) a desk review, (ii) holding a stakeholder workshop/health supply chain mapping workshop, and (iii) field interviews and data collection efforts.

Figure 10, Data Collection Phase of NSCA 2.0



DESK REVIEW: COUNTRY SPECIFIC INFORMATION

Prior to conducting the field assessment data collection activities, the core assessment team should work closely with both the MoH and local stakeholders to gather relevant documentation, and information about the country's health sector and public health supply chain. This documentation should be included in a desk review exercise. It is advised to obtain and review as many desk review documents as possible before the data collection training.

For the desk review activity, data may be compiled in multiple ways including via literature search efforts, review of available relevant secondary data (e.g., existing data sets initially collected for another

purpose but relevant to the current assessment activity), review of primary data (e.g., LMIS specific information pulled for this assessment), receipt of information relevant to the assessment provided directly by the client. To obtain desk review related data sources that are not readily available via public means, reach out through the appropriate channels to request access.

Prior to executing the requests for information, confirm that an MOU is in place that provides permission for document and data sharing as needed. Review the MOU parameters to ensure the content requested is covered. Similarly, be sure to follow the transmission parameters noted in the MOU to transfer files (e.g., Dropbox, email, etc.).

Examples of the types of information that would be useful for the assessment include:

- Country contextual information (e.g. health status, health spending, income, infrastructure, etc.)
- Country health supply chain situation and operations information (e.g. reports of previous assessments, financial information, data from paper-based and/or electronic logistic management information systems [LMIS/eLMIS])
- Strategy documents (e.g., National Health and Pharmaceutical Strategic Plan, Supply Chain Strategic Plan)
- Policy documents (e.g., National Health and Pharmaceutical Policy)
- Planning documents (e.g., Supply Chain System documents, lists of health facilities)
- Routine reports (e.g. annual reports)
- Information on country-wide information systems
- Health supply chain operations information, stock information, financial information
- Unpublished country reports
- Central level information at MOH HQ
- Central medical store related information
- Medicines regulatory authority information
- Health facility information
- Previous supply chain assessments

This information collected and reviewed may provide insights on the environment, the country's health system, and public health supply chain system, and could be used to help define the scope and preliminary plan for the NSCA 2.0 implementation. The knowledge gleaned from the gathered

documents and discussions with both the MoH and other stakeholders will be helpful in drafting the public health supply chain map (it will be reviewed/finalized at a stakeholder/supply chain mapping workshop) as well as informing other areas of the assessment activity. Information reviewed will also be used to inform the planning and preparations for the assessment (e.g., communication and coordination with stakeholders, assessment scope, SOW, timelines, sampling, tracer commodities/KPIs, tool customization, data collection teams, workplan and budgets, etc.). It is helpful to outline which types of information have been gathered, and to link specific documents to elements of the assessment activity (e.g., mapping, KPIs, etc.); this document outlining the links between specific documents and elements of the assessment may make it easier to know which information to draw on during each assessment activity.

The next step includes identifying possible sources of information via logistics management information systems – electronic or paper-based. To obtain the needed data, it is important to: 1) provide information in advance about what data will be extracted from the LMIS system, 2) identify what levels of service are in the public health supply chain LMIS/eLMIS data and who has access, 3) request advance submission of the data as appropriate (e.g., can eLMIS data be downloaded, exported, and transmitted electronically before the on-site visit), and 4) work with the site to determine what will be extracted, when, and by whom.

Conduct Stakeholders/Supply Chain Process Mapping Workshop. The second key activity in the data collection planning process is a stakeholder/public health supply chain process mapping workshop. Weigh the timing of the meeting and the availability of the stakeholders and decide early the best approach for scheduling public health supply chain mapping activities and engaging stakeholders. In doing so, it is important to balance two things – (i) the need to get as much information as possible early, well in advance of the data collection, so the information can be used in planning and preparations for the assessment, and (ii) the need to engage stakeholders in a face-to-face meeting to have their buy in, formally initiate the assessment process, and make sure everyone is on the same page. The stakeholder's workshop could therefore be done early in the process, or a few days before data collection. These two options are considered below:

OPTION I - Hold the workshop early on and update materials right before data collection. Consider this option in a situation where the core assessment team is not familiar with the country. This option may also be a good choice when there isn't much information available online or it is not possible to gather information remotely.

OPTION II - Gather and synthesize information early remotely, create a draft public health supply chain map, then review the map and materials in the stakeholder's workshop right before data collection. Consider this option in a situation where a lot of information is readily available ahead of the data collection activity. For example, this may be the case where the MoH operates and manages through a robust eLMIS system, where a strong implementing partner (local or external) is involved who is knowledgeable about the country and is able to gather the health supply chain mapping information at the same time as the desk review activities. Also consider this option when an external partner is involved to limit the number of trips to country.

TABLE 10. STAKEHOLDER WORKSHOP CHECKLISTS			
PREPARE FOR STAKEHOLDER/SUPPLY CHAIN PROCESS WORKSHOP	(√)	CONDUCTING THE STAKEHOLDER/SUPPLY CHAIN MAPPING WORKSHOP	(√)
Once an option has been selected, make sure workshop preparations are done on time, including the following:		*The workshop should focus on the following key items:*	
Workshop Agenda		Objectives, scope, and methods of assessment	
Workshop materials and supplies (flip charts, masking tape, markers, and guidance for group activity on drafting supply chain maps)		Identify assessment related personnel/teams and clarify roles	
Reserve training venue		Develop assessment timelines	
Identify and engage workshop organizer and facilitators, including high-level MoH officials		Prepare preliminary requests for information and physical verification forms	
Inform participating organizations		Sampling	
Invite workshop participants and facilitators – should represent all levels of health supply chain (e.g., high-level officials, policy makers, influencers, implementers)		Agreed upon tracer commodities and KPIs that will be included in the assessment	
Make payment arrangements for facilitators/participants		Reinforce the importance of quality assurance and roles of stakeholders in assuring quality	
Make training attendance lists		Physical verification forms	
Plan logistics for people from out of town (travel, lodging, per diems)		Tool customization	
		Logistics of data collection	

PUBLIC HEALTH SUPPLY CHAIN PROCESS MAP ACTIVITY[5]

The diverse participant group included in the workshop fosters buy-in for the assessment across all levels of the public health supply chain and allows for representation of diverse perspectives on the public health supply chain system. The public health supply chain process map activity is one part of the workshop where these varying viewpoints converge to allow for the development of a comprehensive representation of the health supply chain. In this activity, misunderstandings about the structure and function of the public health supply chain can be aired and resolved in a collaborative workshop environment. A template PowerPoint presentation to guide this activity can be found on the NSCA toolkit webpage.

Below is a brief overview of the practical steps involved in developing the public health supply chain process map, a key deliverable expected from the stakeholder/public health supply chain workshop. Participants in the workshop should be divided into groups and tasked to discuss, create, and present their public health supply chain process maps to the larger group. A more detailed breakdown follows:

STEP 1: Group Work (approximately 1 hour)

- Divide participants into groups of 4 – 6 persons, either randomly or according to disease program – countries with parallel health supply chains should divide by the latter. Avoid including supervisors and subordinates in the same group and consider cultural nuances to best encourage open discussion and active participation.
- Distribute materials (e.g., flip charts, markers, copies of activity guidance).
- Each small group will be asked to include the following elements in their draft public health supply chain map:
    - On a single flip chart, show each level of the public health supply chain (central, regional/district, service delivery point level) and the public health supply chain entities within each level.
    - Identify which entity or entities are responsible for the key functional areas throughout the public health supply chain system: forecasting and supply planning; procurement and customs clearance; quality and pharmacovigilance; manufacturer/supplier; warehousing and storage; distribution; LMIS; waste management.
    - Draw the flow of products and information between entities. Note how products are transported, who transports products, how and when information is shared (including types of logistics reports and systems), and whether health facilities order commodities from intermediate or central warehouses using a demand-based "pull" system, or suppliers simply "push" products to health facilities
    - Identify monitoring and supervisory processes.

[5] Adapted from: Kathleen Bartram, Elizabeth Kelly, and Melissa Levenger. 2015. National Supply Chain Assessment User's Guide. Arlington, Va. Supply Chain Management System

- Identify funding streams and budget cycles.
- On a separate flip chart, list strengths, weaknesses, opportunities, and threats (SWOT) within the current supply chain.
- Discuss current policies impacting the health supply chain.

During this exercise, facilitators should take time to observe each of the groups, answering any questions and providing guidance throughout the process.

STEP 2: Presentations and plenary discussion (approximately 20–30 minutes per team)

- Assign a note-taker – this person is different than the trainng facilitator - to take notes during the presentation and record items to be addressed at a later time (i.e, parking lot).
- Review presentation guidelines with the teams:
  - Two reporters present the public health supply chain maps and SWOT analysis on behalf of each team.
  - As groups present their public health supply chain maps and SWOT analysis, the facilitator should encourage questions, feedback, and comments from the room. This process should help facilitate a group discussion and collaborative review and revision of the public health supply chain maps toward the desired outcome – a common public health supply chain map that is supported by all stakeholders.
- Facilitators should end this segment by summarizing key points for the group, and revisiting parking lot items to reach consensus on any remaining outstanding issues.

In this step, the facilitators should carefully listen, take notes, and collect the maps and related documents that are produced during the workshop; collecting these documents ensures that the relevant data from the public health supply chain mapping workshop is captured. If necessary, take pictures of draft maps for possible comparison with the final visual map later.

FIELD DATA COLLECTION

Ensure the following steps have been completed as part of the preparation activities for data collection. The information below is broken out into key pieces related to agreements, pre-training preparations, training preparations, post-training logistics, and on-site data collection.

DATA COLLECTION TRAINING

Training for the field team is essential for effective and quality data collection. Data collectors should undergo training to ensure they understand the purpose and objectives, implementation process, and tools of the NSCA 2.0. The training also teaches the data collectors to apply the data collection methodologies and tools uniformly to ensure the collection of high-quality data. A checklist outlining pre-training preparations can be found in Annex 9. The training will also include a practice field data collection exercise.

The training is conducted by the assessment manager, possibly supported by the project lead, . By the end of training, trainees should be familiar with the data collection processes, tools, and devices. Attendees should also be able to plan appropriately and apply the skills and tools to effectively and efficiently collect and submit quality data. This section provides guidance on how to conduct the training to ensure that data collectors are fully prepared to execute the NSCA 2.0 effectively. A typical data collection training will last for 4-5 days.

TRAINING IMPLEMENTATION

For the data collection training sessions, please utilize both the data collection training agenda and associated PowerPoint materials available on the NSCA toolkit webpage. These materials, both agenda and PowerPoints, cover the core topics included in the data collection training activity: Some of the materials may need to be revised prior to training. For example, content such as tracer commodities, levels of the supply chain, functional modules included, physical verification lists, etc. may vary from assessment to assessment. Key topics reviewed in the data collector training include:

- Opening remarks/overview of the training
- Overview/basics of the NSCA 2.0
- Introduction to tablets and software used for data collection
- Overview of CMM and KPI data collection, including role play activities
- Review of data collection timeline and sampling
- Discussion of data collection activities and key considerations
- Review of how to ensure data quality
- Field test to practice collecting assessment data in real life

The training approach includes a mix of didactic lectures (i.e., PowerPoint slides), step-by-step demonstration, and hands on practical exercises whereby trainees practice capturing capability and KPI data on the tablet with trainers providing guidance. Exercises include role plays and practical activities in the classroom. There is also mock data collection during field tests at a health facility. Be sure to identify the health facilities for the field test and book the venue(s) in advance.

Training personnel may include the project lead, assessment manager, and/or relevant MoH official . During training sessions, trainees should be provided with support materials relevant for the activities:

- Paper copies of capability interview questionnaires for the level of the supply chain for which the training is being conducted (i.e. central capability questionnaire, warehouse capability questionnaire, hospital capability questionnaire, SDP capability questionnaire)

- Paper copies of KPI data collection forms for the level of the supply chain for which the training is being conducted (i.e. KPI data collection form SDP, referral hospital, warehouse or central level KPI data collection form)

- Paper copies of health facility stock cards for use during demonstration and hands-on practical activity on collecting KPI/stock data

- Paper copies of health facility order and delivery records for use during demonstrations and hands-on practical exercise on collecting KPI/upstream order/delivery data

- Data collection guides and instructions (both CMM and KPI). These materials can be found on the NSCA toolkit website

- KPI definitions document that includes the Indicator Reference Sheets, either electronically or in paper form. This document can be found on the NSCA toolkit webpage.

- Tablet PCs, fully formatted and loaded with SurveyCTO software, should be available to practice how to use the SurveyCTO software, and how to capture CMM and KPI data on the tablet PC. There should be enough tablet PCs to allow at least one per two trainees during training demos, role plays, practical activities and the field test.

Once classroom training activities have been completed, all trainees will participate in a field test. This activity allows trainees to apply the skills learned in the classroom portion of the training in the field. Two days of training will focus on allowing trainees the opportunity to collect data in real life – two full mornings to collect data at one or more health facilities, depending on how many people are being trained. Each morning, teams visit the local health facilities – e.g. a primary health center/clinic, and/or a hospital and and/or a medical warehouse. Part of this field test will include a focus on producing quality data; participants will discuss challenges faced during data collection activities and how to overcome them effectively in order to produce high quality data.

At the conclusion of the data collection training, each participant will be asked to complete a training evaluation survey.

FIELD DATA COLLECTION PREPARATION

In parallel with the data collection training activity, the core assessment team led by the logistics coordinator should work with local counterparts to ensure that all field visit logistical preparations have been completed by the end of the training week, so data can be collected effectively and efficiently. Steps that need to be completed follow:

Figure 11, Field Data Collection

* Ensure that local holidays and normal working hours are observed and planned into the schedule. Be sure to select appropriate time of year to ensure uninterrupted safe travel for data collections in the field (e.g., avoid the rainy season if possible), consider public and national holidays, and competing activities in the community or in the health facility (e.g., audits, staff training, national or international health activities, stock-taking, immunization days, elections).

NOTIFYING SITES

As the team is preparing to undertake data collection, field sites need to be notified. Following the appropriate procedures and channels, schedule site visits and formally notify relevant health authorities (including sub national or district offices) of the data collection schedule, and any required pre-visit preparatory work and related logistics arrangements.

Assessment leaders should determine if sites should be notified of the visit in advance. When making that determination, it is important to consider the advantages and disadvantages of each approach. Advantages of notifying in advance include increasing the likelihood that key informants will be present and available during the time of the site visit and that required records and information will be available and easily accessible. Disadvantages include increasing the likelihood that the site staff will try to modify their usual practices or take action to fix or conceal any gaps or problem areas within the health facility[6]. It is common practice that an official memo or message is sent to the local authority and site by the relevant central government authority.

To notify sites, first hold a meeting with relevant MoH authorities (and any donor involved in funding the assessment) to jointly discuss and plan the assessment logistics. Formally send the appointment request in writing and attach the assessment scope of work, list of sites to be visited, types of data to be requested or collected at the sites, list of documents to be physically verified at the sites and estimated times for interview. During the meeting with the MoH authorities, request that they notify the identified sites of the planned visit and send them the physical verification lists and data requests prior to the visit, so the site staff can have enough time to prepare the documents and have them ready on the day of the assessment visit. See Annex 11 for Site Communication Templates and Annex 12 for a List of Documents Needed for Physical Verification.

If advance notice is the recommended procedure, appointments need to be reconfirmed at least a week before, and during the assessment week to ensure site staff will be ready and available.

ON-SITE DATA COLLECTION ACTIVITIES

If possible, the data collection teams should be deployed to the field to collect capability and KPI data from sampled sites across all levels of the public health supply chain system in the week following the training. Data collection should be completed in parallel for both the central level and other levels of the supply chain, with separate teams for central and other levels as discussed earlier in this Guide.

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[6] Adapted from: Kathleen Bartram, Elizabeth Kelly, and Melissa Levenger. 2015. National Supply Chain Assessment User's Guide. Arlington, Va. Supply Chain Management System

For the central site data collection team (>4-member team), several people should focus on stock counts and other KPI data collection activities, and 1 to 2 people on capability interviews. For the peripheral data collection team (2-4-member team), 1-2 people should complete capability interviews and a minimum of 2 people should collect KPI data (in some cases at small facilities these may be the same people). The KPI data collection requires a minimum of two people because this data is more complex and time-consuming to collect. If possible, include one person from central or regional/district government level in each data collection team to serve as readily available and accessible point of contact for logistical or other issues that may arise in the field.

During data collection activities, the project lead, assessment manager, logistics coordinator and data manager should remain at central level. The assessment manager manages all fieldwork as well as leads data collection at central level. The data collection supervisors lead and oversee data collection at lower level sites. The data manager cleans and analyzes the submitted data and assists with data interpretation and report writing.

The total data collection timeline will vary, based on number of respondents for the CMM survey, how large the site is, how busy the site is during the visit, and how well data collection is organized (i.e. whether the CMM survey and KPI data collection are done sequentially or simultaneously).

Table 11. List of Documents/Equipment Needed for Field Data Collection Activities

- Tablets – both minimum required and extras in case of problems in the field
- GPS Devices
- Mobile Phones
- CMM paper-based tool
- KPI paper-based tool

- KPI Definitions, Indicator Reference Sheets
- Instructions on completing stock data forms
- Forms for stock data
- Forms for order data collection
- Guide: How to conduct a capability interview
- Guide: How to collect KPI data
- Device Chargers
- WiFi USB adapters/dongles to facilitate daily data submission in cases of poor internet access
- Mobile phone credit (team communication)
- Copies of memo from MoH authorizing the assessment
- Physical verification lists

Communication during data collection is of key importance. Regular communication allows the core assessment team at the center to monitor how well the field activities are progressing, as well as for everyone to mutually coordinate, communicate, and share experiences and lessons learned. As issues arise, the team can collaboratively discuss and solve data collection challenges in real time. Specifically, the pilot experiences in Rwanda and Zambia suggested that WhatsApp groups proved to be a highly effective means of communication and avenue for real time mitigation as needed. Prior to the start of field data collection activities, complete the following:

- Set up a central project hub from where the assessment manager, data manager, logistics coordinator, and others at central level can coordinate, communicate and manage field activities

- Set up a WhatsApp group or other social media platform or other appropriate real-time communication mechanism for use in two-way communication between the hub and field teams.

- Give data collection teams airtime or internet access so the teams are able to continuously communicate with the central hub and can upload the data collected during the day to SurveyCTO daily.

Communicating effectively and making sure everyone buys in and is on the same page regarding the need, objectives, scope and expectations of the assessment right from the outset ensures commitment and teamwork. If site personnel are informed reasonably prior to the visits they will be aware and will likely be prepared and ready to help and provide needed data on the day of the visit.

DATA COLLECTION

When data collection teams travel to the field, it is important that they ensure the following key actions are completed:

- Travel to the field sites with the necessary authorization documents (e.g., an official memo from the relevant central or local government authority indicating that the data collection activity and data collection team visit to the site are approved, including data sharing).
- Ensure that they have all required equipment and materials for the field site where they are collecting data (e.g., electronic devices, paper and electronic copies of documents, guides and instructions – Table 9.)
- Upon arrival at the field site, the data collection supervisors should clearly assign data collection tasks to each member of the data collection team.

Once all these actions are completed, data collection can start. KPI and CMM data collection should be completed concurrently, making it necessary for each of these data collection teams to have at least one tablet. Previous efforts to share one tablet across both KPI and CMM data collection activities made it difficult to collect all necessary data in one day at larger sites.

For further detailed guidance how to collect data during the site visit, review the related resource on the NSCA toolkit website.

DATA COLLECTION RISK MITIGATION STRATEGY

Risks in the data collection process may result in incomplete or low-quality datasets. A brief overview of potential data collection related risks/mitigation strategies are outlined in the table below.

TABLE 12. POTENTIAL DATA COLLECTION RISKS AND POSSIBLE MITIGATION STRATEGIES	
RISK	MITIGATION
Not enough time at each site	Have enough data collectors – typically 2 to 4 per team (1-2 do capability interview and the other 2 collect KPI data). In general, plan to visit one site per day to allow travel time, waiting time, unforeseen delays. Have a manageable list of tracer commodities (if possible, not more than 12-15) – having more will slow down data collection. Alert site ahead of time on who will need to be interviewed and the documents to be reviewed (physical verification list).
Not enough time to visit all sites	Budget enough time to be able to visit all sampled sites. Involve local health players in planning, who know the geography and terrain. Plan for enough data collection teams to visit all sites in the allotted time.
Data collectors not fully knowledgeable of health system	Use data collectors who are familiar with the country health system (e.g. district pharmacists or other supervisory personnel)
Staff not aware of visit in advance	Request the MoH to send the notification and physical verification lists to sites well in advance of the site visit. Reconfirm the appointments 2 days to a week before the visit date to ensure site staff will be ready and available for you.
Staff not aware of data request in advance	Request the MoH to send the physical verification lists to sites well in advance of the site visit
Staff not comfortable sharing data/not confident allowed to share	Make sure the MoH sends advance notice to sampled sites with an authorization letter confirming it is appropriate to share data. Reassure staff that the results will not be used to judge personnel performance.
Staff resistant to let data collectors document info on negative findings as this could be perceived sensitively by their supervisors or higher levels-	Report and present findings in a professional and palatable way while maintaining integrity of assessment. Data will be aggregated and not presented for individual facilities, except higher in the system where there are only one or a few facilities.
Staff not able to answer questions	Ask if another staff member is available to answer questions, especially if the selected staff member is new to the site. At central level make every attempt to find someone to answer the questions, even if this requires a repeat visit or more than one respondent per module.

DATA MANAGEMENT

To manage and clean data appropriately, several key steps need to be completed for field data collection activities. These activities are split between the assessment manager and data manager roles on the core assessment team.

- Subject to internet connectivity, data should be uploaded daily from the data collection tablets to the central database for quality review and cleaning by the data manager
- Data manager should check the quality of data received regularly, and reach out to specific data collectors to clarify any points of confusion or omission

- Maintain regular communication to ensure on-time data collection, and timely risk mitigation if issues arise in the field (e.g., tablets or data collection tool challenges among others)

- Develop an internal monitoring tool and track data collection progress - confirm sampled sites visited, data collected on-time and in the right locations, any issues arising that could adversely impact data collection, what processes etc. were used to address challenges that arose (e.g., compare completed data forms with geolocation markers that have been uploaded into SurveyCTO vis-à-vis the data collection schedules to validate if data collection teams were physically present in the appropriate locations at the appropriate times)

- Data manager should complete an end to end quality assurance check of the data before releasing the data set for analysis and reporting at the end of the data collection period.

DATA CLEANING AND QUALITY ASSURANCE

The data collected during an NSCA 2.0 assessment may be subject to error or inconsistency that could bias the results. Therefore, it is important to put in place measures to prevent or minimize both unintentional or intentional errors during data collection. For example, errors may include values entered outside of allowed parameters (e.g., a value of 11 when only 1-10 are allowed), unit of measurement error such as bottles/packs vs. pack with multiple bottles/patient packs, values incorrectly recorded in local vs international currency.

Assessment personnel play different roles for ensuring data quality, depending on their level and roles in the process (i.e. whether they are involved in organizing/overseeing or executing data collection, or in analyzing the data). Further details and specific examples can be found in Annex 15.

DATA COLLECTION CHALLENGES

During data collection activities, challenges may arise. Examples of potential data collection challenges and possible solutions are outlined below:

TABLE 13. DATA COLLECTION CHALLENGES AND POSSIBLE SOLUTIONS

POTENTIAL DATA COLLECTION CHALLENGE	POSSIBLE SOLUTIONS
Deviation from data collection schedule	• Use flexible data collection plans and schedules with contingencies to modify field travel plans as needed within set parameters (e.g. as long as they maintain the assigned sample of sites and communicate accordingly for central coordination unit approval). • Design and use appropriate tools to track progress and compliance of data collection teams with set schedules and manage or correct deviations before it's too late. • Make sure approved

TABLE 13. DATA COLLECTION CHALLENGES AND POSSIBLE SOLUTIONS	
POTENTIAL DATA COLLECTION CHALLENGE	POSSIBLE SOLUTIONS
	changes to the data collection schedule are properly documented.
Difficulty accessing data	• If it's LMIS/eLMIS data that is not accessible, find out from the health facility who is responsible and has access or can help you access the data. To avoid running into such access problems, alert the sites in advance on what data will be extracted from the LMIS/eLMIS system, identify at what level of the supply chain store the data is available and who has access and coordinate with the site to clarify when and by whom the required data will be extracted. If possible, request for the data to be submitted electronically or by downloading eLMIS data before the site visit. • Make sure data collectors hold introductory/in-briefing sessions with host site staff staff and request the right, knowledgeable health facility staff to assist them with data collection. • Notify facilities ahead of time about the data that will need to be accessed.
Transportation challenges	• Plan field logistics (including securing safe and well serviced vehicles) in time well before the scheduled travel datas. Collaborate as needed with local partners and stakeholders to leverage appropriate safe transportation and other resources for field travel. • Provide data collection teams with appropriate vehicles for the terrain and/or weather conditions in the areas they will travel. Provide vehicles with adequate gas storage capacity and/or adequate reserve gasoline, frequently needed spare parts (e.g. tires) for teams traveling to remote areas with limited or no vehicle service stations. • Schedule travel during appropriate times to avoid interruptions or unsafe travel (e.g., avoid the rainy season if possible), consider public and national holidays, and planned or possible competing activities at the sites to be visited • Provide data collection teams with pre-planned transportation routings • Proactively investigate and understand the nature and contributory factors for the transportation problems and coordinate as needed with relevant parties or stakeholders to mitigate the problems • Plan for data collection teams to spend the weekend in the field if working in difficult to reach areas or areas far from the capital.
Data collectors face problems using tablet PCs, CMM/KPI data collection instruments, or any other issues that may arise during capability interviews or KPI data	• Set up and use WhatsApp group or other appropriate social media platform to enable real time, two-way coordination and communication between the central coordination unit and field teams and mutually communication among field teams to share experiences and discuss and advise each other on solving data collection problems in real time. • The data manager should remotely support the field teams from the central unit by providing real-time answers to any enquiries and help promptly solve field challenges • Carry backup paper forms for collecting the CMM and KPI data.

TABLE 13. DATA COLLECTION CHALLENGES AND POSSIBLE SOLUTIONS	
POTENTIAL DATA COLLECTION CHALLENGE	POSSIBLE SOLUTIONS
collection	
Data quality issues/missing data	• Data manager should continuously check uploaded data for errors, inconsistencies, missing data or other quality issues, and proactively reach out and follow up to address the problems • Properly document any changes made based on the data cleaning and quality assurance process.
Inadequate knowledge of health system among data collection team	• Utilize data collectors who are existing players in the country supply chain and are knowledgeable of the health system, as long as data collectors are assigned to assess outside of their own regions or work environments (to avoid bias). • To the extent possible, make sure data collectors are adequately trained and walked through all capability and KPI data collection instruments (module by module, question by question and related checklists, physical verification lists, guides and instructions to make sure). Also make sure they have all assessment materials and needs, including checklists, physical verification lists, guides and instructions, glossary of terms, pre-prepared transportation routings.

DATA COLLECTION DEBRIEFS

Assessment activities are concluded by debriefing the MoH and donor and/or other key stakeholders with preliminary assessment conclusions.

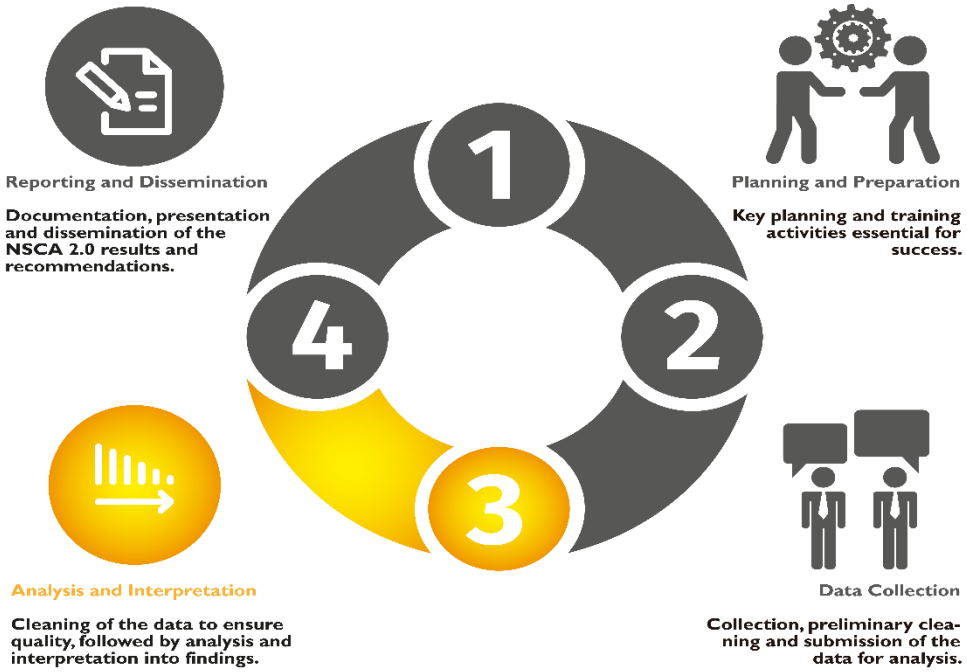
- Starting in the last few days of fieldwork, the assessment manager and data manager should review the data and WhatsApp stream messages and prepare preliminary high-level findings for use during the debriefs.
- Upon completion of field data collection, members of the assessment team should meet to discuss, and agree upon a concrete plan of next steps (and associated responsible parties), informed by the preliminary findings, and have clear actions for delineated responsible parties.
- The core assessment team then prepares a debrief for the steering committee. Once cleared by the steering committee, the debrief is presented to governance team. See the NSCA toolkit webpage for a template to develop the outbrief presentation.
- The core assessment team should hold a debrief session with the data collectors to receive feedback on the assessment and gather any additional information. This is also an opportunity to collect the tablets and resolve any payment issues and serves as a nice conclusion to the field work portion of the assessment.

ANALYSIS

OVERVIEW

During the data collection exercise, as data is uploaded the data manager checks and cleans the data as needed to ensure quality, and s/he then compiles and produces tables of outputs of the core analysis results (both CMM and KPI scores). The toolkit includes a core set of analytics that should be standard output for every assessment:

Figure 12, Analysis Phase of NSCA 2.0



CAPABILITY MATURITY MODEL

- For each level of the supply chain: maturity scores and a bar chart for every functional area
- For each functional area: scores and bar charts showing the maturity score at for each level of the supply chain
- A table of percentage of 'basic' items in place, on average, by level for each functional area
- A 'heat map' and 'bubble chart' depicted maturity scores by level and functional area with scores converted to relative colors/sizes
- Tables showing the responses to descriptive questions

- Average responses to all questions, by level

KPIS

- A summary of each KPI including data for relevant levels of the supply chain
- KPI data, broken down by tracer commodity, where appropriate

The analytic workbooks in the toolkit are set up to produce these core sets of analyses, summary tables and graphs automatically using data exported from the SurveyCTO tool. Additional analyses may be needed based on the team's reviews of the assessment data and the objectives of the assessment.

All CMM maturity model data can be exported into one workbook. KPIs data need to be processed in at least two separate workbooks – one for data that can be collected at non-central levels and another for data collected only at the central level. The three analysis templates (CMM, non-central KPI, and central KPI) are designed to be compatible with Survey CTO output (e.g., data can be directly copied from Survey CTO output and pasted into the templates). The CMM analysis template can accommodate up to 15 different levels of the health system and the non-central KPI analysis template can accommodate up to 10 different levels of the health system. Each of the analysis templates also has accompanying detailed instructions on their use that can be found on the NSCA toolkit webpage.

There are at least two defined deliverables based on the core analytics:

- Debrief at the end of data collection
- Complete set of Core Analytics – to include in Report Templates

It is at the discretion of the steering committee and assessment manager what additional data or analyses should be shared with other stakeholders throughout the process. For example, depending on the structure of the assessment, it may be helpful to share the completed analytics to stakeholders prior to the complete report.

CMM SURVEY ANALYSIS WORKBOOK

Outputs are summarized in six worksheets at the front of the CMM Survey Analysis workbook. They are:

- Dashboard- The dashboard contains four summary outputs: a traditional heatmap of overall maturity scores by level and functional area, a bubble chart heat map of the same information, spider graphs of the results for the five modules asked at all levels of the health system, and a bar chart representing the percentage of basic items in place by module and level of the health system.
- Summary Table- The summary table worksheet presents two tables. The first table combines the overall maturity scores by module across levels of the health system. The second table presents the percentage of basic items in place by module and level of the health system
- Bar Charts- The bar charts worksheet first presents maturity scores, broken down by the contribution to the overall score by maturity categories, across levels of the health system for one

functional module in a bar chart. The second bar chart presents the same information but presenting all functional module results for one level of the health system

- Descriptive (Numbers)– Numeric results for all 'descriptive' questions asked in the CMM survey, for each level of the health system included in the assessment.

- Descriptive (Graphs)– Bar chart results for selected 'descriptive' questions asked in the CMM survey, for each level of the health system included in the assessment.

- QbyQ– Average answers to each of the questions asked in the survey, separated by health system level.

In addition, the template presents results for each of the health system levels included in the assessment. Please note that there are no tabs for individual functional modules.

KPI ANALYSIS WORKBOOKS

Due to the size and complexity of the calculations, there are two analysis templates to convert data collected into final KPIs for analysis and presentation. The first workbook calculates KPIs for those indicators / data that as a rule will only be collected at the 'central' level – that is, indicators that are relevant for the entire country. Note that this does not necessarily mean that these data are only collected from one entity. Nor does it indicate that the data for each KPI will only be collected once; in countries with separate supply chains (e.g., government and private / religion-based supply chains or drugs delivered separately under 'vertical' programs) may collect central level KPIs multiple times. This work book is referred to as the 'Central KPI analysis template'.

The second workbook calculates KPIs for those indicators / data that could be collected from multiple sites throughout the country, and the data from these separate sites need to be combined to calculate the KPIs. Note again that some of the data for this workbook may be collected at a central / national level entity (e.g., the central warehouse) but may also be collected at other sites (e.g., intermediate warehouses, SDPs, etc.). This workbook is referred to as the 'KPI non-central analysis template'. Each of these workbooks comes with detailed instructions on their use. For output, both workbooks contain a worksheet within the workbook named 'Dashboard' and another named 'Tables'. The KPI non-central analysis template also contains a third output sheet name 'Graphs'.

- Dashboard- The dashboard worksheet contains a summary table of the KPIs which are color-coded to reflect how near/far the calculated indicator is from a set target or performance standard. While there are default performance targets included in the templates based on international norms, individual assessment teams should adjust these to reflect targets or goals for the country of interest. The KPI non-central analysis template dashboard worksheet also contains spider graphs, which can be used to compare performance on selected KPIs across the tracer commodities used in the assessment.

- Tables- The tables worksheet contains the results of calculations for the KPIs included in each of the templates, presented in the following order:

TABLE 14. KPIS INCLUDED IN CENTRAL AND NON-CENTRAL ANALYSIS TEMPLATES	
CENTRAL KPI ANALYSIS TEMPLATE	KPI NON-CENTRAL ANALYSIS TEMPLATE
1. Forecast Accuracy	1. Stocked according to plan
2. Supply Plan Accuracy	2a. Percentage of facilities with stockout on day of assessment
3. Source of Funds	2b. Stockout days for the assessment period
4. Percentage of the international reference prices paid	2c. Percentage of days out of stock for the assessment period
5. Percentage of procurement orders placed on vendors that were emergency orders	2d. Average number of days per month with stockout, given that there was a stockout
6. Percentage of the types of procurement undertaken	3a. Stock card accuracy: Percentage of facilities at 100%
7. Vendor on-time and in full delivery rate	3b. Average deviation from 100% accuracy across facilities
8. Supplier Fill Rate	4a. Stock card up to date: Percentage of facilities with stock card up to date (reported)
9. Percentage of procurements that are made based on the National Essential Medicines List	4b. Electronic LMIS record accuracy: Percentage of facilities at 100% (accurate)
10. Average number of days for customs clearance	4c. Electronic LMIS record accuracy: Average deviation from 100% accuracy across facilities
11. Stock turn per annum	4d. Electronic LMIS record up to date: Percentage of facilities with electronic LMIS record up to date
12. Staff turnover rate	5. Wastage from damage, theft, and expiry: Damaged, lost, and expired stock as a percentage of the total stock available*
13. Percentage of supply chain positions vacant	6. Stockout rates by facility
14. Facility reporting rates on-time	7. Order Turnaround Time: Number of days between order receipt and order shipment
15. Facility reporting rates – complete	8. Order on-time rate
16. Percentage of incoming product batches tested for quality	9. Percentage of orders, by type
17. Percentage of product batches tested that meet quality standards	10. Downstream delivery data indicators
	11. Cost indicators
	12. Temperature excursion indicators
	13. Human resources indicators

* For USG-procured commodities that are damaged, lost, or expired, the assessment implementing partner (if hired by USAID) will need to work with USAID to report this to the USAID Office of Inspector General (OIG).

- Graphs- The KPI non-central analysis template also contains a worksheet with graphs which depict the average number of days a commodity was out of stock for the different levels of the supply chain included in the assessment. There is one graph for each tracer commodity.

The CMM Survey and KPI analysis templates provide the basis for analyzing the data, but the assessment team will need to carefully review the data to interpret the data and make recommendations. The guiding principles that formed the analyses templates are:

1. Keep the analysis as simple as possible to meet the objectives: The data analysis should follow the objectives laid out for the assessment. Reporting mean (average) data coupled with assessments of well-performing and poorly performing areas will be sufficient for the objectives of most assessments. Simplicity and straightforwardness in data analysis aids in maintaining stakeholder buy-in and their understanding of the results.

2. Data analysis should be documented and replicable: Data analyses should include notes on definitions (e.g., of KPIs), steps in the analysis, assumptions, and record of different versions of the analysis. If statistical software (such as Stata, R, or SPSS) is used, resulting log and programming files should be retained, and shared if necessary. For analyses done in spreadsheet software (such as Microsoft Excel), careful notes on the steps employed should accompany the analysis. This again will enable justification of the results and aid in maintaining stakeholder buy-in and their understanding of the results.

3. Outliers and variance is often as informative as averages: Results for which there is wide differences across sampled sites, as well as sites with results that are widely different than the results from other sites (i.e., that are outliers) should be assessed and discussed. Outliers, in particular, need to be assessed to determine that the data reported are valid (and not, e.g., an artifact of poor data collection practice or clustered by data collection team), and to assess potential reasons why the site may be an outlier. Similarly, results for which there are wide differences (i.e., high variance) should also be assessed to determine potential reasons why some sites (or groups of sites) have higher results than other sites (or groups of sites).

4. Analysis should follow the sampling structure: The sampling process should inform the data analysis, minimally accounting for:

    - Weighting: If sites have a different probability of selection into the sample, then results should be weighted. Weighting results reflect the probability that an individual facility was sampled. For example, health facilities from larger 'districts' having a greater weight in the determination of the overall average because they 'represent' more facilities / population. Thus, the results should reflect results for the overall population of interest (rather than for the sample). If the assessment is to be repeated at a later date, comparisons between the two assessments will not be valid unless results are weighted. However, if sampling is done on a strict probability of selection proportional to the population size (PPS) basis, then weighting may not be necessary. The analyses templates allow for sample weights to be included in the calculation of averages.

    - Sampling implies uncertainty in the results: At the national level, this likely will not be true, since all relevant facilities may have been included in the sample. At the subnational level, it is neither necessary nor desirable to collect data from all facilities, but, as discussed above, sites will be sampled. This implies that results *may need to reflect this uncertainty*. However, reporting, for example, confidence intervals for a wide set of data points does not necessarily enhance understanding of the results (and may clutter the presentation of the results and make the data analysis much more time consuming). Thus, it is recommended that when differences between sites, levels, or strata, or other breakdowns of interest are reported to be meaningful and important, that the results from standard statistical tests be reported alongside the results. Statistical tests should

be conducted in accordance with the sampling procedures. For example, if multiple SDPs are selected from within the same geographic area (e.g., district or other local government area), these SDPs are 'clustered' and linearized standard errors (or other similar adjustments) to standard errors will be necessary when conducting statistical tests. Analyses should also consider using small population correction factors when conducting statistical tests. The analysis templates do not automatically conduct any statistical tests; these will need to be performed by the assessment team if they are deemed necessary.

- Stratification: If the sample is stratified then the analysis should be done for the specific stratum of interest as well as for the overall sample. Stratification in the sampling implies that results for the different strata are of interest, and thus the data analysis should follow this guidance. The analysis templates allow for multiple levels of the supply chain to be entered and calculated separately.

NOTE ON ADVANCED ANALYTICS

Advanced analytics explore possible relationships between CMM scores and KPIs. No templates are included because the analysis needs to be customized for each assessment, based on the data and technical resources available to conduct the analysis. For example, if a function or level produces a CMM advanced result, but KPI performance fails to meet the expected scores this suggests that the system is failing to utilize the capability available. A deeper analysis may help to form hypotheses as to why this may be so, possible actions to raise the KPI scores, or guide further investigations. On the other hand, where a function or level show a basic CMM result, but the KPI scores exceed targets set locally, this suggest that the system is outperforming the apparent capability. Again, a deeper analysis may help to form hypotheses on why this may be happening.

DATA INTERPRETATION

Data analysis requires interpretation to develop meaningful insights and recommendations from tables and figures. Data interpretation should be a team effort, not just an analytic exercise. It is important to have input of some of those who participated in the data collection process as they may be able to provide context to the findings. The assessment manager should lead this process. This process should start by sharing the core analyses with the assessment team.

There are two key steps in the data interpretation process:

Step 1- The data manager drafts an initial set of findings based on the analyses. The rest of the team reviews data and contributes their findings and inputs.

Step 2- Once initial findings have been compiled and circulated, provide an in-person or virtual forum for the team to discuss the early findings. This forum is important because each participant brings a different perspective based on their experiences in the field, their knowledge of historical context, and how they view the data itself. It is recommended to provide each team member with a chance to comment on what they see as important findings before opening up the discussion. Limitations and omissions in the data collected should also be discussed in this meeting.

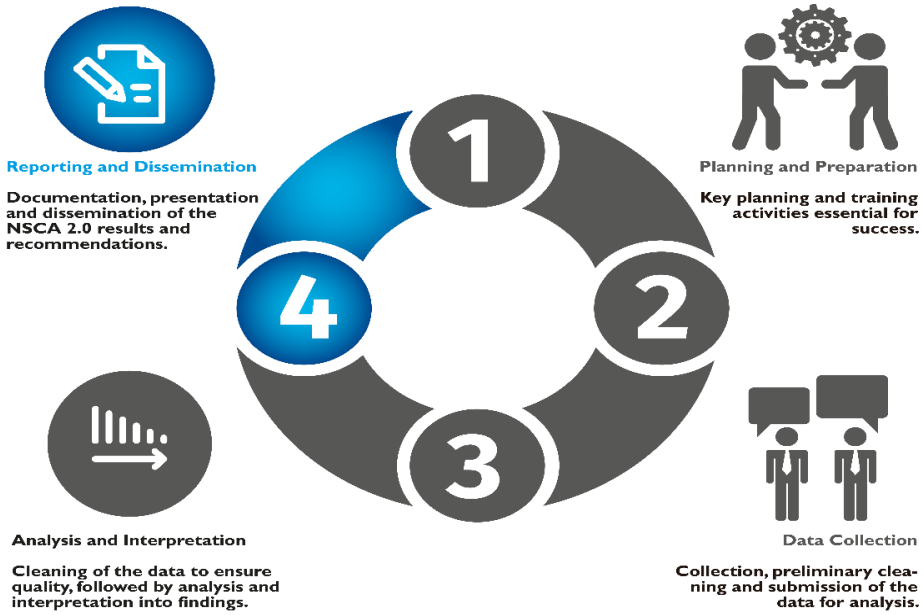
The outputs of this meeting should be a clear understanding of: 1) the key points to be covered in the discussion section of the final report (module and level), 2) the key points to be covered in the recommendations section (module and level), 3) what should be prioritized in the final report, and 4) if any further analysis, or a deeper dive data collection exercise is needed to clarify open questions. This activity is the transition point from the analysis stage to writing the report. This activity will also inform the development of the country outbrief presentation – a preliminary view of the findings that sets the stage for the MoH on what to expect in the final report. A template for the outbrief presentation can be found on the NSCA toolkit webpage.

REPORTING AND PROJECT WRAP UP

REPORT DEVELOPMENT AND REVIEW

Once the assessment findings are agreed upon, the report development and review process can start. The NSCA 2.0 report template is used to progressively draft and update iterations of the assessment report, based on the review and feedback of internal and external reviewers (internal review, initial review by stakeholders outside the core team, near final MoH review).

Figure 13, Reporting Phase of NSCA 2.0



The ultimate goal of the assessment is to convert the data collected into meaningful insights that guide future actions. As such the process of developing the report, and structuring communications is as important as the data. The process of preparing and finalizing report includes multiple stages, with potential iterations in each stage. Time expectations will vary, but the effort required to produce these products is not insignificant.

Draft Zero – Internal Draft: An internal draft of the report is created using the final report template; this template can be found on the NSCA toolkit website page. The project leader is responsible for ensuring the internal draft is prepared in a timely manner and sends it out for team review. Review should be for both content and general format. Multiple people may have drafted different sections, so it is important to review for consistency throughout the report.

Draft 1 – Steering Committee Review: This review is the first review by stakeholders outside the core team. There may need to be multiple rounds of stakeholder review if there are significant questions. There may be conflicting perspectives or challenges; if this occurs, it may be

effective to organize a workshop to discuss areas where there is a lack of consensus. A workshop can often be effective to overcome what appear to be challenges, but are simply different understandings of word choice, or priorities of action. Once the conflicts have been resolved, the document may be shared with the Governance Team before a final edit.

Draft 2- Near Final MoH Review: This document is shared with the Ministry of Health or the organization being assessed. Anticipate questions and allow time for feedback. Keep in mind that the ministry may not have been involved in any of the interim review processes but will be directly impacted by the results and recommendations in the report. Expect dialogue to clarify the way certain things are written, to explain data, how priorities are arrived at, or to suggest other changes. Every effort should be made to ensure the document is accepted as the report needs to be approved by all parties before it can be issued; however, if there are unresolvable differences, the governance team, or sponsor, will act as the final arbiter, and a statement of differences could be included in the report. Be mindful that reports of systemic deficiencies or poor performance could also be perceived sensitively by higher level local counterparts and stakeholders, and, if these topics are not handled properly or expressed, the collaborative relationship could be adversely impacted. The governance team, in conjunction with other senior stakeholders within the MoH, and any donor involved in funding the assessment, determines when and how the report will be issued. The governance team will also be responsible for deciding when a post-assessment meeting of the stakeholder group will be held, this maybe during the report preparation process, or once the report is finalized.

LIST OF DELIVERABLES AND AUDIENCE FOR REPORTS

Make a list of what important deliverables will be needed internally by interim stakeholders prior to sending the final report to the MoH. It is also necessary to make a list of the final set of report deliverables. Understand the different audiences who are going to be reading the report, and what information they might need to take a decision. Consider developing a chart with all deliverables, noting who needs to review each draft, who needs to sign off on the final report, what presentations are going to be needed, and who is going to be responsible for preparing or presenting the material.

SHARING FINAL DATASETS AND CODEBOOKS

Depending upon the funder and the timing of the contract, the raw data and the analysis spreadsheets may be required by the funder. For example, this is a requirement of all new USAID contracts starting in 2015 or later. It is also good practice to make data available to the public. The data set must be anonymized, with information that identifies individuals removed. The process of anonymizing the data should be 1) agreed upon with stakeholders and 2) aligned to funder requirements and any other relevant legal requirements for the context. For example, it will be necessary to remove information such as site level and geolocation variables.

Examples of the analysis spreadsheets and the codebook that translates the names of the fields in the Excel workbooks and in the raw data back to the actual questions in the survey are included in the toolkit. The analysis workbooks (CMM, KPI-Central, KPI-Non-Central) can be found on the NSCA toolkit website. The toolkit also has an example codebook based on the current SurveyCTO code, and it can also be found on the NSCA toolkit website. The codebook will need to be updated with any modifications made to the questions in the SurveyCTO/data collection instruments).

DISSEMINATION PLAN

As the assessment comes to a close, it is important to collaboratively develop a publication and dissemination plan for assessment findings. See Annex 16 for an example dissemination plan.

REPORT TEMPLATES

Report templates are part of the toolkit. These templates include guidance on how to develop the following deliverables that may be included in the assessment dissemination plan:

- **Full Report**: This document provides the most comprehensive view of the assessment implementation, analysis, outcomes and recommendations. The template includes guidance on preparing a final report on assessment findings.
- **Action Brief**: This is a short 2-4-page document to support action on a particular issue.
- **Data Dashboard**: This is a 1-2-page document consisting almost solely of graphics. The template contains recommendations for a suggested layout as well as a set of four to five recommended graphics to give a visual picture of the assessment results. The dashboard is embedded in the analysis workbooks.
- **Presentation template**: The presentation template can be adapted for both a country outbrief presentation (to discuss immediate findings from the assessment) and a final presentation (a more detailed presentation for the funder after all analyses and interpretation activities have been completed). Approximately 1 hr. long PowerPoint presentation (including time for questions) to share and high-level findings.

END OF PROJECT

At the close of the assessment, the funder and MoH should determine if the final report, raw data, and/or any action briefs should be share via a public forum for NSCA 2.0 activities (e.g., USAID Global Health Supply Chain website). The findings from an assessment may be used to benchmark within a country over time as future assessments are completed. These findings could also be used to understand how different public health supply chains compare to one another. Sharing the findings will allow for a better understanding of global challenges and strengths across public health supply chains in the developing world.

ANNEXES

ANNEX 1: LIST OF SUPPLEMENTAL RESOURCES

The following table provides an overview of additional external resources that supplement the information provided in this implementation guide. These tools and resources are utilized to support NSCA 2.0 implementation activities. These resources can be found on the NSCA toolkit website .

TABLE 1. LIST UP SUPPLEMENTAL RESOURCES FOUND ON THE NSCA TOOLKIT WEBSITE

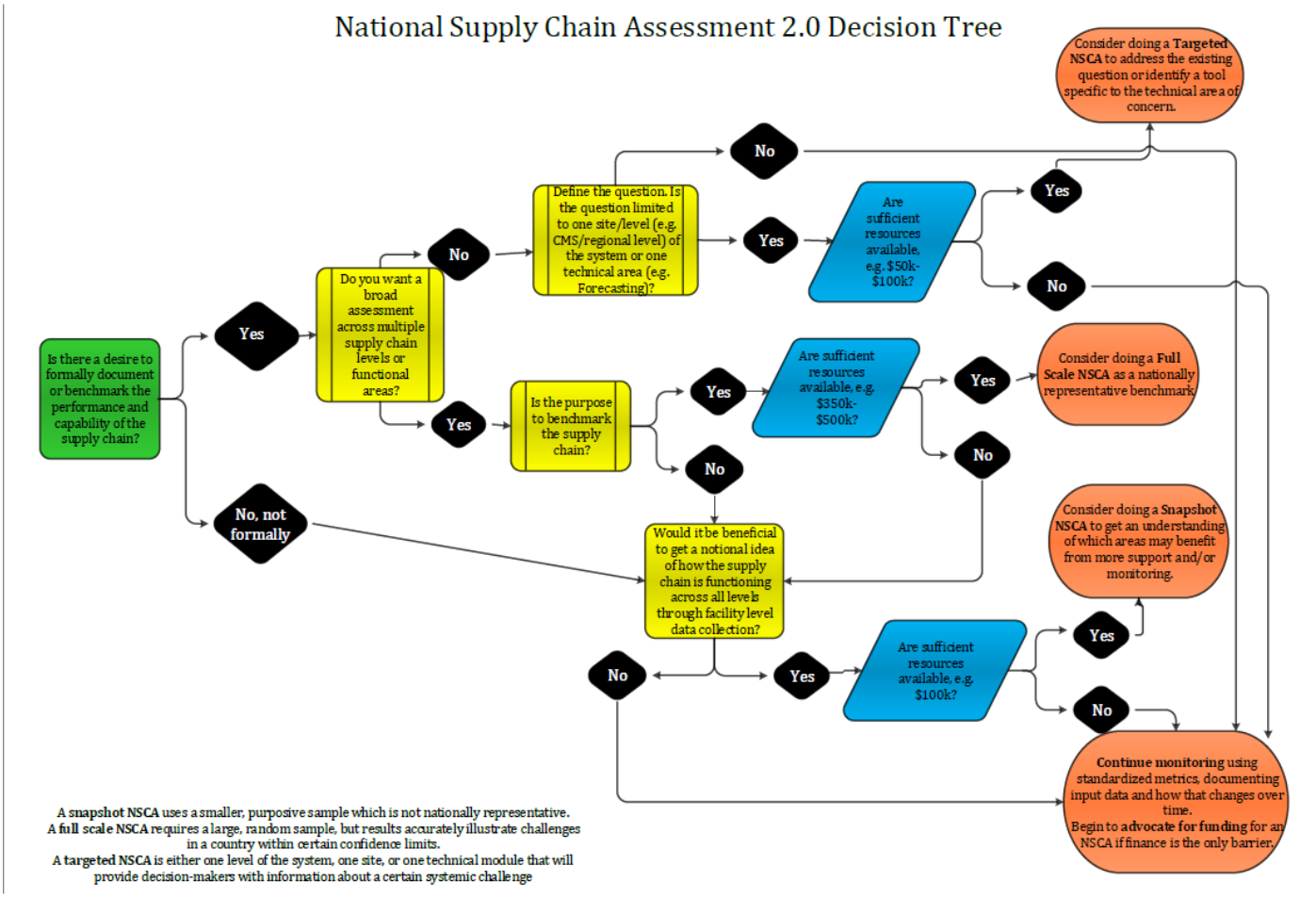
#	RESOURCE	PURPOSE
Overview of the NSCA		
1	Brief Overview: National Supply Chain Assessment	This document provides the reader with an overview of the tool, describing how it can be used and the anticipated outputs.
2	Training of Trainers (TOT) Training Package	Package of materials that can be used to orient a team to the NSCA 2.0 and key components of the assessment process, for global or in-country audiences.
Training and Supply Chain Mapping Resources for the NSCA Toolkit		
1	National Supply Chain Assessment (NSCA): Supply Chain Mapping Workshop	This template presentation provides a guide to the public health supply chain mapping workshop activities.
2	National Supply Chain Assessment (NSCA): Data Collection Training	This template presentation provides a guide to the in-country data collector training completed prior to starting data collection activities.
3	List of Support Resources for Data Collection Training	
4	Glossary	This document includes definitions for terms that are relevant when conducting and NSCA.
5	How to Conduct KPI and Capability Interviews	This document provides guidance on how to conduct KPI and capability interviews during an NSCA.
Planning Tools for an NSCA		
1	Implementation Guide	This document provides detailed instructions on how to complete the full life cycle of activities required to successfully conduct an NSCA.
2	Data Use Policy for the National Supply Chain Assessment (NSCA)	Template that can be adjusted to the needs of each assessment. It is intended to outline the endorsement of the MoH for the assessment activities as well as provide a detailed list of the types of data that will be requested from participating sites.
3	Instructions for Using the Sampling Template	This tool guides the team in identifying the number and type of sample sites for the assessment activities.

TABLE 1. LIST UP SUPPLEMENTAL RESOURCES FOUND ON THE NSCA TOOLKIT WEBSITE		
#	RESOURCE	PURPOSE
4	Sampling Template	This workbook can be used to facilitate identifying the number and type of sample sites needed for the assessment activities.
Data Collection Tools for an NSCA		
CMM		
1	CMM Master Questionnaire	This excel workbook acts as a guide for all of the questions and responses included in the capability maturity questionnaire, for all levels.
2	Guidance on Updating the SurveyCTO Code for the Capability Maturity Model (CMM) Survey	This document provides guidance on how to make adaptations to the CMM SurveyCTO code as needed.
3	CMM SurveyCTO Code	This workbook includes the standard SurveyCTO code for CMM items.
4	Capability Maturity Module Questionnaire for All Levels	This document is a paper-based tool that can be used to collect capability maturity data if tablets can't be used.
KPI-General		
5	Key Performance Indicators	This document provides definitions, data sources, and performance guidance for KPIs included in the NSCA.
KPI – Central		
6	KPI SurveyCTO Code – Central	This workbook includes the standard SurveyCTO code for central KPI items.
7	Guidance on Updating the SurveyCTO Code for the Key Performance Indicator (KPI) Data Collection Central Tool	This document provides guidance on how to make adaptations to the KPI Central SurveyCTO code as needed.
8	KPI Data Collection Form for Data Collected at Central Levels Only	This document is a paper-based tool that can be used to collect KPI central data if tablets can't be used.
KPI-Non-Central		
9	KPI SurveyCTO Code - Non-Central	This workbook includes the standard SurveyCTO code for non-central KPI items.
10	Guidance on Updating the SurveyCTO Code for the Key Performance Indicator (KPI) Data Collection Non-Central Tool	This document provides guidance on how to make adaptations to the KPI Non-Central SurveyCTO code as needed.
11	KPI Data Collection Form for Data Collected at SDPs, Referral Hospitals, and Warehouses	This document is a paper-based tool that can be used to collect KPI non-central data if tablets can't be used.
Analysis Tools for an NSCA		
CMM		

TABLE 1. LIST UP SUPPLEMENTAL RESOURCES FOUND ON THE NSCA TOOLKIT WEBSITE		
#	RESOURCE	PURPOSE
1	**DATA ANALYSIS PLAN FOR THE CAPABILITY MATURITY MODEL (CMM) SURVEY**	This document provides guidance on completing CMM data analysis activities for data collected during an NSCA.
2	Capability Maturity Model Survey Analysis Template	This workbook serves as a repository for raw CMM data, automatically completes pre-programmed analytics, and provides data visualization in the form of pre-populated graphics within the workbook.
3	Instructions for using the CMM Survey Analysis Template for scoring capability maturity model results	This document provides guidance on how to use the CMM analysis workbook & data dashboard.
4	CMM Codebook	This document provides definitions for the variables in the capability maturity model dataset.
KPI-General		
5	Data Analysis Plan for Key Performance Indicators	This document provides guidance on completing KPI data analysis activities for data collected during an NSCA.
KPI-Central		
6	Central KPI Analysis Template	This workbook serves as a repository for raw central KPI data, automatically completes pre-programmed analytics, and provides data visualization in the form of pre-populated graphics within the workbook.
7	Instructions for Using the KPI Central Analysis Template for Calculating Key Performance Indicators	This document provides guidance on how to use the central KPI analysis workbook & data dashboard.
8	KPI Central Codebook	This document provides definitions for the variables in the key performance indicator (central) dataset.
KPI-Non-Central		
9	KPI Non-Central Analysis Template	This workbook serves as a repository for raw non-central KPI data, automatically completes pre-programmed analytics, and provides data visualization in the form of pre-populated graphics within the workbook.
10	Instructions for Using the KPI Non-Central Analysis Template for Calculating Key Performance Indicators	This document provides guidance on how to use the non-central KPI analysis workbook & data dashboard.
11	KPI Non-Central Codebook	This document provides definitions for the variables in the key performance indicator (non-central) dataset.
KPI and CMM		
12	KPI/CMM Mapping for Results Analysis	This document provides guidance on which

TABLE 1. LIST UP SUPPLEMENTAL RESOURCES FOUND ON THE NSCA TOOLKIT WEBSITE		
#	RESOURCE	PURPOSE
		performance indicators are related to specific capability maturity metrics.
Dissemination Tools for NSCA		
1	National Supply Chain Assessment Outbrief and Final Presentation Template	This PowerPoint template can be adapted to develop both the country outbrief presentation and the more comprehensive final presentation.
2	National Supply Chain Assessment Brief – Template	This template provides guidance on developing action, policy or evidence briefs based on the NSCA findings.
3	NSCA Brief Example – Healthland Supply Chain Brief	This document provides an example of how to apply the guidance provided in the NSCA Brief template.
4	Final Report Template	This document provides guidance on developing a full technical report based on the NSCA findings.

ANNEX 2: NATIONAL SUPPLY CHAIN ASSESSMENT DECISION TREE



ANNEX 3: HOW TO SAMPLE

DETERMINING SAMPLING METHODOLOGY, SAMPLE SIZE, AND THE FINAL SAMPLE FOR THE ASSESSMENT

Sampling necessarily serves the objectives of the assessment but must also balance the need for holistic and representative data against both the budget available for the assessment and the opportunity costs of the assessment (in terms of disrupting the normal work patterns of staff from whom the data will be collected).

There are four steps to select the final sample of facilities that will be visited during the assessment: defining the scope of the assessment, defining the sample frame, determining the sample size, and selecting the sample. These four steps are described in more detail below.

DEFINE THE SCOPE OF THE ASSESSMENT

Health systems are complex, with multiple layers and stakeholders. Typical examples are vertical disease programs or decentralized (sub-national) services. Vertical disease programs may be partially (or completely) run by a donor but operating with the personnel and facilities of the government-run health system. Decentralized systems may be entirely managed at the sub-national level but remain partially integrated in a national system. Therefore, a first step in the design of a NSCA is to define the scope of the assessment, i.e. which programs and systems will be studied.

NSCA 2.0 Recommendations:

1. All levels of the supply chain (i.e., all agencies, warehouses, facilities, etc. that handle, receive, or have stewardship over health commodities) should be included in the scope of the assessment. This should include the Ministry of Health, central and intermediate warehouses, referral hospitals, lower-level hospitals, health centers, etc.

2. The goals of the assessment should determine whether or not to include non-governmental systems (e.g., religious health networks, vertical programs).

    a. Decentralized systems will need special considerations for sample size determination and it is recommended that a person with requisite experience be consulted in these cases.

DEFINE THE SAMPLE FRAME

The sampling frame – the population of interest, which typically will include commodity distribution points, health facilities, and community-based agents distributing health commodities – will be determined by the scope of the assessment. Thus, if the assessment is particularly concerned with, e.g., family planning commodities, then facilities / agents that do not handle family planning commodities will not be included in the sampling frame. The sampling frame is typically a list of entities (e.g., of facilities) that potentially can be included in the assessment, with associated information (e.g., district, number of visits, etc.).

NSCA 2.0 Recommendations:

1. As per above, all levels of the supply chain should be included relevant to the goals of the assessment. Thus, for example, inclusion of 'district warehouses' in the sample frame indicates that the names of all district warehouses and other relevant information about the district warehouses needs to be included in the sample frame listing.

2. The list of entities included in the sample frame should be reviewed to ensure that it is complete, up-to-date, and that the entities included in the sample frame listing can be visited for the assessment.

   a. Entities that cannot be visited (for example, due to conflict or seasonal inaccessibility) should NOT be included in the sample frame listing. This means that the assessment findings should not be applied to these entities.

Tip: Health management information systems (HMIS) and electronic / paper LMIS systems often have a listing of health facilities (HMIS) or supply chain entities (LMIS). However, there is often a lag in updating the list of entities in these systems, or entities no longer in operation are sometimes retained in the system to preserve past data. It should not be assumed that these systems provide up-to-date information – further questioning of the list produced by these systems will be necessary.

DETERMINE THE SAMPLE SIZE

The sample size should be determined by reaching a consensus amongst stakeholders regarding the appropriate balance between the opposing objectives of containing costs and maximizing the level of confidence in the results. While local needs and desires should be accounted for in the determination of the sample size, NSCA 2.0 proposes the following general recommendations for a full assessment. Rapid or partial assessments should consider the feasibility of implementing these recommendations but should note areas where the recommendations have not been followed and the reasons for not following the recommendation.

NSCA 2.0 Recommendations:

1. *At a minimum, use a Margin of Error of ±10%, and an 85% level of confidence* (i.e., α=0.15) [indicating that 85% of samples drawn in the same manner as the sample used for the assessment would have a mean within ±15% of the mean observed in the assessment]. These values should be calculated assuming 50% of respondents answer 'yes' (which maximized the sample size). The values of ±10%, and 85% are arbitrary, but have gained acceptance in past supply chain assessments (EVM and NSCA 1.0) as a reasonable tradeoff between precision and costs.

One of the main analyses associated with the NSCA 2.0 is the 'gaps and achievements' analysis. This analysis looks across the questions asked in the capabilities module and identifies those questions where fewer than 20% of respondents answered that an input is present, a process is being done, etc. (gaps) or where more than 80% of respondents answered that an input is present, a process is being done, etc.

(achievements). Based on the sampling criteria above, this indicates that the gaps will be based on confidence intervals up to and including approximately 11%-27%,[7] but will not capture gaps based on confidence intervals of 12% to 28% and above. Thus, the gaps identified could be present (with an 85% level of confidence) in up to 28% of entities, but the process **will** (again with the 85% level of confidence) identify any area where the input/process/etc. is present in 10% or less of entities.

The analysis based on 20%/80% is again arbitrary. Countries may legitimately be concerned that important gaps – e.g., inputs/processes missing from 1/3rd of facilities – are being missed with this analysis. It is certainly possible and acceptable to broaden the '20%/80% window' to include more 'gaps' and/or 'achievements' if deemed necessary. The findings from the NSCA 2.0 pilots show this type of assessment identifies a substantial number of gaps and achievements; broadening the '20%/80% window' may result in the number of gaps/achievements identified being too many to formulate realistic recommendations or action plans. Thus, NSCA 2.0 recommends using the '20%/80% window' at least in the first round of analysis; the size of the window can be adjusted based on the results of the initial analysis.

Individual countries may also argue that the proposed parameters (Margin of Error of ±10% and an 85% level of confidence) are not sufficient for their needs. If this is the case, we recommend first increasing the level of confidence to 90% or 95%.

2. Use hypergeometric sample size formulas[8] that include small population correction factors when determining the sample size. The NSCA 2.0 CMM is based on binary questions; the hypergeometric sample size formulas are appropriate for binary data.[9] As compared to normal approximation sample size formulas, hypergeometric sample size formulas tend to estimate a larger sample size when there is a small overall population and a smaller sample size when there is a large overall population (the threshold for when the two formulas switch is around a population of 65).

3. *Use the 'lowest distribution level' (e.g., district warehouse) or the lowest geopolitical level (e.g., health district) as the primary sampling unit* (as is used in the EVM assessments). In some countries, the two are similar and either could be used. in countries with supply chains that have few tiers (e.g., only at the central and provincial or regional level, or even distribution to health facilities directly from one central warehouse), then the lowest geopolitical unit should be used. Thus, the population of interest when calculating the sample size will be e.g., districts, and finite population adjustment will be made based on this population. once the sample at the lowest distribution level has been determined, the sample will then work both 'upward' and 'downward' to complete the multi-level final sample. 'Upward' indicates that all points in

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[7] The margin of error ±10% applies to 50% 'successes'; at values other than 50%, the margin of error will be less then ±10%.

[8] n = (Nz^2 pq) / ((MOE^2 (N−1)+z^2 pq)), where N is the population size, p is the probability of an outcome (assumed to be 50%), q = 1 – p, MOE is the margin of error, and Z^2 is the confidence level (specified as α=0.15 above).

[9] Many, but not all, of the KPIs are similarly binary in nature (e.g., on-time order rate). Based on pilot experience, the margin of error for the non-binary KPI "number of days a commodity is out of stock" was less than 0.7 days using this sample size approach. Further, average maturity scores for the CMM modules, which are continuous between 0 and 1, rather than binary, had a margin of error of less than ±0.10.

the supply chain feeding into the initial sample should be included (e.g., all the provincial warehouses supplying the district warehouses in the sample should also be included in the assessment). 'Downward' indicates that health facilities / community-based agents supplied by the 'lowest distribution level' should be included in the final sample. If there are more than 20 'lowest distribution points' (or similar) in the sample, this means that 2 or 3 facilities / community-based agents should be selected per 'lowest distribution points' (or similar) in order to maintain the same margin of error and level of confidence as used for the 'lowest distribution points' (or similar).[10] The number of facilities per 'lowest distribution points' (or similar) is dependent upon how similar facilities within one 'lowest distribution points' (or similar) are with each other (as compared to how similar facilities are to each other overall). Based on NSCA 2.0 pilot experience, this 'within unit' correlation is typically high enough to suggest that 3 facilities per 'lowest distribution points' (or similar) may be needed. If fewer than 20 'lowest distribution points' are included in the sample, the number of facilities /community-based agents may need also to be increased.

SELECT THE SAMPLE

In order to establish statistical representativeness, the sample should be drawn randomly, with the probability of selection proportion to the population size.

NSCA 2.0 Recommendations:
1. *Use random sampling* of both the 'lowest distribution points', and of facilities associated with the 'lowest distribution point'. Random selection is the only means of ensuring that the sample is representative of the sample frame. If there are concerns about having certain types of facilities, certain areas of the country, etc. represented, the assessment team should use stratification to ensure these concerns are addressed.

2. *Sampling should be done with the probability of selection proportional to the population size (PPS)*: This is typically done in many survey sample selection processes and ensures that every member of the population served by the 'lowest distribution point' has an equal chance of being included in the sample. Thus, if one 'lowest distribution point' serves 20 health facilities, while another serves 50, the lowest distribution point that serves 50 health facilities will have a greater probability of being included in the final sample. This method ensures that the 'lowest distribution points' selected for the assessment

[10] In a hypothetical country with 100 districts and 2,000 health facilities, 30 districts would need to be sampled (based on confidence levels and Margin of Error specified above), while 41 health facilities would need to be sampled if the health facilities were selected completely at random. However, the health facilities will be **clustered** in the 30 districts selected for inclusion in the assessment, indicating that the design effect due to correlation of answers amongst facilities in the same cluster [district] needs to be taken into account. Rounding up 41/30 to 2 facilities per district indicates the sample will maintain the level of confidence and Margin of Error specified above if the intra-cluster correlation is 0.46 or less; if the intra-cluster correlation is assumed to be higher than 0.46 (which it was found to be in the NSCA 2.0 pilots), then 3 facilities per district may be used, which will accommodate an intra-cluster correlation of up to 0.60 while maintaining the confidence levels and Margin of Error specified above. However, lacking data on the intra-cluster correlation for a particular country, budget constraints may also determine whether 2 or 3 facilities per district are visited.

represent the underlying sample frame. If every 'lowest distribution point' had the same probability of inclusion (i.e., simple random sampling is employed) then it is likely the assessment will have an over-representation of small population areas, while large population areas would likely be under-represented in the sample (again, if there are concerns about a certain population or area being represented in the assessment, consider using stratification).

However, it is not always clear what the population size number should be based upon, and this parameter needs to be determined based on the scope of the assessment and in discussion with stakeholders. **NSCA 2.0 recommends using the final distribution point in the supply chain as the population because this reflects the population that is of interest for the assessment.** Typically, this will be the number of health facilities. Arguably, however, the ultimate objective of a supply chain is to serve patients or the population. While the NSCA 2.0 does not include in its scope the delivery of commodities to patients or the population, use of the overall population or number of patients could also be used to determine the population for PPS selection.

Tip: *Stratification may be used to ensure a particular population / area of interest is included in the assessment*: In principal, stratification does not affect the sample size (in fact, it may even reduce sample size needs), provided that it is done correctly. For example, a country may want to ensure that both health centers and health posts are included in the assessment; facility type may be a stratum for sampling. However, the number of health centers and health posts selected from the should reflect either the overall number of facilities in each strata (if an overall sample of 80 facilities is needed, and 25% of facilities are health posts, then 20 health posts should be selected out of all of the health posts). Some possible variables for stratification include:

- Type of health facility
- Urban / rural, population density, distance from capital, or other geographic features
- Economic or demographic indicators, such as average income in a district, ethnicity, etc.
- Performance in supply chain (based, e.g., on past assessments or data from LMIS)

Note, however, that use of multiple stratification criteria makes the analysis very complicated; it is recommended that 1, or at most 2, strata are used to avoid onerous data calculations. Note that the sampling toolkit provided by the NSCA 2.0 only accommodates one level of stratification (at the health facility level – the level below the 'lowest distribution point'). If further stratification is needed, it is recommended that a person with requisite experience be consulted in these cases.

Tip: Include 'extra' facilities when you sample in order to have 'replacement' facilities ready in the event that some of the facilities in the sample cannot be visited (because they are closed, due to weather, etc.).

LIMITATIONS OF THE RECOMMENDED SAMPLING APPROACH

The sampling strategy proposed above is intended to provide a sample that is adequate to estimate responses to individual CMM questions and KPIs within a certain margin of error. For example, the sample size is designed to estimate the *prevalence* of the presence of a certain CMM input or process, but it is not intended to serve as a basis for a *comparative* analysis between different levels of the supply chain. Comparative assessments require different sample size formula (that would include the amount of

difference of interest to detect and the statistical power to detect that difference). Thus, comparing results between lowest distribution points (or similar) typically would not be meaningful with this sampling approach. Further, as a *prevalence* estimate, the sampling is cross-sectional in nature. This indicates that results can be used to assess correlations or associations, but typically will not provide *causal* interpretations. Finally, the sample is only as good as the data on upon which it is built. If the sample frame is incomplete or out of date, then the sample size calculations will be inaccurate, and the final sample for the assessment may not fully be representative of the population of interest.

ANNEX 4: HOW TO DETERMINE REQUIRED NUMBER AND SIZE OF DATA COLLECTION TEAMS

Data collection teams conduct the site visits to collect data required for the CMM and KPIs. The total number of data collectors and number/size of data collection teams depends on the assessment scope, time frame, volume of data being collected, and sample size, as well as available budget and other resources and related constraints (e.g. shortage of HR). Typically, a team of 2 to 3 or ideally 4 people should be able to assess a hospital-size site in one day.

To establish the required number and size of data collection teams—

i. Determine the assessment sample size, numbers, types/supply chain levels and sizes of sites in the sample (i.e. central level, central warehouse, referral hospitals and SDPs), geographical location and physical distances between the sites; time required or available to travel to, complete data collection and return from all the sites)
ii. Determine the sizes (# of people in each assessment team) and # of assessment teams needed to collect data at small, medium-sized and big sites across levels of the supply chain system.
iii. Determine total time needed or available to collect data from all sampled sites (total time from starting to finishing the full data collection process)
iv. Adjust (ii) and/or (iii) as needed, based on available budget and other resources
v. Finalize the needed #s and sizes of assessment teams

Example: In one country with about 80 assessment sites (including 4 central level institutions), data was collected over a period of 7 working days at the rate of about 11 sites per day. Five central teams of 2-3 people collected data from 4 central level institutions in the capital city (i.e. the MOH headquarters, central medical warehouse, the central regulatory authority and an independent NGO pharmaceutical SC system) over 4 days for both CMM questionnaires/modules and KPI forms. They interviewed persons that were best situated to respond to each module of the questionnaire, verified documentation, and made observations. They used a KPI assessment tool to collect KPI data for 10 tracer commodities from stock cards, LMIS/eLMIS reports, supply and distribution records, temperature excursion data. Likewise, teams of 2-3 data collectors traveled outside the capital city and assessed 75 different field sites over the 7 working days. See Table 1 for a summary of the needs related to this example:

TABLE 1. EXAMPLE OF NUMBER AND SIZE OF DATA COLLECTION TEAMS NEEDED TO COLLECT CMM AND KPI DATA FOR AN NSCA 2.0 ACTIVITY

TYPE OF DATA COLLECTION	TOTAL NUMBER OF TEAMS/PEOPLE	NUMBER OF FACILITIES SAMPLED	WORKING DAYS REQUIRED TO COMPLETE	ASSUMPTIONS
Central Level Data Collector Teams	5 teams (15 people)	4	4	• No travel time/delays included • 3 ppl/team • Collected CMM and KPI data
Non-Central Level Data Collector Teams	11 teams (33 people)	75	7	• 1 site per day per team • No travel time/delays included • 3 ppl/team • Collected CMM and KPI data

Include actors from different levels of the country supply chain system in planning/preparations teams and data-collection team members. That way you can tap into their knowledge and experience regarding

field logistics and promote buy in and local ownership of the assessment. This approach may also facilitate access to key informants and data sources during the exercise.

ANNEX 5: BUDGET CHECKLIST

The budget should reflect the funds needed to execute the NSCA 2.0 assessment. The checklist below provides an overview of key issues that should be considered when developing an NSCA 2.0 budget. When estimating project costs, consider that collaborating organizations could leverage resources toward the budget in cash or kind (e.g., level of effort for their participating staff/data collection training facilitators, data collectors, training venue, vehicles for transportation, etc.).

Figure 1, NSCA 2.0 Checklist

NSCA 2.0 CHECK LIST

Consider the following information when developing the specific country plan and budget:

- Amount of human resources necessary to execute the activities (Staff Labor/LOE and salaries for all NSCA 2.0 personnel). As part of this step, also consider the amount of human resources available to execute the activities.
- Travel and lodging and any other logistical needs (e.g., vehicle rental, per diem/meals and incidental expenses)
- Training related costs (e.g., equipment, supplies, venue and infrastructure needs, refreshments, printing costs)
- Computer hardware and other equipment (e.g., computers, tablets)
- Communication costs and equipment (e.g., phones, sim cards, air time/data)
- Software tools (e.g., project management software, SurveyCTO)
- Miscellaneous expenses (e.g., printing costs, supplies, translation services)

Be sure to account for the following as the team estimates costs for each line item:

- Delays that may be caused by seasonality (e.g., rainy season)
- Local budgeting and billing rates
- Stakeholder workshop/public health supply chain mapping approach, size of group and required travel
- Sample size and geographical distribution of sampled assessment sites
- Data collection timelines, number and source of data collectors, and recruiting approach
- Follow applicable local regulations or policies on paying labor/per diems and/or other allowances
- Reporting and dissemination approach
- Appropriate number of tablets and supporting technology

ANNEX 6: BUDGET TEMPLATE

TABLE 1. NSCA 2.0 BUDGET TEMPLATE				
LINE ITEM (INSERT ADDITIONAL ROWS OR LINE ITEMS AS NEEDED)	UNITS	NUMBER	UNIT COST $	TOTAL
LABOR/SALARIES (insert rows as needed)				
Lead Implementing Partner staff costs (local or external)				
Lead Implementing Partner consultants (local or external)				
Lead Implementing Partner subcontractor staff costs (local or external)				
In Country TA Partner labor costs (if applicable)				
MOH/other local stakeholder staff costs (if not lead partner)*				
Any other local staff participating in the assessment (specify)				
Subtotal - labor costs				**$ -**
INTERNATIONAL TRAVEL				
Airfares	Round trips			
Airport transfers	Transfers			
Visas				
Subtotal - International travel				**$ -**
IN COUNTRY TRAVEL				
In country travel - airfares	Round trips			
In country travel - airport transfer	Transfers			
In country travel - ground transportation				
Vehicle rental	Days			
Fuel				
Other in country travel expenses (specify)				
Subtotal - In Country travel				**$ -**
LODGING, MEALS & INCIDENTAL EXPENSES (M&IE)				
Visiting personnel lodging	Nights			
Local staff lodging	Nights			
Visiting personnel M&IE	Days			
Local staff M&IE or stipends	Days			
Subtotal - Lodging, M&IE				**$ -**
TRAINING				
Travel costs**				
Training venue / facilities rental				
Training venue services (coffee, food etc)				

TABLE 1. NSCA 2.0 BUDGET TEMPLATE				
LINE ITEM (INSERT ADDITIONAL ROWS OR LINE ITEMS AS NEEDED)	UNITS	NUMBER	UNIT COST $	TOTAL
Training materials and related supplies***				
Subtotal – training				**$ -**
EQUIPMENT/IT HARDWARE				
Data collection tablets	Number			
USB modem/dongle	Number			
Mobile phones for field staff	Number			
Sim cards for field staff	Number			
Flash drives	Number			
Other equipment (specify)				
Subtotal - equipment/IT hardware				**$ -**
COMMUNICATION/SOFTWARE TOOLS/MISCELLANEOUS				
Postage and shipping				
Mobile phone credit for field staff	Number			
SurveyCTO license fee	Per month			
Subtotal - communication/software tool/miscellaneous				**$ -**
TOTAL				**$ -**
	*May be in kind, depending on who is funding the NSCA			
	**Budget for facilitator and participant travel to training venue and field test sites			
	***Printing of training materials, data collection tools, pens, clip boards, audiovisual equipment, etc			

ANNEX 7: BUDGET ESTIMATES

The budget to implement a NSCA assessment will largely be dependent upon a number of factors already highlighted above, inclusive of scope, size, makeup and design of the assessment team etc. That said, an estimate cost range is provided for each of the three types of NSCA below:

Snapshot NSCA: For a small or snapshot NSCA that uses a significantly smaller sample size that is not nationally representative, estimate $50,000 to $100,000 budget.

Targeted NSCA: For a targeted medium size NSCA that focuses on either one level of the supply chain, or a few technical modules across the supply chain, or may intend to simply provide decision-makers with information about a certain systemic challenge, consider a budget of $100,000-$200,000.

Full-scale NSCA: For a full-scale NSCA which requires a sizable random sample across all levels of the supply chain, is nationally representative within certain confidence interval, estimates can run from $350,000 to $500,000.

ANNEX 8: JOB DESCRIPTIONS FOR KEY PERSONNEL

This annex provides a brief job description for each of the following roles: project lead, assessment manager, logistics coordinator, data manager, data collector supervisor, data collectors. It is also likely that an administrative support staff will be needed; given that this is a standard role, a job description is not included below for this position.

PROJECT LEAD

BRIEF JOB DESCRIPTION

The Project Lead is responsible for overseeing the full execution of the NSCA 2.0 assessment activity. S/he is responsible for overall contract management, ensuring payment for team members, liaising with funders and key stakeholders, leads the core assessment team, co-leads data collector training activities, participates as needed in data collection activities, and both leads and signs off on contract deliverables, including the final report. This individual should possess leadership, technical, and project management skill-sets.

RECOMMENDED QUALIFICATIONS

- 10+ years of project management experience
- Seasoned project leader in the health, supply chain, and/or development sectors
- Experience working with multiple stakeholders and partners
- Skilled at communicating with executive level (e.g., MoH) stakeholders
- Experienced with leading cross-cultural teams
- Knowledgeable about assessments, data management, data analysis
- Proficient in technical writing
- Possess an M&E skillset
- Comfortable working with cross-cultural teams
- Training experience
- Experience working in a developing context preferred
- Fluent in English
- Fluent in local language where assessment will be performed (Preferred)
- Supply chain knowledge preferred

ASSESSMENT MANAGER

BRIEF JOB DESCRIPTION

The Assessment Manager is the focal person for field-related assessment activities and serves as the primary technical expert for the NSCA 2.0. S/he will act as the backstop to the project lead and remains at the central level during all data collection activities. S/he will be heavily involved in all phases of the assessment activity, recruits data collection supervisors and data collectors, leads data collector training, leads all field data collection activities, serves as the primary point of contact for all data collector teams while they are deployed to collect data, and contributes to contract deliverables as needed – including the final report. S/he will be responsible for timely execution of the data collection workplan, may collect data at the central level, an liaises with local stakeholders as needed. S/he will collaborate closely with the data manager to remotely support field teams to solve data collection challenges (e.g., tablet problems).

RECOMMENDED QUALIFICATIONS

- 10+ experience in supply chain, developing country context preferred
- 5+ years project management experience
- Skilled trainer
- Strong M&E skillset
- Proficient in excel
- Knowledgeable about data collection, analysis, and interpretation
- Familiarity with assessments generally and with NSCA 2.0 preferred
- Technical writing capability

DATA MANAGER

BRIEF JOB DESCRIPTION

The Data Manager serves to support all the data and statistics related needs of the assessment. S/he leads the sampling of the population of respondent facilities, co-leads data collector training, leads coding/programming of the data collection tablets with the questionnaires, prepares the data analysis plan, leads data cleaning and quality assurance activities, carries out planned analyses, and contributes to contract deliverables, including the final report.

RECOMMENDED QUALIFICATIONS

- 10+ years' experience as a statistician
- Experienced in supply chain assessment, LMIS or eLMIS data
- Proficient in SurveyCTO and development and modification of electronic data collection instruments
- Familiar with statistical concepts and software packages such as STAT, SPSS, SAS, R
- Master proficiency of Microsoft Excel

LOGISTICS COORDINATOR

BRIEF JOB DESCRIPTION

The Logistics Coordinator role ensures all activities within an assessment are supported appropriately. Responsibilities include: providing relevant documentation for visas, coordinating all local transportation (e.g., cars, field accommodation), route planning, locating and reserving training/workship venues, sending invitations to trainees or workshop attendees, leads all travel arrangement activities, and collates all materials required to execute the stakeholder training, data collector training, and data collection activities.

RECOMMENDED QUALIFICATIONS

- At least 2 years' experience in logistics or event planning

DATA COLLECTOR SUPERVISOR

BRIEF JOB DESCRIPTION

The Data Collector Supervisor is responsible for overseeing data collection activities in the field. S/he will participate in the data collector training as well as piloting/revising questionnaires as needed. S/he is ensuring data collector teams are adequately prepared for site visits (e.g., familiar with process, prepared appropriate materials, appropriately trained for data collection). The data collector supervisor supervises and monitors data collectors during the data collection process to ensure: interviewee responses are validated, clarification is obtained as needed for specific items, physical verification documents are collected, data cleaning and quality assurance is completed as necessary. This individual will also participate in data collection activities. S/he collaborates with the core assessment team as needed to ensure efficient, high quality data are collected.

RECOMMENDED QUALIFICATIONS

- 3+ years in a supervisory role
- Training as a logistician, pharmacist, nurse, or other public health professional
- Supply chain experience preferred
- Proficient in conducting surveys, preferably in the health sector
- Comfortable with using technology to complete data collection activities
- Strong organization and communication skills
- Available to travel as needed within the country being assessed

DATA COLLECTOR

BRIEF JOB DESCRIPTION

Data Collectors are responsible for conducting site visits to collect data for the NSCA 2.0, including CMM interviews, direct observation, validation, and KPI data collection. S/he will attend data collector training, participate in piloting and refining questionnaires, conduct data collection interviews, ensure quality data collection (e.g., all questions asked/answered, validate responses as appropriate), report challenges in the field, and submit data daily to data collection supervisor. Data collectors should not go to facilities they currently work in or supervise.

RECOMMENDED QUALIFICATIONS

- Training as a logistician, pharmacist, nurse, or other public health professional preferred (Bachelor's degree, diploma, or combination of education and experience)
- Supply chain experience preferred
- Experience conducting surveys preferred
- Comfortable with using technology to complete data collection activities
- Available to travel as needed within the country being assessed
- Fluent in local language (if applicable)

ANNEX 9: TRAINING PREPARATION CHECKLIST

Adequate preparations need to be made to ensure the venue and training materials, supplies and equipment, and field test sites are ready; preparations also need to ensure participants and facilitators are ready and available and the training is executed successfully. These preparations are outlined in the checklist below (Table 1).

An advance team of at least two individuals, the assessment coordinator, logistics coordinator and one additional individual, should also engage in additional preparatory activities the week before the training. These individuals should use this time to ensure that all required appointments have been set and confirmed and that all final logistical arrangements are firmly in place for both training and fieldwork; these preparation activities apply to logistics with the MoH, partner(s), and donor(s). The rest of the team should arrive on the Saturday before the data collector's training to finalize preparations for both the training and subsequent fieldwork.

TABLE 1. TRAINING PREPARATION CHECKLIST

ITEM #	TASK	COMPLETED
	Pre-Training Activities	
1	If appropriate, secure meetings with key government officials, agencies, and other participating stakeholders and partners in advance of training and data collection as needed.	
2	Identify what components of the training need additional emphasis or focus based on participants skills and experience.	
3	Identify training dates.	
4	Produce training materials (e.g., adapted to local context, SurveyCTO, data collection tools, print materials, electronic documents such as power point presentations, and tablets/PCs loaded with appropriate resources, practical activities materials, data collection field test materials).	
5	Arrange printing of all materials required for the training.	
6	Secure documented authorization from the relevant authority to conduct field tests, ensure that you have the MoH data request MOU, and ensure that you clarify relevant info about the field test such as the purpose of the field test, who will visit the health facilities, what they will do at the facilities/what data they will collect, for how long they will be there, etc.	
7	Collect appropriate workshop equipment and supplies (e.g., projector, flip charts, masking tape, markers).	
8	Make sure the agreed upon list of tracer commodities (used to calculate KPIs) is available.	
9	Reserve training venue and arrange for tea/coffee/snacks/meals as appropriate.	
10	Schedule field test venue - Identify and book the health facilities where you would conduct the field tests (towards the end of the training participants will be asked to practice collecting data at local health facilities).	
11	Develop data collection recruitment policy	

TABLE 1. TRAINING PREPARATION CHECKLIST		
ITEM #	TASK	COMPLETED
12	Identify and invite training participants and facilitators, including high-level MoH officials, TA patner staff (local or external), donor stakeholders, assessment coordinator, assessment manager (trainers), data collection supervisors (trainees), data collection team members (trainees).	
13	Make payment arrangements for facilitators/trainings participants.	
14	Make training attendance lists.	
15	Inform participating organizations.	
16	Complete travel logistics for people attending from out of town (e.g., travel, lodging, per diems).	
17	Set up transportation to/from health facility for field test.	
Day of Training Activities		
18	Organize the training room as needed - allowing trainees to sit in groups of 4 to 5 trainees of mixed professions and backgrounds per table.	
19	Ensure tablets or electronics have SurveyCTO programmed in as appropriate.	
20	Charge any tablets or electronics loaded with SurveyCTO data collections intruments and related materials, and ensure they are ready for use.	
21	Prepare participant handouts/binders.	
22	Bring attendance sheets.	

ANNEX 10 : SITE VISIT SCHEDULE TEMPLATE

TABLE 1. SITE VISIT SCHEDULE TEMPLATE						
DATA COLLECTION TEAM #	DATE	REGION	DISTRICT OR SUBREGION	FACILITY TYPE	FACILITY CODE	NAME OF FACILITY
Team 1						

TABLE 1. SITE VISIT SCHEDULE TEMPLATE						
DATA COLLECTION TEAM #	DATE	REGION	DISTRICT OR SUBREGION	FACILITY TYPE	FACILITY CODE	NAME OF FACILITY
Team 2						

ANNEX 11: SITE COMMUNICATION TEMPLATES

When completing an NSCA 2.0, there are, at minimum, three letters that should be sent to the participating sites. These letters are outlined below:

- Assessment Notification
- Data collection date and advance request for data

Correspondence should ideally be completed by electronic delivery as it can reach many people simultaneously. If electronic delivery is not feasible, the next best option should be identified and executed (e.g., hand delivery, postal service, etc.)

ASSESMENT NOTIFICATION

An assessment notification template is provided below. This letter should be sent approximately 3 weeks ahead of data collection activities.

[Insert address block]

[Insert date]

Dear Dr./Professor/Mr./Ms.:

Re: Introduction Letter – Upcoming National Supply Chain Assessment (NSCA).

The Ministry of Health (MoH), with support from [insert name of organization supporting NSCA, if applicable], is conducting a National Supply Chain Assessment (NSCA) of essential medicines. The purpose of the assessment is to provide a comprehensive view of the national public-sector supply chain systems, processes, technologies and human capacity, to inform long-term, transformational in vestments. The NSCA will include a nationally representative sample of health facilities supported through public funds. The results of the assessment will be used to improve the system in determining where both targeted ad technical and financial assistance could be positioned for the greatest impacts in reform.

The NSCA will be conducted across [insert number] randomly selected health facilities in various districts across the country. Selected key stakeholders involved in supply chain management will also be interviewed. The NSCA data collection will take [insert number] weeks from [insert date] to [insert date].

The purpose of this letter is to alert you that a supply chain assessment will be completed in the near future. The next correspondence will request your help with finding, preparing, and sharing documents related to your supply chain before any data collection begins.

For more information or to address any questions, please contact [insert name, contact information, and organization]

[Insert preferred closing and signature]

[Insert signature block information]

ADVANCE REQUEST FOR DATA AND DATE FOR DATA COLLECTION ACTIVITIES

A data request template is provided below. This letter should be sent approximately 1 week ahead of data collection activities.

[Insert address block]

[Insert date]

Dear Dr./Professor/Mr./Ms.:

Re: Advanced Data Request for the National Supply Chain Assessment (NSCA).

The Ministry of Health (MoH), with support from [insert name of organization supporting NSCA, if applicable], is conducting a National Supply Chain Assessment (NSCA) of essential medicines. The purpose of the assessment is to provide a comprehensive view of the national public-sector supply chain systems, processes, technologies and human capacity, to inform long-term, transformational investments. The NSCA will include a nationally representative sample of health facilities supported through public funds. The results of the assessment will be used to improve the system in determining where both targeted ad technical and financial assistance could be positioned for the greatest impacts in reform.

The NSCA will be conducted across [insert number] randomly selected health facilities in various districts across the country. The purpose of this letter is to request materials in advance that will help the national supply chain assessment go smoothly. Please have these materials prepared for review at the time of the data collection visit. [insert list of documents requested]

Additionally, this letter is intended to alert your team to the dates for data collection at your facility. The NSCA data collection will take [insert number] weeks from [insert date] to [insert date]. Our team expects to work with your team on the following date(s): [insert date(s)]. The data collector(s) that will work with your team are [insert names of data collector(s)]. He/she/they are NSCA data collectors and are required to collect information from your district, health facility, or organization. As part of these data collection activities, selected key stakeholders involved in supply chain management will also be interviewed.

Any assistance rendered to the bearer of this letter will be highly appreciated. For more information or to address any questions, please contact [insert name, contact information, and organization]

[Insert preferred closing and signature]

[Insert signature block information]

ANNEX 12: LIST OF DOCUMENTS NEEDED TO COMPLETE PHYSICAL VERIFICATION

This annex includes a brief overview of the documents required to complete the capability maturity model questionnaire. A brief overview of documents that will support KPI data collection is also included.

CAPABILITY MATURITY MODEL PHYSICAL VERIFICATION LISTS BY FUNCTIONAL AREA

PHYSICAL VERIFICATION LIST: MODULE 1 – STRATEGIC PLANNING AND MANAGEMENT

1. A copy of the Supply Chain strategic plan. [MOH, Warehouse, Referral Hospitals]
2. A copy of the stakeholder map. [MOH, Warehouse, Referral Hospitals]
3. A copy of the National Health Sector Strategic Plan and Pharmaceutical Sector Strategic Plan. [MOH, Warehouse, Referral Hospitals]
4. A copy of the supply chain implementation plan. [MOH, Warehouse, Referral Hospitals]
5. Evidence that the supply chain design reforms are being implemented. For example, with meeting minutes or a progress report that documents progress with the reforms. [MOH, Warehouse, Referral Hospitals]
6. A copy of the performance monitoring plan (PMP) or monitoring framework for tracking supply chain performance. [MOH, Warehouse, Referral Hospitals]
7. A copy of the risk management and mitigation/prevention plan. [MOH, Warehouse, Referral Hospitals]
8. Evidence of engagement between the Ministry of Health and private sector companies to improve the supply chain in the last one year. [MOH, Warehouse]

PHYSICAL VERIFICATION LIST: MODULE 2 – HUMAN RESOURCES

1. A copy of a human resource workforce plan that projects future needs for supply chain personnel. [MOH, Warehouse, Referral Hospitals]
2. A copy of staff recruitment policies that make specific reference to supply chain personnel. [MOH, Warehouse, Referral Hospitals]
3. Job descriptions for supply chain, pharmacy, and stores personnel. [MOH, Warehouse, Referral Hospitals, SDP]
4. A copy of a supply chain management capacity building plan or staff development plan for current employees. [MOH, Warehouse, Referral Hospitals, SDP]
5. Database that keeps track of staff that have had capacity building sessions in supply chain management. [MOH, Warehouse, Referral Hospitals, SDP]
6. Supportive supervision guidelines that explicitly refer to supply chain supervision. [MOH, Warehouse, Referral Hospitals]

PHYSICAL VERIFICATION LIST: MODULE 3 – FINANCIAL SUSTAINABILITY

1. Documentation that supply chain cost records are maintained. [MOH, Warehouse, Referral Hospitals, SDP]
2. A copy of a funding strategy that includes funding for supply chain costs. [MOH, Warehouse, Referral Hospitals, SDP]
3. A copy of a cost sharing plan. [MOH, Warehouse, Referral Hospitals, SDP]

PHYSICAL VERIFICATION LIST: MODULE 4 – POLICY AND GOVERNACE

1. Copy of the National Medicines Policy. [MOH]
2. Copies of formally documented management policies or guidelines for the supply chain system. [MOH, Warehouse, Referral Hospitals]
3. Copy of the Standard Treatment Guidelines. [MOH, Referral Hospitals, SDP]
4. Copy of National Essential Medicines List. [MOH]

PHYSICAL VERIFICATION LIST: MODULE 5 – QUALITY & PHARMACOVIGILANCE

1. A formally approved Product Quality Assurance strategy or policy. [MOH]
2. A formally approved Product Quality Assurance guidelines or manual. [MOH]
3. Copies of Certificates of Analysis for medicines received from international sources. [MOH, Warehouse]
4. Copies of Certificates of Analysis for medicines received from domestic sources. [MOH, Warehouse]
5. Documentation that samples of received pharmaceutical products are taken for quality control testing. [MOH, Warehouse, Referral Hospitals, SDP]
6. Copy of standard operating procedures to quarantine and/or recall a product if the product quality is compromised. [MOH, Warehouse, Referral Hospitals, SDP]
7. Data collection tools for pharmacovigilance. [MOH]
8. Standard operating procedures (SOPs) for pharmacovigilance. [MOH, Referral Hospitals, SDP]
9. Standard operating procedures for medicine quality assurance/quality control. [MOH, Warehouse, Referral Hospitals, SDP]

PHYSICAL VERIFICATION LIST: MODULE 6 – FORECASTING & SUPPLY PLANNING

1. Report from most recent forecast that documents the methodology, data sources, and assumptions. [MOH, Warehouse, Referral Hospitals]
2. Standard operating procedures for forecasting. [MOH, Warehouse, Referral Hospitals]
3. A report or other document that documents measurement of forecast accuracy. [MOH, Warehouse, Referral Hospitals]
4. A copy of the supply plan. [MOH, Warehouse, Referral Hospitals]
5. A copy of the procedure for collecting the data for the supply plan. [MOH, Warehouse, Referral Hospitals]
6. Documentation of the data assumptions in the supply plan. [MOH, Warehouse, Referral Hospitals]
7. A copy of the procedure for adjusting and updating the supply plan. [MOH, Warehouse, Referral Hospitals]

PHYSICAL VERIFICATION LIST: MODULE 7 – PROCUREMENT & CUSTOMS CLEARANCE

1. Documentation that procurements are approved by authorized personnel/stakeholders, for example procurement manual/regulations or procurement records. [MOH, Warehouse, Referral Hospitals]
2. A copy of guidelines, manuals, or standard operating procedures (SOPs) for procurement. [MOH, Warehouse, Referral Hospitals]
3. A copy of a prequalification document. [MOH, Warehouse, Referral Hospitals]
4. A database for vendor information. [MOH, Warehouse, Referral Hospitals]
5. Access to the site's procurement website. [MOH, Warehouse, Referral Hospitals]
6. Copies of communications to vendors sharing feedback after the qualification process is completed. [MOH, Warehouse, Referral Hospitals]
7. A copy of a tender document that includes terms and conditions. [MOH, Warehouse, Referral

Hospitals]
8. Copies of notifications to both successful AND unsuccessful bidders after procurement evaluations. [MOH, Warehouse, Referral Hospitals]
9. Copies of a documented procurement appeals process. [MOH, Warehouse, Referral Hospitals]
10. Copies of insurance coverage for products in transit. [MOH, Warehouse, Referral Hospitals]

PHYSICAL VERIFICATION LIST: MODULE 8 – WAREHOUSING & STORAGE

1. Copies of Standard Operating Procedures (SOPs) for operations of the Warehouse. [MOH Warehouse, Referral Hospitals, SDP]
2. Copy of a repair and maintenance plan for storage equipment and utilities. [MOH, Warehouse, Referral Hospitals, SDP]
3. Copy of equipment maintenance logs. [Warehouse, Referral Hospitals, SDP]
4. The national policy / SOP / etc. for determining which stock for a given item to issue first. [MOH]
5. Copies of delivery confirmation. [Warehouse]
6. Copies of cold chain equipment maintenance records. [Warehouse, Referral Hospitals, SDP]
7. Copies of SOPs for handling controlled substances and high value products. [Warehouse, Referral Hospitals, SDP]
8. Copy of a register used to monitor and track expiration dates (paper or electronic).[Warehouse, Referral Hospitals, SDP]
9. Copies of internal or external audit records. [Warehouse, Referral Hospitals, SDP]
10. Copies of license for the storage of pharmaceutical products. [Warehouse]
11. Monitoring plans or reports that document indicators used to monitor warehousing and storage. [MOH, Warehouse, Referral Hospitals, SDP]

PHYSICAL VERIFICATION LIST: MODULE 9 – DISTRIBUTION

1. Copy of an approved distribution plan. [MOH, Warehouse]
2. Evidence of a data management system that captures distribution plans and operations. [Warehouse]
3. Copies of communication with health facilities about the distribution plan. [Warehouse]
4. Evidence that distribution routes are pre-planned and how often they are reviewed, such as minutes from distribution meetings or maps of distribution routes at different points in time. [Warehouse]
5. Documented description of factors taken into consideration when route planning is done (such as route planning SOPs, guidelines, reports). [Warehouse]
6. Copies of policies that cover distribution and transportation of commodities. [MOH, Warehouse]
7. Evidence of procedures for managing transportation assets. [MOH, Warehouse]
8. Evidence that transportation data are captured and maintained. [MOH, Warehouse]
9. Evidence that timely and accurate data is captured from commercial providers for outsourced transportation services. [MOH, Warehouse]
10. Documents regarding any supply chain indicators regularly tracked for transportation operations. [MOH, Warehouse]
11. Documents demonstrating what distribution cost data is collected. [MOH, Warehouse]
12. Evidence that specific interventions have been made for the purpose of reducing transport operating costs. [MOH, Warehouse]
13. Evidence of how POD records are maintained. [MOH, Warehouse]
14. Evidence that quantities of outbound stock (deliveries) are reconciled with proof of delivery, for example, reconciliation reports. [MOH, Warehouse]

PHYSICAL VERIFICATION LIST: MODULE 10: LMIS

1. Copy of policies that guide the paper LMIS - SOPs. [MOH, Warehouse]
2. Copy of policies that guide the electronic LMIS SOPs. [MOH, Warehouse]
3. Evidence of LMIS indicators tracked by the facility. [MOH, Warehouse]
4. Copy of paper LMIS Standard Operating Procedures (SOPs). [MOH, Warehouse, Referral Hospitals, SDP]
5. Copy of electronic LMIS SOPs. [MOH, Warehouse, Referral Hospitals, SDP]
6. Evidence that data quality assessments (DQA) are conducted at this site, such as a Data Quality Assessment report related to supply chain. [MOH, Warehouse, Referral Hospitals, SDP]
7. Access to computers running electronic LMIS at the facility. [MOH, Warehouse, Referral Hospitals, SDP]

PHYSICAL VERIFICATION LIST: MODULE 11 – WASTE MANAGEMENT

1. Copy of formally approved national waste management and disposal regulations. [MOH]
2. Copy of formally approved MOH guidelines for waste management and disposal. [MOH]
3. Copies of any Standard Operating Procedures (SOPs) for waste management and disposal. [MOH, Warehouse, Referral Hospitals, SDP]
4. Copies of approvals of waste disposal process for disposal events. [Warehouse, Referral Hospitals, SDP]
5. Evidence of disposal/destruction events [MOH]

DOCUMENTS TO SUPPORT KPI DATA COLLECTION

All KPIs require source data, specifically: inventory, procurement, forecasting, distribution and human resources data. Thus, sites should have stock cards, or their eLMIS available for each tracer product, procurement records, proof of delivery forms, and should be prepared to answer questions of the data collectors.

ANNEX 13: COUNTRY PLANNING CHECKLIST AND DAILY ACTIVITY SCHEDULES

Below is an illustrative checklist for planning NSCA 2.0 activities in-country, followed by a country activity schedule with a summary of key activity milestones and detailed activity. These are useful tools can be used in developing a country workplan and budget for the assessment

SAMPLE COUNTRY PLANNING CHECKLIST

TABLE 1. SAMPLE COUNTRY PLANNING CHECKLIST

	HIGH LEVEL ACTIVITY	DETAILED STEPS	STATUS (COMPLETE = √)
1	Finalize NSCA SOW, workplan, and budget	NSCA 2.0 SOW Approved by MoH	
		NSCA 2.0 funding source confirmed	
		Develop assessment workplan	
		Develop assessment budget	
2	Prepare for International Consultants (if applicable)	Identify names, travel dates, and itineraries for visiting international consultants	
		Reserve hotel for visiting consultants	
3	Plan and prepare for the assessment	Gather preliminary country information	
		Map out the public health supply chain system	
		Identify sample sites to visit	
		Develop list of tracer commodities	
		Identify and recruit data collectors	
		Customize the NSCA 2.0 to the country context as needed/allowed	
4	Hold stakeholder/public health supply chain mapping workshop	Identiy a list of participants for the stakeholder's workshop	
		Identify venue for stakeholders meeting	
		Prepare agenda for stakeholders' workshop	
		Draft invites for stakeholders' meeting	
		Request MoH signed invitation letters for stakeholders	
5	Train data collectors	Identify a list of participants for the data collector training workshop	
		Identify venue for data collector training	
		Prepare agenda for data collector training	
		Prepare training materials and supplies	
		Draft invites for data collector training	
		Request MoH signed invitation letters for trainees	
6	Prepare for data collection fieldwork	Set up and organize data collection field teams	
		Request MoH signed authorization letter for data collectors	
		Prepare data collection materials (including table PCs, printing questionnaires, and other materials)	
		Develop routing plans for data collectors	
		Make a plan for any closures or unavailability of health sites due to holidays (national, public) or competing activities	
		Arrange field logistics (vehicle hire, authorization letters for data collectors)	
7	Disseminate assessment findings	Prepare debrief with preliminary results for MOH and funders at the conclusion of the field work	
		Write and disseminate assessment report	
		Develop approach/plan for disseminating assessment results	

COUNTRY SCOPING LIST

A simple form should be developed to provide a high-level outline of the assessment. The information included in this document should include:

- Number and name of service levels included in the assessment
- Number and names of functional modules included in the assessment
- List of agreed upon tracer commodities
- List of central sites
- List of facilities included at each level

SAMPLE COUNTRY DAILY ACTIVITY SCHEDULE

The table below provides a sample workplan to help guide the core assessment team in achieving key milestones during the assessment process. Please note that 1) there is not a milestone noted for each day and 2) these milestones are general guidelines and may need to be adapted to the specific assessment needs.

TABLE 1. SAMPLE DAILY ACTIVITY SCHEDULE FOR NSCA WITH NON-LOCAL IMPLEMENTING PARTNER
(THIS CAN BE REVISED IF THE IMPLEMENTING PARTNERS ARE ALL LOCAL)

DATE	ACTIVITY	LEAD RESPONSIBILITY
Day 1	• Data collectors selected and list shared – should be completed two weeks prior to the data collector training.	Assessment Manager
Day 3	• In country agenda final, including the list of teams and site assignments • Decide which coordinating team member(s) will remain at central level in the capital city, and which will travel outside the capital city and assess different field sites. • Coordinate and consult as needed with the Funder.	Assessment Manager
Day 7	• Project Lead arrives ahead of the rest of the team to begin preparations (5-7 days ahead).	Project Lead
Day 8	• If Project Lead is not based locally, hold meeting with local TA Partner to discuss and clarify any outstanding NSCA 2.0 issues and obtain debriefing on local context. • View training venue.	Project Lead
Day 9	• Print training materials and modules	Assessment Manager
	• Meeting with Donor team to obtain debriefing on local context and any outstanding issues for clarification	Project Lead
Day 10	• Meeting with MoH to share data collection plan and discuss expectations	Project Lead
Day 11-12	• Arrival of additional team members.	Project Lead

TABLE 1. SAMPLE DAILY ACTIVITY SCHEDULE FOR NSCA WITH NON-LOCAL IMPLEMENTING PARTNER
(THIS CAN BE REVISED IF THE IMPLEMENTING PARTNERS ARE ALL LOCAL)

DATE	ACTIVITY	LEAD RESPONSIBILITY
	• Core assessment team meets to discuss preparations, training plan, data collection, logistics and any outstanding issues	
Day 13-17	• Data Collector Training	Project Lead
Day 17	• Set up a control tower and means of communication (WhatsApp) to communicate and handle issues encountered by data collection team	Assessment Manager
Day 18	• Finalize logistics and data collection plans	Assessment Manager and Logistics Coordinator
Day 19	• Deployment of data collection teams	Assessment Manager
Day 20	• Data collection for sites 1 to 10	Assessment Manager
Day 21	• Data collection for sites 11 to 20 + Central Level	Assessment Manager
Day 22	• Data collection for sites 21 to 30 + Central Level	Assessment Manager
Day 23	• Data collection for sites 31 to 40 + Central Level	Assessment Manager
Day 24	• Data collection for sites 41 to 50 + Central Level	Assessment Manager
Day 25	• Data collection team returns to the capital city (depending on the country, teams may remain in the field over the weekend)	Assessment Manager
Day 27-28	• Team meeting to discuss data collection, preliminary findings, lessons learned, action items and plan for week 2. Deploy teams for week two data collection	Project Lead
Day 29	• Data collection for sites 51 to 60	Assessment Manager
	• Team meeting to discuss and agree on materials and content for the Donor and MoH debrief	Project Lead
Day 30	• Data collection for sites 61 to 75	Assessment Manager
	• Debrief with Donor at Central Level	Project Lead
	• Meet with Donor and local TA partner (if applicable) to discuss and agree on materials and content for the MoH debrief	Project Lead
Day 31	• Debrief with MOH	Project Lead

*This plan was designed for a country with about 80 assessment sites (including 4 central level institutions). It is just for illustrative purposes – while country plans will generally follow this outline, the specific activities and timelines may be adjusted as needed to suit country context and needs (level, number, size and geographical spread of the sampled sites, number and sizes of data collection teams, availability of stakeholders, competing activities/holidays, time available for field data collection). The Project Lead role here can be executed by either international consultants or local stakeholders.

ANNEX 14: SURVEY CTO RESOURCES

Electronic data collection (using tablets or smart phones) is recommended for the NSCA assessment because it allows real or almost real-time monitoring of data collection and rapid processing of results (without the needs, e.g., for data entry after data collection).

The data collection tools necessary for conducting an NSCA have been prepared using the SurveyCTO platform. It is not required that SurveyCTO be used for an NSCA; there are multiple platforms available for collecting data electronically. The specifications and capabilities of these various platforms change on a regular basis. SurveyCTO was selected for the NSCA 2.0 because it is secure (in terms of encrypting data and in terms of not 'losing' data as it is transferred from tablets to the cloud) and has a low cost. SurveyCTO is compatible with most data processing software like Excel, Stata, etc. and provides a responsive and professional 'help desk'. The downsides of SurveyCTO include that it is compatible only with Android systems, and (for off line data collection) has somewhat limited formats / display capabilities for collecting data.

Pre-generated coding for the standard NSCA questionnaire and KPI data collection should be available from the NSCA website. Further, data analysis templates are designed for use with SurveyCTO output.

An overview of SurveyCTO is available at: https://www.surveycto.com/index.html. This webpage includes information on the product, pricing, and getting help.

- https://www.surveycto.com/support/ Provides links to support center and subscription support.
- https://www.surveycto.com/support/video-library/ provides links to the most popular videos. Of particular interest may be the video: Form Designer: Intro to Form Design, and Android App: Getting Started with SurveyCTO Collect. The full video library and tutorials are available at https://www.youtube.com/user/SurveyCTO.
- Once you subscribe to SurveyCTO, full web-based text tutorials are available.

ANNEX 15: DATA CLEANING AND QUALITY ASSURANCE

If data collection is done electronically, data can be regularly (e.g., daily) checked and 'cleaned' to ensure the quality of the data. When checking and cleaning the data, the data manager should track all comments, notes, questions, and changes made to data received from the data collectors. The data manager should set up a document or other record tracking the day, data collection team, form (e.g, CMM, KPI), entity ID, issue, steps taken, and resolution of all issues. These notes should be specific enough that outside parties can track, for example, exactly which cell (entity, question number) in the database has been queried or altered. If data collections teams are linked to the data manager on social media (e.g., WhatsApp or similar group chats), questions can be sent directly to the data collection teams on social media; otherwise, phone calls or other communication mechanisms will need to be employed. It is better to query data collection teams close to the time when they collected the data to ensure that their memory of the facility/entity is still fresh.

Below are listed issues that were identified during the pilots of the NSCA 2.0 as specific items to check during the quality assurance and data cleaning. Other issues may come up in further investigations and the data manager should closely engage in inspecting the data on a regular basis to catch any further issues that may arise.

Issues applicable to all forms (CMM, non-Central KPI, Central KPI):

1. Look for multiple submissions from the same entity – sometimes data collection teams submit the same form from the same facility multiple times. This may be because they selected the wrong facility name at the start of data collection or because multiple members of the team entered and submitted the data (in which case the device ID listed in the SurveyCTO database will be different). Occasionally, data collection teams may submit the data but not be sure that the data was sent, and then try to recreate the data and send it again.
    a. First, ensure that data collection teams understand that data should only be submitted once and/or that they entered the correct entity ID.
    b. If data were submitted multiple times from different teams' members and the two entries are identical then it is possible to consider that the data are valid. If only one or two questions have different answers, ask the data collection team to clarify the answers to the specific questions. If there are more than just a few differences between the submitted form, likely a phone call with the data collection team will be necessary to understand what happened.
2. Check start and end times for the data entry to ensure that the time of data collection is not shorter than could reasonably be done for that form. If the start time and end time are too close together, a phone call with the data collection team will be necessary to understand what happened.

Issues applicable to the CMM form:

1. Carefully review the 'written' (text) notes and answers at the end of each module and for the 'other: specify' answers. First, the text answers for the "other" should be assessed to determine whether or not the response is a reasonable approximation of another answer category (e.g., 'bookshelves' is specified, while another answer option is 'shelves'). In these cases, the answer category for which the specified 'other' is a reasonable approximation should be answered as

present. Second, text answers for the "other" may be frequently the same/similar, not a reasonable approximation of another answer category, and deemed by the assessment team to be an important input/process/etc. not elsewhere captured in the survey. In these cases, a new answer response should be created for the answers that are the same/similar. If necessary, this new answer response can be assigned to a maturity category (although note that the automatic calculation templates provided as part of the NSCA 2.0 will not be able to accommodate this decision). Third, text answers for the "other" may not be a reasonable approximation of another answer category, be rare (one or two respondents only) and/or deemed by the assessment team to not be an important input/process/etc. In these cases, the answers may be either ignored, or treated as a descriptive question. Similarly, notes and answers at the end of each module may clarify why a certain answer was selected or explain "I don't know" answers, which may result in the data manager altering the responses to other questions.

2. Check if they entered a 'none of the above' and another answer for questions where 'mulitple responses' are allowed. This may also apply to 'I don't know' and another question was answered. Data collection teams should be queried if the answer was 'none of the above' (and the other answer was selected by accident) or if it should be the other answer (and 'none of the above' was selected by accident).

Issues applicable to the KPI forms:

1. Check for '98' or '9998' in stock card available questions; these are codes for missing data. Assess whether or not the amount of missing data is reasonable or if it is routinely entered by a particular data collection team. Cross check missing data between data collection teams (e.g., if a certain type of facility seems to manage or not manage a certain tracer commodities). It may be that a single facility does not manage a tracer commodity while others of the same type do, but clarification with the data collection team can help clarify these issues.
2. Ensure that the dates entered for upstream and downstream order data are within the time period used for the assessment.
3. Check temperature excursion data (if using this KPI) – ensure that data collection teams are entering the number of days of excursions (and not the number of days when there were no excursions). This typically can be done by comparing answers across facilities to spot outliers. (Applicable only for the non-Central tool.)
4. Look at human resources data to ensure the number and types of staff are not widely divergent amongst facilities of the same type. Outliers should be queried.
5. Check whether or not 'stock accuracy' is less than or equal to 'stock cards up to date' – if it is not then the data collection teams may have incorrectly entered whether a stock card was up to date or not. (Applicable only for the non-Central tool.)
6. Similar to the CMM, read and assess any notes submitted by the data collection teams at the end of each module to assess whether the note impacts any of the question answers or the quality of the data.

ANNEX 16: DISSEMINATION PLAN GUIDANCE

A dissemination plan should be prepared by the NSCA 2.0 assessment team. This plan should be developed in the planning stage in the assessment process. This plan should outline who (e.g., audience) the team wants to know about the project, how the target audience(s) can access information, and how does the team what people to consume and use the information provided. Once the goals of the dissemination plan are identified, the team needs to identify the steps required to get the information to the right people and encourage the target audience to use the information provided appropriately. Each step needs to be a standalone action item and a primary point of contact (responsible party) for each task.

TABLE 1. Preparing a Dissemination Plan

#	Task	(√)
1	Outline goals of dissemination activities – how does the team want the information shared consumed and used (e.g., awareness only, change policy, obtain funding for interventions, etc.)	
2	Identify target audience(s) for dissemination activities	
3	Develop strategy to deliver assessment results to each target audience	
4	Develop step-by-step implementation plan to deliver on the goals of the dissemination plan.	