Training Workshop on Quantification with Quantimed and PipeLine Tools in Freetown, Sierra Leone

July 2016

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Training Workshop on Quantification with Quantimed and Pipeline Tools in Freetown, Sierra Leone

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Alan George

July 2016

This report is made possible by the generous support of the American people through the US Agency for International Development (USAID), under the terms of cooperative agreement number AID-OAA-A-11-00021. The contents are the responsibility of Management Sciences for Health and do not necessarily reflect the views of USAID or the United States Government.

About SIAPS

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

Recommended Citation

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Oumer A, George A. 2016. *Training Workshop on Quantification with Quantimed and PipeLine Tools in Freetown, Sierra Leone.* Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

Key Words

quantification, forecasting, supply planning, Sierra Leone, Quantimed, PipeLine, Free Health Care

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ACRONYMS

AIDS	aquired immune deficiency syndrome
ART	antiretroviral therapy
ARV	antiretroviral
CHAI	Clinton Health Access Initiative
CMO	chief medical officer
DDMS	Directorate of Drugs and Medical Supplies
DHMT	district health management team
DIO	district information officer
HIV	human immunodeficiency virus
HQ	headquarters
LMIS	Logistics Management Information System
MOHS	Ministry of Health and Sanitation
MSH	Management Sciences for Health
NQC	National Quantification Committee
RRIV	report, requisition, and issue voucher
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
QTWG	Quantification Technical Working Group
TOR	terms of reference
USAID	US Agency for International Development

ACKNOWLEDGMENTS

The training workshop on quantification with Quantimed® and PipeLine® tools was held in Freetown, Sierra Leone, from May 30 to June 10, 2016, and was funded by USAID Sierra Leone under the SIAPS Project. The authors acknowledge and express their appreciation to the USAID Sierra Leone management for funding this important activity and providing support throughout the process.

The authors would like to thank the Directorate of Drugs and Medicine Supplies (DDMS). Their allowances made for the fruitful participation of their staff at the quantification training. The guidance and information they have provided throughout the process and the support they continue to provide for implementing critical quantification, procurement, and supply chain management actions needed for efficient delivery and use of the commodities are appreciated.

Acknowledgement is also made to the training participants for their active, dedicated participation and for sharing their experiences. They worked diligently with the facilitators and made valuable contributions to make the training a success. Their expertise was instrumental in providing information required for the quantification trainings.

Immense gratitude goes to the SIAPS Sierra Leone management, administration, and technical staff for their tireless logistical support.

INTRODUCTION

Background

In September 2015, SIAPS received funding from the US Agency for International Development (USAID) to provide a two-year, post-Ebola recovery technical assistance to rebuild and strengthen the pharmaceutical supply chain management system in Sierra Leone.

The purpose, objectives, and activities of this program are designed to reflect the Government of Sierra Leone's Health Sector Recovery Plan. Specifically, SIAPS will provide support for strengthening the supply chain system, including capacity-building activities that focus on district-and peripheral-unit levels to assist in restarting programs of the Ministry of Health and Sanitation (MOHS); the DDMS (which is responsible for coordinating and providing pharmaceutical services, including promoting rational use of medicines); the National Pharmaceutical Procurement Unit; and the Pharmacy Board of Sierra Leone.

SIAPS has recently established a field office and recruited technical staff to provide direct support and technical assistance in pharmaceutical system strengthening that focuses on supply chain management. SIAPS will collaborate with all key local and international stakeholders and partners to accomplish its mission.

TRAINING WORKSHOP ON QUANTIFICATION WITH QUANTIMED AND PIPELINE

Purpose and Objectives of the Training

The purpose of this training was to assist the Government of Sierra Leone in promoting good quantification (forecasting and supply planning) practices. Its major objectives were to establish quantification coordination mechanisms and to build local capacity in quantification of health commodities for participants from the MOHS, National Pharmaceutical Procurement Unit, DDMS, districts, hospitals, health programs (tuberculosis, malaria, HIV/AIDS, reproductive health, etc.), and other partners of Sierra Leone. The training workshops mainly focused on quantification principles, methodologies, and tools (Quantimed and PipeLine) and the establishment, importance, and roles of coordination mechanisms for effective quantification and supply chain management.

Preparation for the Workshop

SIAPS headquarters (HQ) and local staff worked together to ensure that the design of the training was aligned with the needs of its principal beneficiaries and to determine priority areas for the quantification workshop. The training was aligned with these priorities:

- Discuss both the forecasting and supply planning components of quantification, with a large emphasis on Quantimed and PipeLine tools

- Build up the capacity of the members of the National Quantification Committee (NQC) and Quantification Technical Working Groups (QTWGs)

- Use local data from health programs and explore its practical application; facilitators used local data from Sierra Leone's Free Health Care, HIV, and malaria programs for training exercises and discussions, especially in the practical sessions using Quantimed and PipeLine

The SIAPS HQ team adapted existing materials from previous quantification workshops and developed new materials when needed in line with agreed objectives, training methodologies, and priorities. The training materials included presentations, exercises, handouts, and job aids. Background information was collected to inform the adaptation and development of the training materials, particularly to ensure that planned activities and exercises were appropriate to the specific context and needs of the participants.

Three preparation days were used in-country to review and print the training materials, discuss arrangements for obtaining quantification data sets to use in the training, and arrange the logistics for the workshop.

Specific Objectives of the Training

The objective of this workshop was for participants to acquire the knowledge and skills to:

- Explain the principles, concepts, rationale, processes, and applications of quantification
- Explain the role of coordination mechanisms for quantification and how to establish them
- Validate the proposed draft terms of reference (TOR) for establishment of NQC and QTWGs
- Explain the different quantification methodologies, their data requirements, calculation steps, applications, and limitations
- Explain the processes for collection, organization, analysis, comparison, and interpretation of data
- Describe data collection and reporting systems/tools used in various settings in Sierra Leone
- Describe the basic principles and approaches for making assumptions
- Describe approaches to building consensus with stakeholders regarding which data and assumptions to use
- Describe approaches to validate quantification processes, data, assumptions, and results
- Describe challenges, opportunities, and possible improvements in supply chain
- Demonstrate skills and knowledge on the use of Quantimed and PipeLine

Training Content and Methodology

The workshop was conducted from May 30 to June 10, 2016, at the Hill Valley Hotel, Freetown. The workshop was divided in three parts to accommodate different objectives and participants (agenda included in annex A):

Part 1 (May 30): 58 people, including the deputy minister of health and sanitation, attended the opening ceremony and introductory sessions on quantification definitions, principles, processes, and methodology. In addition, an introduction on coordination mechanism for quantification was conducted.

Part 2 (May 30-June 2): 29 participants attended the session on quantification principles, processes, and methodologies. More specifically, the training sessions addressed the principles, concepts, and processes of quantification, including good practices; the importance of

coordination mechanisms; different forecasting methodologies, their data requirements, applications, and limitations; and supply planning principles, concepts, and processes. During these first four days, attendants were able to review, discuss, and validate the TOR for the NQC and seven program-specific QTWGs. During this period, the processes of data collection, organization, analysis, and interpretation; selection of forecasting methods; and the principles and approaches for making assumptions and building consensus when quantifying were addressed. Manual exercises, without the use of electronic tools, were also conducted on the consumption and morbidity methods of quantification to ensure deeper understanding of the basic concepts and calculation steps of each methodology before starting on the quantification tools.

Part 3 (June 3-10): 15 participants attended the session on Quantimed and PipeLine, which was held June 3-10, 2016. Introductory sessions on key features, applications, strengths, and limitations of Quantimed and PipeLine were presented and discussed. Participants were taught how to install Quantimed and PipeLine and how to create databases and data sets. Participants exercised on preparation of data for Quantimed and PipeLine and the use of this data in the respective tools. Participants were able to practice how to install the tools, prepare data and assumptions, enter data and assumption into the tools, produce forecasts and supply plans, assess and analyze results for risk assessment, and document assumptions and results. Country real-data on antiretrovirals (ARVs) for adult antiretroviral therapy (ART) and for simple and severe malaria were used during the Quantimed practical sessions; participants were able to produce forecasts for ARVs and malaria medicines using the morbidity method of forecasting; supply plans were developed and discussed for ARVs. In addition, the exercises on ARVs and malaria medicines allowed participants to evaluate actual past quantifications. Program pharmacists from HIV/AIDS and malaria control programs, who participated in the training, expressed the need for making adjustments of assumptions and results of their respective actual quantifications based on what they learned during the training exercises.

The workshop was interactive and participatory to encourage the exchange of skills and experiences among participants. This approach was meant to add depth to the learning process. Participants included staff from health programs (tuberculosis, malaria, HIV/AIDS, reproductive health, etc.); pharmacists from districts and hospitals; staff from the Procurement Unit of the MOHS; staff from the Clinton Health Access Initiative (CHAI); and SIAPS/Sierra Leone staff. The participants of both workshops are listed in annex B.

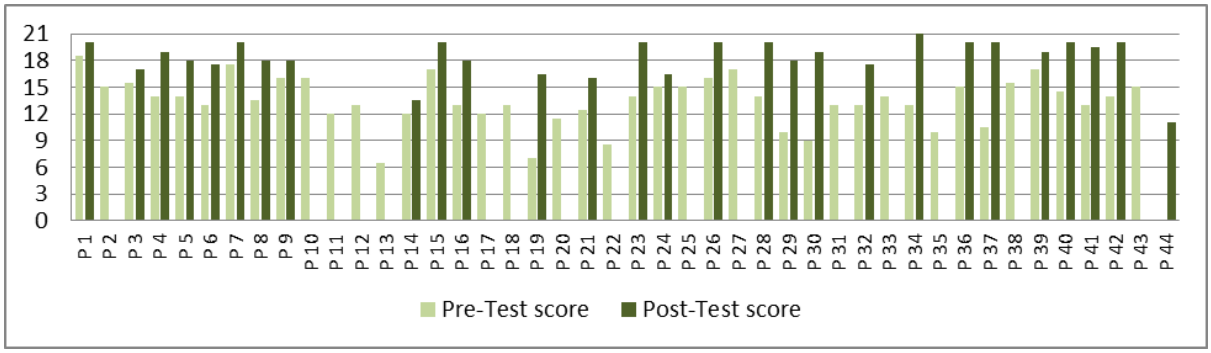
Pre- and Post-Test Results and Analysis

Pre- and post-tests were administered at the beginning and end of each session to assess participants' knowledge and skill improvements (annex C). In general, the pre- and post-tests results show vast improvements in knowledge for all participants (annex D). After the opening session, 43 out of 58 attendees remained and took the pre-test on quantification principles. Because of the design of the training workshop, a subset of the 43 were not expected to take the post-test, as they were only invited to the first day of training on general quantification orientation and to participate in the validation of TOR; their pre-test scores were not used to calculate the overall participants' knowledge improvement.

Quantification Principles, Processes, and Methodologies

A total of 43 participants took the pre-test, 28 took the post-test, and 27 took both the pre- and post-tests. For the 27 participants that took both tests, the average results improved by 35% (average pre-test score of 66% vs. average post-test score of 89%). More notably, of the 27 participants, 4 scored 50% or below in the pre-test (33%, 43%, 48%, and 50%). The same participants then scored 79%, 90%, 86%, and 95% in the post-test, respectively; no participant scored 50% or less in the post-test. In addition, 6 participants (22%) scored over 75% in the pre-test and 26 participants (93%) did so in the post-test.

In comparison to the pre-test, there was an increase in the number of participants with "partial or full correct" answers on all of the 21 questions in the post-test (figure 1 and annex D). Eleven of the 21 questions (2, 6, 7, 8, 10, 12, 13, 14, 16, 18, and 19) were answered correctly by at least 90% of participants, while three questions were answered correctly by 100% of participants (7, 8, and 14). Question 19 was answered correctly by 7% of participants in the pre-test and 96% in the post-test; question 20 was not answered by any one of the 27 participants in the pre-test, but was answered correctly by 68% in the post-test. Each of the questions and their respective answers were discussed at the end of the training, and participants were given the chance to ask questions and get explanations for the answers.



*Participants 2, 10, 11, 12, 13, 17, 18, 20, 22, 25, 27, 31, 33, 35, 38, and 43 completed the pre-test only; participant 44 completed the post-test only.

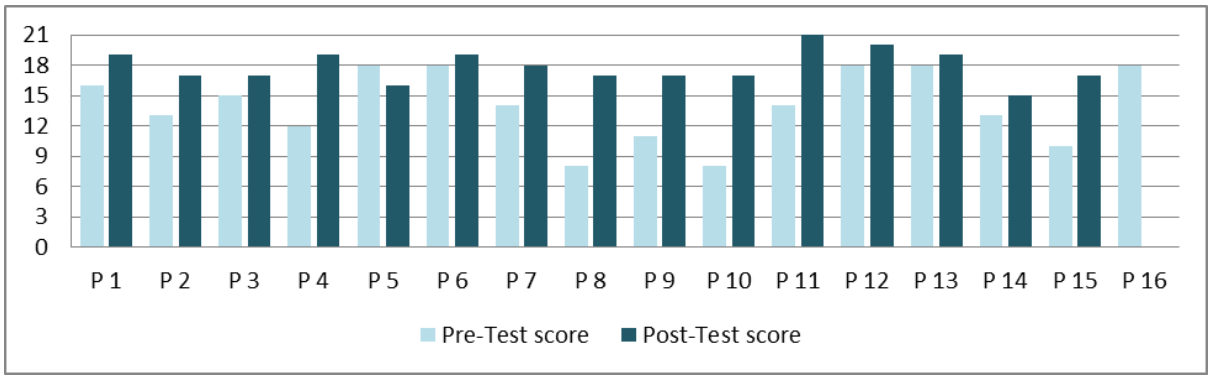
Figure 1. Pre and post test results by participant

Quantification Tools

A total of 16 participants took the pre-test and 15 took both the pre- and post-tests. For the 15 participants that took both tests, the results improved by 30% (average pre-test score of 65% vs. average post-test score of 85%). Three participants scored 50% or below in the pre-test (38%, 38%, and 48%). The same participants then scored 81% each in the post-test. Five participants (33%) scored over 75% in the pre-test and 14 participants (93%) did so in the post-test.

In comparison to the pre-test, there was an increase in the number of participants with "partial or full correct" answers on most of the 19 questions in the post-test (figure 2 and annex D). Eleven of the 19 questions (1, 3, 6, 7, 8, 9, 10, 11, 12, 13, and 17) were answered correctly by at least 90% of participants, while 7 questions were answered correctly by 100% of participants (3, 6, 7,

9, 10, 12, and 13). Question number 5 was answered correctly by 19% of participants in the pre-test and 87% in the post-test. Each of the questions and their respective answers were discussed at the end of the training, and participants were given the chance to ask questions and get explanations for the answers.



*15 participants completed both tests; participant 16 completed the pre-test only

Figure 2. Pre and post test results by participant

Participants' Expectations of the Workshops

The expectations from participants were in line with the objectives of the training. At the end of the training, the participants reported that all expectations had been successfully met. Some of their comments suggest the need for more training time, particularly on the use of Quantimed and PipeLine, as some participants felt that there was a lot of information for them to absorb. Some participants also mentioned certain difficulties with the installation process of the tools due to certain bugs and system incompatibilities between Quantimed specifically and some versions of Windows. The expectations identified at the beginning of the workshop and responses given as to whether the expectations had been met at the end of the workshop are also included as part of annex E.

Participants' Evaluation of the Workshops

The participants' subjective evaluations were quite favorable, with all participants who completed the evaluation reporting that the course objectives had been met successfully (25 participants completed an evaluation for the quantification principles workshop and 15 participants for the quantification tools workshop). The participatory and interactive approach to the workshop, the manual exercises, and the exercises on Quantimed and PipeLine tools received numerous mentions as favorite aspects of the workshop. The evaluations also indicated that the material included in this workshop was considered relevant, useful, timely, and important for Sierra Leone. The need for continued support and additional practice were mentioned as critical for the complete internalization of the knowledge and skills learned during the training. The complete summary of the end of workshop evaluations completed by the participants is included in annex F.

NEXT STEPS

The next steps as agreed in meetings with training workshop participants, DDMS, and the SIAPS Program are set out below.

Immediate Post-Training Actions

- The seven official and functional QTWGs and one NQC will be established. During the training, the proposed TOR were reviewed and validated. The TOR need to be approved and institutionalized by the authorities in Sierra Leone.
-
    - SIAPS to finalize the draft TOR with input from the workshop and send to DDMS: June 10, 2016
    - DDMS to revise and send the draft TOR to all programs and directorate: June 20, 2016
    - Managers and directors to review and send their feedback to DDMS: June 27, 2016
    - DDMS technical staff and SIAPS to review inputs and submit to DDMS director and chief medical officer (CMO) for approval: June 30–July 5, 2016

- The first meeting of the NQC is planned for July 7, 2016. DDMS will lead the planning, prepare a schedule, invite participants, etc.

- The first meetings of the QTWGs are planned for after the NQC meeting (July 7–22).

    - The objectives of these first meetings are to review final approved TOR and to come to agreements on frequency of meetings, indicators to be tracked, tools, and methodologies to be used for quantification. Participants from the tool workshop will introduce Quantimed and PipeLine to other members of the seven QTWGs that did not participate in the workshop.

- The seven QTWGs can start using PipeLine for reporting during the program meetings as well as to their donors. The HIV and TB QTWGs will immediately begin using PipeLine to make and update their supply plans.

- The commodities list will be standardized in the report, requisition, and issue voucher (RRIV) and Channel (DDMS with support from SIAPS and CHAI).

- The health facilities list will be standardized (DDMS with support from SIAPS and CHAI).

- District pharmacists will strengthen coordination with district information officers (DIOs) and M&E officers so that information from RRIVs can be shared with the district and used for decision making. DDMS should inform DIOs of this collaboration through a formal communication, such as a letter.

- District pharmacists will directly discuss the experience of the training and the benefit it will have on their districts with DMOs, DIOs, district liaison officers, and M&E officers. Regional pharmacists will do the same.

- District pharmacists will advocate for and enforce validation of data from the health-facility level to the district.

Follow-on Technical Assistance

- No follow-on, in-country technical assistance on quantification was agreed to at the completion of the training between SIAPS Sierra Leone and SIAPS HQ. However, it is recommended that further quantification trainings be extended to other members of the QTWGs and other supply chain staffs. Refresher trainings may be necessary, depending on the results that can be achieved through remote support and other needs as well.

- It is also recommended that the SIAPS local team provide support to the seven QTWGs for reviewing data, forecasts, and supply plans on Quantimed and PipeLine. SIAPS HQ can provide technical support to validate quantifications done by programs (either through workshops, refresher trainings, or via email).

- During the workshop it was evident that the local teams need more support and training on organization, analysis, and use of available data for decision making, including quantification and procurement.

- It was recommended that focused technical assistance be provided to each of the health programs to address specific needs. One such focused technical assistance includes support during actual quantification exercises. It will also be necessary to follow up with program pharmacists and managers on any adjustments they have made to their respective actual quantifications (forecasts and supply plans) as a result of discussions during the training workshop. This applies mostly to the HIV/AIDS and malaria control programs whose actual assumptions and data were used to do exercises during the training. Progress achieved has to be documented and communicated to stakeholders so that other programs can appreciate the immediate impact of the assistance.

CHALLENGES TO THE QUANTIFICATION PROCESS IN SIERRA LEONE

- Data availability, timeliness, completeness, and quality
    - Limited capacity of existing data collection tools to collect key parameters/indicators
    - No standardization of the products in the reporting tools and the Channel system
    - No adherence to reporting guidelines
- Limited organization, analysis, validation, and use of available data for decision making
    - Lack of knowledge of technical staff on validation, analysis, and use of available data
    - Quality of data on RRIV not validated at the district or health-facility levels; not analyzed at the central level
    - Lack of knowledge of the reporting tools and Channel software by pharmacists before and after posting by the DDMS
    - Actual number of cases and trends not reconciled with program goals
    - Limited number of staff at the health-facility level to manage data
- Lack of coordination among stakeholders to share information and make decisions
    - NQC and QTWGs not yet established
    - Stakeholders not usually available for meetings
    - Lack of coordination and poor communication between the pharmacy unit staff and M&E officers that are responsible for Health Management Information System (HMIS) data and also with the DIOs that are responsible for Logistics Management Information System (LMIS) data
- Uncoordinated quantification process
    - No established procedure for the quantification process
    - No calendar or event for quantification at the national level
    - Excessive bureaucracy in the procurement process (long bidding and bid evaluation periods)
- Limited knowledge, skill, and experience on quantification at the national level
    - Few quantification experts
    - Staff not familiar with steps and calculations involved in the quantification process
    - Quantification methodologies not well known, e.g., adjustment for underreporting was not being considered
- Limited dissemination and implementation/inadequate adherence to STGs
    - Not revised regularly
    - Not widely disseminated

- Insufficient/delayed funding

    - No dedicated funds in national budget for quantification exercises
    - Funds for procurement not released on time
    - Insufficient funding to procure required quantities of products

RECOMMENDATIONS

- Obtain complete and accurate data for quantification

    - Staff should make proper use of current data collection systems (RRIV, Channel) and continuously monitor the information generated by these systems
    - Train and intensify supportive supervision/feedback on the correct use of current information management systems
    - Consider creating SOPs for data collection processes and include clear timelines for reporting
    - Ensure constant availability of a paper-based LMIS at the health-facility level

- Create functional coordination mechanisms for quantification, which is critical to the success of future quantification exercises

    - The NQC and the seven QTWGs should be formally established on the basis of reviewed and validated TORs and should be made official by the appropriate authorities as soon as possible
    - They also need to become functional, as per the agreed plan of action created at the workshop, as soon as possible.

- Participants will need to practice with the tools to strengthen their understanding and skills; the need for further practice on Quantimed and PipeLine were stressed during the training

- Provide refresher trainings on quantification principles and tools to members of the NQC and QTWGs, at least every year to keep the momentum and to make sure that they master the quantification principles, processes, methodologies, and tools

- Have the SIAPS local team follow up with the participants to improve quantification-related activities.

    - Document any adjustments or improvements in the way quantifications are done to track and share progress with all stakeholders. SIAPS HQ can also provide further technical assistance in this matter, upon request.

- Consider development of SOPs to detail the quantification and procurement planning process to standardize practices and provide guidance for new staff

- Institute a national improvement planning exercise

    - This recommendation is made as a way to address all the different challenges discussed during training at one time and is highly recommended.
    - It is recommended that the improvement plan be developed as soon as possible by the respective QTWGs.
    - The QTWGs and NQC may use the challenges identified and recommendations proposed during the training as a starting point.

ANNEX A. WORKSHOP AGENDA

Training Workshop on Quantification with Quantimed and PipeLine Tools

Organized by DDMS in Collaboration with the SIAPS Project
May 30–June 10, 2015

Time	Session	Facilitator
Monday, May 30, 2016		
8:30 am – 9:00 am	Registration	All
9:00 am – 9:30 am	**Opening remarks** DDMS, SIAPS, USAID, DFID, CMO, MOHS	DDMS
9:30 am – 10:00 am	Session 1: Introductions, expectation, goals, objectives, schedule, and norms	Marie
10:00 am – 10:30 am	Session 2: Pre-test	Participants
10:45 am – 11:50 am	Session 3: Introduction to quantification	Andualem
11:50 am – 1:00 pm	Session 4: Coordination mechanisms for quantification	Alan
2:00 pm – 3:30 pm	Session 5: Establishment of quantification committee and TWGs	Muhamed/Marie
3:45 pm – 4:30 pm	Session 6: Quantification processes and steps	Alan
4:30 pm – 5:30 pm	Session 7: Introduction to quantification methods and data requirements	Andualem
Tuesday, May 31, 2016		
8:30 am – 8:45 am	Recap from day 1	Participants
8:45 am – 10:30 am	Session 8: Data collection, organization, analysis and adjustment for quantification with demonstration	Andualem/Marie
10:45 am – 1:00 pm	Session 9: Assumptions and decision making for quantification	Andualem
2:00 pm – 5:30 pm	Session 10: Consumption method: Steps and calculations with Exercise	Alan
Wednesday, June 1, 2016		
8:30 am – 8:45 am	Recap from day 2	Participants
8:45 am – 10:30 am	Session 10: Consumption method: Steps and calculations with exercise	Alan
10:45 am – 12:30 am 1:30 pm – 3:00 pm 3:45 pm – 5:30 pm	Session 11: Morbidity method: steps and calculations with exercise	Andualem
Thursday June 2, 2016		
8:30 am – 8:45 am	Recap from day 3	Participants
8:45 am – 10:30 am 10:45 am – 1:00 am	Session 12: Introduction to supply planning and exercise	Andualem/Alan
2:00 pm – 3:30 pm	Session 13: Discussion on challenges and possible solutions	Participants
4:15 pm – 4:30 pm	Session 14: Questions and answers, review of objectives and expectations	All
4:30 pm – 5:15 pm	Session 15: Post-test and review of questions	Participants
5:15 pm – 5:10 pm	Session 16: Training evaluation (introduction)	Participants
5:10 pm – 5:30 pm	Hand out certificates and closing	DDMS, SIAPS
Friday, June 3, 2016		
8:30 am – 9:30 am	Session 17: Pre-test on tools	Participants

Time	Session	Facilitator
9:30 am – 10:10 pm	Session 18: Introduction to Quantimed	Alan
10:10 am – 10:30 pm	Session 19: Installation of Quantimed	Alan
10:45 am – 1:00 pm	Session 20: Demonstration of Quantimed	Andualem
2:00 pm – 3:30 pm	Session 21: Formulating data and assumptions for Quantimed	Andualem
3:45 pm – 5:00 pm		
Saturday, June 4, 2016		
8:30 am – 8:45 am	Recap from day 5	Participants
8:45 am – 10:30 am	Session 22: Forecasting Exercise using Quantimed	Participants
10:45 am – 1:30 pm		
Monday, June 6, 2016		
8:30 am – 8:45 am	Recap from day 6	Participants
8:45 am – 10:30 am	Session 22: Forecasting exercise using Quantimed	Participants
10:45 am – 1:00 pm		
2:00 pm – 3:30 pm	Session 23: Presentation and discussion of forecasts	All
3:45 pm – 4:45 pm		
4:45 pm – 5:30 pm	Session 24: Summary and application	All
Tuesday, June 7, 2016		
8:30 am – 9:30 am	Session 25: Introduction to PipeLine	Alan
9:30 am – 9:45 am	Session 26: Installation of PipeLine	Andualem
9:45 am – 10:30 am	Session 27: Demonstration of PipeLine	Andualem
10:45 am – 11:30 am		
11:30 am – 1:00 pm	Session 28: Formulating data and assumptions for PipeLine	Alan
2:00 pm – 3:30 pm		Alan
3:45 pm – 5:30 pm	Session 29: Supply planning exercise using PipeLine	Participants
Wednesday, June 8, 2016		
8:30 am – 8:45 am	Recap from day 8	Participants
8:45 am – 10:30 am	Session 29: Supply planning exercise using PipeLine	Participants
10:45 am – 1:00 pm		
2:00 pm – 3:30 pm		
3:45 pm – 5:30 pm		
Thursday, June 9, 2016		
8:30 am – 9:00 am	Recap from day 9	Participants
9:00 am – 10:30 am	Session 30: Presentation and discussion of supply plans	All
10:45 am – 1:00 pm		
2:00 pm – 3:30 pm		
3:45 pm – 5:00 pm	Session 31: Summary and application	All
Friday, June 10, 2016		
8:30 am – 9:45 am	Session 32: Review quiz questions and answers	
9:45 am – 10:30 pm	Session 33: Question and answers, review of objectives and expectations	All
10:45 am – 11:30 pm	Session 34: Post-test and answers on tools	Participants
11:30 am – 11:45 pm	Session 35: Training evaluation on tools	Participants
10:45 am – 11:20 pm	Hand out certificates and closing	DDMS, SIAPS

ANNEX B. LIST OF PARTICIPANTS

General orientation in quantification and validation of draft TOR for establishing NQC and TWGs

No.	Name	Title/position	Organization
1	Zainab Mullah	Pharmacist	Princess Christian Maternity Hospital
2	Saio Turay	Pharmacist	Neglected Tropical Disease Program
3	Musa Gbouma-Alieu	Pharmacist	King-Harman Road Hospital
4	Catherine Jackson-Cole	Pharmacist	National Eye Health Program
5	Alusine A. Musa	Pharmacist	Kenema Government Hospital
6	Amara Bagali Sesay	District Pharmacist	Bombali DHMT
7	Tamimu M. Kallon	District Pharmacist	Bo DHMT
8	Jatu J. Abdulai	Pharmacist	DDMS
9	Augustine S. Brima	Pharmacist	Kenema DHMT
10	Amanda F.Y. Caulker	pharmacist	Port Loko Government Hospital
11	Rebecca Sellu	Pharmacist	National Leprosy and TB Control Program
12	Harold I. Williams	Pharmacist	Kambia Government Hospital
13	Fiona Tait	Pharmacist	CAIPA
14	Johnny Lowe	Team Leader	CAIPA
15	Samuel Sao Bailor	Pharmacist	Western Area DHMT
16	Joyce M. Kallon	Pharmacist	Child Health/EPI Program
17	Musa Salieu Kamara	Pharmacist	Ola During Children's Hospital
18	Francis Smart	RH Program Specialist	United Nations Fund
19	Idrissa Mohamed Kamara	District Pharmacist	Koinadugu DHMT
20	Dr. J.S. Bangura	DMO Representative	Moyamba DHMT
21	Bockarie M. Kobba	District Pharmacist	Moyamba DHMT
22	Ahmed F. Kallon	Hospital Pharmacist	Kailahun Government Hospital
23	Mohamed D. Mansaray	Snr Pharmacist	DDMS
24	Mohamed B. Jalloh	Pharmacist in Charge	Bo Government Hospital
25	Dr. Mohamed Bawoh	Dean	Faculty of Pharmaceutical Sciences, College of Medicine and Allied Health Science, University of Sierra Leone
26	Ernest Jabbie	Pharmacist	Directorate of Reproductive and Child Health
27	Saad El-Din Hussein Hassan	Health Advisor	USAID
28	Bassie Turay	Director	DDMS
29	Dennis Thomas	Ag. Deputy Director	DDMS
30	Samuel H. Serry	Pharmacist	DDMS
31	Sahr A. Yendewa	District Pharmacist	Bonthe DHMT
32	Brenda Stafford	Pharmacist	National Malaria Control Program
33	M. B. Daborh	Director of Support Service	MOHS
34	Veronica L. Deen	Pharmacist	National AIDS Secretariat
35	Madina Rahman	Deputy Minister 1	MOHS
36	Isatu Bah	Security MOH	MOHS
37	Minkailu I Njai	Executive Secretary to Deputy Minister 1	MOHS
38	Dr. Sarian Kamara	Deputy CMO 1	MOHS
39	Joseph Ngegba	Senior Procurement Officer	Procurement Unit, MOHS
40	Joe Gbouma-Alieu	Procurement Officer	Procurement Unit, MOHS
41	Annie Wang	Supply Chain	CHAI
42	Mohamed Bakarr Kanu	National LMIS Officer	DDMS
43	Dr. Matthew Vandy	Program Manager	National Eye Health Program

No.	Name	Title/position	Organization
44	Elizabeth Musa	Principal CHO	Directorate of Primary Health Care
45	Salamatu Lappia	Logistics Coordinator	National AIDS Secretariat
46	Ebun B.Cole	Pharmacist	DDMS
47	Daniel S. Bangura	Pharmacist	Rokupa Government Hospital
48	Tosin Abiodun	Logistics Officer	UNICEF
49	Mbalia Conteh	R.S.M. Specialist	UNICEF
50	Tamba M.D. Saquee	Pharmacist	Bombali Regional Government Hospital
51	Abdul Kabia	Pharmacist	Port Loko DHMT
52	Abdul H. Sankoh	National Logistic Officer	Reproductive Health/Family Planning
53	Murtada Sesay	Country Director	SIAPS
54	Momoh Jusu	M&E Advisor	SIAPS
55	Marie Kolipha-Kamara	STA-SCM	SIAPS
56	Ibrahim Jalloh	Procurement Associate	SIAPS
57	Saidu Kargbo	Operations Manager	SIAPS
58	Daphne Greenwood	Logistics Associate	SIAPS

Workshop on Quantification Principles, Processes, and Methodologies

No.	Name of participant	Organization
1	Veronica Dean	National HIV/AIDS Secretariat
2	Tamimu Mustapha Kallon	Bo District
3	Amara Bangali Sesay	Bombali District
4	Moses Gbouma Allieu	Kingharman Rd. Hospital
5	Momoh Jusuh	SIAPS
6	Marie Ibranatu Kolipha-Kamara	SIAPS
7	Mohamed Kanu	DDMS
8	Jatu J. Abdulai	DDMS
9	Augustine Brima	Kenema District
10	Joyce M. Kallon	CH/EPI Program
11	Brenda Stafford	National Malaria Control Program
12	Rebecca Sellu	TB/Leprosy Control Program
13	Mohamed Mansaray	DDMS
14	Ernest Jabbie	Directorate of RCH
15	Samuel Bailor	Western Area District
16	Annie Wang	CHAI
17	Zainab Mullah	PCM Hospital
18	Sahr Yendewa	Bonthe District
19	Musa S. Kamara	Ola During Hospital
20	Bokarie Kobba	Moyamba District
21	Saio Turay	Neglected Tropical Diseases
22	Daniel Bangura	Rokupa Hospital
23	Idrissa M. Kamara	Koinadugu District
24	Samuel Serry	DDMS
25	Joe Gbouma	MOHS Procurement
26	Salamatu Lappia	National HIV/AIDS Secretariat
27	Ebun B. Cole	DDMS
28	Joseph Ngembai	Directorate of RCH
29	Abdul H. Sankoh	MOHS Procurement

Workshop on Quantification Tools

No.	Name of participant	Organization
1	Veronica Dean	National HIV/AIDS Secretariat
2	Tamimu Mustapha Kallon	Bo District
3	Amara Bangali Sesay	Bombali District
4	Moses Gbouma Allieu	Kingharman Rd. Hospital
5	Momoh Jusuh	SIAPS
6	Marie Ibranatu Kolipha-Kamara	SIAPS
7	Mohamed Kanu	DDMS
8	Jatu J. Abdulai	DDMS
9	Augustine Brima	Kenema District
10	Joyce M. Kallon	CH/EPI Program
11	Brenda Stafford	National Malaria Control Program
12	Rebecca Sellu	TB/Leprosy Control Program
13	Mohamed Mansaray	DDMS
14	Ernest Jabbie	Directorate of RCH
15	Samuel Bailor	Western Area District

ANNEX C. PRE- AND POST-TESTS

1. Pre- and Post-Test Questionnaire on Quantification Principles

Training Workshop on Quantification, May 2016; Freetown, Sierra Leone

Name: _____

(1) Define quantification:

(2) Which one of these **may not be true** about quantification working groups (QWG)/ committees and their roles?

a. Stakeholder mapping is a necessary step to form QWGs
b. Major stakeholders should be represented in QWGs
c. It is important to set performance indicators for QWGs
d. QWGs approve budget allocations for procurement
e. QWGs define the scope and objectives of quantification

(3) Which one of the following **is not** an application of quantification

a. Planning, mobilization and securing financial resources
b. Estimation of storage needs
c. Informing manufacturers on future demand of commodities for manufacturing decisions and preparation
d. Developing standard treatment guidelines
e. Facilitating coordination with donors, procurement agents, health facilities and other stakeholders

(4) Which one of these **is not** a type of data for forecasting?

a. Demographic and population data
b. Morbidity data
c. Service data
d. Consumption data
e. None of the above

(5) Which one of these **is not** required data for consumption method of quantification?

a. List of health commodities with full specifications
b. Reliable records of consumption/issue
c. Estimation of days out of stock
d. Dosage information
e. None of the above

(6) The morbidity method is the best method to use to quantify needs (Circle one answer only)

a. When reliable consumption data is available
b. For new programs or for new products where consumption data is not available

(7) Which one of the following **is not** a step in the quantification process?

a. Planning
b. Forecasting
c. Purchasing
d. Supply planning
e. Consultative quantification workshop

(8) Select the **false** statement

a. HMIS and LMIS are systems/ tools that can be used to collect and organize data for quantification
b. Accurate and timely reporting of data contributes to successful quantification
c. Adjustments need to be made for under-reporting or stock out period
d. Quantification is not affected by quality and availability of data

(9) Which one of the following **is** a reason for making assumptions in quantification?

a. To adjust for missing or incomplete information
b. To estimate effect of programmatic or environmental factors
c. To adjust for changes in standard treatment guidelines
d. To adjust for introduction of new products or formulations
e. All of the above

(10) Which one of the following is a basic principle for making assumptions in quantification:

a. No need for assumptions if complete data is available
b. A head pharmacist alone is enough to do quantifications
c. Use only one method to quantify
d. Base assumptions on evidence
e. Documentation is not necessary

(11) Which one of the following statements **is NOT correct** about Quantimed? (Circle one answer only)

a. Is a forecasting tool
b. Facilitates accurate and consistent data entry
c. Has a set of standard data collection tools
d. Is not applicable for the forecast of commodity demands for scaling up programs
e. Has functionality to export results to Microsoft Excel and in XML file format for subsequent import into PipeLine

(12) The monthly consumption of Amoxicillin 500 mg tablets for the period July to Dec 2015 was as indicated below. Calculate the average monthly consumption for the period.

UOM	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015
TABLETS	60,000	70,000	65,000	50,000	45,000	45,000

(13) Match the correct definition with the term on the left column (select from below).

Term	**Definition**
Desired stock level	
Consumption	
PipeLine®	
Stock on hand	

a. Time between when the pharmaceuticals are ordered and when they are available for use
b. Optimal stock level within the supply system
c. The amount of items stored in the warehouse or facility that are available for use
d. A Microsoft access tool used for supply planning i.e. determining quantity for procurement, cost of procurement and date of delivery of shipments
e. The quantity of medicines dispensed to clients during a specific period
f. Formats used to capture data, process data and present information

(14) Match the alphabet representing the correct calculation for each term in the left column

Adjusted average monthly consumption (AMCa)	
Quantity of each medicine needed for each treatment episode (Q_E)	
Safety stock in months (SS)	
Months of stock on hand	

a. $= \frac{\text{Stock on hand}}{\text{AMC}}$
b. = Lead time + safety stock (months)
c. = (1/2) × review period
d. = Minimum stock level + procurement period
e. = Total consumption ÷ [review period (months) – (total days out of stock ÷ 30.5)]
f. = Number of contacts × frequency of occurrence of a disease
g. = Units per dose × doses per day × number of days

(15) The HIV/AIDS program of country X has the following min and max stock levels set for central warehouse, district warehouse, and health facilities. With shipment interval to central warehouse of 3 months. What is the desired stock level for the program?

	Min stock level	**Max stock level**
Central warehouse	9	15
District warehouse	3	6
Health facilities	2	3

2. Pre- and Post-Test Questionnaire on Quantification Tools

Training Workshop on Quantification Tools, June 2016; Freetown, Sierra Leone

Name: _____

(1) Which one of the following statements **is NOT correct** about Quantimed? (Circle one answer only)

a. Is a forecasting tool
b. Facilitates accurate and consistent data entry
c. Has a set of standard data collection tools
d. Is not applicable for the forecast of commodity demands for scaling up programs
e. Has functionality to export results to Microsoft Excel and in XML file format for subsequent import into PipeLine

(2) Which one of the following **is NOT** an input for PipeLine?

a. Number of cases
b. Shipments
c. Medicines list
d. Stock on hand
e. Shipments

(3) PipeLine is a tool used for:

a. Distribution planning
b. Forecasting
c. Warehouse management
d. Funds management
e. Supply planning

(4) Which one of the following **is NOT** directly tracked in PipeLine?

a. Consumption
b. Shipments
c. Stock on hand
d. Rational medicine use
e. Losses and adjustments
f. Fund expenditures

(5) Which one of the following **is/are** parameter(s) for Quantimed? Select **ALL** that apply:

a. Category
b. Condition
c. Minimum stock level
d. Regimen
e. Medicines

(6) Select the **true** statement:

a. Quantimed cannot perform forecasting based on the morbidity method
b. PipeLine is used for family planning commodities only
c. Quantimed Implements a standard approach for forecasting medicine and supply requirements by quantity and cost
d. PipeLine is a forecasting tool

(7) Who should use PipeLine tool or results from it?

a. Program managers and decision makers
b. Purchasers and donors of commodities
c. Host-country policymakers
d. Suppliers of commodities
e. All of the above
f. None of the above

(8) Mark an "X" under the tool that is used to generate each of the listed "report".

Report name	**Quantimed**	**PipeLine**
Regimen audit		
PipeLine Action		
Shipment summary		
List of regimens by condition and category		
PipeLine problem		
Stock status report		
Regimen episodic costs		

(9) For each of the listed concepts, write "Input" if it is an input into and "Output" if it is an output from the respective tool.

Concept	**Quantimed**	**PipeLine**
Shipment data		
Conditions		
Freight costs		
Stock on hand		
Number of cases		

ANNEX D. PRE- AND POST-TEST RESULTS BY PARTICIPANT

Quantification Principles, Processes, and Methodologies

Participant number	Pre-test results		Post-test results		Change	
	Out of 21	%	Out of 21	%	#	%
1	18.5	88	20.0	95	1.5	8
2	15.0	71				
3	15.5	74	17.0	81	1.5	10
4	14.0	67	19.0	90	5.0	36
5	14.0	67	18.0	86	4.0	29
6	13.0	62	17.5	83	4.5	35
7	17.5	83	20.0	95	2.5	14
8	13.5	64	18.0	86	4.5	33
9	16.0	76	18.0	86	2.0	13
10	16.0	76				
11	12.0	57				
12	13.0	62				
13	6.5	31				
14	12.0	57	13.5	64	1.5	13
15	17.0	81	20.0	95	3.0	18
16	13.0	62	18.0	86	5.0	38
17	12.0	57				
18	13.0	62				
19	7.0	33	16.5	79	9.5	136
20	11.5	55				
21	12.5	60	16.0	76	3.5	28
22	8.5	40				
23	14.0	67	20.0	95	6.0	43
24	15.0	71	16.5	79	1.5	10
25	15.0	71				
26	16.0	76	20.0	95	4.0	25
27	17.0	81				
28	14.0	67	20.0	95	6.0	43
29	10.0	48	18.0	86	8.0	80
30	9.0	43	19.0	90	10.0	111
31	13.0	62				
32	13.0	62	17.5	83	4.5	35
33	14.0	67				
34	13.0	62	21.0	100	8.0	62
35	10.0	48				
36	15.0	71	20.0	95	5.0	33
37	10.5	50	20.0	95	9.5	90
38	15.5	74				
39	17.0	81	19.0	90	2.0	12
40	14.5	69	20.0	95	5.5	38
41	13.0	62	19.5	93	6.5	50
42	14.0	67	20.0	95	6.0	43
43	15.0	71				
44			11.0	52	11.0	
Average result	13.5	64	18.6	89	4.8	35.9

*43 participants completed the pre-test and 28 participants completed the post-test.

Score Range	Pre-test Results		Post-Test Result	
%	# of participants (out of 43)	% of participants	# of participants (out of 28)	% of participants
0 to 20%	0	0	0	0
21 to 40%	3	7	0	0
41 to 60%	9	21	1	4
61 to 80%	26	60	4	14
81 to 100%	5	12	23	82

Quantification Tools

Participant number	Pre-test results		Post-test results		Change	
	Out of 21	%	Out of 21	%	#	%
1	16.0	76	19.0	90	3.0	19
2	13.0	62	17.0	81	4.0	31
3	15.0	71	17.0	81	2.0	13
4	12.0	57	19.0	90	7.0	58
5	18.0	86	16.0	76	-2.0	-11
6	18.0	86	19.0	90	1.0	6
7	14.0	67	18.0	86	4.0	29
8	8.0	38	17.0	81	9.0	113
9	11.0	52	17.0	81	6.0	55
10	8.0	38	17.0	81	9.0	113
11	14.0	67	21.0	100	7.0	50
12	18.0	86	20.0	95	2.0	11
13	18.0	86	19.0	90	1.0	6
14	13.0	62	15.0	71	2.0	15
15	10.0	48	17.0	81	7.0	70
16	18.0	86	-			
Average results	**14.0**	**67**	**16.8**	**85**	**4.1**	**29.5**

*16 participants completed the pre-test and 15 participants completed the post-test.

Score range	Pre-test results		Post-test result	
%	# of participants (out of 16)	% of participants	# of participants (out of 15)	% of participants
0 to 20%	0	0	0	0
21 to 40%	2	13	0	0
41 to 60%	3	19	0	0
61 to 80%	6	38	2	13
81 to 100%	5	31	13	81

Workshop Pre-and Post-Test Results by Question

Quantification Principles, Processes, and Methodologies

Question #	% of participants who answered the question correctly (partially or completely)		% Change
	Pre-test	Post-test	
1	26	89	249
2	84	93	11
3	72	86	19
4	51	57	12
5	51	71	40
6	81	93	14

Question #	% of participants who answered the question correctly (partially or completely)		% Change
	Pre-test	Post-test	
7	70	100	43%
8	93	100	8%
9	60	75	24%
10	65	93	43%
11	79	82	4%
12	77	96	26%
13	93	96	4%
14	98	100	2%
15	51	75	47%
16	91	96	6%
17	60	89	48%
18	81	96	18%
19	7	96	1282%
20	67	93	38%
21	0	68	N/A

*Partial answers were considered as full answers in this analysis.

Quantification Tools

Question #	% of Participants who answered the question correctly (partially or completely)		% Change
	Pre-test	Post-test	
1	88	93	7
2	81	87	7
3	81	100	23
4	81	87	7
5	19	87	362
6	75	100	33
7	75	100	33
8	94	93	0
9	88	100	14
10	94	100	7
11	100	93	-7
12	88	100	14
13	63	100	60
14	69	80	16
15	69	80	16
16	69	80	16
17	69	93	36
18	31	60	92
19	69	87	26

ANNEX E. PARTICIPANTS' EXPECTATIONS OF THE WORKSHOP

Expectations identified by participants at the beginning of the workshop	Feedback from participants at the end of workshop on whether expectations had been met (yes/no?)	Comments
Understand the basics of quantification	Yes	Participants learned about quantification methods, differences between them, and specific data needs.
Understand the quantification process	Yes	Participants learned about the quantification process and the steps involved.
Learn how to use Quantimed and PipeLine	Yes	Participants were able to install and practice on the tools.
Understand how to apply quantification for scaling up health programs	Yes	
Understand the importance and use of data for quantification	Yes	Participants shared their experiences with obtaining accurate data for quantification. They identified data inaccuracies and lack of follow-up in Sierra Leone as a major challenge.
Learn how quantification can be used to minimize wastage	Yes	
To form an NQC	Yes	During the workshop, all participants were involved in reviewing the proposed TOR for the NQC and seven QTWGs, and validating it.

ANNEX F. WORKSHOP EVALUATIONS

1. Overall Evaluation

Question	Yes/no	Comments
1. Has this training workshop met its set goals and objectives?	Yes	100% of the participants that filled out the evaluation stated that the objectives were successfully met.
2. Would you recommend this course to your professional colleagues?	Yes	100% of the participants that filled out the evaluation stated that they would recommend this training to other colleagues and high-ranking decision makers to increase general knowledge about good quantification practices.
3. What are the things about the training you like most?	N/A	The participatory format of the training, which included sharing of experiences between participants and facilitators; the way facilitators presented the information; the exercises; and the use of local, up-to-date data for the exercises.
4. Things to be improved	N/A	Most participants said that the total training time should be extended to better absorb the large amount of information that was transmitted to them and to do more exercises. Participants also requested that certain bugs in the tools be fixed for a more streamlined learning process.
5. Overall comment	N/A	Participants stated their general satisfaction with the training and hoped that further trainings, with the continuous support of SIAPS, can be held to strengthen the health care delivery system in Sierra Leone.

2. Individual Sessions

Quantification Principles, Processes, and Methodologies

Rating scale from 1 to 5: 1 = poor; 2 = fair; 3 = good; 4 = very good; 5 = excellent

Session #	Title of session	Overall rating of the session					
		1	2	3	4	5	Avg. rating
1	Introductions, goals, objectives, schedule, and norms			3	8	16	4.5
3	Introduction to quantification			1	6	19	4.7
4	Coordination mechanisms for quantification			4	15	8	4.1
5	Establishment of quantification committee and TWGs			3	12	11	4.3
6	Quantification processes and steps			2	5	20	4.7
7	Introduction to Quantification Methods and data requirements			1	7	19	4.7
8	Data collection, organization, analysis and adjustment for Quantification with Exercises				10	15	4.6
9	Assumptions and decision making for quantification				9	16	4.6
10	Consumption method: Steps and calculations with Exercise				7	18	4.7
11	Morbidity method: Steps and calculations with Exercise				8	16	4.7
12	Introduction to supply planning			1	5	18	4.7
13	Discussion on challenges and possible solutions			2	10	13	4.4
14	Questions and Answers, review of objectives and expectations			1	10	14	4.4
Overall rating					8	15	4.7

Quantification Tools

Rating scale from 1 to 5: 1 = poor; 2 = fair; 3 = good; 4 = very good; 5 = excellent

Session #	Title of session	Overall rating of the session					
		1	2	3	4	5	Avg. rating
18	Introduction to Quantimed				6	9	4.6
19	Installation of Quantimed			1	3	11	4.7
20	Demonstration of Quantimed			1	2	12	4.7
21	Formulating data and assumptions for Quantimed				8	7	4.5
22	Forecasting exercise using Quantimed			1	4	10	4.6
23	Presentation and discussion of forecasts				5	10	4.7
25	Introduction to PipeLine				5	10	4.7
26	Installation of PipeLine				3	12	4.8
27	Demonstration of PipeLine				5	10	4.7
28	Formulating data and assumptions for PipeLine				10	5	4.3
29	Supply planning exercise using PipeLine				7	7	4.5
30	Presentation and discussion of supply plans				6	9	4.6
33	Q&A, review of objectives and expectations				5	9	4.6
Overall rating					3	12	4.8