The 2019 LabCoP Face-to-Face Meeting

22-25 October 2019
Addis Ababa, Ethiopia
MEETING REPORT

'Applying the LabCoP Theory of Action to strengthen laboratory systems in Africa'

Table of Contents

List of Acronyms

AIDS:	Acquired Immune Deficiency Syndrome
ART:	Antiretroviral Therapy
ASLM:	African Society of Laboratory Medicine
BMGF:	Bill and Melinda Gates Foundation
CDC	Centers / Centres for Disease Control and Prevention
CEO:	Chief Executive Officer
CHAI:	Clinton Health Access Initiative
COP	Country Operational Plan
CSO	Civil Society Organization
DBS:	Dried Blood Spot
EAC/IAC:	Enhanced / Intensive Adherence Counselling
ECHO:	Extension for Community Healthcare Outcomes
EID:	Early Infant Diagnosis
EPHI:	Ethiopian Public Health Institute
GF:	Global Fund to Fight AIDS, Tuberculosis and Malaria
HCW:	Health Worker
HIV:	Human Immunodeficiency Virus
ICAP:	International Center for AIDS Care and Treatment Programs
ICT:	Information, Communications and Technology
I-TECH:	International Training and Education Center for Health
ITPC:	International Treatment Preparedness Coalition
IPs:	Implementing Partners
LabCoP:	Laboratory Systems Strengthening Community of Practice
LIMS:	Laboratory Information Management System
M&E:	Monitoring and Evaluation
MOH:	Ministry of Health
NACP:	National AIDS Control Program
NHL:	National Health Laboratories
PEPFAR	President's Emergency Plan for AIDS Relief
PMTCT:	Prevention of Mother To Child Transmission
POC/POCT:	Point of Care Testing
QC/QI:	Quality Control/ Quality Improvement
RVLT:	Routine Viral Load testing
SME:	Subject Matter Expert
SOP:	Standard Operating Procedures
TAT:	Turnaround Time
TB:	Tuberculosis
TWG:	Technical Working Group
UNAIDS	United Nations Joint Programme on HIV/AIDS
US.	United States
USAID:	United States Agency for International Development
VL:	Viral Load
WHO:	World Health Organization
WM:	Waste Management

Executive Summary

In October 2019, Laboratory Systems Strengthening Community of Practice (LabCoP) and its partners convened the third face-to-face meeting in Addis Ababa, Ethiopia. More than 100 participants from the 11 country teams and global stakeholders including the World Health Organization (WHO), United States Centers for Disease Control and Prevention (CDC), United States Agency for International Development (USAID), The Global Fund to Fights AIDS, Tuberculosis and Malaria, the Clinton Health Access Initiative (CHAI), International Training and Education Center for Health (I-TECH), International Treatment Preparedness Coalition (ITPC), ICAP, and the Bill and Melinda Gates Foundation (BMGF) attended this four-day meeting, which took place from 22 to 25 October 2019.

The objectives of the meeting were to assess the progress of countries in implementing action plans formulated in 2018, as part of the President's Emergency Plan for AIDS Relief (PEPFAR) Country Operational Plan for 2019 (COP19); engage civil society in efforts to scale up viral load (VL) testing, through the development of a VL testing awareness hashtag campaign; plan for the next collective strategy to scale up VL testing services and discuss the next phase of the LabCoP project.

The meeting provided an opportunity for country teams to: review the implementation progress of their previous work plans against the results of the VL testing self-assessment, share best practices and develop action plans for the next year. Country teams identified gaps in their laboratory system for VL testing scale-up, shared best practices among country teams, determined areas of support needed from the LabCoP project and collaborating partners and used the assessment results to develop improvement plans.

The VL testing self-assessment by the country teams indicated that waste management and biosafety, sample transport and referral linkage, VL test result delivery system and utilization, and VL monitoring and evaluation were the weakest thematic areas. Based on the shared best practices in the meeting, the identified thematic areas were prioritized for intervention and the country teams revised their action plans (COP19 - COP20) to include all these areas.

Malawi and Zambia were awarded as winners of the VL testing awareness hashtag campaign, and all the country teams prepared plans to implement the awareness hashtag campaign with support from global stakeholders, ITPC and Africa Centres for Disease Control and Prevention (CDC).

This meeting emphasized the need to engage civil society in VL testing scale-up efforts and documented several best practices and recommendations. For phase 2 of the LabCoP project, there was consensus for LabCoP to: emphasize system aspects of knowledge sharing, strengthen the leadership and communication capacity of country teams, increase country ownership of LabCoP, and engage more countries through a tiered approach. During breakout sessions, country teams developed draft action points for key thematic area. These formed the

starting points for 2020 work plans, which were to be finalized in December 2019.

1. Background

The LabCoP project created an innovative learning network that fosters South-to-South learning by linking multidisciplinary teams from 11 countries[1] to exchange laboratory experiences and best practices. LabCoP was launched during the regional VL testing meeting in Addis Ababa in October 2017. Convened by the African Society for Laboratory Medicine (ASLM), with technical support from ICAP at Columbia University and funding from BMGF, LabCoP aims to help countries strengthen their laboratory systems with an initial focus on assisting countries in meeting the UNAIDS 90-90-90 treatment targets via peer-to-peer learning amongst laboratorians, clinicians, policymakers, patients and communities.

LabCoP fosters peer-to-peer learning by convening through a variety of modalities including monthly Extension for Community Healthcare Outcomes (ECHO) sessions (webinars) and digital platforms for real-time discussion and knowledge sharing, such as the WhatsApp and Slack platforms. During the 1-hour ECHO sessions, subject matter experts share their experiences with key considerations and best practices for different thematic areas along the VL testing cascade with country teams, followed by open discussions. Online discussions and exchanges continue on WhatsApp and Slack. Knowledge products from all such discussions are generated, including the LabCoP cookbook of recipes, a quarterly newsletter, and e-blasts. These are all hosted on the ASLM LabCoP website. To complement these virtual activities, the LabCoP management team conducts country visits to provide technical support and advocacy for laboratory systems strengthening. Once a year, all country teams meet in face-to-face meetings to review progress, share experiences and best practices, as well as develop action plans for the upcoming year.

The second LabCoP face-to-face meeting in Kampala in October 2018 helped to review the progress of the project and prioritized demand creation and VL test results utilization for intervention. The LabCoP satellite session to the ASLM2020 conference in Abuja in December 2018 aimed at assisting country teams to finalize their action plans, which they had started at the October 2018 meeting in Uganda. Before the 2018 face-to-face meetings, country teams conducted a self-assessment of the status of their VL testing services by using a standardized scorecard that was developed by LabCoP and its partners. The

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[1] The 11 countries include; Democratic Republic of the Congo, Ethiopia, Kenya, Malawi, Sierra Leone, South Africa, South Sudan, Tanzania, Uganda, Zambia, and Zimbabwe.

scorecard covers all the thematic areas from demand creation to results utilisation and the underlying laboratory systems. In this assessment, country teams identified the four weakest thematic areas: demand creation, laboratory optimisation, waste management and results utilisation. Demand creation and results utilization were prioritized for intervention by country teams during the October 2018 face-to-face meeting in Uganda. LabCoP then supported the 11 member countries to develop and implement action plans aimed at addressing these two critical priority areas. These formulated action plans were based on the best practices and better ideas shared within LabCoP, and they were subsequently incorporated into PEPFAR-funded COP19 and into the Global Fund reprogramming cycle.

The 2019 LabCoP face-to-face meeting aimed to assess the progress of country teams with implementing their formulated action plans in 2018, increase engagement of civil society in VL testing scale-up efforts, and deliberate on additional topics for the project in addition to VL testing. The meeting was convened in Addis Ababa from 22 to 25 October 2019. The meeting was attended by over 100 participants from LabCoP member countries, global stakeholders from WHO, Africa CDC, the United States CDC, ITPC, the Global Fund, CHAI, Unitaid, ICAP, and BMGF, among others.

1.1 Objectives

a) To review the countries' progress towards implementing VL testing systems strengthening action plans and achieving scale-up of VL testing services, using data from the structured self-assessment;
b) To identify best practices for dissemination, root causes for slow improvement, continuing challenges, and priority needs for the coming year;
c) To assist countries in designing feasible monitoring and evaluation (M&E) systems for national VL testing cascades and data use for improvement;
d) To review and assess the 11 VL testing demand-creation campaigns and support each country team to draft a dissemination plan using local, national and international platforms;
e) To introduce new laboratory systems strengthening 'hot topics' beyond VL testing scale up (like the integration of diagnostic testing and role of the private sector); and
f) To obtain feedback from member countries and other stakeholders for LabCoP support and coordination.

This four-day meeting involved several plenary sessions, break-out sessions and panel discussions, all designed and conducted to achieve the expected outcomes. The last day of the meeting was entirely dedicated to laboratory waste management to discuss how to implement safer, practical, and sustainable

methods/technologies for the disposal of waste generated by medical laboratories, including waste from VL and early infant diagnosis (EID) and testing for related co-infections (tuberculosis, hepatitis, human papillomavirus).

2. Session Summaries

2.1 Day One Sessions

2.1.1 Session 1: Welcome and opening remarks

The opening session was chaired by Dr Collins Otieno, Project Lead, from ASLM. Opening remarks were provided by Dr Tedla Yared from CDC Ethiopia, Dr Yenew Kebede from Africa CDC and Dr Ebba Abate, the Director-General of the Ethiopian Public Health Institute (EPHI).

In his remarks, Dr Yared put special emphasis on the role of VL testing in HIV care and indicated that it is a collective role for all stakeholders to ensure proper patient monitoring through VL testing. He reiterated that CDC Ethiopia's partnership with the government of Ethiopia has been very instrumental in scaling up HIV VL testing for improvement of care for people living with HIV and that other country teams should emulate this partnership.

Dr Kebede made reference to the Africa HIV Viral Load Movement, which had just been launched in September 2019. He stated that Africa CDC seeks to partner with LabCoP to advance the movement's objectives. The next steps for Africa HIV Viral Load Movement and the Addis Ababa Declaration on the HIV Viral Load Movement include: engaging with the Member States to maximize policy and political support, engaging the financial sector to mobilize resources, and working with bilateral and multilateral partners, among others (http://www.africacdc.org/press-centre/news/108-addis-ababa-declaration-on-the-hiv-viral-load-movement-to-end-aids-by-2030-in-african-union-member-states).

Dr Abate then officially opened the meeting. In his remarks, Dr Abate highlighted that Ethiopia had been devoting efforts to strengthen demand creation, results utilization, waste management and laboratory optimization, all of which were highlighted as weak thematic areas during the 2018 LabCoP face-to-face meeting in Uganda. Dr Abate was optimistic that Ethiopia would benefit from the 2019 LabCoP meeting and wished all the participants a happy stay for the meeting. He declared the meeting officially opened.

Setting the stage

Dr Charles Kiyaga, the LabCoP Project Manager opened the discussion by describing LabCoP's achievements over the two years of its existence. By October 2019, LabCoP had convened 22 ECHO sessions, each attended by approximately 100 participants, who had discussed pertinent topics in laboratory systems strengthening. Over 15 000 exchanges on different topics of interest had been made through the WhatsApp group, with more than 250 members, and Slack, with over 100 members, thereby fostering peer-to-peer exchange. The LabCoP website had been very instrumental in hosting all knowledge products generated by the project, making them available to members and non-members alike. The content featured various resources including links to view past ECHO videoconference sessions, the cookbooks of best practices, and issues of the LabCoP Quarterly newsletter.

In addition to the virtual communication platforms, LabCoP had held two face-to-face meetings in Kampala in October 2018 and Abuja in December 2018 (Figure 1). The project had conducted 7 country visits, which had enabled the engagement of the visited country teams and mobilization of efforts to scale up VL testing services.

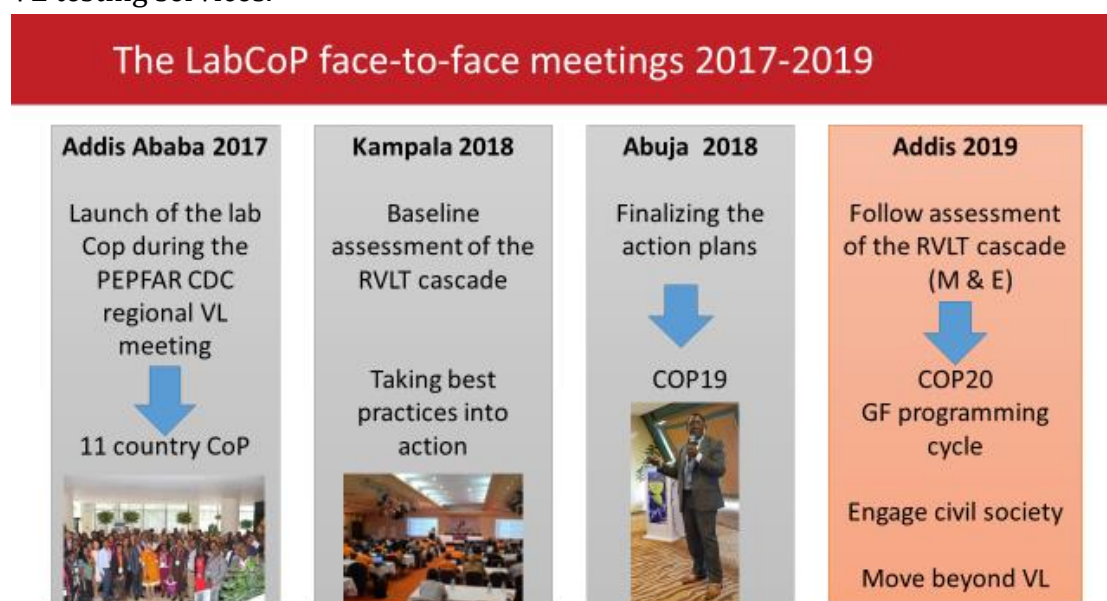*Figure 1: LabCoP face-to-face meetings. Abbreviations: GF, Global Fund; RVLT, routine viral load testing*

Dr Peter Ehrenkranz from BMGF followed Dr Kiyaga's framing remarks by further detailing the significant progress in access to VL testing that has been achieved by countries. He emphasized that the role of LabCoP is to use results to improve patient outcomes and highlighted challenges in the use of unsuppressed

VL test results to improve the care of unstable patients, using results from one country as a case study (Figure 2).
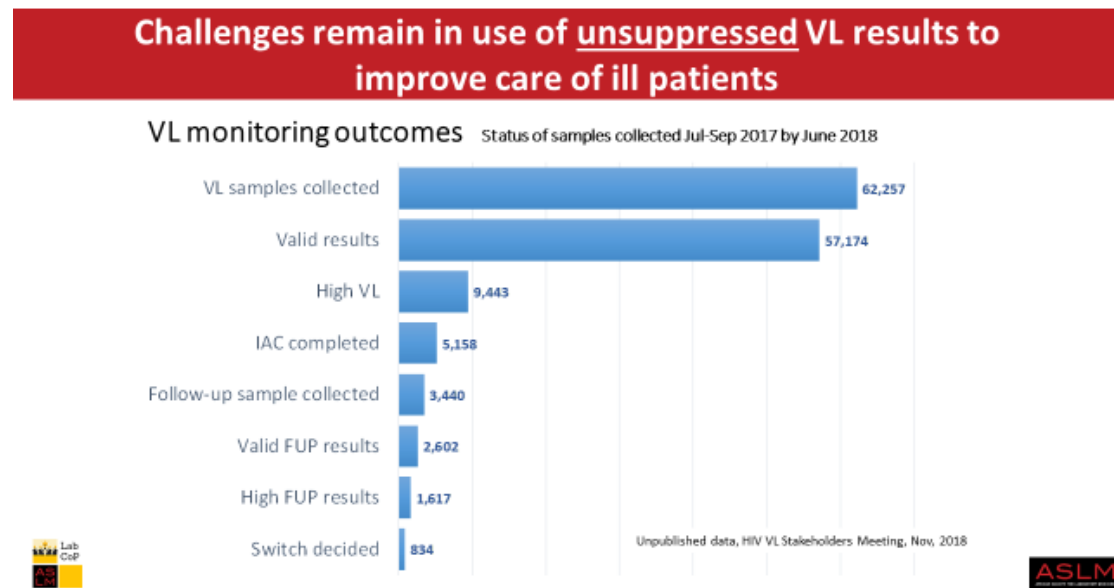

Figure 2: Country case study: poor management and follow-up of clients with unsuppressed VL. Abbreviations: IAC: Intensive Adherence Counselling; FUP: Follow-Up.

Among some of the best practices to mitigate this challenge, Dr Ehrenkranz highlighted the iThemba pilot project in South Africa where results are returned to patients directly through phone SMS. In his conclusion, Dr Ehrenkranz emphasized that VL testing is a test case for LabCoP, but work should not start or end with VL testing and asked the participants to think about the way forward for LabCoP.

Dr Pascale Ondoa, Director of Science and New Initiatives at ASLM, discussed progress on the VL testing cascade thematic areas prioritized by LabCoP in 2018. She elaborated on the country-specific weaknesses, including waste management, network optimization, demand creation and results utilisation, taking Ethiopia as an example. Significant progress has been made in scaling up routine VL testing; however, more emphasis should now be put on the engagement of civil society in all VL testing efforts. Dr Ondoa concluded by describing the expected outcomes of the 2019 LabCoP face-to-face meeting, which include: documenting progress of the VL testing cascade, advancing best practices beyond VL testing scale-up, factoring in different perspectives on routine VL testing result utilization and demand creation, and formulating clear

plans to monitor and evaluate the routine VL testing cascade to inform the third '90'.

2.1.2 Session 2: Measuring our progress: the LabCoP country self-assessment of the VL testing cascade

Dr Getachew Kassa from ICAP presented a summary of country self-assessment results, highlighting the most common challenge areas (Figure 3). The domains with the lowest scores were: waste management and biosafety, sample transport and referral linkage, VL test result delivery system and utilization, and VL testing M&E.
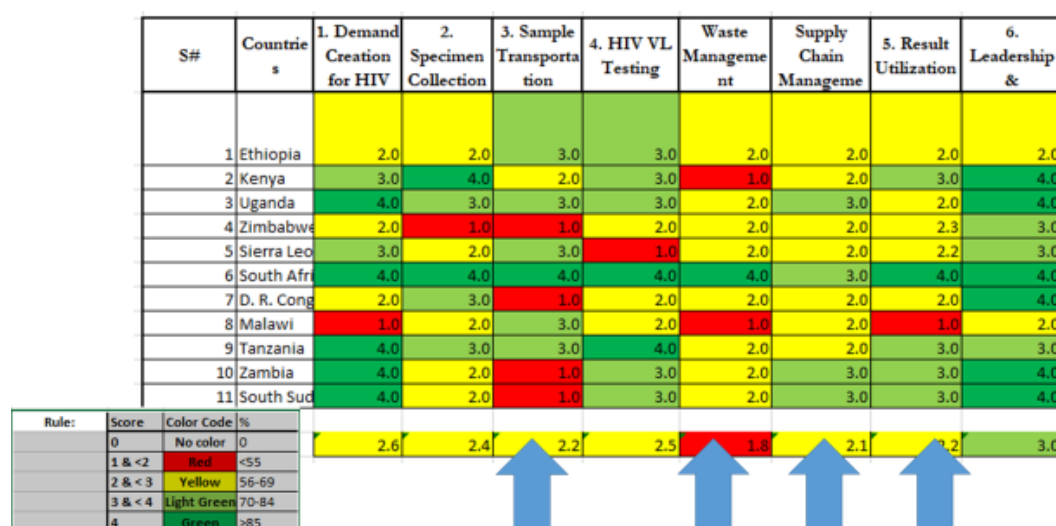
S#	Countries	1. Demand Creation for HIV	2. Specimen Collection	3. Sample Transportation	4. HIV VL Testing	Waste Management	Supply Chain Management	5. Result Utilization	6. Leadership &
1	Ethiopia	2.0	2.0	3.0	3.0	2.0	2.0	2.0	2.0
2	Kenya	3.0	4.0	2.0	3.0	1.0	2.0	3.0	4.0
3	Uganda	4.0	3.0	3.0	3.0	2.0	3.0	2.0	4.0
4	Zimbabwe	2.0	1.0	1.0	2.0	2.0	2.0	2.3	3.0
5	Sierra Leo	3.0	2.0	3.0	1.0	2.0	2.0	2.2	3.0
6	South Afri	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
7	D. R. Cong	2.0	3.0	1.0	2.0	2.0	2.0	2.0	4.0
8	Malawi	1.0	2.0	3.0	2.0	1.0	2.0	1.0	2.0
9	Tanzania	4.0	3.0	3.0	4.0	2.0	2.0	3.0	3.0
10	Zambia	4.0	2.0	1.0	3.0	2.0	3.0	3.0	4.0
11	South Sud	4.0	2.0	1.0	3.0	2.0	3.0	3.0	4.0
		2.6	2.4	2.2	2.5	1.8	2.1	2.2	3.0

Rule:	Score	Color Code	%
	0	No color	0
	1 & <2	Red	<55
	2 & <3	Yellow	56-69
	3 & <4	Light Green	70-84
	4	Green	>85

Figure 3: The VL self-assessment dashboard from the country self-assessments

Getachew then described the results from the assessment of each of the seven domains in VL testing assessment scorecard. He indicated that improvements were observed in the VL testing domains in certain countries. He highlighted that the uptake of VL testing services among people living with HIV in the 11 countries was still low at 53%, with poor management of Patients with unsuppressed VL (Figure 4).
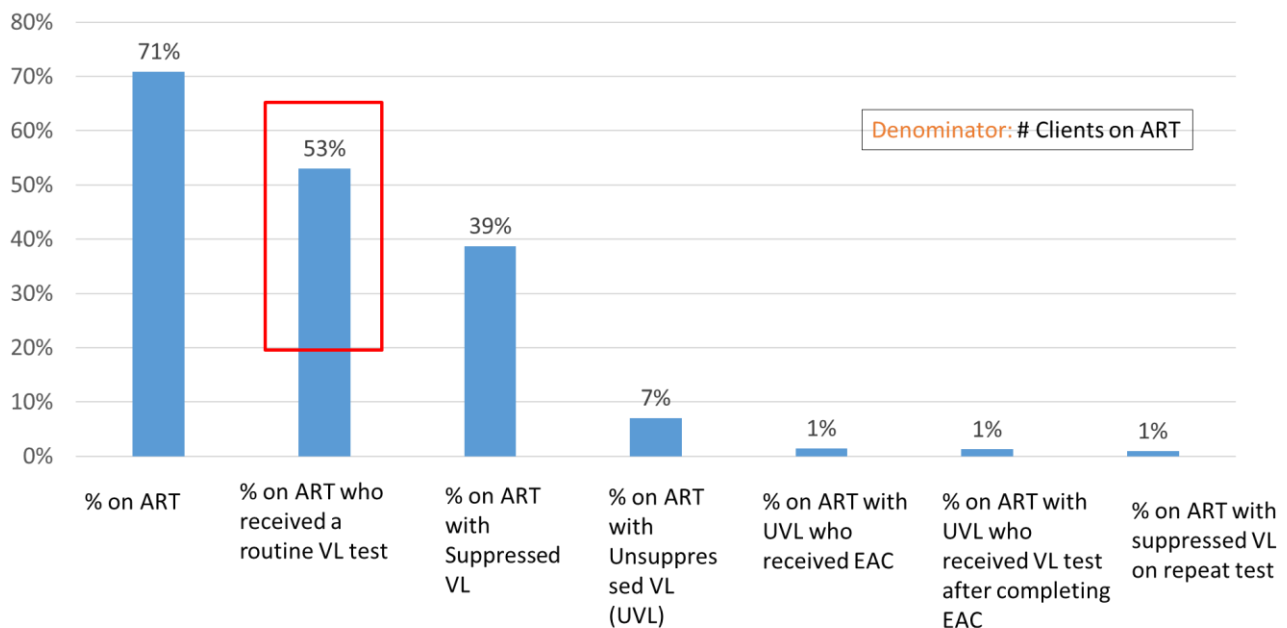
Figure 4: Self-assessment reports on the VL testing cascade for 11 LabCoP countries in 2019.

The key challenges for M&E VL testing in countries included: lack of defined/standardized indicators for monitoring VL testing coverage and results utilization, no standard system of reporting, lack of uniform indicators across facilities in the same country, lack of standardized data capturing tools and registers, inconsistent monitoring of VL testing implementation, and poor monitoring system for proper implementation of enhanced adherence counselling (EAC) or intensive adherence counselling (IAC) and repeated VL tests. Dr Kassa concluded by emphasizing that the assessment results helped to identify the gaps that need concerted efforts for improvement.

Ms Norah Vere from the Zimbabwe Ministry of Health presented Zimbabwe's experience with the VL testing scorecard self-assessment. The process of completing the scorecard involved gathering together the different stakeholders and collecting the different sources of data. The challenges faced by Zimbabwe in completing the tool were mainly in the computation of the national VL testing cascade section. The collection of national data was a challenge, as there were missing data and inadequate VL testing cascade data. Their identified gaps were in demand creation, specimen collection (after including all tests), sample transportation, VL test turn-around time and results utilisation. There was a need for national efforts to improve the identified gaps and a number of activities were to be undertaken by the country team to fill the gaps.

During the discussion, civil society participants indicated that the VL testing cascade should not start from demand creation, but rather from patient

education and sensitization. The meeting reached a consensus that there was an urgent need to reflect on how best to fill the identified gaps in the assessment and work as a team to solve the challenges identified. There was also consensus that the meeting had to identify strategies on how to engage with the civil society/ community and create demand in all the efforts to scale up VL testing.

2.1.3 Session 3, Breakout Session 1: Review of country assessments – prioritizing areas of weaknesses

This session was designed as a break-out session where two to three country teams were grouped together to describe their respective VL testing scale-up progress amongst themselves, highlighting the main gaps and strengths. The groups came up with prioritized challenges for improvement together with the corresponding priority strategies and interventions to be undertaken to solve the identified challenges. These group discussions were one and a half hours, and the groups also worked on a set of slides, which they presented in the plenary.

Following the discussions, some groups reported back on the identified strengths, common challenges identified and the prioritized interventions, as shown in Table 1.

Ethiopia and Uganda	
Common Challenges	- Demand creation (limited engagement of people living with HIV and civil society organizations CSOs) - Result utilization; mainly for clients with unsuppressed VL - Lack of sample tracking
Prioritized interventions	- Involve CSOs and people living with HIV in demand-creation efforts - Improve results utilization with proper follow-up and management of clients with unsuppressed VL - Improve laboratory information management systems (LIMS) to include sample tracking
Kenya and the Democratic Republic of the Congo	
Common Challenges	- Poor results utilization in rural areas - Sub-optimal sample transportation systems - Poor waste management with no policies or strategic plans - Most human resources are donor-supported; hence not sustainable
Prioritized interventions	- Develop waste management policies and also get technical assistance from ASLM for waste management - Integrate sample transportation and lobby for stakeholder buy-in - Advocate for government funding to ensure sustainability

Zimbabwe and Tanzania	
Common Challenges	- Sub-optimal demand creation - Inadequate sustainability of VL testing programs by governments - Inadequate optimization of sample referral system (limited funding) - Sub-optimal results utilization

Prioritized interventions	- Demand creation
	  • Use expert clients to support education on VL testing
	  • Review of patient files to identify those who attended the clinic but did not have a VL test ordered
	  • Use stickers on patient files to identify those due for a VL test
	- Sustainability
	  • Promote ownership by strengthening the leadership of the program
	  • Encourage ministry of health engagement
	  • Integrate laboratory and clinic reporting tools
	- Inadequate result utilization
	  • Email results to clinicians
	  • Use expert clients to support patient education on VL testing

South Sudan and Malawi	
Common Challenges	- Minimal demand creation efforts - Sub-optimal results utilization - Lack of adequate monitoring tools.
Prioritized interventions	- Engage civil society and involve social networks through talk shows and outreach activities - Engage clinicians on results utilization and support supervision and mentorship - Develop M&E tools and indicators

Table 1: Outcomes of Breakout Session 1

2.1.4 Session 4: Panel presentations | Sharing best practices: Result Utilisation

As a preamble to this session, M**r Anafi Mataka**, Senior Scientist from ASLM, described the progress made by the project on VL test result utilization with special emphasis on the result utilisation recipe, which details challenges and possible solutions in the test utilization cascade (Figure 5).
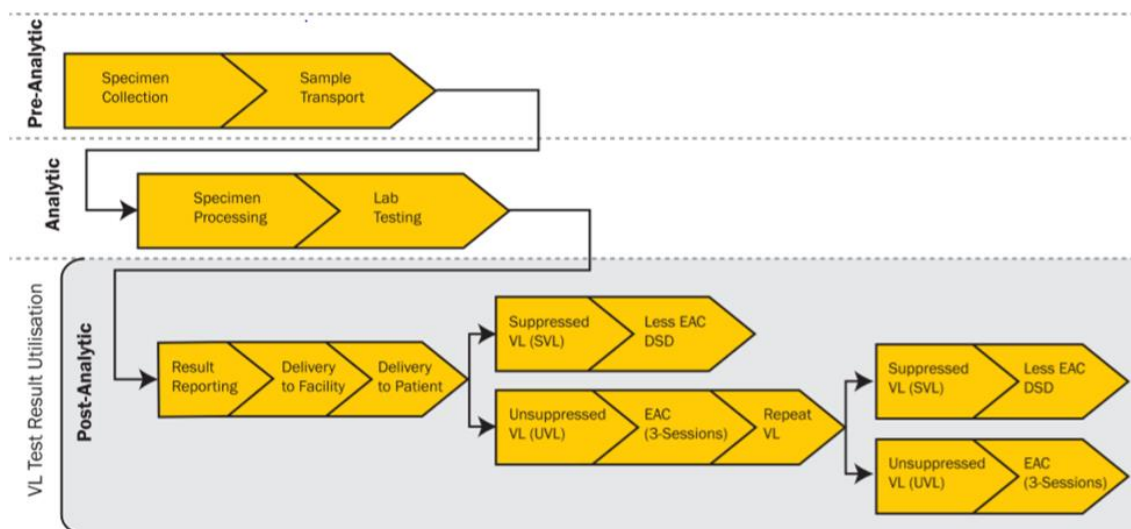
Figure 5: Test utilisation cascade

Ms Victoria Kiwanuka from the National Forum of People Living with HIV/AIDS Networks in Uganda (NAFOPHANU) then described the perspective of patients regarding results utilization. She highlighted that results utilization is key in ensuring that patients either adhere to treatment or follow the suggested intervention. The challenges that HIV clients face regarding results utilization include long results turn-around time, missing results, limited involvement of people living with HIV in VL testing programs, both within the community and at the facility, and limited or complete lack of knowledge on how to interpret results. To improve results utilization, expert clients should be used to inspire other clients and to provide essential peer-based support to clients with unsuppressed VL through supporting IAC interventions, both within the community and at the facility. Other innovations for recipients of care to access their results in a timely manner, such as text messages, should be used. More hub riders to reach underserved areas to ensure universal service coverage should be recruited, and points of care should be decentralized.

Dr **Brown Chiwandira** from the Ministry of Health in Malawi followed up Dr/Mrs Kiwanuka's presentation with a presentation on the perspective of healthcare workers. He emphasized that to ensure proper results utilization, health workers need national clinical guidelines/standard operating procedures (SOPs) that include testing algorithms, eligibility criteria, and client management protocols, data capturing tools that include viral load logbook and high VL (unsuppressed) registers, sample transport systems, and short turn-around times for results. There is also a need for capacity and motivation among health workers to achieve proper test results utilization. In his conclusion, Dr Brown said that proper results utilization is also dependent on a well-organized HIV

clinic, which must have: a client flow and shared responsibilities (flagging of files, sample collection, result documentation, IAC and patient follow up), appointment of a VL focal person, linkage with local networks of people living with HIV, and a patient tracking system especially for unsuppressed clients.

Dr Nadine Abiola shared Francophone countries' experiences regarding results utilisation from I-TECH with a case study from Cote d'Ivoire.

During the plenary discussion, the civil society activists raised concerns about missing VL results, which make HIV clients lose trust in the system and thereby abandon the services. They further emphasized the need to track patient samples and results to avoid misplacement of them. It was also agreed that there was an urgent need to sensitize people living with HIV about the interpretation of their results, as a way to create adherence to antiretroviral therapy and IAC sessions. The option of using better results delivery models like SMS was also discussed and plans to explore it laid, awaiting the results of the pilot project that was being conducted in South Africa.

2.1.5 Session 5, Breakout Session 2: Progress achieved for results utilisation against the made action plans

Five groups of two to three countries discussed the progress they had achieved for results utilization while referring to the developed action plans. Within their groups, countries presented strategies that worked and those that failed, and they also described how civil society was involved in all these efforts. The groups made presentations about their deliberations.

Table 2 summaries some of the progress achieved for results utilization from the groups that reported back.

Country	Key progress with results utilisation
Sierra Leone	▪ Enhanced adherence counselling through the use of expert clients and support groups ▪ Integration of VL indicators into the health management information system ▪ Fast-tracking electronic results notification ▪ Developed high VL registers ▪ Established a treatment switching committee meeting
Malawi	▪ Strengthening of the laboratory-clinic interface through the ongoing development of clinical/laboratory VL SOPs ▪ Identified focal VL persons ▪ Flagging up of high VL results on patient cards
Tanzania	▪ Development of a system for clinicians to request laboratory

	results electronically
	    ▪ Scale-up of Laboratory Regional Collaborative project
	▪ Use of stickers for patient files to mark those due for a VL test
	▪ Review of laboratory data
	    ○ Data cleaning exercise successful.
	    ○ Data used for programme improvement and quantification
	▪ Dispatch log introduced to track results return to the facility
	▪ VL dashboard started but not yet done
	▪ Finalization of integrated reporting tool for EAC in the central database

Zambia	▪ Connection of electronic health records to the laboratory is underway with 150 sites connected ▪ VL champions introduced to help put results in the patient's file ▪ Standardization of EAC materials and introduction of high VL clinics
Uganda	▪ Unsuppressed results are followed up by the Ministry of Health in Uganda in a national continuous quality improvement (CQI) collaborative starting in January 2019 ▪ List of 90 000 unsuppressed people living with HIV generated from the national laboratory in June 2019 for follow-up ▪ 56 000 followed up to date (CQI dashboard has cascade) ▪ Adolescent viremia clinics introduced
Kenya	▪ SOPs and job aids developed and distributed ▪ Developed IEC materials which are to be distributed ▪ 97 000 people living with HIV enrolled for demand creation for notifications, appointments, messages
South Sudan	▪ Result transmission has been improved ▪ Establishment of weekly multi-disciplinary laboratory team meetings for a status check ▪ Developed SOPs for sample tracking and result utilization ▪ Mentorship on result tracking and result up-date ▪ Supervision and mentorship on results utilisation

Table 2: Results utilization achievements by country

2.2 Day Two Sessions

The second day of the meeting commenced with a recap of the day one events and sessions by Dr Charles Kiyaga.

2.2.1 Session 6: Best Practices for Demand Creation

In his presentation about LabCoP's progress with demand creation, **Dr Nicholus Nanyeenya, ASLM LabCoP Project Officer** emphasized the need to use innovative strategies like the LabCoP project itself to improve demand creation for VL testing. Significant progress had been made with demand creation and this included two ECHO sessions that were convened about demand creation and the decision-making matrix which had key priority interventions for the thematic area. The other key area of progress was the LabCoP recipe about demand creation, which can be used by country teams in their efforts to create demand for VL services.

Ms Solange Baptiste from ITPC presented the global perspective on demand generation, emphasizing that knowledge is necessary but not sufficient to generate demand (Figure 6). Country case studies of Kenya and Zimbabwe were described; though there was about 94.8% awareness of VL testing, uptake was not directly proportional to the awareness. Only 1 in 4 VL test results are returned to the patient within two weeks.
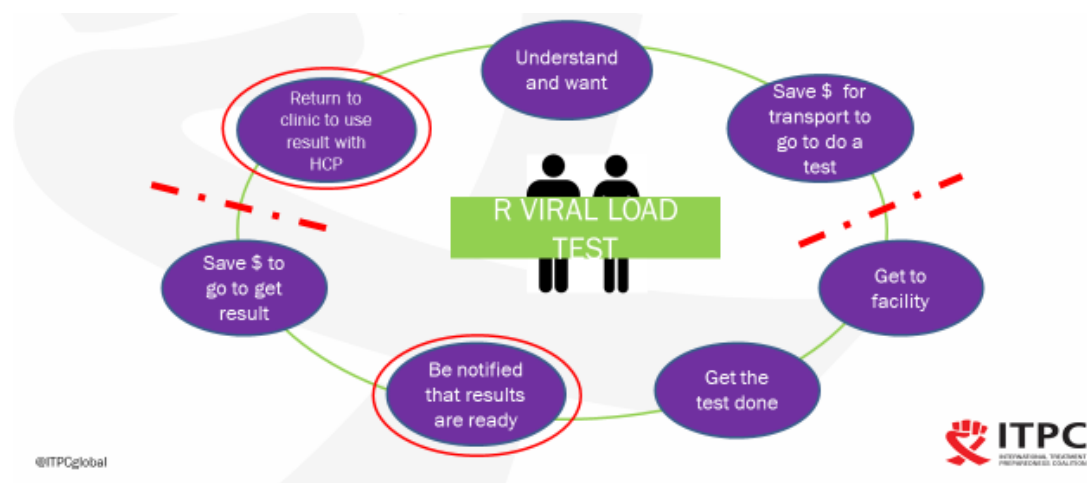
Figure 6: VL testing cascade from the perspective of the recipients of care

In her conclusion, Solange emphasized the need to use technology to improve VL services offered for better patient outcomes, ensure funding for treatment literacy, and to optimize diagnostic networks across diseases.

Mr Moses Nsubuga, aka **Supercharger,** through his presentation ', Switching from wearing condoms to demanding my VL results' told his life story of how VL

testing changed his life and entire love life. He emphasized the need to engage civil society at each and every stage of the VL testing cascade. He also called upon the meeting attendees to advocate for all health workers to always educate people living with HIV about the services being offered, not just providing the services.

Mr Abdelaye Keita from Fondation Mérieux shared the experience of the Francophone countries using Mali as a case study. He described the process of scaling up VL services in Mali, highlighting the key achievements and the best practices identified.

Mr Idrissa Songo from the Network of HIV positives in Sierra Leone (NETHIPS) described the role and responsibilities of NETHIPS in advocating for people living with HIV in Sierra Leone. The various strategies used in demand creation for VL testing in Sierra Leone include use of expert clients and support groups, and continuous engagement with the National AIDS Control Program to include people living with HIV in the planning processes. However, challenges like stock-outs of test reagents, breakdown of testing equipment, and inadequate numbers of expert clients hinder progress. He called for combined efforts to find solutions to the challenges faced and listed numerous recommendations that can be used.

In the discussion, retention of people living with HIV into care emerged as a key challenge and several strategies like the use of support groups to encourage clients and community social workers to track lost clients were suggested. Sensitization of people living with HIV through education was also discussed and it was agreed that this should be a collective effort from all involved parties, including health workers, partners and civil society. Supercharger emphasized that condoms are equally important, because they prevent sexually transmitted infections and unwanted pregnancies, among others but people living with HIV who are in marriages/relationships should be empowered with the knowledge to understand that undetectable=transmissible (U=U) and make informed decisions.

2.2.2 Awarding ceremony for VL awareness campaign winners

LabCoP had organized a VL awareness hashtag campaign competition among the LabCoP country teams. The country teams had come up with hashtags that they were going to use to promote VL services through social media. These hashtags had been submitted to the LabCoP team, which, with support from ITPC, selected the best hashtag.

The winning hashtag was a coined from the hashtags submitted by Malawi and Zambia, and the two countries were chosen as the winners. Mr Ndlovu Nqobile, Chief Executive Officer (CEO) of ASLM, handed the awards to the winning teams.

All countries were tasked with developing simple action plans to guide the implementation of formulated hashtags in creating awareness in communities with support from the LabCoP team, ITPC and Africa CDC.

2.2.3 Session 7, Breakout Session 3: Progress achieved for demand creation against the made action plans

In this session, country teams were again grouped into two to three countries per group and each group deliberated on the progress of interventions for demand creation against action plans, highlighting what worked and the challenges encountered. The groups also discussed on how they best implemented the VL hashtag campaign and developed drafts of action plans with strategies for distribution and expansion of the campaign.

Table 3 summaries some of the best practices identified by the different groups during the break-out session and the strategies proposed for implementing the VL awareness hashtag campaign.

Tanzania and Kenya	
Best practices	**Tanzania** ▪ Use of the ECHO model to discuss issues relating to demand creation in Tanzania ▪ Use of mass media owned by the government for campaigns and community engagement on high VL ▪ Use of expert clients (volunteers, mentor mothers) trained to deliver talks during clinic hours **Kenya** ▪ Ushauri system giving positive messages to people living with HIV ▪ National mentorship cascade ▪ Dissemination of guidelines using ECHO ▪ Adolescent use of Operation Triple Zero (OTZ) campaign (0 missed appointments, 0 missed pills, 0 VL result)
Strategies for VL awareness campaign	▪ Engaging mobile phones companies to create awareness about VL testing (Tanzania) by sending the VL testing messages to the public ▪ Scale-up use of expert clients (volunteers, mentor mothers) trained to deliver talks during clinic hours ▪ Use social media (Instagram, Twitter) to deliver messages to the community

	- Capitalizing on Population-based HIV Impact Assessment results dissemination to kick off the hashtag campaign ▪ Involvement of the CSO community in HIV messaging
Uganda and Sierra Leone	
Best practices	▪ Use of civil society, support groups of people living with HIV, traditional and religious leaders for the community and interpersonal engagement ▪ Communication with healthcare workers in case of breakdown of VL testing machines and safe storage of specimens ▪ Reagent markup ▪ Youth and adolescent peer support groups
Strategies for VL awareness campaign	▪ Kick-off campaign launch (Involve target group: adolescent, young people, key populations and expert clients) ▪ Coverage – highest burden and poor performing areas ▪ Use of non-digital media strategies (Stakeholder meetings, music, VL concert, and VL videos) ▪ Metric for success using a short survey
Zimbabwe and South Africa	
Best practices	▪ Including demand creation as part of VL testing training packages ▪ Agenda of Technical Work Group to include time for civil society feedback on demand creation activities ▪ Blended learning
Strategies for VL awareness campaign	▪ Launching a campaign ▪ Distribution - The fastest way to reach the community of people living with HIV through bulk SMS, community/national radio, databases of people living with HV - For reaching healthcare workers: use partners, couriers for samples and results. - Use popular figures to promote the hashtag on social media. - Post a visual in the pharmacy area where it can be seen - Put a sticker on the antiretroviral medication bottle - A small digital poster that can be circulated on WhatsApp

Table 3: Best practices and strategies identified for implementing the VL awareness hashtag campaign

2.2.4 Session 8: Panel Presentation | sharing best practices (Integrated diagnostics and Laboratory Network Optimization)

Dr Lara Vojnov, from WHO, highlighted how integrated diagnostics support the scale-up of routine VL testing and management of advanced HIV disease and described the multi-disease technology assays availability for different testing platforms. There is a need for integration of diagnostics, which has potential benefits and efficiencies like increased access to testing, leveraging existing resources and shared operational costs. She noted that future discussion would shift towards delivering of integrated diagnostic services, and that integrated testing platforms were only part of the solution. The WHO and ASLM molecular diagnostics integration global meeting in July 2019 brought together countries, donors, partners, and key stakeholders from across diseases, including HIV, tuberculosis, hepatitis, cervical cancer, and sexually transmitted infections, to discuss on how best to achieve integration. She described the financing and cost-sharing strategies that can be used and highlighted patient and site mapping processes to achieve diagnostic network optimization using existing tools like USAID- Foundation for Innovative. New Diagnostics LabEquip and CHAI's integration tool among others.

Dr Marguerite Massinga Loembe from Africa CDC and ASLM then presented on how to optimize the configuration of laboratory networks, including laboratory mapping, sample networking, instrument mapping and measuring network performance (Figure 7). She emphasized that effective laboratory networks have core capabilities which include: political, legal and regulatory structures and organization, coverage and rapid response, LIMS, infrastructure, human resources, quality, biosafety and biosecurity, and priority diseases. She also discussed the gaps and challenges for successful VL and early infant diagnosis testing scale-up and described the process of laboratory network optimisation, with a special emphasis on the ASLM Africa laboratory mapping program.

Figure 7: Laboratory networks optimization process.

Mr Charles Atem from CHAI described the integration of diagnostic testing, highlighting that optimization is an exercise that aims to redesign the set-up of the diagnostic network to increase access, maximize impact, and generate efficiencies. He then described the objectives, guiding principles, framework, and scope of diagnostic network optimization (Figure 8).
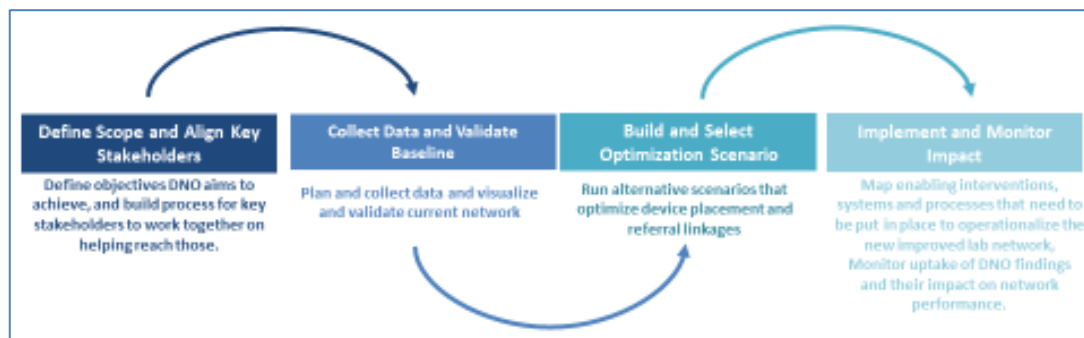

Figure 8: Diagnostic network optimisation framework.

In the presentation 'PEPFAR's approach for Diagnostic Network Optimization', **Dr Shirley Lecher** described challenges to diagnostic networks, including resource limitations for continued expansion of testing services, fragmented and parallel sample transport networks, suboptimal instrument placement and utilization, insufficient patient access to appropriate testing services, limited visibility into complete diagnostic capabilities, and diverse strategies and implementation approaches across donors, implementing partners and laboratory stakeholders. Dr Lecher outlined a two-step approach to network optimization. (1) Ensure complete national stakeholder buy-in and political will, with country teams collecting data from ministries of health and PEPFAR data sources to complete a modified LabEQUIP template. (2) Clearly define the country goal and priorities for expanded optimization, collect additional data for geospatial analysis and modelling assumptions, import data into a geographic information system visualization tool, present outputs to refine assumptions and establish data gaps and further refine expectations for the optimization, establish a stakeholder workshop and present initial models, complete a full data review with stakeholders (testing sites, instruments, testing volumes, sample collection sites, programmatic patient demands by site, existing referral linkages and further refine models), and develop a prioritized, time-bound implementation plan.

Dr Raiva Simbi from the Ministry of Health in Zimbabwe presented a country case of laboratory network optimization, noting successes and challenges. He described sample transportation activities and a mitigation plan for integrating the sample transport system. He also described equipment placement and the VL

network. He highlighted the lessons learnt in integrating the sample transport system and in achieving laboratory network optimisation.

2.2.5 Session 9, Breakout Session 4: Optimizing laboratory network for integrated diagnostics

In this session, five groups of two to three countries discussed how they could achieve network optimization and integration of HIV and tuberculosis laboratory testing services, highlighting best practices for replicating successful network optimization and challenges. During the report-back presentations, all groups highlighted the need to bring all stakeholders together and work as a team in achieving laboratory network optimization.

2.3 Day Three Sessions

2.3.1 Session 10: Panel presentations | Sharing best practices (M&E Systems)

Dr Collins Otieno, in his presentation, 'What gets measured gets done: an overview of M&E needs to advance the third 90', emphasized the rationale of having M&E systems for VL testing services and shared the guidance tool that was developed by WHO and others to guide countries in developing M&E systems for VL testing. Countries can begin with assessing M&E systems for VL testing and clinical outcomes, for instance, listing the indicators used at the national and facility level and the tools used to capture data, then developing an M&E framework considering the list of indicators and data capturing forms needed. From there, countries can establish a team to work on this and present to key stakeholders for review, adapting the data capturing tools and aligning them with the national health information management system. The M&E framework can be implemented by starting with few districts and facilities and monitoring progress, then scaling up to the rest of the country with regular monitoring and evaluation of VL testing implementation and outcomes.

Dr Shirley Lecher described a VL implementation monitoring tool, highlighting key indicators across the VL cascade that can be used to monitor leaks across the cascade including turn-around time (Figure 9). The tool was designed to help identify clinics, laboratories, regions, or specific processes for targeted interventions to maximize effort and improve access to VL testing. She also described the various monitoring indicators for VL testing that cover issues related to testing demand, specimen collection, laboratory processes and result utilization.

Figure 9: Monitoring indicators and turn-around times across the VL cascade

Dr Victor Bigira from Uganda and Dr Nadine Abiola shared the Francophone countries' experiences regarding results utilisation from I-TECH with a case study from Cote d'Ivoire. **Michael Mwangi** from Kenya presented on the role of LIMS to support M&E and advance routine VL towards the 3rd '90' and described several data sources that are used at both health facilities and laboratories (Figure 10). He emphasized that data quality is key in having proper M&E systems and LIMS can be used to monitor and evaluate VL programs.
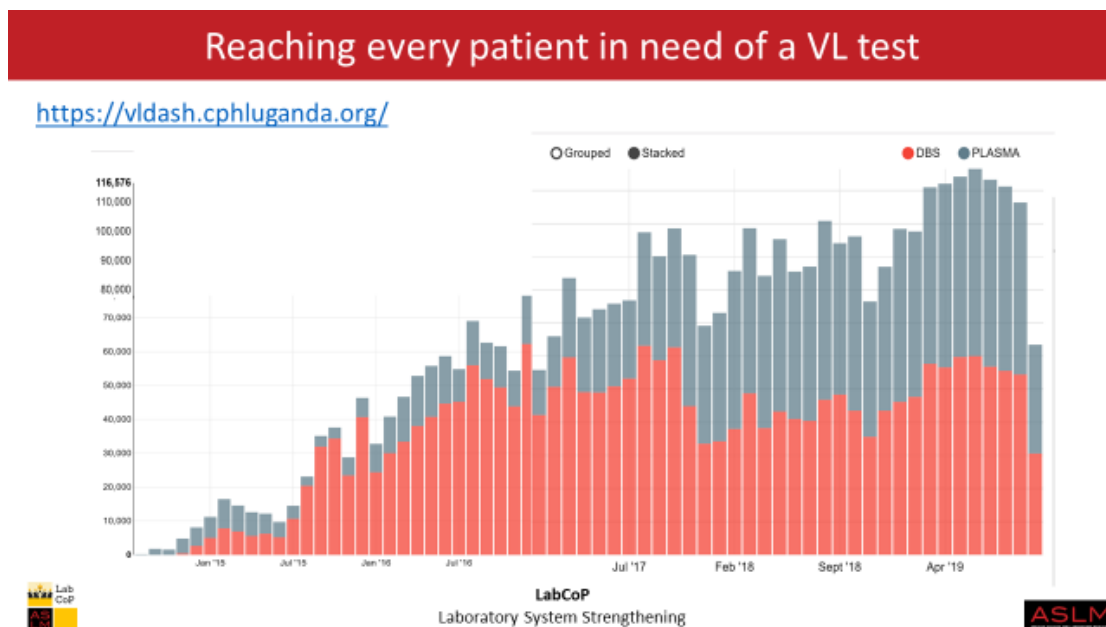

Figure 10: Snapshot of the LIMS VL dashboard used in program monitoring

Mr Naseem Cassim presented South Africa's country experience in implementing M&E systems, highlighting the progress achieved and the challenges faced. He described the processes through which the country's M&E

systems were developed. Their future plans include developing a unique patient identifier to develop a patient-centric data repository to improve cohort analysis, integrating their data systems and developing a consolidated M&E platform.

2.3.2 Session 11, Breakout Session 5: M&E to achieve the 3rd '90'.

In this session, five groups discussed strategies for developing functional M&E plans. The country teams also started the process of developing their action plans to improve the meeting-prioritized thematic areas along the VL cascade In the report back, the country teams indicated that they had started on the process of making their country action plans and promised to work with their in-country stakeholders to finalize them.

2.3.3 Session 12: Closing Ceremony | LabCoP Way forward towards phase 2

In her closing remarks, **Dr Pascale Ondoa** from ASLM thanked everyone for attending and actively participating in the meeting. She reviewed the original meeting expected outcomes which included: documenting the progress of routine VL testing, advancing best practices beyond viral load scale-up, factoring in the different perspectives of the routine VL test result utilization and demand creation, and formulating clear plans to monitor and evaluate the routine VL testing cascade to inform the 3rd '90'. She highlighted the meeting outcomes which included: strong engagement of civil society, tracking progress with the implementation of the previous country action plans, formulation of new action plans and documenting best practices across the different thematic areas of the VL cascade. Dr Ondoa indicated that the next phase of LabCoP was to build on the existing project activities and strategies to emphasize system aspects of knowledge sharing, strengthen the leadership and communication capacity of country teams, increase country ownership of the LabCoP, and to engage more countries through a tiered approach.

Dr Peter Ehrenkranz from BMGF acknowledged all the global stakeholders and country teams for attending the meeting. He encouraged country teams to devote efforts to all the different thematic areas of the VL cascade from demand creation to results utilization, and he emphasized that the recipients of care should be at the centre of all these efforts to create the desired outcomes. He motivated the country teams and called upon them not to lose hope even when they are still facing several challenges. He cautioned all the participants about halting other healthcare programs in the bid to scale up VL testing services.

Dr Lara Vojnov from WHO thanked all the participants and encouraged them to pass on the information they had learned, including best practices, to their

colleagues who had not attended the meeting. She emphasized the need for LabCoP to expand its scope beyond VL testing scale-up.

Dr Shirley Lecher from the International Laboratory Branch at the United States CDC applauded the civil society participants for their active participation in the meeting and emphasized the continued need to engage civil society at every step in the process of scaling up VL testing. She called upon country teams to finalize and operationalize the action plans they had developed and reach out to their in-country stakeholders and partners to seek their buy-in and funding for implementation.

Mr Ndlovu Nqobile, the CEO of ASLM, acknowledged everyone for participating in the meeting and urged all the country teams and stakeholders to continue working together as a team in scaling up VL testing services. He then officially closed the meeting.

2.3.4   Site visit to Ethiopian Public Health Institute

Following the official closure of the meeting, the country teams made a site visit to EPHI where they were given an overview of the institution and the functioning of the entire laboratory sector in Ethiopia.

At EPHI, the country teams had a tour of the HIV molecular laboratory, interacting with the laboratory staff and discussing best practices and challenges faced.

2.4   Day Four: Towards safer, practical, and sustainable methods and technologies for the disposal of laboratory waste

Made possible by funding from BMGF, WHO, the Global Fund and Unitaid, Day 4 was attended by just over 60 participants from 13 African countries, implementing partners and donor organizations. The aim was to discuss current field experiences, raise awareness, identify best practices, strategies and methods for building and sustaining waste management systems, policy frameworks, and challenges and map concrete way forward for implementing safer, practical, and sustainable methods/technologies for the disposal of waste generated by medical laboratories, including waste from VL and early infant diagnosis testing and testing for related co-infections (tuberculosis, hepatitis, human papillomavirus). The day comprised introductory panel presentations to set the scene, a focus on best practices and solutions that have been observed in the field, a private sector roundtable, a look at current waste management efforts, and a group discussion for action planning and the way forward.

2.4.1 Session 14| Opening remarks and setting the scene

In his opening remarks, **Mr Ndlovu Nqobile** from ASLM thanked all the key stakeholders including UNITAID, Global Fund, CDC-ILB, country teams and all the other stakeholders for attending that special meeting on improving laboratory waste management. He then gave an overview of the program, including the sharing of best practices and a session with the private sector. Mr **Addisu Kebede** from the Ministry of Health in Ethiopia welcomed everyone to the session and indicated the need for collective efforts to improve waste management. He highlighted that Ethiopia is also working hard to enhance waste management and learning from ASLM waste management sessions. Ms **Franziska Fuerst** from the Global Fund thanked all the meeting participants for attending, outlined the expectations for the day, and highlighted the theme and objectives of the meeting.

In the keynote address about the need for safer management of medical waste (policy and regulation frameworks), **Thomas Stevens** from the Zambia CDC described the country challenges and barriers, which included: lack of country-specific waste management regulations, policies, guidelines, and regulatory bodies; shortage of local waste management technical expertise; lack of awareness about the dangers of hazardous waste and its effect on public health and the environment; limited financial and human resources to build sustainable waste management systems; lack of infrastructural and technological advancement; and lack of adequate information on hazardous waste generated (like volume, location and source). He then described observed waste management practices and potential waste management technologies and considerations (Figure 11).

Figure 11: Observed waste management practices described

Mr David Bressler from the International Laboratory Branch at the United States CDC then gave an overview of the WHO Bluebook on the safe management of waste from healthcare activities, highlighting potential waste management remediation technologies and considerations. Mr **Anafi Mataka** from ASLM then described the sharing and identification of knowledge and best practices for waste management within LabCoP and how LabCoP has helped to improve the management of laboratory waste.

2.4.2 Session 15 | Best practices and solutions from the field

Mr David Bressler discussed the key issues specific to waste management for VL and EID testing scale-up and emphasized that by 2020, more than 30 million VL tests will be performed globally with 924 000 litres of effluent chemical waste and 2 102 100 kg of solid waste produced annually. The majority of VL testing facilities are in low- and middle-income countries with limited infrastructure and little to no existing waste management policies and practices. Improper management of laboratory waste poses a significant threat to public health and the environment. He gave an overview of guanidinium thiocyanate, a toxic waste produced from VL testing. The challenges and barriers to waste management include lack of country-specific waste management regulations and guidelines, limited financial and human resources, lack of technological and infrastructural capabilities, and shortage of local waste management technical expertise. He described the role of the different global stakeholders in improving waste management and discussed the next steps.

Mr James Kandulu from Malawi described VL test waste disposal through high-temperature incineration at cement factories. In May 2018, 2000 kg of hazardous waste was incinerated at Shayona cement factory. Kasungu, Malawi, The overall cost was US$1.52/kg of waste, which was lower compared with the cost of US$1.91/kg for disposal at the semi-industrial incinerator in Lilongwe, Malawi.

Mr Levi Vere from Zimbabwe described costing for waste management solutions in Zimbabwe including waste from both conventional and point-of-care testing (Figure 12).
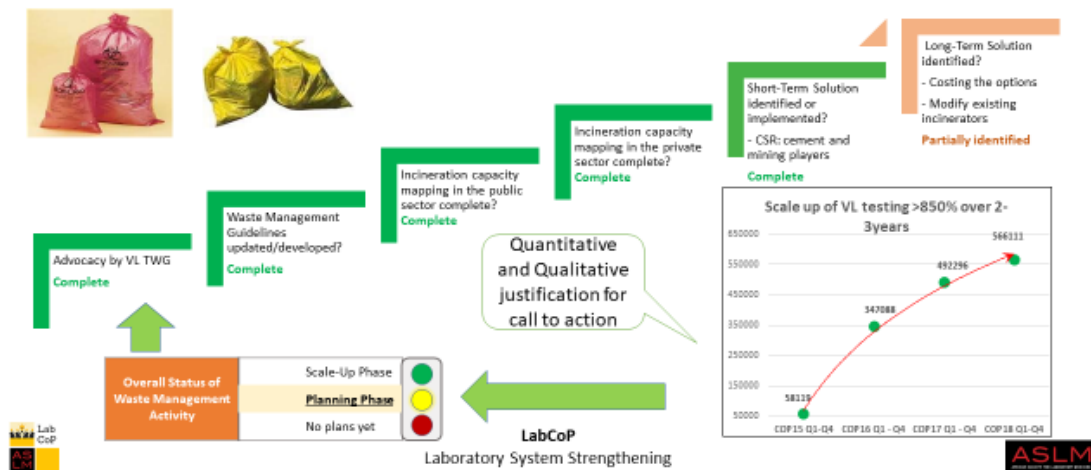
Figure 12: Current progress in VL waste management activities in Zimbabwe

Ms Mmashela Kgole from South Africa described the healthcare waste management policy and regulatory framework in South Africa. She gave an overview of the country context and said that the South African Waste Information Centre (SAWIC) registers all major hazardous waste generators, treatment and disposal facilities. There are 19 authorized healthcare waste management treatment facilities with a treatment capacity of about 48 000 tons, 10 thermal treatment facilities (incinerators and pyrolysis) and 9 non-burn treatment facilities (microwave, autoclaves). She then described South Africa's legal and regulatory framework, and the National Health Laboratory Service's waste management policy and procedures.

2.4.3   Session 16 | Panel discussion / Private Sector roundtable

In this session, the manufacturers called in using a virtual connection. The key discussion themes were:

- What role can the private sector play in the reduction and disposal of medical/laboratory waste

- How can LabCoP gather partners, countries and the private sector to work together to improve the adoption of safer and more cost-effective waste management practices?

Attendees
Private sector participants: Abbott (Pam Pillay), Biomerieux (Lala Haidara) Cepheid (Charles Kasipo), Roche (Joni Zurawinski and Dave Herrmann)

The moderator, Dr Raiva Simbi from the Ministry of Health in Zimbabwe, opened the session by giving each representative from the private sector, an opportunity to summarise their current approaches to sustainable manufacturing, disposal policies and practices and any other related initiative:

Cepheid: Cepheid is committed to offering quality products and quality management systems. Their instruments are in compliance with environmental regulations and they are committed to waste minimization.

Roche: Roche has a waste management program within the company with a priority commitment to waste reduction. They conduct onsite audits (by an external company) to assess the production of waste. They have a strong program for capacity-building. Although it has not yet extended to environmental issues, they consider this an opportunity to capacitate the ground engineers in waste management.

Biomerieux: Biomeriux is committed to minimizing the impact of its products on the environment by integrating environmental considerations into product development. They are investing resources to encourage waste reduction.

Abbott: Abbott is committed to a safer impact of their products to the end-user. Their packaging materials are recyclable, they offer guanidinium thiocyanate-free products and they are in compliance with environmental regulations. They have a Field Support Staff program to help manage mPima waste appropriately.

The manufacturers took turns discussing and responding to questions the following areas
- Innovative strategies to minimise the environmental impact of products
- Opportunities for reverse logistics and fostering of take-back schemes
- Scope and appetite for concrete partnerships to:
  - Improve in-country waste treatment infrastructures
  - Build human capacity
  - Undertake more research to more robustly assess the environmental impact of healthcare workers

LabCoP Family Feedback post roundtable:
In a high-level conversation, attendees discussed various aspects of waste management. The following issues were highlighted:
- Most felt that waste management continues to be a challenge with no straightforward answers coming from manufacturers
- There is no legislation in most countries in the region (except South Africa)
- Regarding cost per test, there should be a global estimate of costs to help negotiate costs and/or to present to donors to incorporate into costing
- Roche has some policies in place but it has not trickled down to the country level
- The Integrated Diagnostic Consortium included in the waste management workstream. A document on "Manufacturer Asks" is being drafted to guide and engage manufacturers

- Manufacturers are committed to meeting environmental standards, but there is not much direct engagement with customers to manage the generated waste. Continuous engagement will be required

Country requests
  o Countries felt manufacturers have not done enough, and pushed for the polluter pays principle and shared responsibility for the cost of waste management.
  o Countries expressed a desire to visit and get a feel for manufacturer waste disposal facilities and practices.
  o Country teams emphasized the need for certification of waste disposal by the private sector and also requested that the private sector, as part of its social responsibility, merge and set up incinerators in developing countries. It was indicated that the political will is available but there is a lack of funding and waste management frameworks for such incinerators to be set up.
  o Countries suggested that contractors and subcontractors who are hired to manage laboratory waste should be followed up to ensure that they dispose of the waste properly. Furthermore, countries suggested that the cost per test should be inclusive of waste management, which would enable the private sector to help out with waste management.

Summary:
- Manufacturer approaches to waste management were varied and not clearly defined. They ranged from manufacturer-owned facilities for disposal or provision of training to outsourcing.
  o Regarding sustainable arrangements and manufacturing disposal policies, Cepheid indicated that they made several investments in environmental programmes. Roche said that they have position papers for the reduction and elimination of biological waste, for instance, incineration is recommended for chemical waste. They have developed a risk assessment tool and plan to develop a tool for waste disposal. Biomeurix indicated that they introduced initiatives to reduce waste production, for example, their 'produce>> reuse>>recycle>>dispose' and community initiatives. Abbott indicated that they have adopted safe waste management policies, they have safety data sheet documentation, and m-PIMA is guanidinium thiocyanate free.
- Although waste management is lagging behind, engagement will continue.
- Although it is good to know that manufacturer have waste management policies, the lack of engagement between manufacturers and laboratory stakeholders means stakeholders do not have enough information to understand what manufacturers are actually putting on offer.
- It is a good thing to learn that manufacturers welcome the idea on reverse logistics – with respect moving expired goods from the laboratories for the purpose of capturing value, or proper disposal. This could be explored in 2020 and beyond.
- There was evidence of a great appetite for partnership. Manufacturers recommended creating a channel for the 'water to flow' whereby ASLM

takes the lead in creating a framework to support work on waste management issues.

- o Need for a framework. Industry wants to meaningfully contribute to safer disposal and treatment of waste. However, all manufacturer attendees indicated that this is difficult in the absence of a guiding framework through which they can contribute. They challenged ASLM to facilitate the development of such a framework.
- o The Global Fund has started a framework draft.

2.4.4 Session 17 | Current efforts on waste management

Ms Franziska Fuerst from the Global Fund discussed the case for strengthening national waste management systems, highlighting the Global Fund 2017 to 2022 strategy of investing to end epidemics. She described gaps identified from several case studies in waste management and guided country teams on how to include healthcare waste management in their funding requests and grants, based on the modular framework handbook (under the module Resilient and Sustainable Systems for Health where a new intervention area 'avoidance, reduction and management of health care waste' had been included). Dr/Mrs Fuerst highlighted an upcoming technical brief on sustainable healthcare waste management whose aim is to support applicants in making informed decisions on a waste management approach that can, in principle, be supported through Global Fund grants.

Mr David Bressler from the International Laboratory Branch at the United States CDC discussed findings from country facility assessments conducted by his office, the Global Fund and ASLM, and Dr Collins Otieno from ASLM described how a concept similar to the LabCoP theory of action can be applied to strengthen waste management systems (Figure 12).
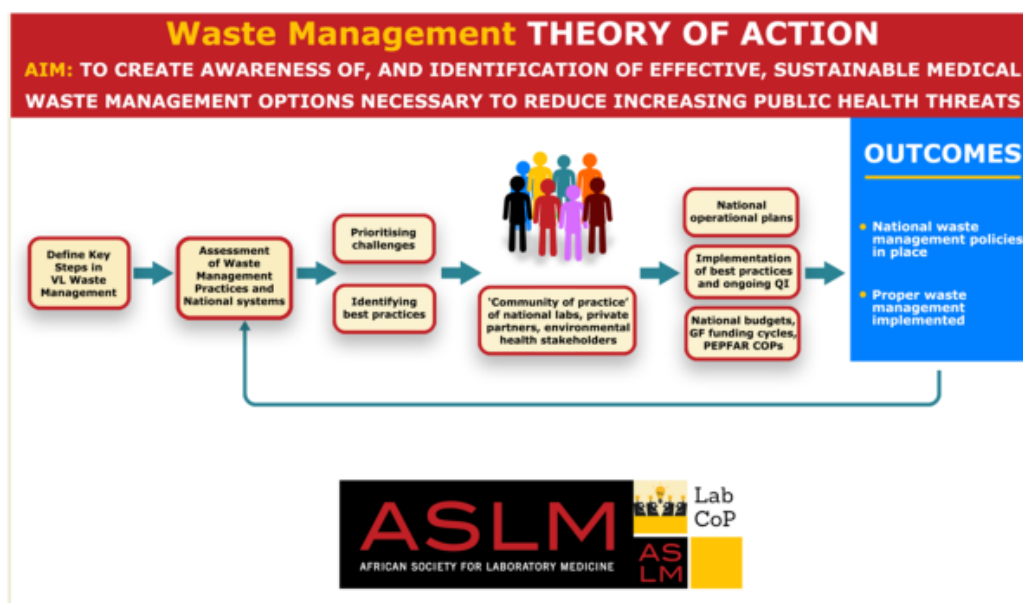
Figure 12: Applying the LabCoP theory of action to strengthen waste management systems

2.4.5   Session 18 | Breakout session - Group discussions and action planning: way forward towards improvement interventions

The country teams were put in groups of two to three countries to discuss best practices in waste management, common challenges faced and prioritized action interventions.

Country	Short term strategies	Medium term strategies	Long term strategies
Uganda	Solid waste management Construction of the incinerator. Sub-contractions	Liquid waste management. Unware of the endpoint of liquid waste	There are no national policy and Guidelines on waste management
DRC	Procurement of an incinerator Transportation of the waste	Only one (1) incinerator is in place, however its not yet functional	There are no national policy and Guidelines on waste management
South Sudan		No national country regulation and guidelines on waste Management -disposal of waste is done by incineration and for EID/VL waste are poured in to the sink	No Maintenance of incinerator -Incinerator temperature doesn't reach 1000 C at reference lab
Zambia	Solid waste is incinerated with high temperature over 1000C	Liquid waste poured to the sink -No national country regulation and guidelines on waste Management	

Zimbabwe	HCW sources are Lab waste, Pharm. waste Clinical waste. Guidelines now published	VL liqiud waste management capacity - No capacity at the moment Waste is stored in containers & later incinerated at a pvt lab (but with challenges) GXP cartridges are incinerated at hospital incinerators	Transportation of waste from all the mol. Labs to the pvt/designated incinerators remains a challenge Costing will be required before engaging prospective funders (GF etc)
Malawi		HCWM Guidelines Not available – only guidelines are under development . VL liqiud waste management capacity MSF supporting incineration @ one of the mol. labs All VL liquid waste goes down the drain 2 Hightemp incinerators under construction (GF funds). 2 more to be supported by GAVI	After completion of the Hightemp incinerators we will likely have challenges with fuel (kerosene) for burning. This is a present challenge with the hospital-based incinerators
Kenya	General HCWM plan & guidelines available	Non-burning technologies available: Autoclave shredder Microwave technology All these are for SOLID waste management All VL liquid waste goes down the drain	
Eswatini	Working with Environmental Health to develop Waste management guidelines Contracted private waste disposal company		Focal person overwhelmed to coordinate waste management activities
Lesotho	Developed SOPs on Chemical liquid waste management (awaiting approval) Submitted proposal to Global Fund on Waste management TA (WM mapping) Reviewed Standards and guidelines for Health Care Waste with Environmental Health	Accumulated liquid waste due to lack of proper disposal means	Budget cut for Waste management activities Follow up on implementation of proper waste disposal by private contractor

Thereafter they developed the first draft of their intended short-, medium- and long-term plans. Uganda and the Democratic Republic of the Congo, Kenya and Sierra Leone, Tanzania and Ethiopia, Malawi and Zimbabwe, Zambia and South Sudan developed draft plans were submitted to the ASLM Secretariat (Appendix 1). Most of the short-term plans included developing guidelines, policies and SOPs, whereas medium- to long-term plans included infrastructure investments such as high-temperature incinerators.

Country	Short term strategies	Medium term strategies	Long term strategies
Uganda	Capacity building/ training of Health workers/ Laboratorians Baseline assessment-Country level	Cost modelling of waste management-Country level. Develop waste management policy/Guidelines.	
DRC	Capacity building/ training of Health workers/ Laboratorians Baseline assessment-Country level	Cost modelling of waste management-Country level. Develop waste management policy/Guidelines.	
South Sudan	Assessment of Juba teaching hospital incinerator and regional incinerator for the capacity and temperature. Involve technical working group in the developing of national waste management regulation and policy. Write a letter to undersecretary to request for new incinerator.		Lobbying for big incinerator for reference lab from CCM or global fund
Zambia	Meeting with stake holder and expertise to discuss waste management. Assessment of incinerator in all facilities for functioning and repair. Develop national waste management regulations and policy. Use cement manufactures for waste disposal.		Train biomedical engineer on the maintenance of the incinerator
Zimbabwe	Modification of 2 existing MoH incinerators to have capacity to incinerate @ 1000°C. Engaging cement factories to incinerate @ their kilns is another option. Quantifying the waste being generated is a prerequisite before engaging funders.		
Malawi	Quantifying the waste being generated is a prerequisite before engaging funders. Policy needed ASAP		
Kenya	TA needed to do an assessment of the country's capacity with what's possible using the available capacity and then outline the gaps		
Eswatini	Working with Environmental Health to develop Waste management guidelines. Coordination of waste management activities	Contract private waste management company	
Lesotho	Approval of developed SOPs on Chemical liquid waste management	Pilot VL, EID liquid waste management using Charcoal. Map VL and EID waste collection to central level	Construct High temperature incinerator

Participants agreed to next steps, including:

- Consolidating and finalizing the plans; incorporated into broader LabCoP Plans for 2020
- Regular follow up of progress with the country teams; plans for eight countries due 18 Dec 2019.
- Assisting teams to identify possible technical assistance or funding to carry out the plans; the Global Fund has developed a draft, still in progress, that they hope to be shared. The Global Fund was scheduled to provide a talk to the laboratory community on funding opportunities for waste management and laboratory strengthening in December 2019.

2.4.6   Session 19 | Closing remarks

Ms Franziska Fuerst from the Global Fund thanked all the country teams and global stakeholders for attending the meeting and she encouraged them to continue sharing experiences about improving waste management. David Bressler from the United States CDC encouraged the country teams to attend the waste management sessions and to make use of them as sources of knowledge in creating sustainable waste management systems. Mr Ndlovu Nqobile from ASLM acknowledged all the partners and the country teams for organizing and attending the meeting. He encouraged country teams to put into practice the best practices and strategies learned to improve waste disposal and management. He officially closed the meeting.

3. Acknowledgements
Special thanks to all the country teams and global stakeholders who both devoted their efforts in the meeting preparations, and also attended the meeting.

4. Appendix: Meeting Agenda

Time	Session	Facilitator/Presenters
8:00 -8:30	**Registration**	**ASLM**
8:30 -9:30	**Session 1 | Welcome and opening remarks (10 min each)** • Ethiopia MoH/dignitaries: official opening • Africa CDC the Africa viral load movement • Update on the VL scale-up and the 3rd 90 • LabCoP Theory of action and achievements so far • LabCoP & strengthening lab systems: towards and beyond scaling up RVLT • ASLM: Conference objectives and expected outcomes	**Eileen Burke (GF)** MoH representative Y Kebede/J. Nkengasong (ACDC) Lara Vojnov (WHO) Charles Kiyaga (ASLM) Peter Ehrenkranz (BMGF) Pascale Ondoa (ASLM)
9:30-10:15	**Session 2 | Measuring our progress: the LabCoP country self-assessment of the VL testing cascade** • Summary of country self-assessment results-highlighting top 3-4 common challenge areas (20 min) • Zimbabwe MOH: Follow-up assessment results and improvement actions. (15 min) • Q&A (10 min)	**Thandi Onami (BMGF)** Getachew Kassa (ICAP) Norah Vere (Zimbabwe MOH)
10:15 Coffee/Tea break	
10:45-13:00	**Session 3 | Breakout Session #1: Review of country assessments – prioritizing areas of weaknesses** • 5 groups of 2-3 countries (90 min) ○ Discuss their progress or lack thereof, highlight main gaps and strengths, and provide a root cause analysis across all domains and systems of the VL testing cascade. ○ Review their action plan & prioritize areas for improvement in a year • 3 countries report back (10 min each) • Ethiopia, DRC and S.Sudan	**Anafi Mataka (ASLM)**
13:00 Lunch	
14:00-15:00	**Session 4 | Panel presentations | Sharing best practices** **Topic 1: RVLT Result Utilization** • Recap of progress on Result utilization (Including result utilization recipe) (10 min) • The perspective of the patients – Country (Uganda) team (15 min)	Anafi Mataka (ASLM) Victoria Kiwanuka (Uganda)

	• The perspective of the Health Care workers (Malawi) (15 min)	Brown Chiwandira (Malawi)
	• The perspective of the partners	Shirley Lecher (CDC)
	• Francophone countries' Experiences (10 min)	Nadine Abiola (I-Tech)
	Q &A (10 min)	

15:00-16:10	**Session 5 | Breakout Session #2:**
	• Instructions / guidance / transfer to breakout group rooms (10 min)
	5 groups of 2-3 countries (60 min). Each group discuss:
	  - Progress of interventions for results utilization against the action plans.
	  - What worked and what did not work.
	• How was civil society engaged alongside the rest of the country team?
		Charles Kiyaga (ASLM)

	16:10 Coffee/Tea Break	
16:30-17:15	**Session 5 | Report back** (2 slides, 5min each group) o Kenya, Sierra Leone, Zambia, Tanzania S. Sudan • Discussion and conclusion (10 min)	
17:15-17:30	Close of day / recap / announcements	Collins Odhiambo (ASLM)

Wednesday, October 23

Time	Session	Facilitator/Presenters
8:30-9:00	**Recap of Day 1 / Review of Day 2 agenda and goals**	**Charles Kiyaga (ASLM)**
9:00-10:15	**Session 6| Best Practices for Demand Creation?** • Recap of progress on-demand creation (including demand creation Lab CoP recipe) • Regional Survey - Evidence, ITPC- Solange (20 minutes) • Switching from wearing condoms to demanding your VL results: Undetectable = untransmissible	**Ndlovu Nqobile, ASLM** Nicholus Nanyeenya (ASLM) Solange Baptiste (ITPC) Moses Supercharger (Uganda) Abdelaye Keita (Fondation

	• Francophone countries Country Experiences, (15 minutes)	Mérieux)
		TBD
	• NETHIPS, Sierra Leone (15 minutes)	
10:15 Coffee/Tea break		

10:45-12:30	**Session 7 | Breakout Session #3:**
	
	• Instructions/guidance/transfer to breakout group rooms (5 min)
	• 5 groups of 2-3 countries (60 min)
	   o Each group discuss the progress of interventions for demand creation against the action plans. What worked and what did not work?
	   o Review the challenges and successes. How can the hashtag campaigns address this? Develop a country plan with strategies for distribution and expansion of the hashtag campaign (60 min)
	Report back
	• Each group gives a short report-back (5min each. 25 min)
	• Result of the hashtag competition, conclusion and way forward (10min)
	   o Uganda, Sierra Leone, DRC, S. Africa, Zambia
		Moderator: Solange Baptiste (ITPC)

12:30 Lunch		
13:30-14:30	**Session 8 |Panel Presentation | sharing best practices** **Topic 3 Integrated diagnostics and Laboratory Network Optimization (10 min each)** • How integrated diagnostics can support the scale-up of RVLT and HIV advanced disease management? • Optimizing Laboratory networks configuration: Mapping and measuring the performance of Laboratory networks • Integration of diagnostic testing and the role of the private sector • Network optimization and improving RVLT • Country Example of Lab Network Optimization – Successes and Challenges Q &A (10 min)	**Shirley Lecher (CDC)** Lara Vojnov (WHO) Marguerite Massinga Loembe (ASLM/Africa CDC) Trevor Peter (CHAI) GHSC -PSM (Matt Wattleworth/ Clement Ndongmo) Raiva Simbi (Zimbabwe**)**
14:30-	**Session 9| Breakout Session #4: Optimizing**	**Lara Vojnov (WHO and**

Time	Session	Facilitator/Presenters
15:35	**laboratory network for Integrated diagnostics** • Instructions/guidance/transfer to breakout group rooms (5 min) • 5 groups of 2-3 countries discuss (60 min) ○ feasibility of TB/HIV integration ○ considerations for Lab Network Optimization efforts • other integration considerations?	GHSC- PSM)
15:35 Coffee/Tea break	
16:00-16:30	**Session 9| Report back** • Two selected countries present plans to optimize the network for TB/HIV (or other) integration (10 min each) ○ S Africa, Ethiopia • Discussion and Q&A (10 min)	
16:30-17:00	Close of day / recap / announcements	Collins Odhiambo (ASLM)

Thursday, October 24

Time	Session	Facilitator/Presenters
8:30 -8:45	**Recap of Day 2 / Review of Day 3 agenda and goals**	**Charles Kiyaga (ASLM)**
8:45 -9:45	**Session 10| Panel presentations | Sharing best practices** **Topic 4 M &E Systems** • '*What gets measured gets done*': an overview of M&E needs to advance the third 90. (10 min) • M & E to scale up RVLT. Perspective from partners (10 min) • LIMS to support M & E and advance RVLT towards the 3rd 90 (10 min) • Country experience - South Africa - T (10 min) • Q &A (10 min)	**Aaron Shibemba (Zambia MoH)** Collins Odhiambo (ASLM) Shirley Lecher (CDC-ILB) Tim & Judi (CHAI Kenya) Somayya Sarang (NHLS-South Africa)
9:45-10:50	**Session 11| Breakout Session #5: M & E to achieve the 3rd 90.** • Provide instructions Instructions/guidance **(**10 min**)** • Plan interventions to establish or improve data collection for M & E of the RVLT cascade. How can countries track RVLT nationally, and fill in section 7 of the self-assessment tool?	**Peter Ehrenkranz (BMGF)**

	(90 min).	
10:50 Coffee/Tea break		
11:15-12:15	**Session 11| Report back** • Each group present on a strategic approach to collect M & E data on the national VLT cascade (10 minutes each) o Tanzania, Ethiopia, Kenya, Malawi, Uganda • Discussion and Q&A (10 min)	
12:15-12:30	**Session 12| LabCoP Way forward towards phase 2** • ASLM (phase 2) • Gates • WHO • CDC • GF • ITPC	**ASLM & Partners**
12:30 Lunch		
14:30-16:30	• **Visit EPHI**	**Dr Amha Kebede (ASLM)**

Friday, October 25 - Waste Management

Time	Session	Facilitator/Presenters
8:30-9:30	**Session 13| Introductions and setting the scene** • Welcome remarks • Workshop outline and outcomes: Towards safer, practical, and sustainable systems for management of medical waste • Keynote: The need for safer Management of Medical Waste: policy, regulation frameworks • Overview of current guidance on WM – WHO Blue Book on safe waste management • Knowledge sharing and identification of best practices for waste management within LabCoP Q &A (10 min)	**Peter Ehrenkranz (BMGF)** EPHI Representative Eileen Burke (Global Fund) Thomas Stevens (CDC-Zambia) Dave Bressler (CDC) Anafi Mataka (ASLM)
9:30-11:00	**Session 14| Best practices and solutions from the field (10 min each)**	**Malawi MoH**

	• Viral Load/EID waste management (15 min) • **Mozambique**: *Trans-Border Movement of waste/Cement Factory* • **Malawi**: *High-Temperature incineration, Cement Factory* • **Zimbabwe**: *Costing for WM Solutions* • **South Africa**: *Policy and Regulatory Frameworks* Q &A (25 min)	Dave Bressler (CDC) Mozambique MoH Malawi MoH Zimbabwe MoH South Africa MoH
11:00 Coffee/Tea break
11:20-13:00	**Session 15| Panel Discussion / Manufacturers Roundtable** • How the manufacturers of these technologies can contribute to the reduction or proper waste disposal of medical/Laboratory waste • How can LabCoP gather partners, countries and manufacturers to improve the adoption of safer and more cost-effective WM practices?	**Raiva Simbi (Zimbabwe)** Panel Discussion - Key manufacturers: Abbott, Roche, Biomeriuex, Cepheid, Hologic, etc -
13:00 Lunch
14:00-15:20	**Session 16| Current Efforts on Waste Management** • Perspective for strengthening national waste management systems: Guidance, SOP, funding opportunities (20 min) • Findings from Facility assessments (CDC-ILB -GF ASLM Waste Management efforts) (40 min) o Kenya, Malawi, Ethiopia, Eswatini, Zimbabwe • Applying the LabCoP theory of action to the strengthening of waste management systems (10 min) Q &A (10 min)	**Tanzania MOH** Global Fund Dave Bressler (CDC)/MoHs Collins Odhiambo (ASLM)
15:20 Coffee/Tea break
15:30-16:30	**Group Discussions and Action Planning: way forward toward improvement interventions**	**Anafi Mataka (ASLM)**
16:30-16:45	Closing remarks	BMGF, GF, CDC, ASLM