The SLMTA programme: Transforming the laboratory landscape in developing countries

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Introduction
Efficient and reliable laboratory services are essential to a functioning health system as high-quality laboratory testing plays a key role in patient care, surveillance and outbreak investigation. Poor laboratory quality and its negative impact on healthcare systems have been documented for resource-limited settings, including sub-Saharan Africa (SSA). Using the number of accredited laboratories as a quality metric, a 2013 survey showed that 37 out of the 49 countries in SSA had no medical laboratories accredited to any internationally-recognised standards. Of the 380 accredited laboratories in that region, 91% were in South Africa and only 17% were public health laboratories.

In recent years, however, several landmark events have drawn attention to the poor state of public health laboratories and have pushed for strengthening of laboratory systems and networks. One of these events was the issuance of the World Health Organization (WHO)–Lyon statement in 2008, which called for countries with limited resources to pursue practical quality management systems and to adopt a stepwise approach to quality improvement and accreditation. Another was the 2009 launch of a laboratory management training programme called ‘Strengthening Laboratory Management Toward Accreditation’ (SLMTA).

Effective management and leadership are critical to strengthening health systems and the scaling up of health service delivery. Many countries and partners have initiated efforts to enhance management of health programmes and service delivery in developing countries, with measurable success. Most of these management capacity-building efforts focused on managers from hospitals, primary healthcare centers (such as family planning, mother–child health, etc.), or vertical public health programmes (such as tuberculosis [TB] and...
management capacity-building efforts have primarily targeted senior laboratory officials where the focus is on laboratory policy, system and network development, as opposed to daily operations of individual laboratories. Training programmes are needed to enable laboratory managers to use available resources (staff, budgets, supplies, equipment, buildings and information) efficiently for planning, implementation and evaluation of service delivery in order to meet patients’ and clinicians’ expectations and public health needs.

The SLMTA programme was created in response to the observed need for structured laboratory management training and quality improvement by the US Centers for Disease Control and Prevention (CDC), in collaboration with the American Society for Clinical Pathology, the Clinton Health Access Initiative, and the World Health Organization’s Regional Office for Africa (WHO AFRO). SLMTA is a competency-based management training programme which uses a series of short didactic courses and work-based applied learning projects with the goal of achieving immediate and measurable laboratory improvements. It provides a practical approach to addressing everyday challenges using available resources.

The SLMTA training curriculum and implementation method were pilot-tested in 15 laboratories in Uganda from August 2008 to March 2009, yielding promising results. SLMTA was then officially launched in 2009, with implementation beginning in 2010. As of the end of 2013, SLMTA had been rolled out in 47 countries and 617 laboratories, and had improved enrolled laboratories an average of 23 percentage points after one round of SLMTA training in a pre/post study using the WHO AFRO Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA) checklist. This report provides a detailed description of the SLMTA programme and highlights some challenges, achievements and lessons learned during its first five years of implementation (2009–2013) in developing countries.

Key components

The design of the SLMTA curriculum and its implementation exemplify what is known as ‘good practice’ in management competencies development. The SLMTA curriculum covers the 10 key competencies of a laboratory manager: productivity; work area; inventory; procurement; equipment maintenance; quality assurance; specimens; laboratory testing; test result reporting; and document and records control. A total of 66 tasks and job routines define effective laboratory management and constitute the learning objectives of the curriculum. A typical SLMTA training programme spans from 12 to 18 months (Figure 1). Training is conducted in a series of three workshops, each lasting three to four days, utilising 44 instructional activities and more than 100 job aids. Each activity provides hands-on, practice-based learning experience for specific management tasks. The total training time is approximately 60 hours to teach all 44 activities.

After each workshop, participants implement improvement projects in their home laboratories. There are two types of improvement projects: complicated projects that require extensive planning and data collection before and after the change; and simpler ‘just do it’ types of projects that can be implemented immediately with minimal time and resources (Box 1). Implementation of improvement projects requires teamwork involving the entire laboratory staff, thus ensuring that the projects become part of the laboratory’s continuous improvement processes. Participants are encouraged to implement locally-appropriate solutions using existing resources. During the home-based learning period after each workshop, participants are supported by periodic supervisory visits or on-site mentoring guided by standardised tools. This structured supervision and support component is critical to the success of the SLMTA programme.

The formal laboratory evaluation component is designed to identify weaknesses and areas that require improvement, measure success of the programme and indicate future goals for the laboratory. Evaluations are based on WHO AFRO’s five-stage accreditation-preparedness scheme, called SLIPTA, which recognises laboratories according to their
level of compliance with the International Organisation for Standardization (ISO) 15189 standard. Under the SLIPTA scheme, laboratories are audited using the SLIPTA checklist, which includes 111 items divided into 12 sections (Table 1) based on the 12 Quality System Essentials from the Clinical and Laboratory Standards Institute (CLSI). After an audit, a laboratory receives a score out of 258 points in order to determine its star rating – from ‘0’ (0–141 points, < 55%) to ‘5’ (244–258 points, ≥ 95%). Not all laboratories will pursue accreditation; regardless, the SLIPTA scheme provides the roadmap and motivation for laboratories to make steady improvement in service delivery and patient care.

SLMTA and SLIPTA are closely linked. The SLIPTA checklist provides the SLMTA programme with a means to identify gaps and benchmark progress. SLMTA, on the other hand, equips laboratory management with the ability to implement quality management systems in order to improve their performance on the SLIPTA scale and eventually achieve formal accreditation status. To support this link, individual SLIPTA checklist items are mapped to each of the 44 instructional activities in the SLMTA curriculum so that participants know exactly which management action will fulfill the requirements of any given checklist item. Because of this close linkage between the SLMTA curriculum and the SLIPTA checklist, in June 2012, after modification of the SLIPTA checklist, the SLMTA curriculum underwent revisions to remap the revised checklist items to SLMTA instructional activities.

Each laboratory participating in SLMTA conducts an internal audit at the beginning (baseline) and the end (exit) of the programme using the SLIPTA checklist. The difference between baseline and exit scores, as well as their respective star ratings, is calculated in order to quantify the effects of the programme on laboratory function and quality (Figure 1). In addition to the SLIPTA scores, laboratories demonstrate their progress through improvement project data such as turn-around time, sample rejection rate, stock out rate, customer satisfaction survey results and before-and-after photographs of physical changes.

### TABLE 1: Sections of the WHO AFRO SLIPTA checklist and star ratings.

<table>
<thead>
<tr>
<th>Section</th>
<th>Points</th>
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<tbody>
<tr>
<td>1. Documents and records</td>
<td>25</td>
</tr>
<tr>
<td>2. Management reviews</td>
<td>17</td>
</tr>
<tr>
<td>3. Organisation and personnel</td>
<td>20</td>
</tr>
<tr>
<td>4. Client management and customer service</td>
<td>8</td>
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<tr>
<td>5. Equipment</td>
<td>30</td>
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<tr>
<td>6. Internal audit</td>
<td>10</td>
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<tr>
<td>7. Purchasing and inventory</td>
<td>30</td>
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<tr>
<td>8. Process control and internal and/or external quality assessment</td>
<td>33</td>
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<td>9. Information management</td>
<td>18</td>
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<tr>
<td>10. Corrective action</td>
<td>12</td>
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<tr>
<td>11. Occurrence and/or incident management and process improvement</td>
<td>12</td>
</tr>
<tr>
<td>12. Facilities and safety</td>
<td>43</td>
</tr>
<tr>
<td>Total score</td>
<td>258</td>
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### Variations from the basic implementation model

Some countries have customised SLMTA delivery to fit their local context. Two notable variations are Cameroon and Lesotho, which adapted their programmes to address local challenges and to enhance existing laboratory capacity-building efforts. Despite the variations, both adaptations adhere to the critical requirement of implementing SLMTA as a process (a series of workshops with improvement projects and mentoring) rather than a single training event.

### Cameroon

Most countries conduct the SLMTA training in a central location. This centralised model provides logistical convenience, particularly when many laboratories are enrolled in the same round, allowing the programme to train many laboratories at one time. It also enables personnel from various laboratories to interact and learn from each other. However, there are drawbacks, including, (1) high costs associated with renting a venue and travelling participants; (2) staff must be absent from their laboratories for prolonged periods because of travel between home and training locations; and (3) a limited number of staff can attend the course, creating a potential divide between those who are trained and those who are not. Working with a very limited budget, Cameroon decentralised the workshops and conducted facility-based training, with teams traveling to the laboratories in the programme to provide training on site. Whilst this model required more time from the trainers, it enabled hospital management and clinicians to be involved in the training alongside laboratory management, facilitating advocacy. In addition, it allowed the course to be better tailored to the needs of the individual laboratories, with all discussions related to site-specific challenges and solutions.

### Lesotho

The schedule and frequency of trainings for the initial SLMTA round in Lesotho were modified in order to match existing mentorship timetables. At the time that SLMTA was adopted, the country had already begun a structured mentorship programme with an embedded mentor. This mentor soon became certified as a SLMTA trainer so that he could enhance on-going mentoring efforts with the SLMTA programme. These laboratories received SLMTA training one day per week over two blocks of six weeks each, spaced six months apart. The total training time was the same as the standard three-workshop model. Because of the availability of a full-time mentor, these laboratories received more intensive and frequent monitoring visits – a total of 12 visits versus the standard six – and were able to implement numerous improvement projects.

### Capacity building for programme scale-up

In order to facilitate programme scale-up, a training-of-trainers approach was used to develop indigenous trainers,
who in turn implement the SLMTA programme in-country.27
Because the quality and integrity of the programme relies
heavily on these local trainers, it is critical that they are
competent and well qualified. To achieve that goal, the
programme has established strict screening criteria in
order to ensure that potential trainers have the necessary
availability, motivation and commitment, along with a
technical background. A formal training-of-trainers course
was developed in which SLMTA master trainers teach
both the curriculum content and also facilitation skills. This
two-week course provides a demanding but supportive
environment where participants conduct teach-back of
assigned activities from the curriculum and immediately
receive constructive feedback from master trainers in order
to improve their facilitation skills and understanding of
the content. To graduate, participants must fulfill several
requirements: (1) 100% daily attendance, including group
work sessions; (2) equal responsibility in the preparation and
facilitation of teach-back assignments; (3) 100% completion
of homework; and (4) endorsement by a master trainer.
Participants and their organisations also receive reports
providing performance reviews and recommendations on
specific roles that they are competent to play in programme
implementation.

Timely, specific, behaviour-focused feedback is the
cornerstone of training-of-trainers. As such, the master
trainers’ ability to mentor the participants and provide
constructive feedback determines the quality of trainers
produced. The rapid expansion of the SLMTA programme
has resulted in the demand for more master trainers
who can train trainers. Given the crucial role that master
trainers play in developing competent trainers, they must
be highly motivated and effective, their qualifications
must be impeccable and their development and selection
process rigorous. To be considered as a master trainer
candidate, he or she must: (1) be a certified SLMTA trainer;
(2) have conducted the entire SLMTA process; (3) have
the availability and commitment needed to be a strong
asset to the programme; and (4) be nominated by an
existing master trainer. Eligible candidates are invited to
a training-of-trainers course, where they apprentice under
existing master trainers whilst sharing the course workload
equally.27 Throughout the course, these candidates receive
coaching and feedback on their performance from master
trainers and their competence and commitment are assessed
constantly.

Additional considerations
Country commitment
Countries adopting the SLMTA programme are advised to
fulfill certain pre-requisites to ensure success. Firstly, they
must have a national laboratory policy and strategic plan,
along with a laboratory technical working group in order to
drive the initiative forward. Secondly, countries must ensure
financial and political support for SLMTA and a commitment
to improving laboratory quality at all levels: Ministry of
Health, hospital management, laboratory management and
laboratory staff. It is critical that SLMTA sites have dedicated
quality assurance and safety officers. It is also important
for participants to remain in the same job or organisation
throughout the duration of the programme and to be allowed
the time needed to participate in the programme.

Site selection
Site selection should be based on several factors, including
facility infrastructure, staffing levels, impact on coverage of
patient care, geographic considerations and demonstration of
site commitment. The number of laboratories enrolled for
each round of SLMTA (i.e., cohort) has varied by country
– ranging from one each in Angola and Swaziland to 27 in
Malawi.25 Countries have been advised to start small and
scale up progressively. However, political pressure for
broader impact and the desire for more laboratories to benefit
from SLMTA may have resulted in some countries enrolling
large numbers of laboratories. Four countries (Ethiopia,
Malawi, Nigeria and Uganda) have enrolled > 20 laboratories
in the first or subsequent SLMTA cohorts.25 Enrolling a large
number of laboratories requires more human and logistical
resources for the provision of sufficient site monitoring
and support. In addition, it is essential that there is good
communication and coordination amongst trainers and
mentors so as to ensure consistency throughout the group.

Most countries have continued to enroll new laboratories
in subsequent SLMTA cohorts.25 Kenya to date has initiated
six cohorts of SLMTA, enrolling a total of 50 laboratories
and seven blood banks. Lesotho, a small country with only
19 laboratories, has reached a high coverage of 18 (95%)
laboratories over three cohorts of SLMTA.

Human resources
Countries vary in their capacity to rollout the SLMTA
programme. Implementation requires three primary cadres:
trainers to teach the curriculum; auditors to perform the
internal audits; and mentors to facilitate the improvement
projects. Regional and in-country SLMTA training-of-trainer
workshops conducted during the past five years have steadily
produced more local trainers.27 Although the demand for
SLMTA trainers still exceeds the supply, the deficiency is
less severe than that of qualified auditors and mentors. Using
unqualified auditors may lead to inaccurate audit findings
and missed non-conformities. This gap is being addressed
slowly as many countries are seeking partners’ help with
regard to scaling up auditor training.

Mentorship and site visits may be the most challenging
aspect of implementation and are often overlooked in the
initial programme planning. Site visits require personnel
time, transportation resources (fuel, vehicle, driver) and
lodging and per diem if overnight stays are necessary. If this
component is not scheduled and budgeted properly from
the beginning, countries often struggle to provide the onsite
support and supervision that are critical to the programme’s
success. Site visits are necessary in order to check the progress of the improvement projects, assess effectiveness of the previous workshops, troubleshoot site-specific issues and provide motivation and encouragement. Site visits often involve meetings with top facility management to advocate support for the laboratory. The length of site visits has varied greatly between countries and even amongst laboratories within the same SLMTA cohort, ranging from half a day to three or more days at each site. The frequency and length of site visits should be considered carefully and planned according to the size and scope of testing activities in the laboratory. In addition, the level of quality at baseline and progress thereafter, as well as site staff’s experience with regard to implementing quality systems, should be considered. Laboratories needing more support should receive longer or more frequent visits to enable them to make measurable improvements and sustain their motivation.

The need for extensive but affordable site support has led countries such as Cameroon, Mozambique, Swaziland and Zimbabwe to establish structured mentorship programmes with full-time facility-based local mentors – a model spearheaded by Lesotho. This model has well-defined goals for each mentoring engagement, extended contact time on site, defined periods when mentors are absent, consistent approaches across laboratories and measurement of progress using standardised tools. Mentors may come from the laboratories they are assigned to mentor, from a local partner, or from outside the country. Mentors receive training in SLMTA implementation, mentorship and auditing. Because of their extended participation in the laboratories they are mentoring, they are able to gain knowledge of the rhythms, practices and personalities of the laboratory, enabling them to facilitate the necessary changes in attitudes and behaviours.

Other strategies have been used to provide the needed support for the SLMTA laboratories. In Kenya, for example, select SLMTA hospital laboratories were paired, or ‘twinned’, with internationally-accredited research laboratories. The accredited laboratories mentored the SLMTA laboratories in quality management system implementation.

Experience from Africa

SLMTA was launched in Africa in 2009. By the end of 2013, it had been implemented in 23 countries on the continent with a total of 503 participating laboratories, which constituted 87% of all the SLMTA-enrolled laboratories in the world. As the continent that launched SLMTA, Africa has demonstrated to the world that with ingenuity, innovation and determination, implementing quality management systems is possible, despite resource limitations. To date, four SLMTA-enrolled laboratories in Africa have been accredited to ISO 15189, whilst many more are making great progress in continuous quality improvement. In the sections below, we highlight the experiences of four African countries.

Mozambique – Country ownership and sustainability

To develop a self-sufficient quality programme, Mozambique integrated SLMTA within the existing structure of the Ministry of Health laboratory system. A National Laboratory Quality Technical Working Group was established and a dedicated coordinator hired. The Ministry of Health provided the vision and leadership in implementation and advocacy, coordinated and financed the programme with partner support and pressed for SLMTA activities to be included in provincial and hospital annual plans and budgets. Decentralising programme management to the provincial level has enabled them to increase programme coverage and lower the costs.

Rwanda – Data-driven advocacy

As with many other countries, Rwanda’s laboratories suffered from chronic service disruptions as a result of reagent stock-out and equipment breakdowns from lack of maintenance. An improvement project was assigned to the SLMTA-enrolled laboratories, which tracked the number of tests not performed because of stock-out and equipment breakdowns over a three-month period. They then calculated the funds required to purchase needed reagents and maintain equipment, along with the revenue that would have been generated from these tests, finding that the missed income was far greater than the cost of preventing stock-out and equipment breakdowns. This return on investment analysis persuaded hospital management to prioritise reagent supplies and to contract with manufacturers to provide regular maintenance services for the laboratory equipment.

Cameroon – Expanding quality past the laboratory

In Cameroon, management at one hospital witnessed the transformation of its laboratory after SLMTA and undertook to extend the quality into other units of the hospital. They formed their own quality improvement teams, which have reported improved hospital cleanliness, reduced patient waiting times, greater patient satisfaction, development of new treatment protocols and increased recognition of the importance of patient safety. Additionally, a reduction in infection rates and stillbirths, as well as an increase in the number of patients served and hospital revenue, have been observed.

Zimbabwe – Overcoming contextual challenges

Zimbabwe has suffered economic crises in the past few decades, resulting in deterioration of the healthcare system and a shortage of human resources. Participants in its two SLMTA cohorts have identified creative solutions to overcome the extensive logistic and resource challenges. For example, standard operating procedures were handwritten in exercise books, Levy-Jennings charts were plotted manually and a paper-based system was used where computerised Laboratory Information Systems were not
SLMTA’s global reach and influence outside Africa

The SLMTA-driven laboratory quality improvement achieved in Africa has inspired countries in other regions to follow suit, even in the absence of a regional or national accreditation preparedness scheme such as WHO AFRO’s SLIPTA. Outside the continent of Africa, 24 countries from the Caribbean Region, Central and South America and Southeast Asia have adopted the SLMTA programme and have used the SLIPTA checklist to measure gaps and the progress of enrolled laboratories. The Caribbean Region, comprising many island countries with diverse geography, people, size and economy, has implemented SLMTA in 12 countries. After completing the SLMTA programme, Bahama’s National HIV Reference Laboratory was accredited and two other enrolled laboratories in the region are also seeking international accreditation. In Southeast Asia, impressive results have also been observed in Cambodia and Vietnam, where one provincial laboratory that tests clinical as well as food and environmental samples was accredited to ISO 17025 in 2013. A desire to automate data collection, analyse and manage SLIPTA audit data more efficiently and to enable real-time graphical display of actionable results at audited facilities led to the development of a multi-lingual electronic tool in Vietnam. This tool has been shared with the global SLMTA community. In Latin America, a partnership was forged where 14 military laboratories from eight countries in the region were enrolled in PROMELA (Programa de Mejoramiento de Laboratorios de las Fuerzas Armadas de Latinoamérica), an overarching laboratory improvement programme using SLMTA as its principle training tool in addition to other practical laboratory training and biosafety and/or infection control training. The fact that two Africa-based master trainers (one Anglophone, one Lusophone) came to assist in the first Spanish-speaking training-of-trainers in Latin America underscores the benefits of standardised training and highlights SLMTA’s true global nature and its far-reaching network across borders and continents.

Lessons learned

Throughout the SLMTA rollout, countries have overcome many challenges such as attrition of SLMTA-trained staff, encouraging the entire laboratory to work as a team, engaging hospital management, and insufficient mentorship capacity. Table 2 summarises the most common challenges and offers corresponding recommendations to help guide future implementation. Despite the challenges, SLMTA has

<table>
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<th>Common challenges</th>
<th>Recommendations</th>
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| Number of labs enrolled in each cohort of SLMTA: | - Limit the number of laboratories according to available financial, logistical, and human resources.  
- Use the initial SLMTA-enrolled laboratories to identify problems most likely to affect other laboratories in the country.  
- Present recommendations to upper management and advocate for system-wide reform. |
| Programme disruptions: How can delays and disruptions during SLMTA implementation be minimised? | - Before implementation, identify costs of the entire process, including all activities necessary to achieve accreditation preparedness. Budget resources accordingly.  
- Define and agree on roles and responsibilities with all parties involved.  
- Set dates of all programme activities during planning and adhere to the schedules.  
- Request authorisation for budget, travel dates, release of trainers at the beginning of the programme. |
| High staff turnover: How can staff turnover be minimised during the SLMTA process? | - The Ministry of Health and hospital management should be enlisted to help reduce reassignment during SLMTA implementation. Consider signing a Memorandum of Understanding with heads of the participating institutions to confirm commitment.  
- Sites should not be enrolled if management does not agree to keep staff in current positions for the duration of the programme.  
- Minimise the impact of turnover by training more than one person from each site. |
| Non-SLMTA staff involvement: How can staff members not involved in the SLMTA training be engaged for the overall improvement effort? | - Require those who attend the SLMTA workshops to share their knowledge and tools with their colleagues when they return home.  
- Hospital and laboratory management must be engaged and mandate that improvement projects involve all laboratory staff. |
| Hospital management: What is the best way to engage hospital management? | - Identify a clinician who is a champion for the laboratory, and enroll that person in SLMTA.  
- Communicate with the hospital administration, keeping them informed on issues and progress. Publicize the laboratory’s success stories.  
- Conduct the SLMTA activity “Meet the Clinicians” on site to facilitate communication between laboratory staff and clinicians. |
| Site support and mentoring: What is the best way to ensure that each laboratory receives sufficient mentorship support, given limited mentoring capacity and resources? | - Limit the number of laboratories enrolled based on the available resources required for on-site support and mentoring.  
- Establish a structured mentorship programme using local mentors who have been carefully selected and trained.  
- Clearly define, measure, and report outcomes of mentorship engagement. |
| Program sustainability: How can SLMTA become self-sustaining within a country? | - Establish or strengthen quality management systems coordination within the existing Ministry of Health structure.  
- Decentralise programme management to provincial levels to increase programme coverage whilst lowering cost.  
- Integrate SLMTA into pre-service curriculum for laboratory professionals.  
- Select and train laboratory managers or other qualified individuals as mentors within their own laboratories.  
- Conduct in-country training-of-trainers to develop a cadre of local SLMTA implementers for continuous implementation.  
- Reduce programme costs by using health facilities for training, rather than renting meeting space. Integrate small “bite-size” training sessions into established laboratory routines, such as teaching one activity during weekly staff meetings.  
- Present recommendations to upper management and advocate for system-wide reform. |

SLMTA, Strengthening Laboratory Management Toward Accreditation.

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worked successfully by demonstrating that with resolve, commitment and ingenuity, laboratory teams in developing countries can improve their service delivery using existing limited resources. It also demonstrates that starting with small tangible improvements (‘low-hanging fruit’) and gradually building upon early successes can boost laboratory teams’ confidence and motivate them to tackle the harder issues. This strategy is similar to the ‘Little Steps’ approach that has been shown to be effective in sustaining healthcare quality improvement efforts in developing countries.

Within a few years, SLMTA has demonstrated its transformative power, emerging as a flagship programme for laboratory system strengthening in PEPFAR-supported countries. A recent 2013 Institute of Medicine report identified the improvement of laboratories under PEPFAR support and guidance as a signature achievement. In addition, it states that:

PEPFAR’s laboratory efforts have had a fundamental and substantial impact on laboratory capacity in countries. This laboratory infrastructure has been, and continues to be, leveraged to improve the functioning of countries’ entire health systems.

As laboratories do not exist in a vacuum, there have been calls for the SLMTA model to be adapted for the clinical settings in developing countries, with a goal toward overall hospital accreditation. This will ensure the sustainability of laboratory improvements and accreditation, and boost the centrality of quality management systems in hospital facilities, resulting in better patient care.

SLMTA implementation has been supported primarily with PEPFAR resources. To ensure its longevity and viability beyond PEPFAR, countries must work hard to integrate the SLMTA components into normal laboratory operations, decentralize programme planning and budgeting to the provincial or lower level, look for ways to be financially self-sufficient (such as charging enrollment fees for privately-owned laboratories) and incorporate the curriculum into pre-service education.

**Conclusion**

After five years of implementation, SLMTA has proven to be an effective programme for the strengthening of laboratory health systems, with a focus on building management capacity in order to achieve quality services for improved patient care. Evidence to date has indicated widespread success of the programme in its ability to facilitate continuous quality improvement in the enrolled laboratories. SLMTA has the unique potential to help laboratories make progress through the SLIPTA process, improve quality of services and subsequently achieve accreditation to ISO 15189.

The authors also extend their gratitude to all the SLMTA implementers for their tireless effort in improving the quality of laboratory systems and patient care in resource-limited settings.

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**Competing interests**

The authors declare that they have no financial or personal relationship(s) which may have inappropriately influenced them in writing this article.

**Authors’ contributions**

K.Y. (CDC) led the development of the SLMTA programme, oversaw its global implementation and wrote the manuscript. T.M. (ASLM) played a key role in programme expansion and implementation and provided input to the manuscript. E.L. (CDC) provided substantial input to the writing of the manuscript. J.N. (CDC) provided high-level strategic direction for programme development, implementation and manuscript writing.

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