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**Laboratory Logistics Management and Capacity Building at Facility Level:**  
Concept paper based on the Supervision, Performance Assessment and Recognition  
Strategy

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## **PREFACE**

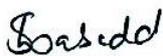
Capacity building is an important aspect of any Ministry of Health Program. In Uganda today, the human resource capacity in laboratories especially at health facility level is greatly constrained with a number of challenges including under staffing, high staff attrition and lack of harmonized training materials. With such challenges, it is important that laboratory facility staff are supported and mentored in their day to day work.

The Supervision Performance Assessment and Recognition Strategy (SPARS) has been adopted by Pharmacy Division at the Ministry of Health, Uganda, as a strategy for strengthening medicines management at health facility level. Improvements have been registered not only in medicines management but also in the health facility staff's management capacity in handling various facility issues. Data generated during supervision has been useful at both district and national level for monitoring performance and crafting workable solutions for medicines management challenges.

Evidence based on improvements in medicines management has proved that supportive supervision coupled with performance assessment (SPARS approach) can be adapted to any program area, hence the development of the LAB SPARS concept.

This concept paper details the roll out of LAB SPARS approach based on lessons learnt among 79 districts implementing SPARS for medicines management. It further details five component areas necessary for comprehensive performance assessment of laboratory logistics supply chain at facility level.

This concept should be used as a guide for national roll out of the LAB SPARS approach by partners supporting facility level activities and are able to fund the implementation. This concept and initial roll out among selected districts is supported by Uganda Health Supply Chain (UHSC) project.



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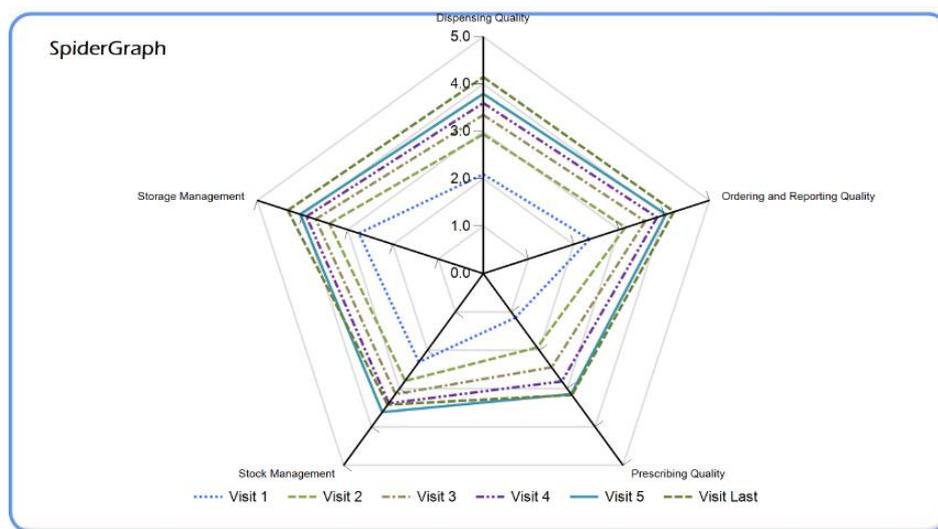
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## 1. Introduction

Supervision Performance Assessment and Recognition Strategy (SPARS) was initially implemented in the 45 MSH-led, USAID-funded program, Securing Ugandans' Right for Essential Medicines, (SURE), supported districts and rolled out to other districts by implementing partners to cover a total of 105 districts as of July 2013. The Uganda SURE follow on program, Uganda Health Supply Chain (UHSC) program, (UHSC), is continuing with the medicines SPARS roll out to all districts in the country. Implementation of SPARS by Medicines Management Supervisors (MMS) has greatly led to improvement in medicines management. Sufficient evidence from over 1000 health facilities has shown SPARS to be successful not only in improving medicines management but also goes a long way in building health workers capacity through the continued on-the-job training and mentoring.

District staff selected by the District Health Officer are trained in a two week examinable course as Medicines Management Supervisors (MMS). The MMS's are facilitated to do routine facility support supervision which involves on-the-job training and mentoring of health workers coupled with performance assessment using an indicator based assessment tool with 27 qualitative and quantitative indicators. Results from the initial 45 districts have shown great improvement in medicines management, as seen below

*Figure 1: National performance after SPARS intervention*



Visit number	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit Last
Total score average	10.61	14.18	16.21	17.53	18.64	19.52
Number of visits	1681	1556	1459	1289	1105	869

SPARS has enabled establishment of continuous information sharing of medicines management from facility to district level. This information is valuable for managers at all levels to identify problems, assess impact of interventions and make evidence based decisions.

## 2. Objective of the LAB SPARS Concept Paper

This concept paper outlines why the SPARS approach should be adopted by the CPHL. It also outlines how it can be rolled out to improve capacity at facility level, including a detailed implementation approach and the resources needed.

### **3. Justification of SPARS Approach**

#### **Laboratory supply chain management**

Findings of an assessment conducted in 2012 indicated inadequate storage, disorganised storage areas and limited access to reliable power as some of the major challenges at health facility<sup>1</sup>. The report further showed that only 44% of the public health facilities were aware of the test menus relevant to their level of care.

In addition, 7% of the facilities noted poor equipment maintenance as a concern with poor equipment functionality cited as having a major effect on alignment of test procedures as well as affecting overall laboratory logistics negatively. A similar assessment conducted between 2010 to 2016 showed that document<sup>2</sup>s and records was among the four worst performing components of the twelve SLMTA quality systems essentials. The average baseline score for documentation and records was 33% whereas the mid-term results indicated an average score of 48% which falls short of the 50% mark.

#### **Complementary supervision strategies for SLMTA**

The Strengthening Laboratory Management Toward Accreditation (SLMTA) program was developed to promote immediate, measurable improvement in laboratories of developing countries<sup>2</sup>. Like many other countries in the developing world, Ministry of Health, Uganda /Central Public Health Laboratories, (CPHL), adopted SLMTA as the overall program to laboratory quality systems improvement. Approximately 100 (majorly from HCVI and above) out of the over 2,400 labs in the country have been enrolled into SLMTA. SLMTA as a program, focuses on twelve laboratory based thematic areas, with a framework for implementation and has demonstrated improvements in the quality of laboratory services delivered ,however, the design of the SLMTA package needs to be complemented with other country-specific strategies to achieve greater synergy.

One such strategy is Lab SPARS to improve systems that focus on laboratory supplies capacity-building initiatives at facility level, with more frequent support and assessments by mentors. The four areas from SLMTA that are interlinked with laboratory supplies management to be addressed by Lab SPARS are: laboratory equipment, laboratory information systems, quality assurance and finance management.

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<sup>1</sup> Pedun MO and Larsen CH. (2012). Uganda Laboratory Logistics System Assessment(Uganda). Kampala: SURE-USAID.

<sup>2</sup> Yao et al, K. (2010). Improving Quality Management Systems of Laboratories in Developing Countries: An Innovative Training Approach to Accelerate Laboratory Accreditation. American Journal of Clinical Pathology, Vol 134(3): 401 - 409.

### **Quality of Laboratory supervision**

Centrally, CPHL is in charge of coordinating all support supervision activities. Whereas support supervision tools are available, the key assessment areas put minimal emphasis on Stock Management, Storage management, recording, receipt and recording and equipment management. At district level, the concept of District Laboratory Focal Persons (DLFP) was adopted in Uganda in 2002 as part of the Integrated Disease Surveillance Response (IDSR). All districts designated laboratory personnel are drawn from their existing staff to fulfill the role of DLFP. As various laboratory strengthening programs were rolled out throughout the country, the role of DLFPs expanded beyond surveillance and rapid response to include; coordination of logistics, quality assurance and training. Currently, DLFPs coordinate such activities as ordering, receiving and storage of laboratory supplies, they act as the first controllers in the AFB slide rechecking external quality assessment scheme, and are engaged in regular support supervision of laboratories in their districts. However, their activities in support supervision have been limited by lack of support in terms of transportation, specific supervision tools and competing priorities since the position of DLFP is an additional responsibility to their bench tasks.

### **4. Implementation of Lab SPARS**

It is important to understand what it entails to roll out a performance assessment and capacity building strategy before commencement. This section details, step by step of what it takes to roll out such a strategy and the cost involved.

#### **4.1 Stakeholders Engagement**

Lab SPARS implementation requires involvement of the major stakeholders right from the planning stage all through the implementation stages. The major stakeholders in Lab SPARS include Uganda national health laboratory services, National warehouses, District Health Office, Health facility, Health development partners, and the Implementing partners (IPs).

#### **4.2 Defining Performance Assessment Components**

Effective evaluation of program performance requires that key performance indicators are defined. These are the guiding components in assessing performance at facility level, with the information generated feeding centrally into the program. The agreed-upon performance assessment components form the basis for health facility staff capacity building through continuous mentoring and on-the-job training by the trained district based Laboratory SPARS Supervisors (LSS). The 5 performance assessment components and indicators suggested are as below;

##### **Stock management**

1. Availability of reagents for selected tests on day of visit
2. Stock card availability
3. Correct filling of stock card
4. Does physical count agree with stock card balance?
5. Is AMC in the stock card correctly calculated?
6. Is Stock book correctly filled?
7. Is AMC in the stock book correctly calculated?

8. Number of items not overstocked?
9. Order fill rate

#### **Storage Management**

10. Cleanliness of the laboratory including storage facilities
11. Proper hand washing practices
12. System for storage of laboratory reagents and supplies
13. Storage conditions for laboratory supplies/reagents
14. Storage practices of laboratory reagents

#### **Ordering, Receipt and Recording**

15. Reorder level calculations
16. Adherence to ordering and delivery procedures
17. Availability of a laboratory product catalogue

#### **Laboratory Equipment**

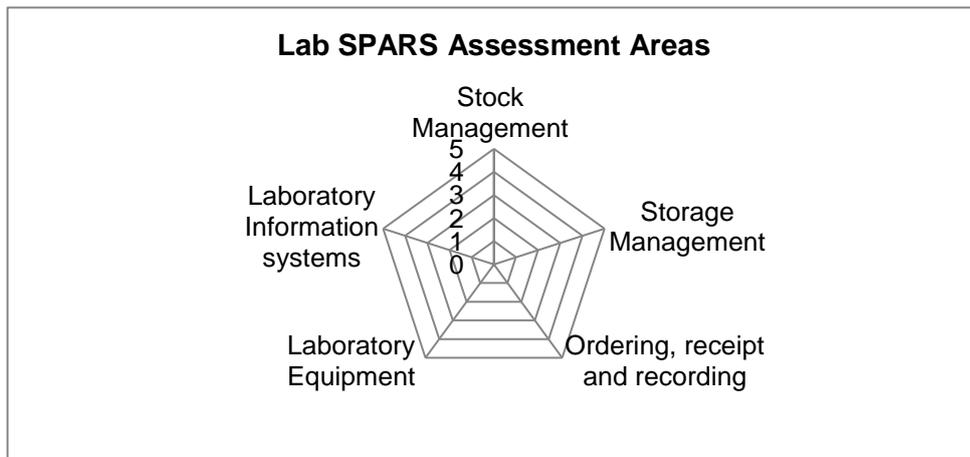
18. Developing and maintaining facility equipment inventory
19. Equipment management plan to ensure equipment functionality
20. Equipment Functionality
21. Equipment utilization

#### **Laboratory Information systems**

22. Availability of laboratory data collection forms
23. Adherence to the reporting schedules of the HMIS 105 to the district
24. Accuracy of HMIS 105 (lab tests)
25. Availability of HMIS 105 forms of previous 6 months on day of visit)
26. Availability of displayed information on day of visit
27. Filing of reports

The five assessment areas are summarized in a spider graph. The graph shows progress in the lobes based on the improvements made during the Lab SPARS implementation.

Figure 2: Lab SPARS Assessment Areas



#### 4.3 Development of a Lab SPARS performance mentoring tool

The 27 indicators covering the 5 domains assessed form the basis for Lab SPARS performance mentoring tool. The layout of the mentoring tool allows for performance assessment at each visit to the facility.

#### 4.4 Development and review of training materials

SPARS combines five strategies; (Education) classroom training, managerial (manuals), (Regulatory) setting standards and recognition coupled with performance assessment.

The Lab SPARS performance mentoring tool guides the content of the training materials. Training materials including trainer and participant guides have been developed by a selected technical working team involving CPHL staff, implementing partners and UHSC staff.

The training is modular based. All the key performance components outlined in step two above are included in the modules. Modules include:

- All the 5 performance components outlined above;
- General supervision, mentoring and coaching principles and how to specifically supervise and measure performance of the 27 indicators;
- Problem analysis before identifying solutions
- Communication
- Quality Improvement (QI) principles
- Data management, especially analysis for decision making

Effective communication is important for a supervisor during any supportive supervision program. Supervisors should also be taught how to carry out mentoring and on-the-job training during every supportive supervisory visit. Supervision is not inspection but mentoring and coaching with the aim of improving performance.

#### **4.5 Phased roll out**

Lab SPARS will be rolled out by CPHL/UHSC in a phased manner starting with a pilot and then a national roll out which will be informed by the pilot study impact assessment. Twenty (20) districts have been selected to participate in the Lab SPARS pilot phase. The districts were purposively selected based on PEPFAR priority and UHSC supported districts leveraging on the available resources (bikes and knowledge from experienced MMSs). All high level facilities (Hospitals, HC IVs and HC IIIs) government and PNFP facilities within the pilot districts were selected for inclusion.

#### **4.6 Selection of Lab SPARS Supervisors (LSS)**

Lab SPARS Supervisors (LSS) who implement SPARS are district-level health care staff members employed by the government. District Health Officers select LSS based on their experience in managing health unit laboratories, leadership and management skills, interest in and knowledge of laboratory issues.

#### **4.7 Training of Lab SPARS Supervisors**

The supervisors undergo a 2 weeks training in; general supervision, mentoring and coaching principles, problem analysis before identifying solutions, communication, quality improvement principles and data management. The LSS also receive a 3 days' basic computer training and use of the SPARS electronic database.

#### **4.8 Implementation of Lab SPARS in districts**

Laboratory SPARS supervisors are required to make a supervision schedule at the end of the 2 weeks classroom training. This is followed by a 5-day practical training on data collection, mentoring and coaching of health facility staff through five one-day visits to the facilities, under the guidance of experienced trainers/mentors.

Drawing experience from the implementation of medicines management SPARS; the LSS supervise the facilities every two months for the first 5 visits. With each visit, data is collected for all the performance components; however, focus for staff mentoring, coaching and on-the-job training is given to at least one component (of the five) per visit.

#### **4.9 Recognition strategy**

Health facility staff and Lab SPARS supervisors who achieve improvements are recognised. The aim of the SPARS recognition component is to provide motivation.

Rewards are largely linked to performance; for example, lab SPARS supervisors who pass the training course receive a bag containing pens, a calculator, and a netbook. In addition, when they pass the driving license and defensive riding tests, they receive a motor bike license, a motor bike and riding gear. After a specified number of supervisory visits, Lab SPARS supervisors are also recognised with cellphone airtime. Other recognition items for Lab SPARS supervisors include internet airtime and

payment for expenses linked to the SPARS visits they make. Funds for motorbike repairs, servicing and new tyres are provided as well.

Similarly, facilities that score well receive rewards so as to help them deliver quality laboratory services. In addition, items for personal use such as T-shirts, calendars, toilet paper, sugar, tea and mugs are provided.

The recognition strategy is kept as inexpensive and simple as possible to maintain costs to a minimum.

## 5. Data handling and information processing

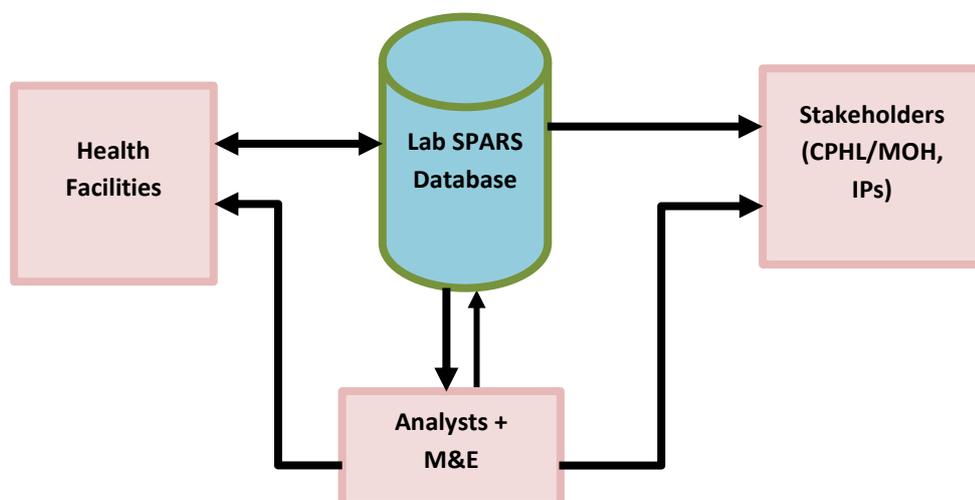
All district level supervisors (DLSS/HSD-LSS) are trained in basic computer literacy, electronic data collection and submission. During Lab SPARS implementation the electronic and manual data collection tools are used concurrently.

### 5.1 Electronic Data and Information processing

The Lab SPARS survey tool has been translated into an electronic tool to allow for data capture and analysis. The district level supervisors (DLSS/HSD-LSS) are trained in computer literacy and use of the electronic tool. The data provided by facilities resides on a server at CPHL. This central data repository allows for fast reporting and information sharing with relevant stakeholders at different levels. It is possible for data to be extracted from the database for further analysis using statistical packages e.g. STATA.

With input from the M&E team, the programmer customizes the electronic tool for the generation of particular reports against specific variables. The electronic system generates reports at national, regional, and district and facility levels.

#### Data flow diagram



## **5.2 Data quality measures**

Each Lab SPARS supervisor cross-checks the completed laboratory assessment tool for completeness, accuracy and consistency prior to entering the information into the e-tool. This ensures that only good quality data gets into the database. In addition, a sample of hard copy completed assessment tools is obtained and cross-checked on the database by the data analyst at CPHL to ensure that the information on the hard copy tool corresponds to what was entered by the Lab SPARS supervisors. This minimizes data entry errors thereby improving on the quality of data collected by the team.

As a further quality control measure, the Lab SPARS database has checks embedded in it to ensure that values that are out of range, illogical and incorrect are not entered hardcopy tool.

## **5.3 Data Analysis**

Study outcomes on a continuous scale are tested for normality using Schapiro Wilks test and depending on the results of this test, parametric (t-tests) or non-parametric (Wilcoxon) tests are used to determine the differences between the intervention and control facilities. Bivariate analysis is used to identify other factors influencing the improvement of Lab SPARS score. Multivariate analysis is used to determine the association between the statistically significant factors in the bivariate analysis and the outcomes of the study. All analyses are done using Stata version 12.0.

## **6. Reporting**

Technical reports are generated routinely from the Lab SPARS database and shared at different levels including the facility, district, regional and national level. At any one visit, the laboratory SPARS supervisors generate a brief report on key findings, especially the gaps that call for urgent action by the facility in a given focus area. The laboratory SPARS supervisor and the facility staff jointly agree on solutions to be implemented to address these gaps prior to the next supervision visits.

On a quarterly basis, the central coordination team compiles a progress report to be shared with the DHO's office and other stakeholders. Annually, a technical report is compiled by the central office and feedback meetings held as well. Additionally feedback from the RLFP is be integrated into the quarterly and annual technical reports.

## **7. Performance monitoring**

The performance of the facilities is monitored through the routine support supervision using the indicator based tool (Lab SPARS supervisor's mentoring and assessment tool) and reported through the dashboard.

Additionally, the performance of the district-level supervisors is monitored to ensure that facilities supervised show progressive improvement and that Supervisors meet their monthly targets. A three tier structure involving the DHO's office, the Regional Laboratory Focal Person (RLFP) and central coordination office at CPHL is utilized.

On a monthly basis, the district level supervisor provide a performance report and a work plan for the next 2 months to both the DHO and the CPHL coordination office. On a quarterly basis, the RLFPs/CPHL staff provide technical support to the Lab SPARS Supervisors and ascertain progress towards the set targets. Independent feedback from the RLFP is provided to the DHO's office, CPHL management and UHSC by email for action where necessary

#### **8. National roll out and Sustainability**

The CPHL, with support from the UHSC program will lead the roll out of the approach among selected 20 districts. Lessons learnt from the initial phase of implementation will be documented and disseminated to all stakeholders. To ensure sustainability of Lab SPARS, a pool of trainers will be created by CPHL. These will involve central level CPHL staff, Implementing partners and Regional lab focal person

## Appendix 1: Budget for activities

	Detail	Unit cost	Days / units	No.	Total	Notes
	<b>Initial Startup Costs</b>					
1	<b>Stakeholders' engagement meeting</b>					
	Per diem for 62 participants	161,000	62	2	19,964,000	40 participants from the pilot districts, 4 from comparison districts, 9 RRH Directors, 9 Lab In Charges RRH
	Fuel refund for the participants (each district team travelling in one car)	3,700	114	20	8,436,000	114 liters in 20 districts, average distance of 400km
	Venue hire	600,000	1	1	600,000	Drivers from the 20 pilot districts, 9 RRH
	Break tea	10,000	1	71	710,000	
	Lunch + Drink	30,000	1	71	2,130,000	
	Afternoon tea	10,000	1	71	710,000	71 attendees
	Water during meeting (Morning+ Afternoon)	4,000	1	71	284,000	
	Stationery - pens, folders, markers, note books, tape	1	1	1	302,000	
	<b>Sub Total</b>				<b>33,136,000</b>	
2	<b>Review of training materials</b>					
	Venue hire	400,000	5	1	2,000,000	
	Break tea	10,000	5	23	1,150,000	
	Lunch + Drink	30,000	5	23	3,450,000	
	Afternoon tea	10,000	5	23	1,150,000	
	Water during meeting (Morning+ Afternoon)	4,000	5	23	460,000	
	Stationery - flip charts, tape, pens, note books, markers	1	3	1	70,000	
	<b>Sub Total</b>				<b>8,280,000</b>	

	Detail	Unit cost	Days / units	No.	Total	Notes
3	<b>Training of Trainers</b>					
	Training costs for 13 Trainers of Trainers(TOTs)	4,300,000	13	1	55,900,000	Training for 2 weeks
	<b>Sub Total</b>				<b>55,900,000</b>	
4	Procurement of Lab SPARS supervisors computers and modems					
	Procurement of computers and modems	3,060,000	1	42	128,520,000	computer, modem, computer lock; dollar rate
	<b>Sub Total</b>				<b>128,520,000</b>	
5	Procurement of Motor cycles					
	Purchase of motorcycles	13,600,000	42	1	571,200,000	42 motorcycles at USD 4000 per bike
	Comprehensive Insurance for the motorcycles (annual)	6,800,000	42	1	285,600,000	Insurance for 1 year
	<b>Sub Total</b>				<b>856,800,000</b>	
6	Purchase of riding gear					
	Purchase of riding gear	2,300,000	42	1	96,600,000	Based on medicines SPARS expenses
	<b>Sub Total</b>				<b>96,600,000</b>	
7	Distribution of motorcycles to the 20 districts					
	Per diem for driver for 20 days	210,000	42	1	8,820,000	Per diem 90,000 plus accommodation 120,000
	<b>Sub Total</b>				<b>8,820,000</b>	
	<b>Training of Supervisors</b>					
8	Training of the Lab SPARS Supervisors in lab logistics					
	Training costs for 42 supervisors	4,300,000	42	1	180,600,000	42 supervisors trained for 2 weeks
	<b>Sub Total</b>				<b>180,600,000</b>	
9	Practical Field orientation/Baseline					
	SDA for Baseline/orientation assessment	17,000	5	42	3,570,000	Orientation visit for 42 supervisors after 2 weeks

	Detail	Unit cost	Days / units	No.	Total	Notes
						class room training
	Fuel	3,000	5	20	300,000	Budgeted at 500kms per district at a cost of 3,450 per litre, for 20 districts.
	Accommodation and per diem for UHSC & MoH staff	161,000	1	100	16,100,000	Per deim for UHSC staff and any other central staff
	<b>Sub Total</b>				<b>19,970,000</b>	
10	Electronic tool /Basic computer training for Lab SPARS Supervisors					
	Training costs for 42 supervisors	2,150,000	3	42	270,900,000	3 days training
	<b>Sub Total</b>				<b>270,900,000</b>	
11	Defensive riding course and driving license for Lab SPARS supervisors					
	Costs for the 42 supervisors and the riding license	1,500,000	1	42	63,000,000	5 day training
	<b>Sub Total</b>				<b>63,000,000</b>	
12	Printing					
	Printing the training materials	10,000,000	1	1	10,000,000	
	<b>Sub Total</b>				<b>10,000,000</b>	
	<b>Total start up cost</b>				<b>1,732,526,000</b>	
	<b>Running Costs for Supervisors</b>					
13	Modem monthly subscription for the LAB SPARS supervisors					
	Modem subscription for the 42 supervisors	45,000	12	42	22,680,000	45,000 per month for 1 GB, for 12 months, for 42 supervisors
	<b>Sub Total</b>				<b>22,680,000</b>	
14	Monthly airtime to support communication with assessment sites					
	Communication with the facilities (pre-visit and also feedback)	20,000	12	42	10,080,000	20,000 per month, for 42 Supervisors for 12 months

	<b>Detail</b>	<b>Unit cost</b>	<b>Days / units</b>	<b>No.</b>	<b>Total</b>	<b>Notes</b>
	<b>Sub Total</b>				<b>10,080,000</b>	
15	Lab SPARS supervisors Facilitation					
	Facilitation for routine support supervision visits by supervisors	35,000	5	297	51,975,000	318 facilities will be assessed 5 times (including the baseline assessment)
	Bike maintenance (service and small repairs)	400,000	1	42	16,800,000	400,000 per year
	<b>Sub Total</b>				<b>68,775,000</b>	
	<b>Routine Central Team Implementation Costs</b>					
16	Targeted support supervision to health facilities					
	MOH staff facilitation					
	Per diem for CPHL staff to provide technical support	161,000	4	5	3,220,000	
	<b>Sub Total</b>				<b>3,220,000</b>	
17	Monthly central support supervision to the pilot districts					
	Per diem 1 UHSC staff and 1 driver for 5 days, for 9 months	210,000	10	9	18,900,000	
	<b>Sub Total</b>				<b>18,900,000</b>	
	<b>Total running costs</b>				<b>123,655,000</b>	\$ 33,420
	<b>GRAND TOTAL</b>				<b>1,856,181,000</b>	

