

In Côte d'Ivoire, a new approach to informing harmonized laboratory systems

In many developing countries, national health systems are burdened with thousands of commodities required for monitoring HIV/AIDS diagnosis and treatment. Without harmonizing and standardizing equipment, laboratories must invest in maintaining machines that may not best address their needs, causing complicated instrument and supply chain management, as well as increased costs. This diverts money and energy that could be used in other ways to increase access to treatment. As a solution, SCMS invests in cutting-edge laboratory harmonization efforts with local governments, public health staff and implementing partners to strengthen laboratory systems and create one unified, integrated national laboratory network.

In Côte d'Ivoire: unique laboratory challenges

Since efforts to scale up national HIV/AIDS treatment began in 2004, Côte d'Ivoire has seen growing challenges in managing laboratory equipment. National laboratory facilities have had to adapt management techniques while striving to maintain hundreds of different commodities. With staff using varying techniques to conduct the same tests

on different machines throughout the country, inconsistent operations have arisen among laboratories. SCMS is helping the Ministry of Health (MoH) and partner stakeholders to maintain and update laboratory systems. Together they are working on harmonization activities to reduce the burden of equipment maintenance and resupply for national health facilities.

Maputo and the first steps towards harmonization

Harmonization efforts began in Côte d'Ivoire in response to the 2008 World Health Organization's (WHO) Maputo Declaration on Strengthening of Laboratory Systems, which declared an urgent need to improve laboratory capacity in developing countries. In 2008 SCMS, the CDC Retrovirus Côte d'Ivoire (CDC Retro-CI) project and PEPFAR implementing partners established a standardized list of laboratory equipment and related laboratory com-



FACSCount machines are among the many essential laboratory machines, used to monitor the stage of HIV infection in patients



Using nationally harmonized machines, such as this hematology analyzer, cuts down on added burdens of cost and maintenance

modities for anti-retroviral treatment (ART) sites supported by PEPFAR. This effort took into account the country's seven-tiered health system (i.e. rural health centers, special rural health centers, urban health centers, special urban health centers, regional hospitals, university hospitals and national reference laboratories), recommending where best to place required laboratory machines across all facility levels. These recommendations guided all laboratory instrument procurements for PEPFAR and formed a foundation for the next stage of laboratory harmonization activities.

Looking to simplify using forecast data

In December 2011, SCMS took a new approach to harmonization in Côte d'Ivoire by analyzing up-to-date testing data, known as service statistics, to determine usage levels of the laboratory instruments. These service statistics are traditionally used for forecasting – making predictions for the future based on present costs and level of use within laboratories. In this harmonization activity, however, service statistics were used to assess how much each machine contributed to current national testing services. The collaborative activity involved key stakeholders, including MoH, DIEM (Direction of Infrastructures, Maintenance and Equipment), LNSP (National Laboratory of Public Health), PSP-CI (Pharmacie de la Santé Publique de Côte d'Ivoire – the central medical store) and CDC. Participants ranked equipment as critical, important or desirable.

To help narrow down the number of instruments for consideration on standardized lists, SCMS laboratory experts worked with participants on assessing machines and how much they contributed to testing overall. This meant looking at the following required instruments: CD4 machines (to monitor the progress of the disease before initiating patients onto anti-retroviral treatment), viral load machines (to monitor patients on treatment and detect HIV infection in infants under 18 months) and hematology/chemistry machines (to monitor care and treatment outcomes).

SCMS and participants then collected the agreed data to assess equipment cost, capacity, demand and existing coverage. This activity mapped the national picture for:

- distribution rates of instruments used for diagnostic tests and treatment
- contribution rates of instruments used for diagnostic tests (i.e. how much each machine contributes to national testing, overall)
- utilization rates of instruments (i.e. how frequently each machine is used in the laboratory)

Based on these evaluations, SCMS performed quantification activities with laboratory experts from LNSP, CDC and other stakeholders to create five-year forecasts of medical supply needs. Such five-year forecasts enable decision-makers to reach informed conclusions on sustainable equipment choices for MoH facilities and stakeholders. The forecasts took into account Côte d'Ivoire's tiered health facility system, and recommended appropriate five-year instrument lists for all seven levels.

The aim of the optimization process was to standardize lists of tests and laboratory equipment for use in all national facilities. SCMS worked with local partners, donors and the government to decide which instruments to prioritize and which to consider removing. Illustrated by Table 1, these recommendations eliminated usage of five of 20 currently used machines, as indicated in yellow. Compared to other machines, these instruments ranked low in number and contributed least to the total number of national tests (with the exception of Hitachi 902, no longer in production). In other words, their removal would reduce the burden on laboratory systems created by their added cost, maintenance, management and additional commodity requirements.

Table 1: SCMS Harmonization data - Laboratory equipment in Côte d'Ivoire 2011

[*note – items in yellow, recommended for removal]

Test	Instrument	Instrument count	Distribution (Instrument Coverage)	Diagnostic Contribution
CD4	FACSCALIBUR	9	8%	33%
	FACSCOUNT	70	62%	39%
	GUAVA	32	28%	28%
	CYFLOW	2	2%	0%
Biochemistry	COBAS INTEGRA 400	5	4%	26%
	HITACHI 902	5	4%	9%
	KONELAB 20	14	12%	11%
	COBAS C111	15	12%	7%
	FULLY	52	42%	39%
	KENZA MAX	27	22%	6%
	HUMALYSER	2	2%	1%
	REFLOTTRON PLUS	3	2%	1%
Hematology	ACT 5 DIFF	1	1%	1%
	SYSMEX XT2000i/1800i	7	6%	30%
	ACT DIFF	66	58%	32%
	SYSMEX KX21N	36	31%	34%
	MEDONIC CA620	5	4%	3%
Viral load	TAQMAN 48	2	29%	99%
	NUCLISENS	4	57%	0%
	ABI PRISM 7000	1	14%	1%

Recommendations that last

SCMS's recommendations continue to inform future analysis and efforts to help Côte d'Ivoire adopt a national standardized laboratory equipment list. In the meantime, harmonization improvements are already producing gains. Since 2008, Côte d'Ivoire's health system has been using fewer brands of machines for the same tests. This eliminates the need for using multiple reagents and additional staff training.

In terms of utilization, laboratories are now more aware when machine usage is low, which aids decisions on whether or not to buy more machines. Facilities are also more knowledgeable of where to place machines, when needed. The five-year forecast based on the harmonization exercise informs donor funding negotiations and long-term supply planning, promoting a more sustainable supply plan. The SCMS-supported laboratory harmonization exercise has informed a technical briefing document that will be used in future procurement decisions and to revisit the current national ministerial decree on laboratory testing services. The harmonization exercise has the potential to help the national health system reduce costs and better manage laboratory equipment and supplies; money and resources that can be spent on other urgent priorities – including treating more patients.

ABOUT SCMS

The Supply Chain Management System (SCMS) was established to collaborate within country and global partners to ensure a reliable, cost-effective and secure supply of high quality medicines and health products for HIV/AIDS prevention, care and treatment. SCMS is funded as part of the President's Emergency Plan for AIDS Relief. Visit us at www.scms.pfscm.org.

The author's views expressed in this publication do not necessarily reflect the views of the US Agency for International Development or the United States government.

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