

BLIS

Deployment and Results



One time data entry



Reduced burden for
technicians & doctors



**Shorter waiting
times** for patients



**Fewer errors, more reliable
results, quality control**



Easy to view patient
history & **track** samples



Aggregate **patterns &
trends** for quick response

BLIS Benefits

1-month trial phase
launched in 3 labs in
Cameroon in May

Launched in
Uganda,
Tanzania, Ghana

Launched
in DRC

Launched
in Kenya

2010

2011

2012

2013

2014

Followed by 6-month pilot phase; measuring benefits
quantitatively: record-keeping time; waiting time; errors;
patient history retrieval time; user satisfaction level.

Many more
since!



**The system has been in continuous use since deployment
in each case!**

C4G BLIS Deployments

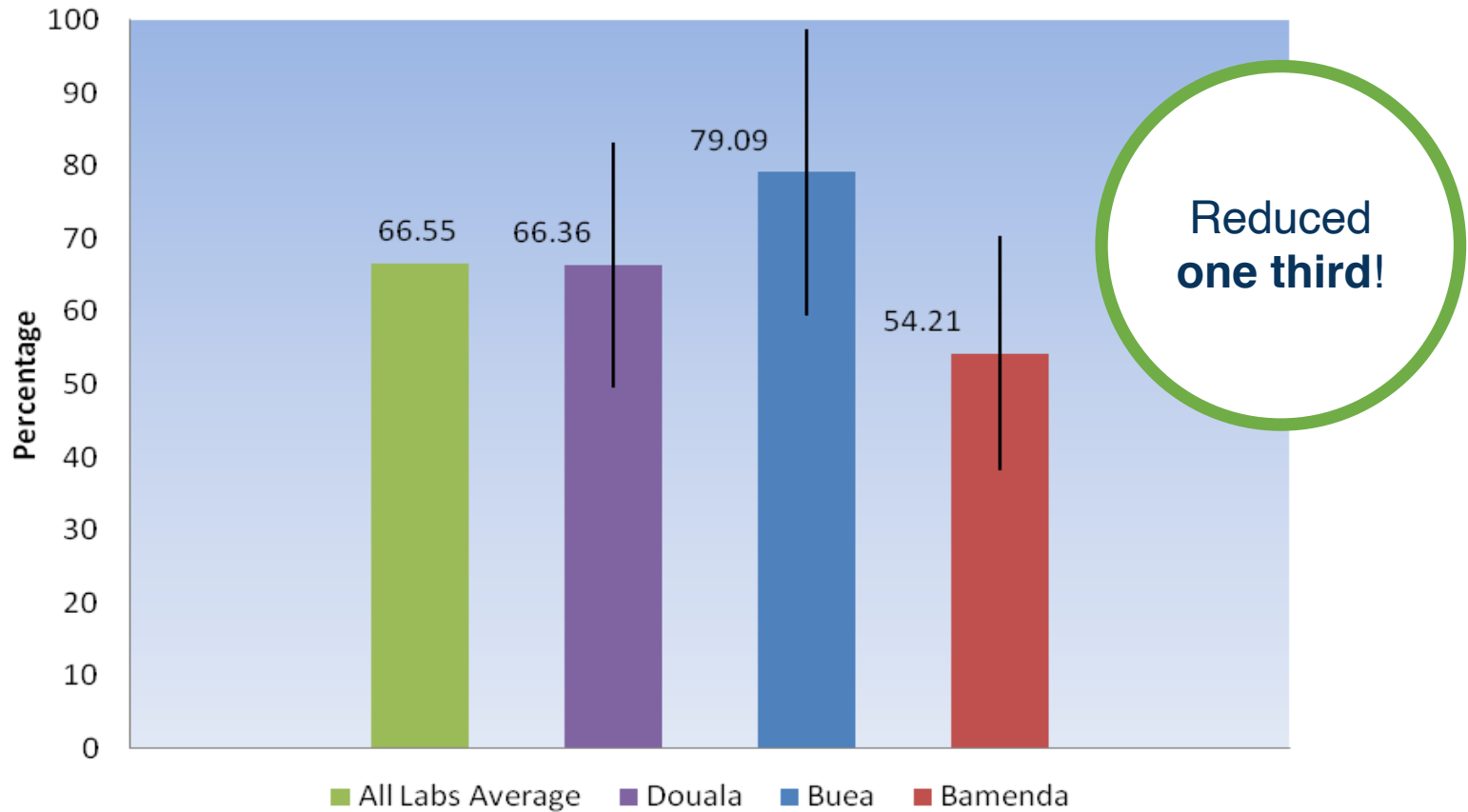
Error & Work Reduction

Error Reduction

Error reduction was determined by:

- Reports sent back to lab for verification
- Complaints concerning patient reports
- Data entry errors
- Invalidated results
- Results not issued





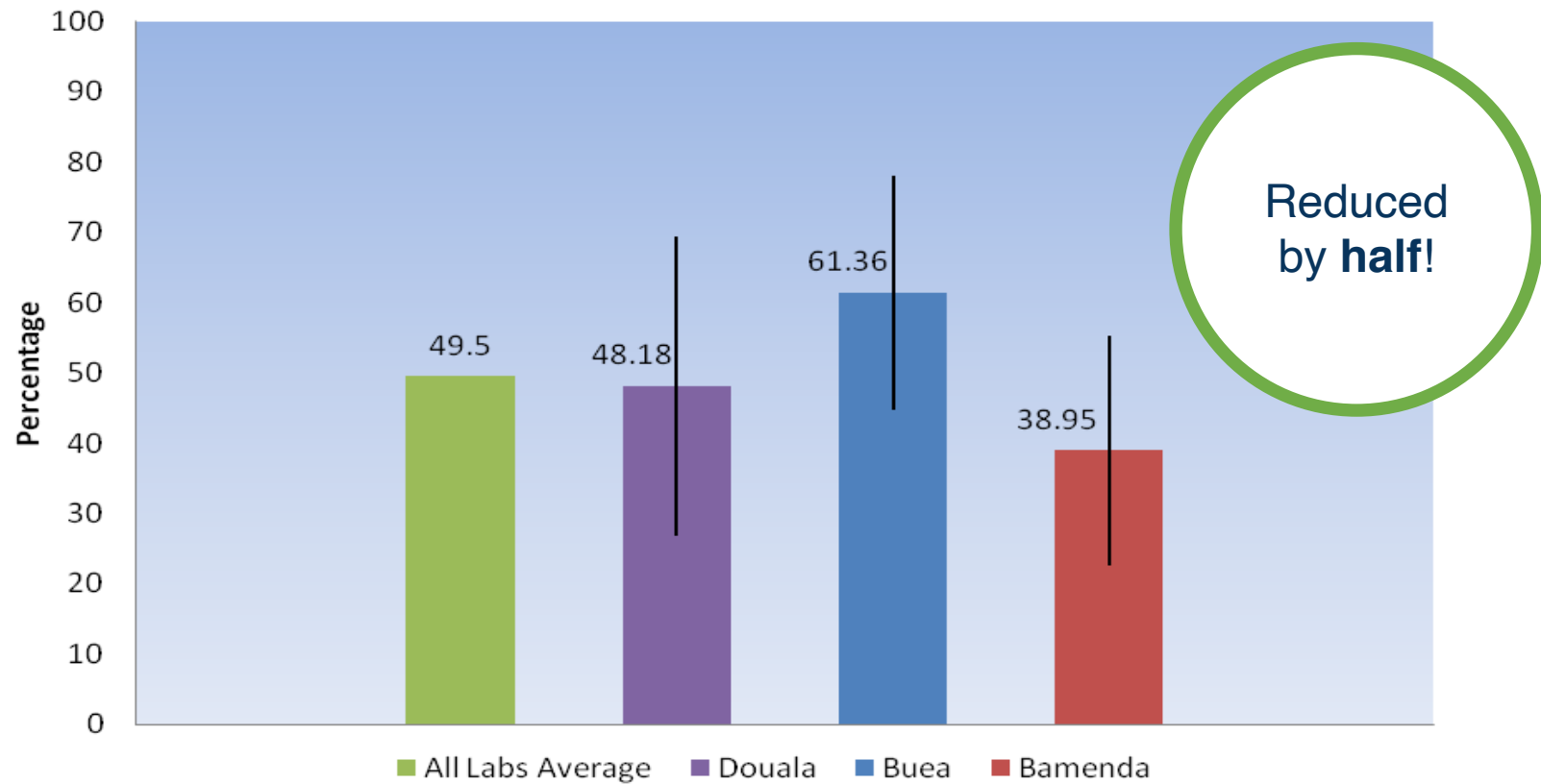
Error Reduction

Workload Reduction

The workload reduction was determined by:

- Patients' registration time
- Result entry time
- Result search time
- Time taken to calculate infection rates
- Turn-around time





Workload Reduction

User Ratings & Additions

Voluntary User Ratings

1	=	Highly satisfactory	<i>Prompted at logout, can choose to skip.</i>
2	=	Satisfactory	
3	=	Neither satisfactory nor unsatisfactory	
4	=	Unsatisfactory	
5	=	Highly unsatisfactory	

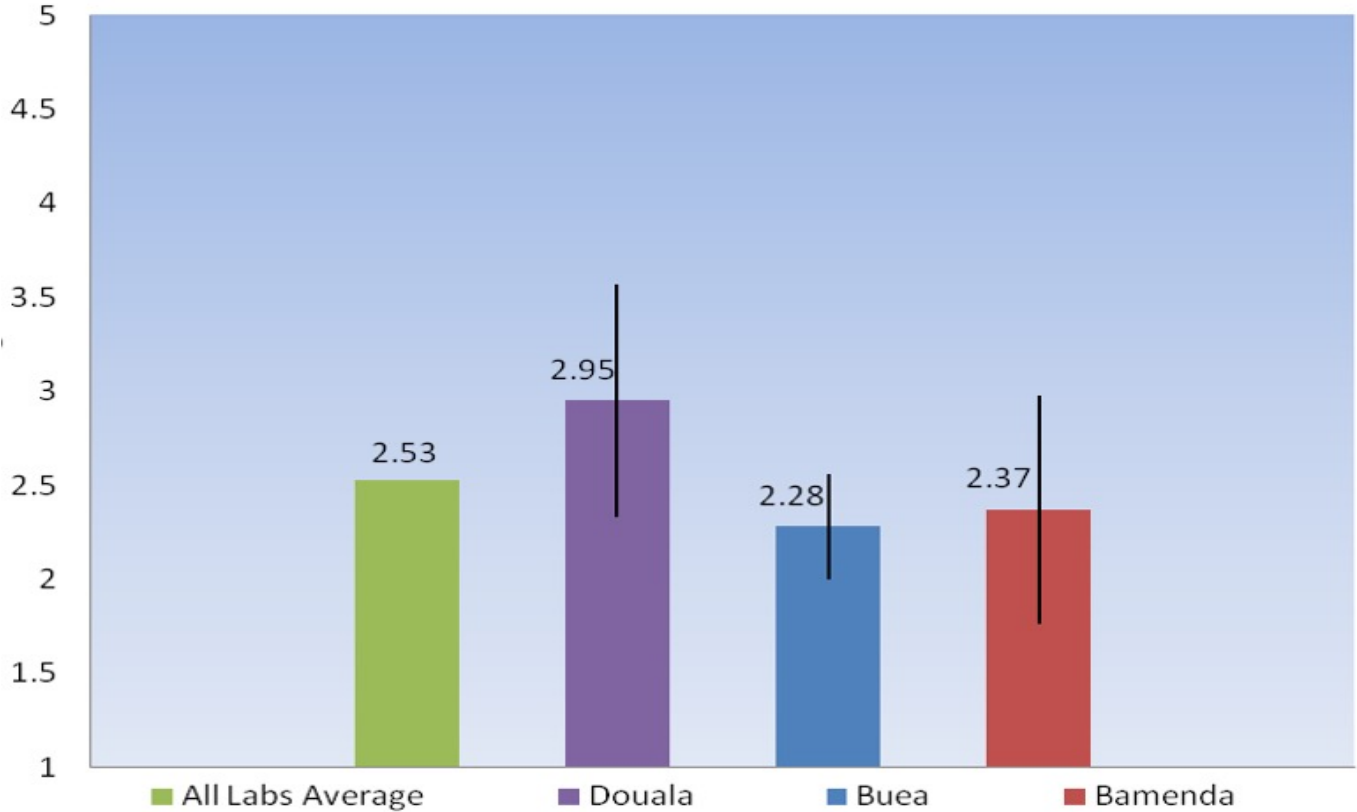
5 Highly
unsatisfactory

4 Unsatisfactory

3 Neither satisfactory
nor unsatisfactory

2 Satisfactory

1 Highly
satisfactory



User Ratings

“A very important remark from Buea, is the fact that they are already **closing earlier because the BLIS is **facilitating easy registration** and **delivery of results.**”**

Elive Ngale reports on 8/25/2010,
near the conclusion of the 1-month trial

Anecdotal Feedback: From Buea

“...those at registration were reluctant to use BLIS because they are **afraid they would eventually be required to work with BLIS** when the project succeeds. They think that **working on the computer will not give them enough time to do some private jobs** which they call ‘PP’ (personal pocket) to earn some private cash...”



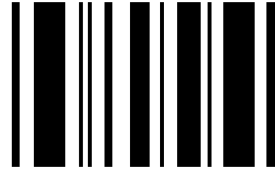
Views of **country-wide
aggregate data &
prevalence**



**Country director
interface**



Billing module



Barcode reader interface



Instrument interface

Later Additions

Surveys, Trends & Current Status

Q1. How has C4G BLIS impacted your laboratory's workflow?

Q2. How has C4G BLIS affected your workload?

Q3. How has C4G BLIS impacted the speed of patient registration?

Q4. How has C4G BLIS impacted the accuracy and correctness of test results?

(1. Significant improvement 2. Minor improvement 3. No improvement 4. Minor degradation 5. Significant degradation.)

Q5. How would you rate your overall level of satisfaction with using C4G BLIS?

(1. Highly satisfied 2. Moderately satisfied 3. Neither satisfied nor unsatisfied 4. Moderately unsatisfied 5. Highly unsatisfied)

Q6. How inclined are you to recommend C4G BLIS to other labs?

(1. Highly likely 2. Somewhat likely 3. Neither likely nor unlikely 4. Somewhat unlikely 5. Highly unlikely)

Q7. Which features of C4G BLIS do you use most frequently?

Q8. Which features of C4G BLIS are most useful to you?

Question	Avg (1-5)	1		2		3		4		5	
Q1. Impact	1.06	37	88%	5	12%	0	0%	0	0%	0	0%
Q2. Workload	1.88	20	48%	16	38%	2	5%	3	7%	1	2%
Q3. Speed	1.53	25	60%	16	38%	1	2%	0	0%	0	0%
Q4. Accuracy	1.88	31	74%	10	24%	1	2%	0	0%	0	0%
Q5. Satisfaction	1.30	23	55%	19	45%	0	0%	0	0%		
Q6. Would you recommend?	1.06	37	88%	5	12%	0	0%	0	0%		

1 is the best outcome, 5 is the least desirable





Number of patients served
weekly increased
(7.14% to 25%)



Number of tests conducted per
week by these labs increased
(13.33% to 25%)



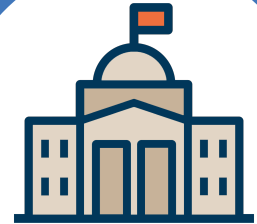
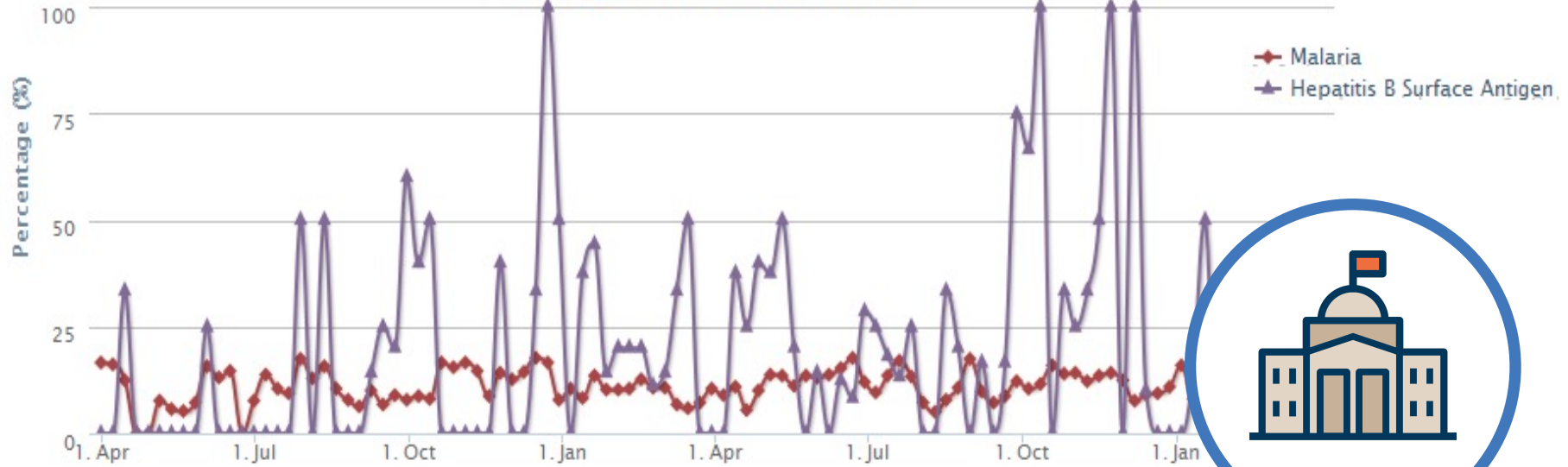
Number of errors went down
(66% to 100%)



High Data capture rate
(> 98%)

Results of April 2013 Survey

Prevalence rate (April 1, 2011 - April 1, 2013)
Buea Regional Hospital Lab, Cameroon



Sustainability

- C4G BLIS is **free, open-source**.
- **Functionality** has been **extended** by local IT groups.
- **PEPFAR funds initial computer installations** as part of its lab improvement/accreditation program.
- **CDC helped fund GT students** in the early years, as well as travel.
- Labs using C4G BLIS **serve many more patients**, making significantly **more revenue!**
- Most **labs have installed additional computers** and a local router network, at their **own cost**.



Current Status:

<http://blis.cc.gatech.edu>

Version 3.6,
after 80+ previous versions

C4G BLIS

Home	BLIS in Use	Download	Updates	Contact	Developers	News	BLIS Community
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C4G Basic Laboratory Information System (BLIS) is an open-source system to track patients, specimens and laboratory results.

C4G BLIS is a joint initiative of Computing for Good (C4G) at the Georgia Institute of Technology, the Centers for Disease Control and Prevention (CDC) and Ministries of Health of several countries in Africa. This [research](#) article published in the *Proceedings of the Eighth ACM International Conference on Information and Communication Technologies and Development, ICTD 2016*, discusses the research, development and evaluation of the system. Early work on the project is described in [this](#) MS thesis.

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Firefox Update

If your lab is running a very old version of firefox (such as firefox 4.5), you will have issues running the latest v3.3 BLIS update. To upgrade Firefox to a new version, please install this patch: [Download Link](#)

FAQ

- Q: I am trying out BLIS. How do I login?

A: Please login using the credentials: cameroon_dir/dir123 (as country director), testlab1_admin/admin123 (as admin) or testlab1_tech1, testlab1_tech2/tech123 (as lab technician).



Upcoming Challenges:



General solution
for interfacing
(*with instruments,
other systems*)



Data security and
exchange



Internet and cloud-
based versions

**C4G
BLIS**

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A humbling, inspiring experience