

Parasites in blood, virtual microscopy Round 1, 2019

Welcome to the Parasites in blood, virtual microscopy.

Specimens

The original specimens were human thin blood film specimens. Virtual microscopical slides of the specimens are available in the EQA portal LabScala.

Product 5470: Giemsa stained thin blood films S001 and S003

Product 5471: MGG stained thin blood films S002 and S004

(May-Grünwald-Giemsa)

Clinical details:

Specimens S001 and S002

A car driver in Benin, who suffers from mild fever and transient migratory swellings.

Specimens S003 and S004

A 35-year-old male who has travelled in Kamerun for 2 weeks. Suffers from fever (39.5°C).

Results

Please report your results in LabScala. Instructions are found in "LabScala User instructions" on the top right-hand corner of LabScala web page. In case you encounter any problems using the electronic result form, please contact the EQA Coordinator during the round is open.

Confirm your finding in the result form by pressing the plus sign (+) at the end of the row.

It is possible to report multiple results by different performers (up to 5). Laboratory should "Add a new answer" to each specimen by clicking the + button on the right margin of the result forms blue top bar. Remember also to identify the performers (use the same order of the performers for each specimen).

▼ Final results

Clinical details:
A senior medical researcher was performing mosquito field tests in Western Tanzania. After returning home he started to have headache and grumbling in the stomach. He had fever, which passed away, but returned the next day with shivers. At a visit to doctor malaria was suspected and samples taken.
Lab examinations showed: Hb 128 g/L and Thromb 130 E9/L.

View image

* Finding	* Lifecycle	% of parasitaemia	Details	Add
Other blood parasite	Other lifecycle	- Choose -	model answer	+

* Further action: Referred

* Performer: Charlie Smith

Confirm your finding here.
If you report several finding rows, it is considered as a mixed infection.

2019-11-04

Instructions

Product no. 5470-5471

LQ769519011-014/FI

Subcontracting: Sample preparation, Sample pretesting

The shipment contains instructions.

Closing date

Please return your results via LabScala no later than **November 27, 2019.**

The expected results of the round will be published in LabScala in the View Reports section by December 2, 2019.

Inquires

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Estimation of the percentage of parasitaemia in thin blood film

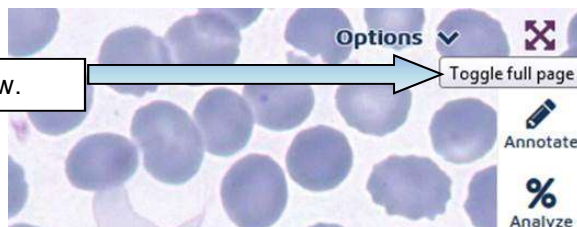
When calculating the percentage of parasitaemia, count the number of infected red blood cells in 1000-2000 red blood cells in a thin blood film.

A red cell infected with multiple parasites, counts as one parasitised cell. Gametocytes are not counted.

Example: 3 parasitised red cells/100 red blood cells = 3% parasitaemia.

Aiforia Cloud program

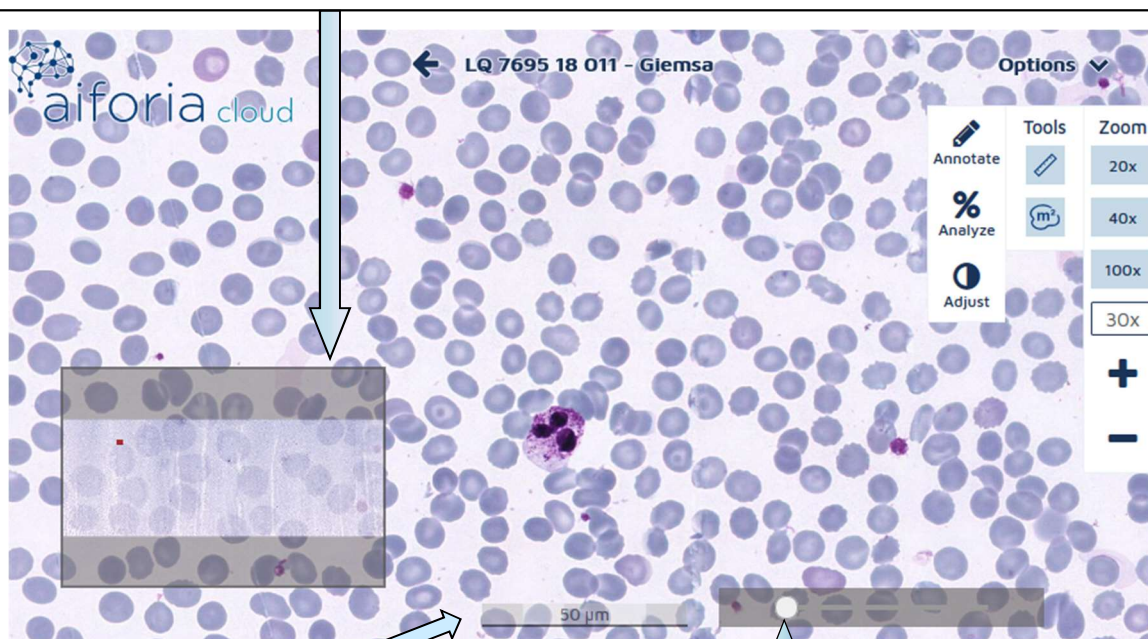
Use the "Toggle full page" tool to get a full screen view.



You can zoom in or out with the scroll wheel on your mouse, or by using the zooming controls in the right margin (x20, x40, x100). Alternatively you can use keyboard buttons: + and -.

Cursor up, down, left and right will navigate in x/y directions in addition to the mouse control.

The small picture is an overview panel of the thin blood film specimen. You can use it as a tool to find a proper thin place on the blood film.



Use the **focus** tool to focus the microscope picture (focus tool slides laterally).
At the bottom you have the **scale** tool, which contains a measuring instrument (example 50 µm).

Barcodes for the specimens

S001: LQ769519011



S003: LQ769519013



S002: LQ769519012



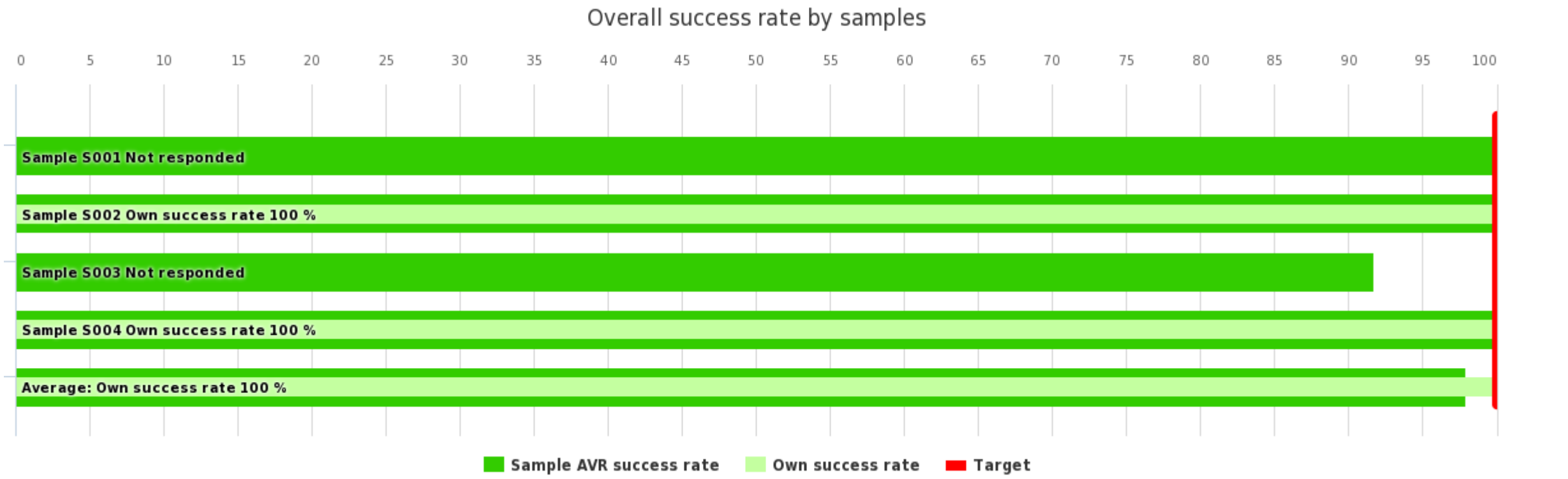
S004: LQ769519014



Client report

	No of participants	No of responded participants	Response percentage
Parasites in blood, Giemsa stain, virtual microscopy, October, 1-2019	7	6	85.7 %
Parasites in blood, May-Grünwald-Giemsa stain, virtual microscopy, October, 1-2019	11	9	81.8 %

Summary



Summary	Own score	Max score	Own success rate	Difference	AVR success rate
Sample S001	-	-	-	-	100 %
Sample S002	4	4	100 %	0 %	100 %
Sample S003	-	-	-	-	91.7 %
Sample S004	4	4	100 %	0 %	100 %
Average:			100 %	2.1 %	97.9 %

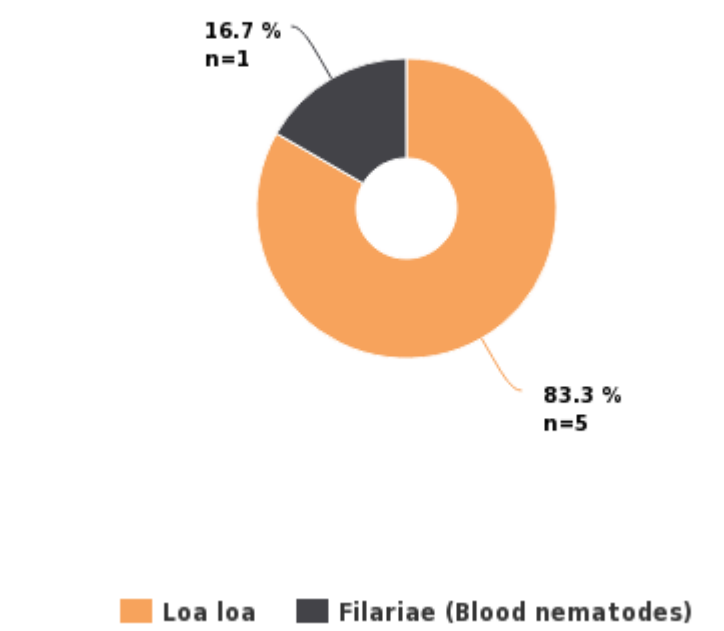
History	Test nr.	Own success rate	Difference	AVR success rate
History not found				

Sample S001 | Loa loa (Giemsa)



Sample S001 results	Responded	Own score	Max score	Own success rate	Difference	AVR success rate	Count
	Parasites	-	-	-	-	100 %	6
	Further action	-	-	-	-	-	6
Total:		-	-	-	-	100 %	12

Sample S001 Expected finding: Loa loa



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	Own score	Max score	Own success rate	Difference	AVR success rate	Finding Score
Expected finding: Loa loa		6	-	-			100 %	
	Loa loa	5						4
	Filariae (Blood nematodes)	1						4
Total:		6	-	-	-	-	100 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		6		
	Loa loa	5		
			N/A	5
	Filariae (Blood nematodes)	1		
Total:		6		

LIFECYCLE

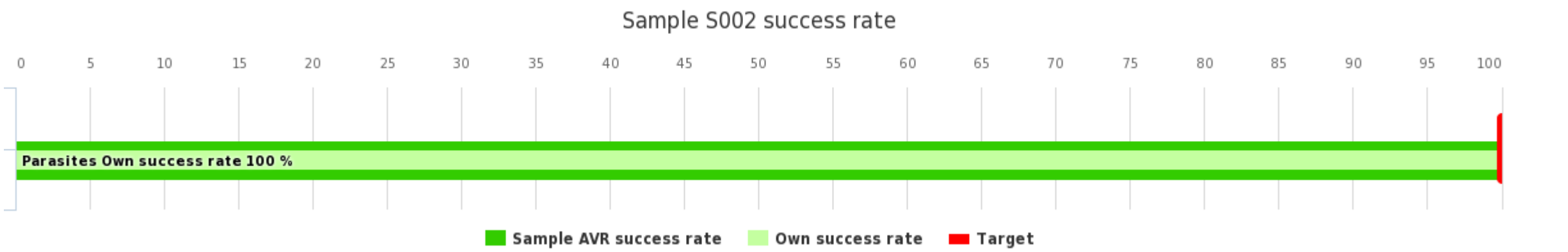
Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		6		
	Loa loa	5		
			Microfilariae	5
	Filariae (Blood nematodes)	1		
			Microfilariae	1
Total:		6		

FURTHER ACTION

Result	Result count
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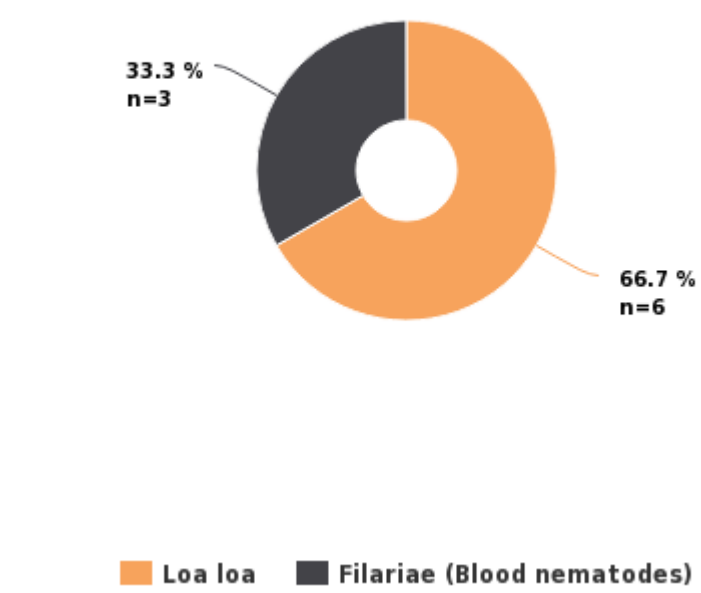
Not referred for further action	2
Referred for further action	4
Total:	6

Sample S002 | Loa loa (MGG)



Sample S002 results	Responded	Own score	Max score	Own success rate	Difference	AVR success rate	Count
	Parasites	4	4	100 %	0 %	100 %	9
	Further action	-	-	-	-	-	9
Total:		4	4	100 %	0 %	100 %	18

Sample S002 Expected finding: Loa loa



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	Own score	Max score	Own success rate	Difference	AVR success rate	Finding Score
Expected finding: Loa loa		9	4	4	100 %	0 %	100 %	
	⦿ Loa loa	6	4	4	100 %	0 %		4
	Filariae (Blood nematodes)	3						4
Total:		9	4	4	100 %	0 %	100 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		9		
	⦿ Loa loa	6		
			N/A	2
	Filariae (Blood nematodes)	3		
			N/A	1
Total:		9		

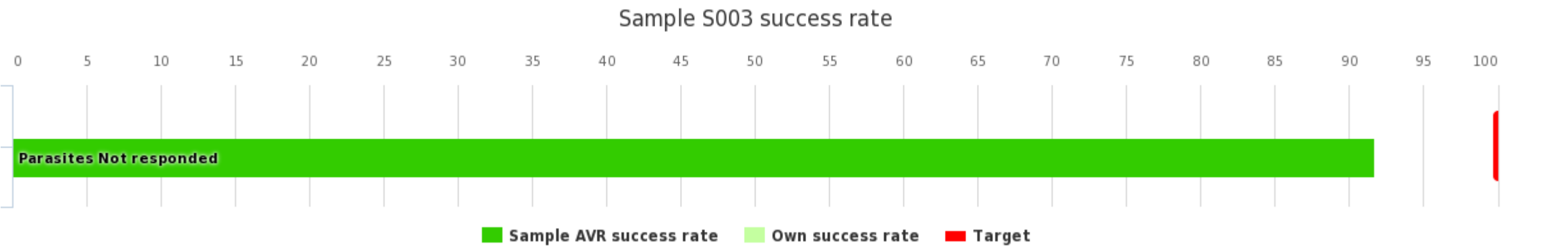
LIFECYCLE

Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		9		
	⦿ Loa loa	6		
			⦿ Microfilariae	6
	Filariae (Blood nematodes)	3		
			Microfilariae	3
Total:		9		

FURTHER ACTION

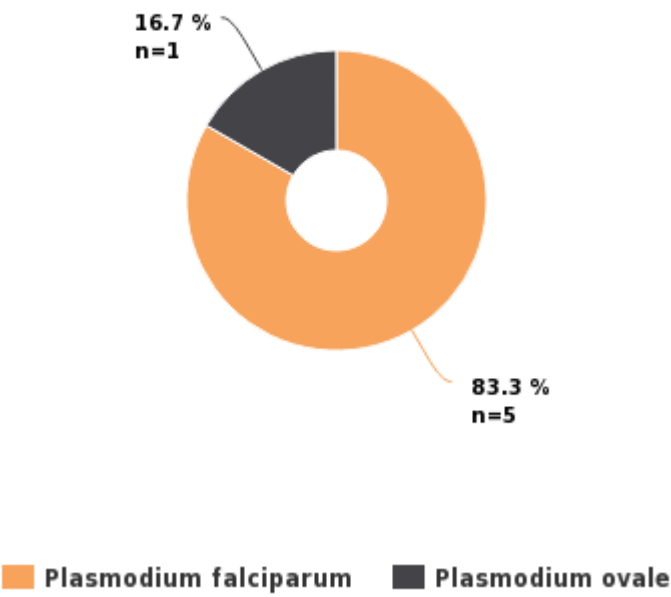
Result	Result count
<input checked="" type="radio"/> Not referred for further action	3
Referred for further action	6
Total:	9

Sample S003 | Plasmodium falciparum (Giemsa)



Sample S003 results	Responded	Own score	Max score	Own success rate	Difference	AVR success rate	Count
	Parasites	-	-	-	-	91.7 %	6
	Further action	-	-	-	-	-	6
	Total:	-	-	-	-	91.7 %	12

Sample S003 Expected finding: Plasmodium falciparum



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	Own score	Max score	Own success rate	Difference	AVR success rate	Finding Score
Expected finding: Plasmodium falciparum		6	-	-			91.7 %	
	Plasmodium falciparum	5						4
	Plasmodium ovale	1						2
Total:		6	-	-	-	-	91.7 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		6		
	Plasmodium falciparum	5		
			> 4,0%	5
	Plasmodium ovale	1		
			> 4,0%	1
Total:		6		

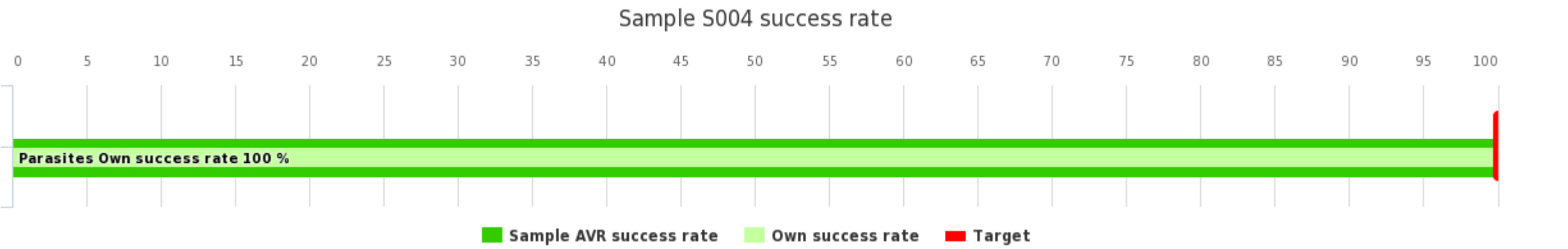
LIFECYCLE

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		6		
	Plasmodium falciparum	5		
			Early trophozoites (ring stage)	5
			Mature trophozoites	2
	Plasmodium ovale	1		
			Early trophozoites (ring stage)	1
			Mature trophozoites	1
Total:		6		

FURTHER ACTION

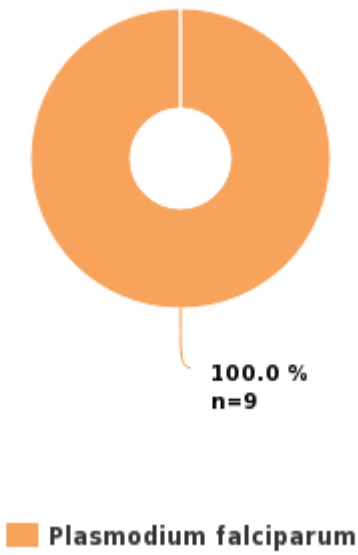
Result	Result count
Not referred for further action	1
Referred for further action	5
Total:	6

Sample S004 | Plasmodium falciparum (MGG)



Sample S004 results	Responded	Own score	Max score	Own success rate	Difference	AVR success rate	Count
	Parasites	4	4	100 %	0 %	100 %	9
	Further action	-	-	-	-	-	9
Total:		4	4	100 %	0 %	100 %	18

Sample S004 Expected finding:
Plasmodium falciparum



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	Own score	Max score	Own success rate	Difference	AVR success rate	Finding Score
Expected finding: Plasmodium falciparum		9	4	4	100 %	0 %	100 %	
	⦿ Plasmodium falciparum	9	4	4	100 %	0 %		4
Total:		9	4	4	100 %	0 %	100 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		9		
	⦿ Plasmodium falciparum	9		
			⦿ > 4,0%	8
			0.1-1.9%	1
Total:		9		

LIFECYCLE

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		9		
	⦿ Plasmodium falciparum	9		
			⦿ Early trophozoites (ring stage)	9
			Gametocytes	1
			Mature trophozoites	1
Total:		9		

FURTHER ACTION

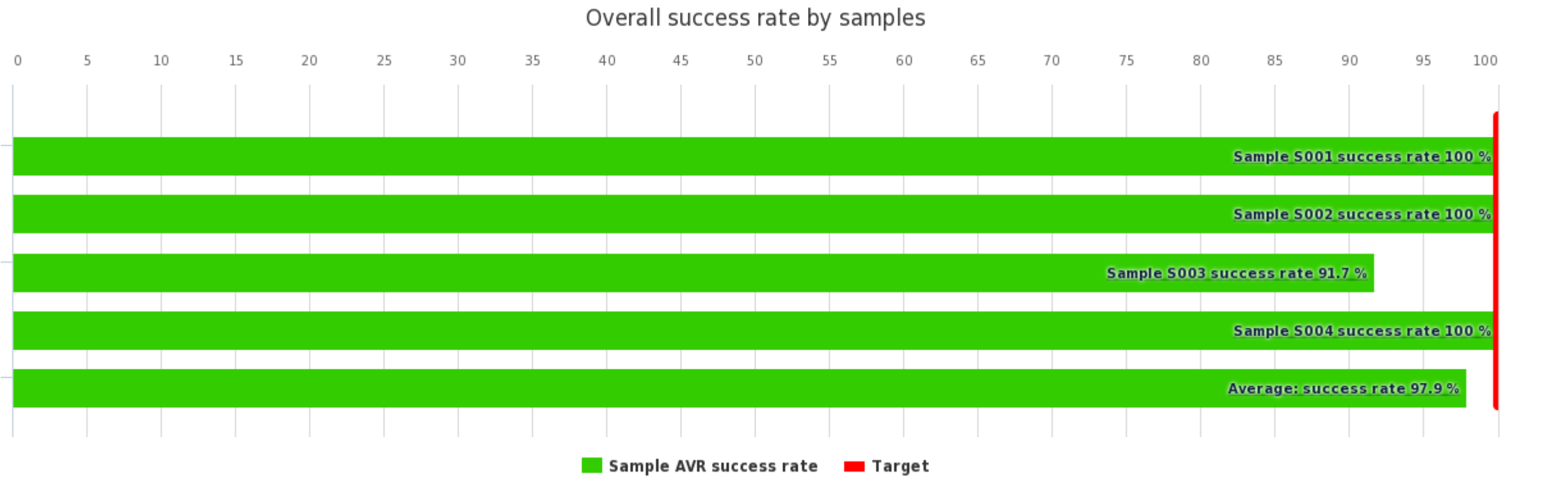
Result	Result count
⦿ Not referred for further action	3

Referred for further action	6
Total:	9

GLOBAL REPORT

	No of participants	No of responded participants	Response percentage
Parasites in blood, Giemsa stain, virtual microscopy, October, 1-2019	7	6	85.7 %
Parasites in blood, May-Grünwald-Giemsa stain, virtual microscopy, October, 1-2019	11	9	81.8 %

Summary



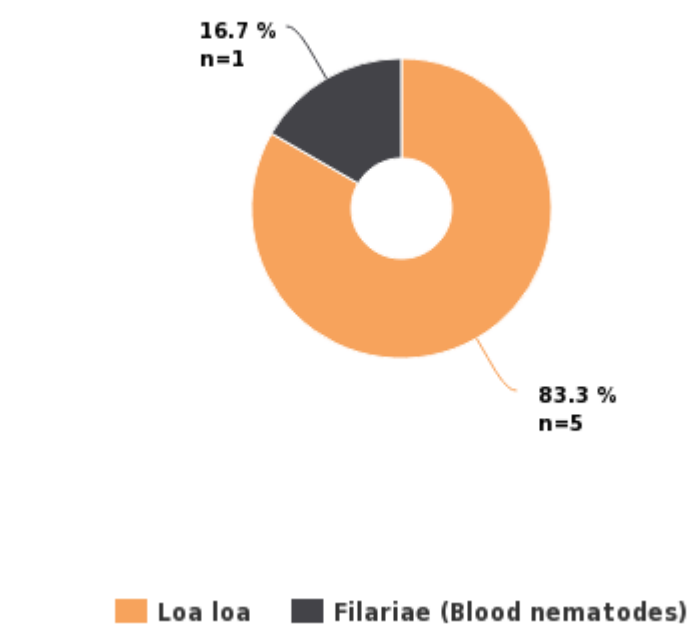
Summary	AVR success rate
Sample S001	100 %
Sample S002	100 %
Sample S003	91.7 %
Sample S004	100 %
Average:	97.9 %

Sample S001 | Loa loa (Giemsa)



Sample S001 results	Responded	AVR success rate	Count
	Parasites	100 %	6
	Further action	-	6
Total:		100 %	12

Sample S001 Expected finding: Loa loa



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	AVR success rate	Finding Score
Expected finding: Loa loa		6	100 %	
	Loa loa	5		4
	Filariae (Blood nematodes)	1		4
Total:		6	100 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		6		
	Loa loa	5		
			N/A	5
	Filariae (Blood nematodes)	1		
Total:		6		

LIFECYCLE

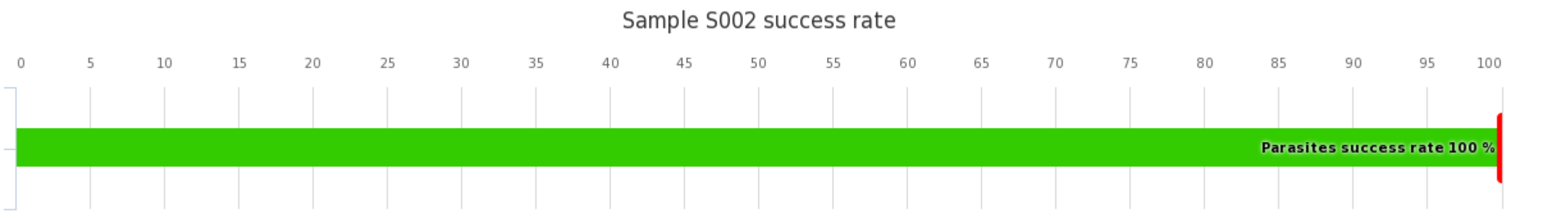
Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		6		
	Loa loa	5		
			Microfilariae	5
	Filariae (Blood nematodes)	1		
			Microfilariae	1
Total:		6		

FURTHER ACTION

Result	Result count
Not referred for further action	2

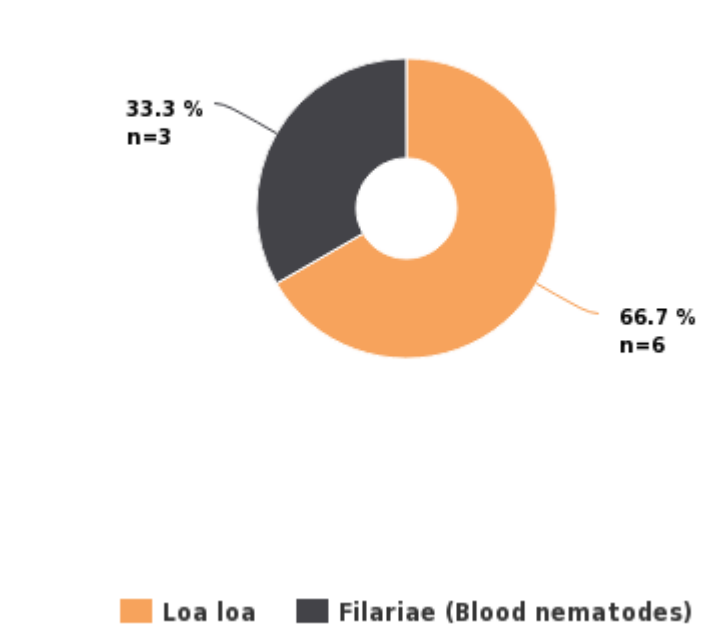
Referred for further action	4
Total:	6

Sample S002 | Loa loa (MGG)



Sample S002 results	Responded	AVR success rate	Count
	Parasites	100 %	9
	Further action	-	9
Total:		100 %	18

Sample S002 Expected finding: Loa loa



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	AVR success rate	Finding Score
Expected finding: Loa loa		9	100 %	
	Loa loa	6		4
	Filariae (Blood nematodes)	3		4
Total:		9	100 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		9		
	Loa loa	6		
			N/A	2
	Filariae (Blood nematodes)	3		
			N/A	1
Total:		9		

LIFECYCLE

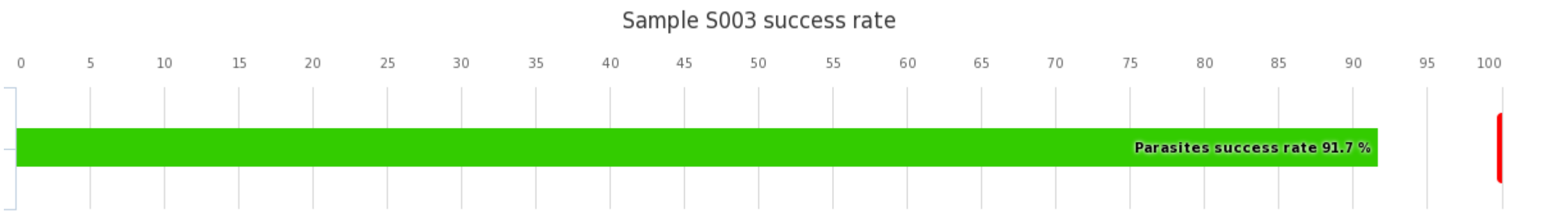
Finding group	Finding	Finding count	Result	Result count
Expected finding: Loa loa		9		
	Loa loa	6		
			Microfilariae	6
	Filariae (Blood nematodes)	3		
			Microfilariae	3
Total:		9		

FURTHER ACTION

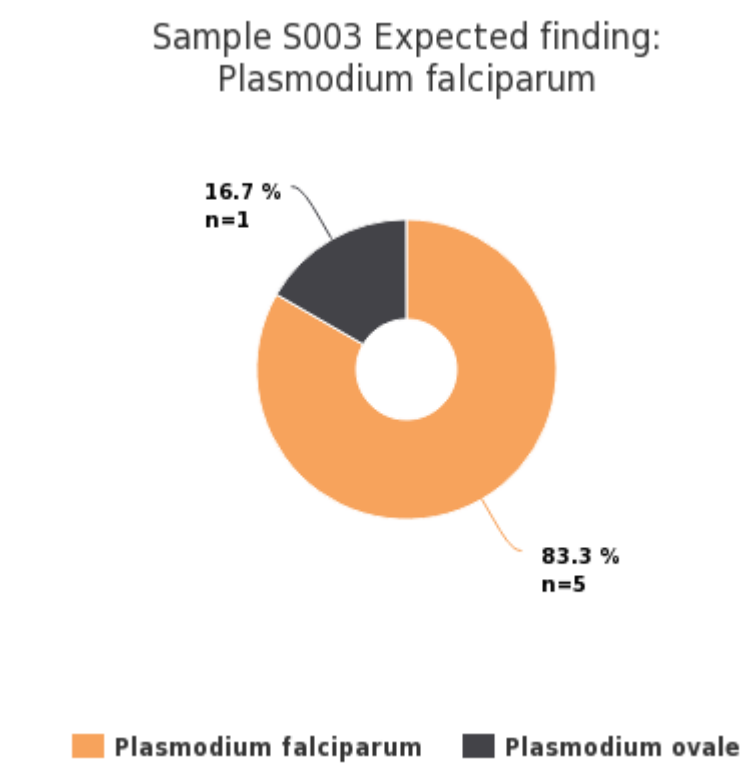
Result	Result count
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Not referred for further action	3
Referred for further action	6
Total:	9

Sample S003 | Plasmodium falciparum (Giemsa)



Sample S003 results	Responded	AVR success rate	Count
	Parasites	91.7 %	6
	Further action	-	6
Total:		91.7 %	12



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	AVR success rate	Finding Score
Expected finding: Plasmodium falciparum		6	91.7 %	
	Plasmodium falciparum	5		4
	Plasmodium ovale	1		2
Total:		6	91.7 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		6		
	Plasmodium falciparum	5		
			> 4,0%	5
	Plasmodium ovale	1		
			> 4,0%	1
Total:		6		

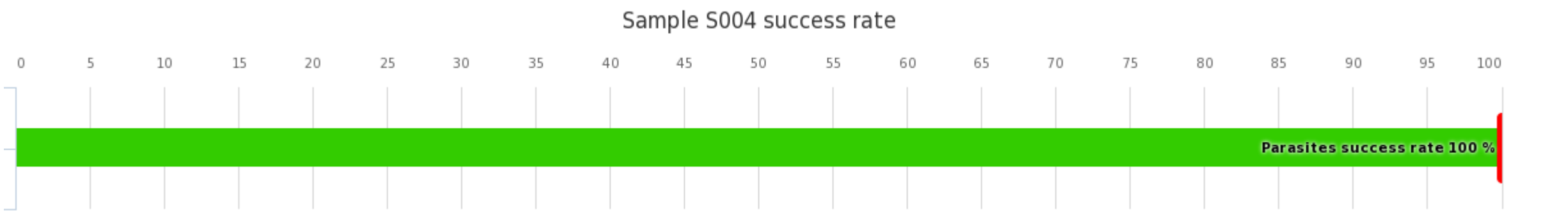
LIFECYCLE

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		6		
	Plasmodium falciparum	5		
			Early trophozoites (ring stage)	5
			Mature trophozoites	2
	Plasmodium ovale	1		
			Early trophozoites (ring stage)	1
			Mature trophozoites	1
Total:		6		

FURTHER ACTION

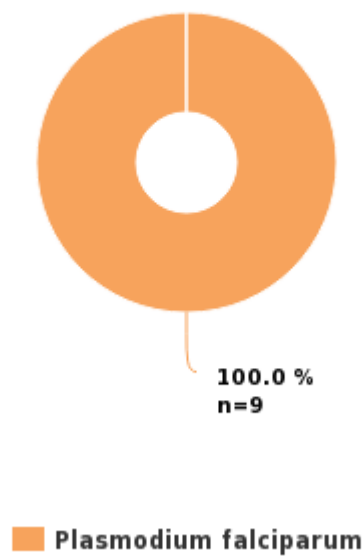
Result	Result count
Not referred for further action	1
Referred for further action	5
Total:	6

Sample S004 | Plasmodium falciparum (MGG)



Sample S004 results	Responded	AVR success rate	Count
	Parasites	100 %	9
	Further action	-	9
Total:		100 %	18

Sample S004 Expected finding:
Plasmodium falciparum



REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	AVR success rate	Finding Score
Expected finding: Plasmodium falciparum		9	100 %	
	Plasmodium falciparum	9		4
Total:		9	100 %	

PARASITAEMIA

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		9		
	Plasmodium falciparum	9		
			> 4,0%	8
			0.1-1.9%	1
Total:		9		

LIFECYCLE

Finding group	Finding	Finding count	Result	Result count
Expected finding: Plasmodium falciparum		9		
	Plasmodium falciparum	9		
			Early trophozoites (ring stage)	9
			Gametocytes	1
			Mature trophozoites	1
Total:		9		

FURTHER ACTION

Result	Result count
Not referred for further action	3
Referred for further action	6

Total:	9
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Parasites in blood, virtual microscopy Round 1, 2019

A total of 14 laboratories located in eight different countries participated in this round. Seven laboratories had ordered MGG stained specimens, three laboratories Giemsa stained specimens and four laboratories both.

Specimens and expected findings

There were four digital thin blood film specimens for examination of the presence of blood parasites.

Giemsa-stained thin blood films: Specimens S001 and S003.

MGG-stained thin blood films: Specimens S002 and S004.

Specimens S001 (Giemsa LQ769519011) and **S002** (MGG LQ769519012):

Clinical details: *A car driver in Benin, who suffers from mild fever and transient migratory swellings.*

Expected finding, S001 & S002: ***Loa loa***

Specimens S003 (Giemsa LQ769519013) and **S004** (MGG LQ769519014):

Clinical details: *A 35-year-old male who has travelled in Kamerun for 2 weeks. Suffers from fever (39.5°C).*

Expected finding, S003 & S004 ***Plasmodium falciparum***, parasitaemia ~11%

Results

The reports for this scheme are generated in LabScala. Choose report name on the left column of My report view.

Accepted results are marked with green color and laboratory's own result with a black radio button (●). In the scoring section you can see summaries of overall success rate and sample-specific success rates (%). Sample-specific interpretations are shown in pie diagrams as percentages and the total interpretation counts in the tables. Please note that by default the distribution pies are closed in the scoring reports. You can open the distribution pies by clicking the screen button at the right end of the result distribution row. The findings reported by the participants have been grouped into tables according to the expected findings of each specimen. If a laboratory has reported multiple findings indicating a mixed infection, the additional findings have been grouped to a separate finding group.

If you have no results you will get a note: "You have not responded in time, only global report is available."

For information on report interpretation and performance evaluation, please see the "EQAS Interpretation guidelines" in LabScala User instructions. In case you have any questions regarding the reports, please contact the EQA Coordinator.

Pretesting

All specimens were pretested in a reference laboratory using both Giemsa and MGG staining.

2019-12-20

Final report

Product no: 5470-5471

LQ769519011-014/FI

Subcontracting: Sample preparation, sample pretesting

Items sent 2019-11-04

Round closed 2019-11-27

Expected results 2019-12-02

Final report 2019-12-20

The report contains

Expected results of the specimens, scheme expert comments and individual result and scoring summary.

Request for corrections

Typing errors in laboratory's result forms are on laboratory's responsibility. Labquality accepts responsibility only for result processing. Requests must be notified by writing within three weeks from the date of this letter.

Authorized by

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Comments

Specimens S001 LQ769519011 (Giemsa) and S002 LQ769519012 (MGG):

The specimens S001 and S002 were positive for blood parasites and the expected finding was *Loa loa* microfilariae. All laboratories reported these specimens as positive for blood parasites and also identified the parasite correctly as *Loa loa* or filaria.

Loa loa is a filarial parasite that causes a disease called loiasis, which is one form of filariasis. The adult worms in this disease migrate in tissues and cause occasional swellings. The disease involves secretion of microfilariae into the blood circulation. They are visible in blood smears that have been taken especially during the day-time.

Figure 1. Specimen S001 (Giemsa stain).

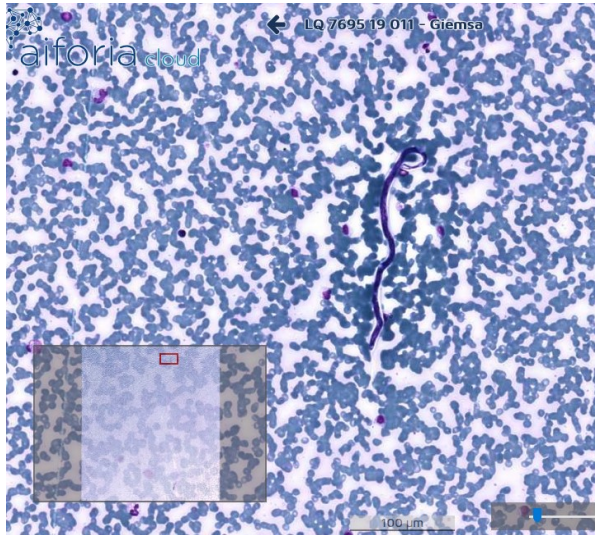
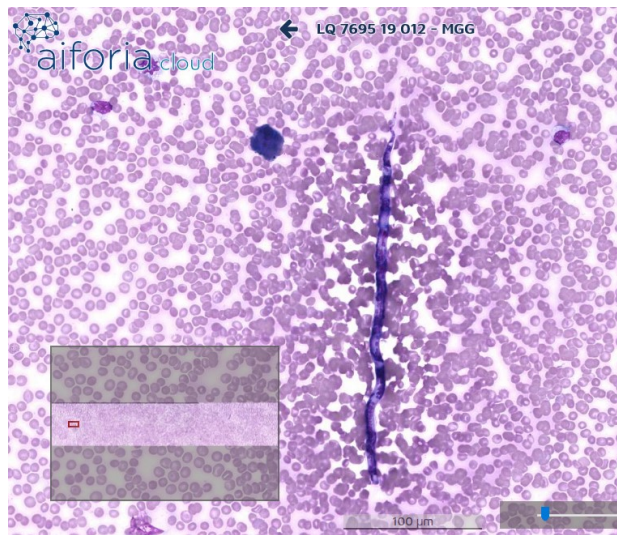


Figure 2. Specimen S002 (MGG stain).



The *Loa loa* microfilariae are slender, 250–300 µm long and 6–8 µm wide parasite worms that, when seen in the microscope, are usually easily recognizable in blood smears. The specific identification of *Loa loa* can be made by the presence of a thin sheath and body nuclei that extend until the tip of the microfilaria. Here the nuclei are best visible in the top part of the MGG stained microfilaria. Pictures taken from the Aiforia platform.

Specimens S003 LQ769519013 (Giemsa) and S004 LQ769519014 (MGG):

The specimens S003 and S004 were positive for blood parasites and the expected finding was: ring forms of *Plasmodium falciparum*. Parasitaemia percentage was very high, about 11%. All laboratories reported these specimens as positive for blood parasites and 14 out of 15 (93%) responders reported the finding correctly as *Plasmodium falciparum*. One participant reported *P. ovale* from the Giemsa stained specimen S003.

P. falciparum is the causative agent of the most serious and common form of malaria in humans. It can be seen as compact rings inside red blood cells, whose sizes have not become increased. Often the ring-formed trophozoites are located on the edges of the red blood cells, and there can be more than one of them inside a single cell (figures 3 and 4).

Pictures taken from the Aiforia platform:

Figure 3. Specimen S003 (Giemsa stain) *Plasmodium falciparum*.

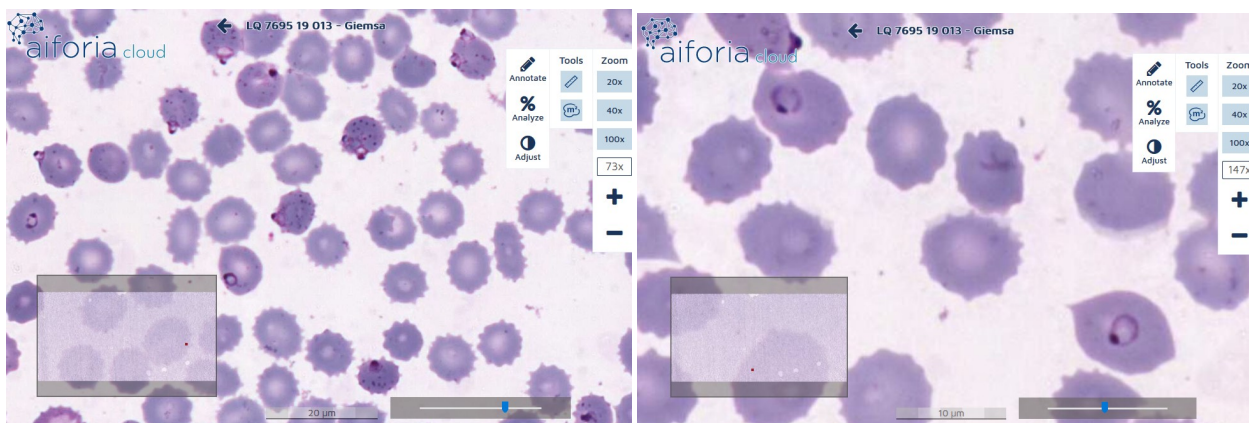
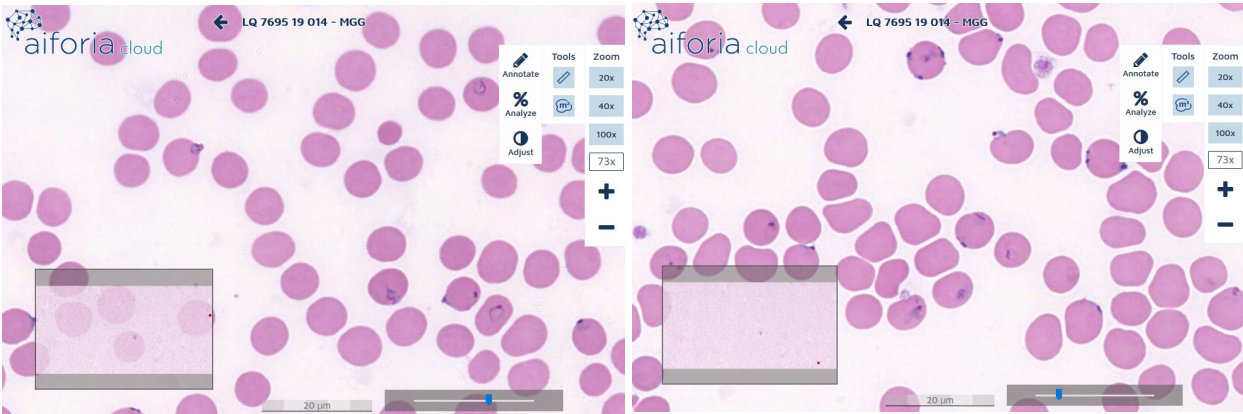


Figure 4. Specimen S004 (MGG stain) *Plasmodium falciparum*.



Postanalytical phase

- 79% (11/14) of the laboratories returned their results in time.
- Of the responders, 67% (10/15) would have sent the *Loa loa* specimen and 73% (11/15) would have sent the *Plasmodium falciparum* specimen to a reference laboratory.
- Mix-up of the specimens: No apparent mix-up of specimens was observed.

Scoring

Results reported for the “Report to the clinician” part are scored. Scoring is implemented for each result or specimen when 60% or more of the participants report a correct result. Laboratory’s scores have been converted to percentage (own success rate, % from maximum scores) with a target at 100%. Own success rate is compared with the success rate of all results.

Specimens S001 and S002:	<i>Loa loa</i>	4 p
	Filaria	4 p
	Other	0 p
Specimens S003 and S004:	<i>Plasmodium falciparum</i>	4 p
	<i>Plasmodium</i> sp.	4 p
	Other <i>Plasmodium</i> species	2 p
	Other	0 p

Maximum score of the Parasites in blood, round 1, 2019 is 8/8.

End of report

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