

WORKSHOPS ON SCHISTOSOMIASIS SUB-DISTRICT LEVEL DATA REVIEW FOR SHRINKING THE MAP; BETTER UTILIZATION OF AVAILABLE PREVALENCE DATA AND SUB- DISTRICT LEVEL PLANNING FOR SELECTED COUNTRIES



DATA ANALYSIS SUMMARY REPORT

CONTENTS

I.	Introduction	5
II.	Objectives and expected outcomes of the workshops	6
	II.1. Objectives	6
	II.2. Expected outcomes	6
III.	Participation	6
IV.	Preparatory works	7
	IV.1. Situational analysis	7
	IV.2. Data Review and preparatory workshops by Data Experts	7
V.	Main workshop achievements	7
	V.1. Data Review by Countries	7
	V.2. Data Analysis	8
	V.3. Use of the Results	8
	V.3.1. General statistics	8
	V.3.2. Summary statistics of the endemicity calculated using district data	9
	V.3.3. Summary statistics of the endemicity calculated using sub-district data	10
	V.3.4. Change in endemicity categories	11
	V.3.5. Estimates of the population requiring PC and PZQ by district level implementation versus estimates by sub district level implementation	12
	V.3.6. Comparison between underestimates and overestimates of drug needs at district level	13
VI.	Action points of the workshops	16
	VI.1. Action points for countries	16
	VI.2. Action points for ESPEN/WHO	16
VII.	ANNEXES	17
	VII.1. Annex 1: Supplemental data collection for the refinement of schistosomiasis endemicity at sub district level	17
	VII.2. Summary Statistics of the 22 Countries Included in the Analysis	18
	VII.2.1. Global Summary	18
	VII.2.2. Country Summaries	19
	VII.2.2.1. Burkina Faso	19
	VII.2.2.2. Cameroon	20
	VII.2.2.3. CAR	21

VII.2.2.4. Chad	22
VII.2.2.5. Côte d'Ivoire	23
VII.2.2.6. DRC	24
VII.2.2.7. Gabon	25
VII.2.2.8. Ghana	26
VII.2.2.9. Guinea	27
VII.2.2.10. Kenya	28
VII.2.2.11. Madagascar	29
VII.2.2.12. Malawi	30
VII.2.2.13. Mali	31
VII.2.2.14. Namibia	32
VII.2.2.15. Niger	33
VII.2.2.16. Senegal	34
VII.2.2.17. South Sudan	35
VII.2.2.18. Tanzania (Mainland)	36
VII.2.2.19. Togo	37
VII.2.2.20. Uganda	38
VII.2.2.21. Zambia	39
VII.2.2.22. Zimbabwe	40
VII.3. Annex 3: Memories of the workshops	41

ACRONYMS AND ABBREVIATIONS

ESPEN	Expanded Special Programme of NTD Elimination
GSA	Global Schistosomiasis Alliance
IU	Implementation Unit
JRSM	Joint Request for Selected Preventive Chemotherapy Medicines
LASER	London Applied and Spatial Epidemiology Research Group
LSHTM	London School of Hygiene and Tropical Medicine
M&E	Monitoring and Evaluation
NTD	Neglected Tropical Diseases
PC	Preventive Chemotherapy
PZQ	Praziquantel
RTI	RTI International (formerly Research Triangle Institute)
SAC	School age children
SCI	Schistosomiasis Control Initiative
WHO	World Health Organisation

LIST OF TABLES

Table 1: Number of administrative units and sub-units by country	6
Table 2: Number of sub-districts by endemicity category with district prevalence	9
Table 3: Number of sub-districts by endemicity category with sub-district prevalence	9
Table 4: Changes in endemicity categories from district prevalence to sub-district prevalence	10
Table 5: Number of sub-districts in each category of treatment adequacy	11
Table 6: Comparison of population requiring PC and PZQ needs in district level and sub-district level implementation	12
Table 7: Comparison between underestimates and overestimates of drug needs at district level	12
Table 8: Number of sub-districts in each category of final decision	13
Table 9: Number of sub-districts in each category of final decision	15

I. INTRODUCTION

Since the launch of the NTD roadmap, up to 23 countries¹ have commendably reached the 75% or more coverage target for schistosomiasis by 2017. A total of 75 million SAC were treated in 2017, representing an unprecedented coverage of 69.4% from 29 countries that reported data in a timely manner.

Despite this commendable progress, some concerns were raised around the efficient use of the donated medicines. Many programmes implement PZQ distribution at district level despite the focality nature of schistosomiasis distribution.

While the number of persons requiring preventive chemotherapy (PC) was reduced by 42 million following the completion of schistosomiasis mapping in 41 countries of the African region by 2015, there are major gaps in how the mapping data have been interpreted to determine the endemic areas requiring PC in various countries. Some countries use the mean prevalence in the district to classify the district endemicity while some other use the highest site prevalence. In either case, there is areas that are either under treated or over treated. The best approach is to implement PZQ distribution at community level, but this approach has some limitations due to the little number of communities that are surveyed within a district.

Earlier in 2017, ESPEN commissioned a consultative group in Brazzaville to further support the analysis of current implementation approaches based on the mapping data, to review areas that are implementing based on mean District prevalence and requesting for PZQ based on the district level aggregated data, leading to either 'under-treating' or 'over-treating' in some areas. It was demonstrated that many countries were implementing PZQ distribution largely at district level but also few of them were implementing at community levels. Therefore, it becomes mandatory to support countries to use the available mapping data and other evidences to adapt the PZQ distribution to the focality nature of schistosomiasis.

One of ESPEN's 4 overarching goals is to ensure that medicines are used effectively and delivered to those that need them by strengthening the supply chain management for donated medicines. Within this context, ESPEN wishes to increase efficiency and scale up PZQ distribution by ensuring that countries order the right amounts of medicines, and that only the people that need the medicines are treated.

Then, in 2017-2019 included in the data validation missions² in countries, the collection of all useful data on schistosomiasis. That included demographic, epidemiological and geographic data at district level and more importantly at much lower level than the district.

Early this year, ESPEN commissioned a consultant to review all available data and define a methodology and tools for the analysis of schistosomiasis data at sub-district level. The outcomes of this works include the elaboration of the data analysis methodology that comprise data requirement guide, data gaps, data analysis tool. Subsequently, two workshops were planned to train the programmes officers in the new approach.

The workshops were organized for NTD programme coordinators, schistosomiasis focal points and NTD data managers from 24 (13³ francophone and 11⁴ anglophone) countries in the African region, whose selection were supported by a potential significant impact gained by moving from the district level implementation to sub-district level implementation.

1 Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Gambia, Guinea, Madagascar, Malawi, Mali, Mauritania, Niger, Senegal, Sierra Leone, Togo, United Republic of Tanzania, Yemen, Zimbabwe

2 In July 2017, ESPEN trained a pool of consultants who have been carried out data review and validation missions in countries

3 The workshop for francophone countries took place in Brazzaville, 23-26 July 2019 and includes Burkina Faso, Cameroun, Côte d'Ivoire, Gabon, Guinée, Madagascar, Mali, Niger, CAR, DRC, Senegal, Chad, Togo

4 The workshop for francophone countries took place in Brazzaville, 13-16 August 2019 and includes Ethiopia, Ghana, Kenya, Malawi, Namibia, Nigeria, South Sudan, Tanzania (Mainland), Uganda, Zambia, Zimbabwe

II. OBJECTIVES AND EXPECTED OUTCOMES OF THE WORKSHOPS

The objectives and expected outcomes include the following:

II.1. OBJECTIVES

- Conduct sub-district level analysis using prevalence data and other spatial and environmental data district by district, to describe districts that should adjust their implementation strategy to refine the PZQ distribution map.
- Update sub-district level planning for participating countries.
- Revise PZQ needs based on endemicity review using available data at sub-district level.
- Update JRSM based on sub-district (or lowest implementation level).

II.2. EXPECTED OUTCOMES

- Updated sub-district level implementation planning for participating countries.
- Updated PZQ needs based on endemicity review using available data.
- Updated Joint request for selected medicines (JRSM) based on prevalence data delineated to sub-district levels.

III. PARTICIPATION

The workshops were organised for the NTD programme managers, schistosomiasis officers, data managers or M&E officers.

They were facilitated by a pool of facilitators comprising ESPEN staff, schistosomiasis experts and data consultants.

Notable partners (SCI, RTI, GSA) supporting countries in schistosomiasis control/elimination also took part. The table below shows the importance of the attendance.

Table 1: Categories of participants of the workshops

Participant profile	Francophone	Anglophone
NTD/HQ	1	1
ESPEN/NTD/AFRO	7	6
Consultants	8	9
Partners	5	6
NTD Programme Officers (Directors, Programme Coordinators, M&E officers, Data managers)	35	30
Total	56	51

IV. PREPARATORY WORKS

The preparation of the workshops started earlier in May 2019 with various works.

IV.1. SITUATIONAL ANALYSIS

A situational analysis and preparatory works have been conducted in May-June 2019. It includes:

- The inventory of available data
- The assessment of the fitness of available data to the purpose of the sub-district analysis
- Elaboration of the sub-data analysis framework and requirements
- Elaboration of the sub-district analysis tool
- The completion of sample analysis (6 countries⁵ were included)
- Support in collection of additional data

IV.2. DATA REVIEW AND PREPARATORY WORKSHOPS BY DATA EXPERTS

Peer intensive and extensive data reviews have been carried out prior to the workshops. 16 data managers (8 for each workshop) spent a week before each of review all available countries data to ensure that they meet the data requirement compliance and are of acceptable quality for the analysis. Three datasets (demographic, epidemiological and geographic) were concerned by this activity. Two preparatory workshops⁶ were held by data consultants for this purpose. It was also the occasion to collect additional.

This resulted in organising and putting together all country data into a single document (Excel workbook) for each country. The Excel workbook is built on the data analysis template that was developed earlier.

The main data source was the ESPEN schistosomiasis global database maintained by the LASER Group of LSHTM. Two data managers from.

V. MAIN WORKSHOP ACHIEVEMENTS

The data analysis is divided into 3 mains activities:

- Data review
- Data analysis
- Data interpretation

V.1. DATA REVIEW BY COUNTRIES

The data review is the first activity of the workshops. It consists of reviewing all available countries data previously prepared during the preparatory workshops. Three datasets (demographic, epidemiological and geographic) were concerned by this activity.

⁵ Benin, Burkina Faso, Burundi, Guinea Bissau, Rwanda, Togo.

⁶ The first workshop was held from 15 to 19 July 2019 for the francophone workshop and the second from 12 to 16 August for the anglo-phone workshop.

V.2. DATA ANALYSIS

The data analysis came after the data review and preparation. It consists of performing the various calculations that led to the endemicities both for the districts and the sub-districts. The calculations include also the population requiring PC and the amounts of PZQ needed. The calculations are done.

The calculations are performed in 2 steps that are (1) the calculation of district and sub-district prevalence based on the epidemiological and (2) the determination of the endemicity status of the sub-district based on the prevalence calculation results.

Generally, a prevalence is calculated for every district or sub-district that have data for each diagnostic method for which data are available. The prevalence is used to categorise the district or sub-district into one of the different endemicity categories. Then the population needing PC and the amounts of PZQ are estimated.

The second step of the calculation is the final classification where every sub-district is categorised using the prevalence results.

It is important to note that the complete analysis was not achieved at the end of the workshops for all countries. The level of completion varies 50 to 90 %.

Additional works have been carried out after the workshops to bring the analysis to their current level of achievement.

Currently, the analysis is completed for 22 countries that are included in the summary statistics. Two countries, Nigeria and Ethiopia need onsite support to complete the exercise.

V.3. USE OF THE RESULTS

The results are used in various ways. First, it is used to demonstrate the inequity and inadequacy that can occur in the district level implementation. In this case, the endemicity used for the sub-district using the district data is compared to the endemicity calculated for the sub-district using its own data. The comparison pointed out the evidence of under or over treatment in some sub-districts.

The ultimate consideration of the results is to find a way to adjust the sub-district endemicity to be close as much as possible to the reality. Discussion among experts at the workshops led to the decision tree on the figure of page 15. The final decision tree as it called provides means to determine the most likely endemicity of the sub-district.

The decision prioritizes the sub-district data if the quality is acceptable to determine the endemicity of the sub-district. How in absence of sub-district data or if available data are of unacceptable quality, it recommends using the endemicity of any neighbouring and similar sub-district or look for further information (environmental data) to support the decision. In the meantime, if no data is readily accessible, the district endemicity may be used.

The table in annex 1 is a questionnaire proposed by the expert to collect additional epidemiological and environmental data where no data is currently available to take decision on the sub-district endemicity.

The next sections of this document contain summary indicators generated from the data analysis outputs.

Some negative conclusions (inadequate, treatment strategy, PZQ misused, etc.) of the comparative analysis between the use of district and sub-district data do not necessarily explain the situation in the countries. They are just to illustrate what will open if corrective measures are not applied. Many countries that attended the workshop are already at some extent applying the community-based approach and the workshop is an opportunity to strengthen the existing capacities and encourage other countries to do so.

V.3.1. GENERAL STATISTICS

The data analysis covered 24 countries. However, the complete analysis is achieved for 22 countries (see the table below) that provided a complete demographic and epidemiological data. Two countries Nigeria and Ethiopia which worked with partial datasets (one state out of 37 for Nigeria and one Region out of 9 for Ethiopia) are not included in the summary statistics. The summary statistics in the rest of this documents include then only the 22 countries.

Table 2: Number of administrative units and sub-units by country

Country	Number of admin 1 (province, region, state)	Number of IUs (districts)	Number of sub-IUs (sub-districts)
Burkina Faso	13	70	2,103
Cameroon	10	189	1,766
CAR	7	35	72
Chad	23	120	1,541
Côte d'Ivoire	20	86	2,254
DRC	26	519	8,999
Gabon	10	51	229
Ghana	16	260	1,375
Guinea	8	38	384
Kenya	47	290	1,448
Madagascar	22	114	1,640
Malawi	3	32	430
Mali	11	75	1,378
Namibia	14	35	121
Niger	8	72	1,090
Senegal	14	77	1,519
South Sudan	10	80	514
Tanzania (Mainland)	26	174	3,151
Togo	6	44	712
Uganda	4	134	7,317
Zambia	10	103	1,421
Zimbabwe	10	63	1,967
Grand Total	318	2,661	41,431

The geographical scope of the 22 countries concerned 318 admin 1 (state, province, region), 2,661 IUs (districts) and 41,431 sub-IUs (sub-districts). The sub-IUs are the third and the fourth administrative levels.

V.3.2. SUMMARY STATISTICS OF THE ENDEMICITY CALCULATED USING DISTRICT DATA

The table below summarizes for every country the classification of the sub-IUs by endemicity categories using the prevalence calculated for the districts.

In total, 13% of the sub-IUs are not endemic, 23.8% are classified unknown and 63.2 % have endemicity status ranging from low to high.

Table 3: Number of sub-districts by endemicity category with district prevalence

Country	Not endemic	Low	Moderate	High	Unknown	Total
Burkina Faso	1,075	582	44		402	2,103
Cameroon	431	789	489	5	52	1,766
CAR	8	19	24	15	6	72
Chad	35	379	581	175	371	1,541
Côte d'Ivoire	114	1,323	309	45	463	2,254
DRC	873	881	4,328	366	2,552	9,000
Gabon	31	173	26			230
Ghana	95	280	238	117	645	1,375

Country	Not endemic	Low	Moderate	High	Unknown	Total
Guinea	49	93	119	123		384
Kenya	637	202	293	28	290	1,450
Madagascar	18	149	355	286	933	1,741
Malawi	9	328	94			431
Mali	116	265	555	204	241	1,381
Namibia	33	52	26		10	121
Niger	9	452	485	131	13	1,090
Senegal	176	508	388	53	394	1,519
South Sudan	107	212	154	18	24	515
Tanzania (Mainland)	110	309	61		2,763	3,243
Togo	13	589	70		40	712
Uganda	1,012	3,883	1,812	95	699	7,501
Zambia	68	637	628	28	60	1,421
Zimbabwe	374	1,365	228			1,967
Total	5,393	13,470	11,307	1,689	9,958	41,817
	13.0%	32.2%	27.0%	4.0%	23.8%	100%

The categories of unknown endemicities are justified by the following reasons:

- The epidemiological data are not complete. The missing data are mostly the very old surveys for which the data were not readily accessible. Even if those data are available, some countries have excluded them arguing that the current endemicity for those IUs are based on recent impact assessment data in sentinel sites (sentinel site impact surveys are geographically limited but used to redefine endemicity for wider geographical scope).
- All the available data are not linked correctly to their IUs (misspelling of geographic entities names).

V.3.3. SUMMARY STATISTICS OF THE ENDEMICITY CALCULATED USING SUB-DISTRICT DATA

The table below is identical to the previous one with difference that the endemicity status are determined using the epidemiological data of the sub-IUs.

In total, 6.8% of the sub-IUs are not endemic, 79.3% are classified unknown and 13.9 % have endemicity status ranging from low to high.

Table 4: Number of sub-districts by endemicity category with sub-district prevalence

Country	Not endemic	Low	Moderate	High	Unknown	Total	% with own prevalence
Burkina Faso	56	29	8		2,010	2,103	4.4%
Cameroon	276	122	60	13	1,295	1,766	26.7%
CAR	9	14	9	12	28	72	61.1%
Chad	126	95	154	54	1,112	1,541	27.8%
Côte d'Ivoire	214	203	131	26	1,680	2,254	25.5%
DRC	359	135	702	137	7,667	9,000	14.8%
Gabon	27	55	16		132	230	42.6%
Ghana	31	70	45	31	1,198	1,375	12.9%
Guinea	40	25	30	45	244	384	36.5%
Kenya	263	57	134	49	947	1,450	34.7%
Madagascar	13	39	51	85	1,553	1,741	10.8%
Malawi	54	87	112	8	170	431	60.6%

Country	Not endemic	Low	Moderate	High	Unknown	Total	% with own prevalence
Mali	34	51	82	50	1,164	1,381	15.7%
Namibia	32	34	31	7	17	121	86.0%
Niger	5	163	158	44	720	1,090	33.9%
Senegal	70	31	28	8	1,382	1,519	9.0%
South Sudan	113	51	74	21	256	515	50.3%
Tanzania (Mainland)	86	44	35	2	3,076	3,243	5.1%
Togo	272	120	96	19	205	712	71.2%
Uganda	470	661	465	148	5,757	7,501	23.3%
Zambia	124	109	166	75	947	1,421	33.4%
Zimbabwe	159	109	81	10	1,608	1,967	18.3%
Total	2,833	2,304	2,668	844	33,168	41,817	20.7%
	6.77%	5.51%	6.38%	2.02%	79.32%	100%	20.7%

Overall, 20.7% have been classified by their own data. This varies from 4.4 to 86.0%

The high number unknown endemicity has different justifications:

- All survey data are not also available.
- All the available site data are not linked or incorrectly linked to their sub-IUs and such site data are not used in the calculation of the sub-IU prevalence.
- Surveys usually cover few sub-IUs in the IU. The protocol recommends a minimum of five sites per IU while an IU have an average of 16 sub-IUs, the number of sub-IUs by IU ranging from 1 to 152. The average sites.

V.3.4. CHANGE IN ENDEMICITY CATEGORIES

The table below summarize the changes in the sub-district endemicities when using the sub-district data instead of the district data. The changes are grouped into 3 categories. The treatment strategy applied to the endemicity category is adequate in case of no change. When treatments needs are lower, then the sub-district is over treated under district endemicity. It is under treated if treatment needs are higher with the sub-district data.

Table 5: Changes in endemicity categories from district prevalence to sub-district prevalence

Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	772				772
	Low		1,228			1,228
	Moderate			1,417		1,417
	High				255	255
Over Treatment	Low	935				935
	Moderate	284	293			577
	High		1	45		46
Under Treatment	Low			448	14	462
	Moderate				320	320
Total		1,991	1,522	1,910	589	6,012

The table below illustrates the number of sub-districts in each category of treatment adequacy.

Table 6: Number of sub-districts in each category of treatment adequacy

Country	Adequate treatment	Over Treatment	Under Treatment	Total	% of inadequate strategy
Burkina Faso	60	9	1	70	14.3%
Cameroon	221	76	22	319	30.7%
Chad	182	53	29	264	31.1%
Côte d'Ivoire	146	98	51	295	50.5%
Gabon	65	17	10	92	29.3%
Guinea	84	16	14	114	26.3%
Madagascar	88	30	29	147	40.1%
Mali	81	12	15	108	25.0%
Niger	183	32	58	273	33.0%
Togo	114	258	84	456	75.0%
Kenya	307	35	23	365	15.9%
Uganda	434	327	110	871	50.2%
Ghana	139	14	11	164	15.2%
Zambia	151	139	89	379	60.2%
Zimbabwe	120	84	18	222	45.9%
Tanzania (Mainland)	28	13	11	52	46.2%
South Sudan	147	29	24	200	26.5%
Malawi	100	52	52	204	51.0%
Senegal	74	48	14	136	45.6%
CAR	33	4	2	39	15.4%
DRC	857	210	94	1,161	26.2%
Namibia	58	2	21	81	28.4%
Total	3,672	1,558	782	6,012	38.9%
	61.1%	25.9%	13.0%	100.00%	38.9%

About 39% of the sub-districts that have their own data are either over or under treated. This is very significant. This percentage varies from 14 to 75 %.

V.3.5. ESTIMATES OF THE POPULATION REQUIRING PC AND PZQ BY DISTRICT LEVEL IMPLEMENTATION VERSUS ESTIMATES BY SUB DISTRICT LEVEL IMPLEMENTATION

The table below summarizes the treatment needs in both district and sub-district implementations. The difference in PZQ estimations for SAC decrease or increase from one country to another. But at a wider scale (6,012 sub-districts in 22 countries), the number of SAC and the amount of PZQ decrease by 6.79% which constitutes a saving of PZQ. However, the increase in the PZQ needs must not be seen negatively. The most important benefit is the better targeting that addresses the focality of schistosomiasis and shrinking of the map of PZQ distribution.

Table 7: Comparison of population requiring PC and PZQ needs in district level and sub-district level implementation

Country	# of sub-IU	SAC estimates (IU endemicity)	SAC estimates (sub-IU endemicity)	PZQ estimates for SAC (IU endemicity)	PZQ estimates for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates
Burkina Faso	70	45,523	32,032	113,815	80,085	-29.64%
Cameroon	319	403,839	366,512	1,009,645	916,314	-9.24%

Country	# of sub-IU	SAC estimates (IU endemicity)	SAC estimates (sub-IU endemicity)	PZQ estimates for SAC (IU endemicity)	PZQ estimates for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates
CAR	39	349,382	354,592	873,463	886,487	1.49%
Chad	264	663,614	625,950	1,659,078	1,564,913	-5.68%
Côte d'Ivoire	295	399,824	301,833	999,627	754,624	-24.51%
DRC	1,161	2,482,118	2,198,546	6,205,453	5,496,506	-11.42%
Gabon	92	126,533	122,175	316,353	305,452	-3.45%
Ghana	164	382,303	379,261	955,786	948,182	-0.80%
Guinea	114	617,152	667,241	1,542,901	1,668,121	8.12%
Kenya	365	784,130	773,626	1,960,359	1,934,095	-1.34%
Madagascar	147	401,464	413,778	1,003,687	1,034,474	3.07%
Malawi	204	1,275,789	1,244,158	3,189,521	3,110,422	-2.48%
Mali	108	327,896	340,247	819,758	850,634	3.77%
Namibia	81	118,789	135,946	296,981	339,872	14.44%
Niger	273	902,101	995,998	2,255,306	2,490,047	10.41%
Senegal	136	127,796	94,369	319,510	235,934	-26.16%
South Sudan	200	564,920	574,299	1,412,328	1,435,774	1.66%
Tanzania (Mainland)	52	48,056	42,705	120,148	106,767	-11.14%
Togo	456	468,448	311,003	1,171,225	777,547	-33.61%
Uganda	871	717,255	570,788	1,793,295	1,427,088	-20.42%
Zambia	379	817,714	714,183	2,044,354	1,785,510	-12.66%
Zimbabwe	222	147,776	87,033	369,484	217,606	-41.11%
Total	6,012	12,172,422	11,346,275	30,432,077	28,366,454	-6.79%

V.3.6. COMPARISON BETWEEN UNDERESTIMATES AND OVERESTIMATES OF DRUG NEEDS AT DISTRICT LEVEL

The table below demonstrate once more all the inconvenience of wider scale distribution of PZQ.

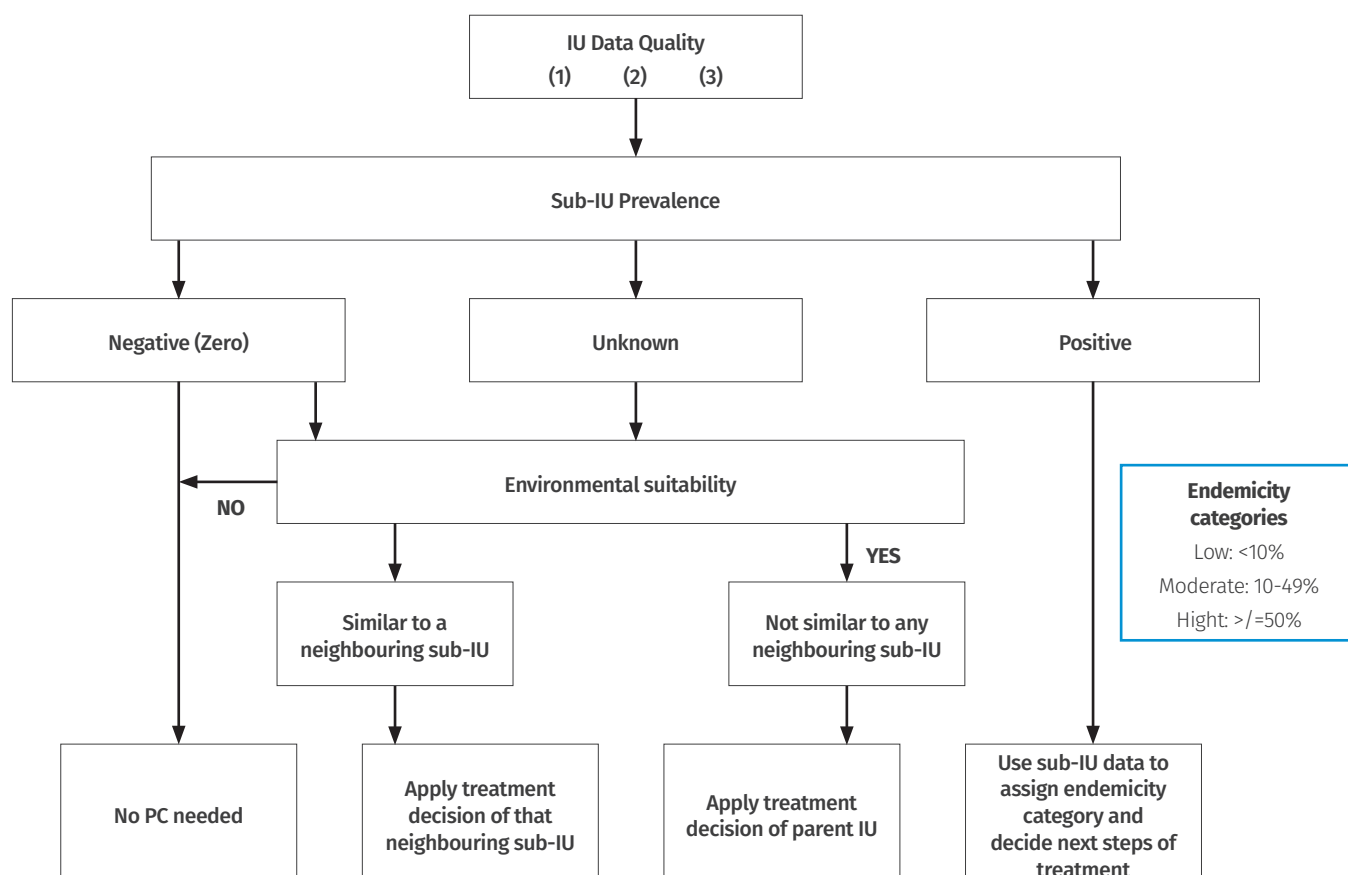
It shows that in all case there an amount of PZQ that is not requested due to under estimation and in the other hand, there is an amount of PZQ unnecessarily distributed. In many cases (15 countries out of 7) the amount of PZQ in excess is more than enough to compensate the gaps where under estimation occurred.

Table 8: Comparison between underestimates and overestimates of drug needs at district level

Country	Number of sub-IUs with epidemiological data	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed PZQ	Misused PZQ
Burkina Faso	70	29,949	337	13,828	843	34,572
Cameroon	319	266,384	34,727	72,054	86,825	180,152
CAR	39	314,825	16,007	10,797	40,018	26,993
Chad	264	455,940	60,956	98,620	152,399	246,564
Côte d'Ivoire	295	182,208	39,278	137,269	98,209	343,196
DRC	1,161	1,747,621	167,200	450,772	418,032	1,126,963
Gabon	92	113,348	2,843	7,201	7,111	18,006

Country	Number of sub-IUs with epidemiological data	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed PZQ	Misused PZQ
Ghana	164	331,893	16,174	19,216	40,438	48,043
Guinea	114	434,804	83,654	33,565	209,140	83,916
Kenya	365	542,088	99,140	109,644	247,857	274,118
Madagascar	147	269,680	51,509	39,195	128,782	97,998
Malawi	204	685,546	199,481	231,112	498,716	577,795
Mali	108	251,062	35,334	22,983	88,341	57,460
Namibia	81	85,032	19,566	2,409	48,920	6,023
Niger	273	567,346	142,631	48,734	356,592	121,843
Senegal	136	56,415	12,985	46,412	32,467	116,039
South Sudan	200	362,981	85,373	75,994	213,441	189,992
Tanzania (Mainland)	52	24,010	6,590	11,941	16,477	29,855
Togo	456	130,983	71,866	229,311	179,691	573,337
Uganda	871	325,946	79,394	225,861	198,517	564,732
Zambia	379	369,090	137,767	241,298	344,443	603,276
Zimbabwe	222	59,128	9,517	70,260	23,796	175,669
Total	6,012	7,606,279	1,372,329	2,198,476	3,431,055	5,496,542

The evidence shown in the table above definitely demonstrate that the sub-district implementation is never a choice but a MUST. The big challenge is that the current available mapping data are far from enough to define an endemicity status for each sub-district. The current approaches in to make use of any other evidence in addition to the epidemiological survey data to determine the sub-district endemicity status. The flowchart on the figure below is an algorithm that is proposed and used to fill the data gaps.



The algorithm prioritizes the sub-district data if this exist and shows that the sub-district is endemic. In the absence of sub-district survey data, the district data is used or the previous endemicity reported for the district is used. But before using the district information, it is proposed in the algorithm to find any neighbouring sub-district that has data and use its data for the sub-district. The last option is to collect more environmental evidence in the addition of the suitability maps provided by the LASER team at LSHTM.

The table below summarize the final endemicity of the sub-district by final decision type

Table 9: Number of sub-districts in each category of final decision

Country	Final Decision						Total
	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	4. Use highest adjacent endemicity	5. Need further assessment	6. Not endemic	
Burkina Faso	93	1,608	402				2,103
Cameroon	471	1,243	52				1,766
CAR	44	22	6				72
Chad	429	741	364		7		1,541
Côte d'Ivoire	574	1,217	463				2,254
DRC	1,333	5,115	2,552				9,000
Gabon	98	132					230
Ghana	177	553	645				1,375
Guinea	140	244					384
Kenya	503	664	283				1,450
Madagascar	188	620	933				1,741
Malawi	260	13	16	142			431
Mali	217	923	241				1,381
Namibia	104	7	10				121
Niger	370	707	13				1,090
Senegal	66	374	249		559	271	1,519
South Sudan	228	233	9	1	10	34	515
Tanzania (Mainland)	167	313	2,763				3,243
Togo	507	165	40				712
Uganda	752	1,269	2,195	179		3,106	7,501
Zambia	466	388	71	482	14		1,421
Zimbabwe	359	1,608					1,967
Total	7,546	18,159	11,307	804	590	3,411	41,817
	18.1%	43.4%	27.0%	1.9%	1.4%	8.2%	100.00%

18.1 % of the sub-districts are classified by their own data and 70% by the district data. Only 1.9% are classified by a neighbouring sub-district. 8.2 % are classified not endemic either by their own data or environmental information.

VI. ACTION POINTS OF THE WORKSHOPS

VI.1. ACTION POINTS FOR COUNTRIES

1. Identify and submit all the sub-districts/health area lists to benefit from the following decisions:
 - a. Sub-districts/Health Areas not to benefit from mass treatment;
 - b. Sub-districts / Health Areas to benefit from mass treatment and
 - c. Sub-districts / Health Areas for which decisions are expected following additional investigations;
2. Revise the PZQ request in the JRSM considering the changes made following the workshops
3. Implement praziquantel distribution at sub district level once endemicity classification per sub district level is available (medicines remaining after distribution targeted at sub district level in 2020 will be utilized in 2021);
4. Disseminate the relevant packages and tools received from the workshops to health actors at the level of the Regions/Provinces, Health Districts, Health Centres and Health Posts as well as to the implementing partners of the schistosomiasis control programmes.

VI.2. ACTION POINTS FOR ESPEN/WHO

1. Continue technical support to countries for the adequate implementation of the sub-district approach to focus PC with Praziquantel, for its effective and country-wide application by 2020 at the latest;
2. Following the workshop, establish a communication network/framework to facilitate exchanges between programme coordinators/focal points, ESPEN and Experts, to support the application of the approach to focus mass treatment;
3. Provide technical support to countries where needed by sending consultants or WHO staff where necessary to support the data analysis exercise;
4. Continue advocacy for availability of PZQ for adult treatment.

VII. ANNEXES

VII.1. ANNEX 1: SUPPLEMENTAL DATA COLLECTION FOR THE REFINEMENT OF SCHISTOSOMIASIS ENDEMICITY AT SUB DISTRICT LEVEL

COUNTRY:

REGION / PROVINCE:

DISTRICT:

SUB DISTRICT/HEALTH AREA^(a):

HEALTH FACILITY NAME^(b):

No	Name of the village or community	Total population in 2019 in the village	Potential Schistosomiasis cases reported in the village (haematuria or diagnosed by microscopy at health facility): 1 if Yes 0 if No	Type of water body ^(c) : 1. River, Lake 2. Pond 3. Irrigation canal 4. Rice plantation 5. Other wetland (specify) 6. None	Activities around the water body ^(c) : 1. Fishing 2. Farming 3. Domestic use 4. Other (specify) 5. None	Source of water supply ^(c) : 1. Pond, lake, river 2. Drill or well 3. Household pump 4. Pipe 5. Other (specify) 6. None	Sanitation status ^(c) : 1. Open defecation 2. Household latrines	Availability of health post: 1 if Yes 0 if No	Availability of laboratory where microscopy is done 1 if Yes 0 if No	Availability of Community health workers/ Drug distributors 1 if Yes 0 if No	Number of schools in the village (write number of schools)
1											
2											
3											
4											
5											
6											
...											
	Total										

(a) Country to use the appropriate name

(b) Front line health facility to fill the form (or Praziquantel delivery channel)

(c) Enter all numbers that apply Annex 2: Country Summary Statistics

VII.2. SUMMARY STATISTICS OF THE 22 COUNTRIES INCLUDED IN THE ANALYSIS

VII.2.1. GLOBAL SUMMARY

Summary Statistics of the 22 Countries Included in the Analysis

Number of IUs and sub-IUs			Demography - Total, SAC and adult population				
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population	
318	2,661	41,431	2020	543,377,808	157,096,385	288,270,975	
Number of sub-districts by endemicity categories by district mean prevalence							
Not endemic	Low	Moderate	High	Unknown	Total		
5,393	13,470	11,307	1,689	9,958	41,817		
12.9%	32.2%	27.0%	4.0%	23.8%	100.0%		
Number of sub-districts by endemicity categories by sub-district highest prevalence							
Not endemic	Low	Moderate	High	Unknown	Total		
2,833	2,304	2,668	844	33,168	41,817		
6.8%	5.5%	6.4%	2.0%	79.3%	100.0%		
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence							
Endemicity category calculated (sub-IU)							
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total	
Adequate treatment	Not endemic	772				772	
	Low		1,228			1,228	
	Moderate			1,417		1,417	
	High				255	255	
Under Treatment	Low			448	14	462	
	Moderate				320	320	
Over Treatment	Low	935				935	
	Moderate	284	293			577	
	High		1	45		46	
Total		1,991	1,522	1,910	589	6,012	
Treatment Strategy Adequacy with District Mean Prevalence							
Adequate treatment		Under Treatment		Over Treatment		Total	
3,672		782		1,558		6,012	
61.1%		13.0%		25.9%		100.0%	
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation							
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates		
6,012	12,172,422	11,346,275	30,432,077	28,366,454	-6.8%		
Treatment Inequity and Inefficient PQZ Allocation							
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused		
6,012	7,606,279	1,372,329	2,198,476	3,431,055	5,496,542		
Number of sub-districts by endemicity categories with the final decision tree							
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	4. Use highest adjacent endemicity	5. Need further assessment	6. Not endemic	Total
Not endemic	2,389	3,733	2,881	81		3,411	12,495
Low	1,896	6,555	4,639	88			13,178
Moderate	2,442	6,711	1,976	241			11,370
High	799	1,157	1,223	123			3,302
Unknown	20	3	10	271			304
Need further assessment					590		590
Null			578				578
Total	7,546	18,159	11,307	804	590	3,411	41,817
	18.0%	43.4%	27.0%	1.9%	1.4%	8.2%	100.0%

VII.2.2. COUNTRY SUMMARIES

VII.2.2.1. BURKINA FASO

Burkina Faso

Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
13	70	2,103	2020	21,510,241	6,217,183	11,506,076
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	Unknown		Total	
1,075	582	44	402		2,103	
51.1%	27.7%	2.1%	19.1%		100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	Unknown		Total	
56	29	8	2,010		2,103	
2.7%	1.4%	0.4%	95.6%		100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	Total	
Adequate treatment	Not endemic	39			39	
	Low		19		19	
	Moderate			2	2	
Under Treatment	Low			1	1	
Over Treatment	Low	8			8	
	Moderate		1		1	
Total		47	20	3	70	
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment	Over Treatment			Total	
60	1	9			70	
85.7%	1.4%	12.9%			100.0%	
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
70	45,523	32,032	113,815	80,085	-29.6%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
70	29,949	337	13,828	843	34,572	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	56	1,023		1,079		
Low	29	548	268	845		
Moderate	8	37	134	179		
Total	93	1,608	402	2,103		
	4.4%	76.5%	19.1%	100.0%		

VII.2.2.2. CAMEROON

Cameroon						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
10	189	1,766	2018	25,489,978	6,805,832	14,376,355
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
431	789	489	5	52	1,766	
24.4%	44.7%	27.7%	0.3%	2.9%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
276	122	60	13	1,295	1,766	
15.6%	6.9%	3.4%	0.7%	73.3%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	89				89
	Low		88			88
	Moderate			44		44
Under Treatment	Low			9		9
	Moderate				13	13
Over Treatment	Low	54				54
	Moderate	14	8			22
Total		157	96	53	13	319
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment		Over Treatment		Total	
221	22		76		319	
69.3%	6.9%		23.8%		100.0%	
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
319	403,839	366,512	1,009,645	916,314	-9.2%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
319	266,384	34,727	72,054	86,825	180,152	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	276	340	26	642		
Low	122	499	26	647		
Moderate	60	399		459		
High	13	5		18		
Total	471	1,243	52	1,766		
	26.7%	70.4%	2.9%	100.0%		

VII.2.2.3. CAR

CAR

Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
7	35	72	2019	5,132,540	1,165,088	3,079,526
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
8	19	24	15	6	72	
11.1%	26.4%	33.3%	20.8%	8.3%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
9	14	9	12	28	72	
12.5%	19.4%	12.5%	16.7%	38.9%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Endemicity category calculated (sub-IU)				Total
		Not endemic	Low	Moderate	High	
Adequate treatment	Not endemic	5				5
	Low		10			10
	Moderate			9		9
	High				9	9
Under Treatment	Moderate				2	2
Over Treatment	Low	1				1
	Moderate	1	2			3
Total		7	12	9	11	39
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment		Under Treatment		Over Treatment	Total	
33		2		4	39	
84.6%		5.1%		10.3%	100.0%	
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
39	349,382	354,592	873,463	886,487	1.5%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
39	314,825	16,007	10,797	40,018	26,993	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	9	3		12		
Low	14	3		17		
Moderate	9	10		19		
High	12	6		18		
Null			6	6		
Total	44	22	6	72		
	61.1%	30.6%	8.3%	100.0%		

VII.2.2.4. CHAD

Chad

Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
23	120	1,541	2019	18,249,716	6,697,669	9,070,108
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
35	379	581	175	371	1,541	
2.3%	24.6%	37.7%	11.4%	24.1%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
126	95	154	54	1,112	1,541	
8.2%	6.2%	10.0%	3.5%	72.2%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	12				12
	Low		42			42
	Moderate			101		101
	High				27	27
Under Treatment	Low			11		11
	Moderate				18	18
Over Treatment	Low	26				26
	Moderate	5	11			16
	High		1	10		11
Total		43	54	122	45	264
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment		Under Treatment		Over Treatment		Total
182		29		53		264
68.9%		11.0%		20.1%		100.0%
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
264	663,614	625,950	1,659,078	1,564,913	-5.7%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
264	455,940	60,956	98,620	152,399	246,564	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	5. Need further assessment	Total	
Not endemic	126	18	18		162	
Low	95	244	15		354	
Moderate	154	368	100		622	
High	54	111	27		192	
Need further assessment				7	7	
Null			204		204	
Total	429	741	364	7	1,541	
	27.8%	48.1%	23.6%	0.5%	100.0%	

VII.2.2.5. CÔTE D'IVOIRE

Côte d'Ivoire						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
20	86	2,254	2018	25,947,689	6,227,431	15,568,596
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
114	1,323	309	45	463	2,254	
5.1%	58.7%	13.7%	2.0%	20.5%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
214	203	131	26	1,680	2,254	
9.5%	9.0%	5.8%	1.2%	74.5%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	21				21
	Low		105			105
	Moderate			20		20
Under Treatment	Low			43	2	45
	Moderate				6	6
Over Treatment	Low	87				87
	Moderate		11			11
Total		108	116	63	8	295
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment	Over Treatment	Total			
146	51	98	295			
49.5%	17.3%	33.2%	100.0%			
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
295	399,824	301,833	999,627	754,624	-24.5%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
295	182,208	39,278	137,269	98,209	343,196	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	214	76		290		
Low	203	913	71	1,187		
Moderate	131	188	342	661		
High	26	40	50	116		
Total	574	1,217	463	2,254		
	25.5%	54.0%	20.5%	100.0%		

VII.2.2.6. DRC

DRC						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
26	519	8,999	2018	103,139,835	36,099,149	47,444,396
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
873	881	4,328	366	2,552	9,000	
9.7%	9.8%	48.1%	4.1%	28.4%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
359	135	702	137	7,667	9,000	
4.0%	1.5%	7.8%	1.5%	85.2%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	143				143
	Low		74			74
	Moderate			575		575
	High				65	65
Under Treatment	Low			29		29
	Moderate				65	65
Over Treatment	Moderate	160	32			192
	High			18		18
Total		303	106	622	130	1,161
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment	Over Treatment	Total			
857	94	210	1,161			
73.8%	8.1%	18.1%	100.0%			
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
1,161	2,482,118	2,198,546	6,205,453	5,496,506	-11.4%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
1,161	1,747,621	167,200	450,772	418,032	1,126,963	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	359	723	1,792	2,874		
Low	135	701	550	1,386		
Moderate	702	3,410	187	4,299		
High	137	281	23	441		
Total	1,333	5,115	2,552	9,000		
	14.8%	56.8%	28.4%	100.0%		

VII.2.2.7. GABON

Gabon						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
10	51	229	2019	2,039,968	550,332	1,298,785
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic		Low	Moderate		Total	
31		173	26		230	
13.5%		75.2%	11.3%		100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic		Low	Moderate	Unknown	Total	
27		55	16	132	230	
11.7%		23.9%	7.0%	57.4%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
		Endemicity category calculated (sub-IU)				
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	Total	
Adequate treatment	Not endemic	12			12	
	Low		50		50	
	Moderate			3	3	
Under Treatment	Low			10	10	
Over Treatment	Low	12			12	
	Moderate	3	2		5	
Total		27	52	13	92	
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment		Under Treatment	Over Treatment		Total	
65		10	17		92	
70.7%		10.9%	18.5%		100.0%	
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
92	126,533	122,175	316,353	305,452	-3.4%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
92	113,348	2,843	7,201	7,111	18,006	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity		2. Use IU endemicity		Total	
Not endemic	27		19		46	
Low	55		95		150	
Moderate	16		18		34	
Total	98		132		230	
	42.6%		57.4%		100.0%	

VII.2.2.8. GHANA

Ghana						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
16	260	1,375	2019	30,575,341	7,490,973	18,864,984
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
95	280	238	117	645	1,375	
6.9%	20.4%	17.3%	8.5%	46.9%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
31	70	45	31	1,198	1,375	
2.3%	5.1%	3.3%	2.3%	87.1%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	20				20
	Low		55			55
	Moderate			41		41
	High				23	23
Under Treatment	Low			3		3
	Moderate				8	8
Over Treatment	Low	4				4
	Moderate	2	8			10
Total		26	63	44	31	164
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment		Under Treatment		Over Treatment		Total
139		11		14		164
84.8%		6.7%		8.5%		100.0%
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
164	382,303	379,261	955,786	948,182	-0.8%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
164	331,893	16,174	19,216	40,438	48,043	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	31	74		105		
Low	70	216	35	321		
Moderate	45	175	252	472		
High	31	88	31	150		
Null			327	327		
Total	177	553	645	1,375		
	12.9%	40.2%	46.9%	100.0%		

VII.2.2.9. GUINEA

Guinea						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
8	38	384	2019	12,191,247	3,047,867	6,705,190
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Total		
49	93	119	123	384		
12.8%	24.2%	31.0%	32.0%	100.0%		
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
40	25	30	45	244	384	
10.4%	6.5%	7.8%	11.7%	63.5%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	16				16
	Low		15			15
	Moderate			21		21
	High				32	32
Under Treatment	Low			3		3
	Moderate				11	11
Over Treatment	Low	4				4
	Moderate		7			7
	High			5		5
Total		20	22	29	43	114
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment	Over Treatment	Total			
84	14	16	114			
73.7%	12.3%	14.0%	100.0%			
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
114	617,152	667,241	1,542,901	1,668,121	8.1%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
114	434,804	83,654	33,565	209,140	83,916	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	Total			
Not endemic	40	25	65			
Low	25	60	85			
Moderate	30	77	107			
High	45	82	127			
Total	140	244	384			
	36.5%	63.5%	100.0%			

VII.2.2.10. KENYA

Kenya						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
47	290	1,448	2019	50,485,015	13,883,360	28,826,948
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
637	202	293	28	290	1,450	
43.9%	13.9%	20.2%	1.9%	20.0%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
263	57	134	49	947	1,450	
18.1%	3.9%	9.2%	3.4%	65.3%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	180				180
	Low		29			29
	Moderate			89		89
	High				9	9
Under Treatment	Low			3		3
	Moderate				20	20
Over Treatment	Low	22				22
	Moderate	4	9			13
Total		206	38	92	29	365
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment	Under Treatment	Over Treatment	Total			
307	23	35	365			
84.1%	6.3%	9.6%	100.0%			
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
365	784,130	773,626	1,960,359	1,934,095	-1.3%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
365	542,088	99,140	109,644	247,857	274,118	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	263	408	213	884		
Low	57	118		175		
Moderate	134	128	70	332		
High	49	10		59		
Total	503	664	283	1,450		
	34.7%	45.8%	19.5%	100.0%		

VII.2.2.11. MADAGASCAR

Madagascar						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
22	114	1,640	2018	26,872,591	7,389,970	15,183,022
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
18	149	355	286	933	1,741	
1.0%	8.6%	20.4%	16.4%	53.6%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
13	39	51	85	1,553	1,741	
0.7%	2.2%	2.9%	4.9%	89.2%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Treatment Strategy Adequacy		Endemicity category calculated (sub-IU)				
		Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	2				2
	Low		15			15
	Moderate			30		30
	High				41	41
Under Treatment	Low			6		6
	Moderate				23	23
Over Treatment	Low	1				1
	Moderate	4	19			23
	High			6		6
Total		7	34	42	64	147
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment		Under Treatment		Over Treatment		Total
88		29		30		147
59.9%		19.7%		20.4%		100.0%
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
147	401,464	413,778	1,003,687	1,034,474	3.1%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
147	269,680	51,509	39,195	128,782	97,998	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	13	16	82	111		
Low	39	119	295	453		
Moderate	51	267	403	721		
High	85	218	153	456		
Total	188	620	933	1,741		
	10.8%	35.6%	53.6%	100.0%		

VII.2.2.12. MALAWI

Malawi						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
3	32	430	2019	18,756,847	5,195,645	10,053,673
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic		Low	Moderate		Total	
9		328	94		431	
2.1%		76.1%	21.8%		100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
54	87	112	8	170	431	
12.5%	20.2%	26.0%	1.9%	39.4%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	1				1
	Low		64			64
	Moderate			35		35
Under Treatment	Low			48		48
	Moderate				4	4
Over Treatment	Low	48				48
	Moderate	2	2			4
Total		51	66	83	4	204
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment		Under Treatment		Over Treatment		Total
100		52		52		204
49.0%		25.5%		25.5%		100.0%
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
204	1,275,789	1,244,158	3,189,521	3,110,422	-2.5%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
204	685,546	199,481	231,112	498,716	577,795	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	4. Use highest adjacent endemicity	Total	
Not endemic	54			12	66	
Low	85	13		13	111	
Moderate	108		8	22	138	
High	8		8	4	20	
Unknown	5			91	96	
Total	260	13	16	142	431	
	60.3%	3.0%	3.7%	32.9%	100.0%	

VII.2.2.13. MALI

Mali						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
11	75	1,378	2019	20,461,101	5,831,413	10,537,467
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
116	265	555	204	241	1,381	
8.4%	19.2%	40.2%	14.8%	17.5%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
34	51	82	50	1,164	1,381	
2.5%	3.7%	5.9%	3.6%	84.3%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	14				14
	Low		17			17
	Moderate			35		35
	High				15	15
Under Treatment	Low			5		5
	Moderate				10	10
Over Treatment	Low	4				4
	Moderate	4	3			7
	High			1		1
Total		22	20	41	25	108
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment		Over Treatment		Total	
81	15		12		108	
75.0%	13.9%		11.1%		100.0%	
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
108	327,896	340,247	819,758	850,634	3.8%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
108	251,062	35,334	22,983	88,341	57,460	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	34	88		122		
Low	51	217	112	380		
Moderate	82	451	96	629		
High	50	167	33	250		
Total	217	923	241	1,381		
	15.7%	66.8%	17.5%	100.0%		

VII.2.2.14. NAMIBIA

Namibia						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
14	35	121	2019	2,675,057	615,263	1,685,286
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	Unknown		Total	
33	52	26	10		121	
27.3%	43.0%	21.5%	8.3%		100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown		Total
32	34	31	7	17		121
26.4%	28.1%	25.6%	5.8%	14.0%		100.0%
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	28				28
	Low		19			19
	Moderate			11		11
Under Treatment	Low			16	1	17
	Moderate				4	4
Over Treatment	Moderate		2			2
Total		28	21	27	5	81
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment		Under Treatment		Over Treatment		Total
58		21		2		81
71.6%		25.9%		2.5%		100.0%
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
81	118,789	135,946	296,981	339,872	14.4%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
81	85,032	19,566	2,409	48,920	6,023	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity		Total	
Not endemic	32	5			37	
Low	34	1			35	
Moderate	31	1			32	
High	7				7	
Unknown			10		10	
Total	104	7	10		121	
	86.0%	5.8%	8.3%		100.0%	

VII.2.2.15. NIGER

Niger						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
8	72	1,090	2019	22,424,629	6,727,431	11,212,574
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
9	452	485	131	13	1,090	
0.8%	41.5%	44.5%	12.0%	1.2%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
5	163	158	44	720	1,090	
0.5%	15.0%	14.5%	4.0%	66.1%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	5				5
	Low		99			99
	Moderate			69		69
	High				10	10
Under Treatment	Low			39	1	40
	Moderate				18	18
Over Treatment	Moderate		31			31
	High			1		1
Total		5	130	109	29	273
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment		Over Treatment		Total	
183	58		32		273	
67.0%	21.2%		11.7%		100.0%	
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
273	902,101	995,998	2,255,306	2,490,047	10.4%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
273	567,346	142,631	48,734	356,592	121,843	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	5	4		9		
Low	163	301		464		
Moderate	158	316		474		
High	44	86		130		
Null			13	13		
Total	370	707	13	1,090		
	33.9%	64.9%	1.2%	100.0%		

VII.2.2.16. SENEGAL

Senegal						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
14	77	1,519	2019	16,648,800	4,799,862	8,773,928
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
176	508	388	53	394	1,519	
11.6%	33.4%	25.5%	3.5%	25.9%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
70	31	28	8	1,382	1,519	
4.6%	2.0%	1.8%	0.5%	91.0%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Treatment Strategy Adequacy		Endemicity category calculated (sub-IU)				
		Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	30				30
	Low		22			22
	Moderate			20		20
	High				2	2
Under Treatment	Low			8		8
	Moderate				6	6
Over Treatment	Low	31				31
	Moderate	8	9			17
Total		69	31	28	8	136
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment		Under Treatment		Over Treatment	Total	
74		14		48	136	
54.4%		10.3%		35.3%	100.0%	
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
136	127,796	94,369	319,510	235,934	-26.2%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
136	56,415	12,985	46,412	32,467	116,039	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	5. Need further assessment	6. Not endemic	Total
Not endemic					271	271
Low	30	90	2			122
Moderate	28	233	66			327
High	8	51	181			240
Need further assessment				559		559
Total	66	374	249	559	271	1,519
	4.3%	24.6%	16.4%	36.8%	17.8%	100.0%

VII.2.2.17. SOUTH SUDAN

South Sudan							
Number of sub-IUs			Demography - Total, SAC and adult population				
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population	
10	80	514	2019	12,916,829	3,461,705	7,465,924	
Number of sub-districts by endemicity categories by district mean prevalence							
Not endemic	Low	Moderate	High	Unknown	Total		
107	212	154	18	24	515		
20.8%	41.2%	29.9%	3.5%	4.7%	100.0%		
Number of sub-districts by endemicity categories by sub-district highest prevalence							
Not endemic	Low	Moderate	High	Unknown	Total		
113	51	74	21	256	515		
21.9%	9.9%	14.4%	4.1%	49.7%	100.0%		
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence							
Endemicity category calculated (sub-IU)							
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total	
Adequate Treatment	Not endemic	52				52	
	Low		37			37	
	Moderate			51		51	
	High				7	7	
Under Treatment	Low			11		11	
	Moderate				13	13	
Over Treatment	Low	17				17	
	Moderate	2	8			10	
	High			2		2	
Total		71	45	64	20	200	
Treatment Strategy Adequacy with District Mean Prevalence							
Adequate Treatment	Under Treatment		Over Treatment		Total		
147	24		29		200		
73.5%	12.0%		14.5%		100.0%		
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation							
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates		
200	564,920	574,299	1,412,328	1,435,774	1.7%		
Treatment Inequity and Inefficient PQZ Allocation							
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused		
200	362,981	85,373	75,994	213,441	189,992		
Number of sub-districts by endemicity categories with the final decision tree							
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	4. Use highest adjacent endemicity	5. Need further Assessment	6. Not endemic	Total
Not endemic	89	59				34	182
Low	47	107					154
Moderate	68	57	9				134
High	21	7		1			29
Unknown	3	3					6
Need further assessment					10		10
Total	228	233	9	1	10	34	515
	44.3%	45.2%	1.7%	0.2%	1.9%	6.6%	100.0%

VII.2.2.18. TANZANIA (MAINLAND)

Tanzania (Mainland)						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
26	174	3,151	2020	45,004,423	8,595,830	22,952,266
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	Unknown	Total		
110	309	61	2,763	3,243		
3.4%	9.5%	1.9%	85.2%	100.0%		
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
86	44	35	2	3,076	3,243	
2.7%	1.4%	1.1%	0.1%	94.9%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
		Endemicity category calculated (sub-IU)				
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	8				8
	Low		17			17
	Moderate			3		3
Under Treatment	Low			10	1	11
Over Treatment	Low	11				11
	Moderate		2			2
Total		19	19	13	1	52
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment		Under Treatment		Over Treatment		Total
28		11		13		52
53.8%		21.2%		25.0%		100.0%
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
52	48,056	42,705	120,148	106,767	-11.1%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
52	24,010	6,590	11,941	16,477	29,855	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	Total		
Not endemic	86	79		165		
Low	44	211	2,463	2,718		
Moderate	35	23		58		
High	2		272	274		
Null			28	28		
Total	167	313	2,763	3,243		
	5.1%	9.7%	85.2%	100.0%		

VII.2.2.19. TOGO

Togo

Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
6	44	712	2019	7,535,599	2,260,706	3,767,967
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	Unknown		Total	
13	589	70	40		712	
1.8%	82.7%	9.8%	5.6%		100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown		Total
272	120	96	19	205		712
38.2%	16.9%	13.5%	2.7%	28.8%		100.0%
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate treatment	Not endemic	1				1
	Low		93			93
	Moderate			20		20
Under Treatment	Low			67	4	71
	Moderate				13	13
Over Treatment	Low	231				231
	Moderate	15	12			27
Total		247	105	87	17	456
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate treatment	Under Treatment		Over Treatment		Total	
114	84		258		456	
25.0%	18.4%		56.6%		100.0%	
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
456	468,448	311,003	1,171,225	777,547	-33.6%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
456	130,983	71,866	229,311	179,691	573,337	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity		Total	
Not endemic	272	12	19		303	
Low	120	143	21		284	
Moderate	96	10			106	
High	19				19	
Total	507	165	40		712	
	71.2%	23.2%	5.6%		100.0%	

VII.2.2.20. UGANDA

Uganda						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
4	134	7,317	2019	43,708,826	12,832,064	22,633,065
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
1,012	3,883	1,812	95	699	7,501	
13.5%	51.8%	24.2%	1.3%	9.3%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
470	661	465	148	5,757	7,501	
6.3%	8.8%	6.2%	2.0%	76.7%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	41				41
	Low		248			248
	Moderate			144		144
	High				1	1
Under Treatment	Low			63	2	65
	Moderate				45	45
Over Treatment	Low	221				221
	Moderate	27	79			106
Total		289	327	207	48	871
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment	Under Treatment		Over Treatment		Total	
434	110		327		871	
49.8%	12.6%		37.5%		100.0%	
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
871	717,255	570,788	1,793,295	1,427,088	-20.4%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
871	325,946	79,394	225,861	198,517	564,732	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	4. Use highest adjacent endemicity	6. Not endemic	Total
Not endemic	122	442	731		3,106	4,401
Low	263	645	781			1,689
Moderate	250	182	253			685
High	105		430			535
Unknown	12			179		191
Total	752	1,269	2,195	179	3,106	7,501
	10.0%	16.9%	29.3%	2.4%	41.4%	100.0%

VII.2.2.21. ZAMBIA

Zambia						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
10	103	1,421	2019	16,207,907	6,272,448	8,638,818
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
68	637	628	28	60	1,421	
4.8%	44.8%	44.2%	2.0%	4.2%	100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
124	109	166	75	947	1,421	
8.7%	7.7%	11.7%	5.3%	66.6%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	4				4
	Low		48			48
	Moderate			85		85
	High				14	14
Under Treatment	Low			46	2	48
	Moderate				41	41
Over Treatment	Low	75				75
	Moderate	31	31			62
	High			2		2
Total		110	79	133	57	379
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment		Under Treatment		Over Treatment		Total
151		89		139		379
39.8%		23.5%		36.7%		100.0%
Population requiring PC and PQZ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PQZ for SAC (IU endemicity)	# of PQZ for SAC (sub-IU endemicity)	Variation in SAC and PQZ estimates	
379	817,714	714,183	2,044,354	1,785,510	-12.7%	
Treatment Inequity and Inefficient PQZ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
379	369,090	137,767	241,298	344,443	603,276	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity	2. Use IU endemicity	3. Use JRSM endemicity	4. Use highest adjacent endemicity	5. Need further assessment	Total
Not endemic	122	15		69		206
Low	106	194		75		375
Moderate	165	174	56	219		614
High	73	5	15	118		211
Unknown				1		1
Need further assessment					14	14
Total	466	388	71	482	14	1,421
	32.8%	27.3%	5.0%	33.9%	1.0%	100.0%

VII.2.2.22. ZIMBABWE

Zimbabwe						
Number of sub-IUs			Demography - Total, SAC and adult population			
Province	IU	Sub-IU	Year	Total Population	SAC Population	Adult Population
10	63	1,967	2019	15,403,629	4,929,164	8,626,021
Number of sub-districts by endemicity categories by district mean prevalence						
Not endemic		Low	Moderate		Total	
374		1,365	228		1,967	
19.0%		69.4%	11.6%		100.0%	
Number of sub-districts by endemicity categories by sub-district highest prevalence						
Not endemic	Low	Moderate	High	Unknown	Total	
159	109	81	10	1,608	1,967	
8.1%	5.5%	4.1%	0.5%	81.7%	100.0%	
Changes in endemicity categories from district mean prevalence to sub-district highest prevalence						
Endemicity category calculated (sub-IU)						
Treatment Strategy Adequacy	Endemicity category calculated (IU)	Not endemic	Low	Moderate	High	Total
Adequate Treatment	Not endemic	49				49
	Low		62			62
	Moderate			9		9
Under Treatment	Low			17	1	18
Over Treatment	Low	78				78
	Moderate	2	4			6
Total		129	66	26	1	222
Treatment Strategy Adequacy with District Mean Prevalence						
Adequate Treatment		Under Treatment		Over Treatment		Total
120		18		84		222
54.1%		8.1%		37.8%		100.0%
Population requiring PC and PZQ by district level implementation versus y sub- district level implementation						
# of sub-IUs	# of SAC (IU endemicity)	# of SAC (sub-IU endemicity)	# of PZQ for SAC (IU endemicity)	# of PZQ for SAC (sub-IU endemicity)	Variation in SAC and PZQ estimates	
222	147,776	87,033	369,484	217,606	-41.1%	
Treatment Inequity and Inefficient PZQ Allocation						
# of sub-IUs	SAC adequately treated	SAC missing treatment	SAC unnecessarily treated	Unclaimed drugs	Drugs misused	
222	59,128	9,517	70,260	23,796	175,669	
Number of sub-districts by endemicity categories with the final decision tree						
Final Endemicity Category	1. Use sub-IU endemicity		2. Use IU endemicity		Total	
Not endemic	159		304		463	
Low	109		1,117		1,226	
Moderate	81		187		268	
High	10				10	
Total	359		1,608		1,967	
	18.3%		81.7%		100.0%	

VII.3. ANNEX 3: MEMORIES OF THE WORKSHOPS

