



# **HKI & SCHISTOSOMIASIS ELIMINATION IN AFRICA**

Yaobi Zhang

2 October 2019

# OVERVIEW



- Section 1: HKI and NTDs
- Section 2: Schistosomiasis in Africa
- Section 3: USAID support and Burkina Faso case study
- Section 4: Challenges and opportunities



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SECTION 1. HKI AND NTDS

# HKI AND ITS MISSION

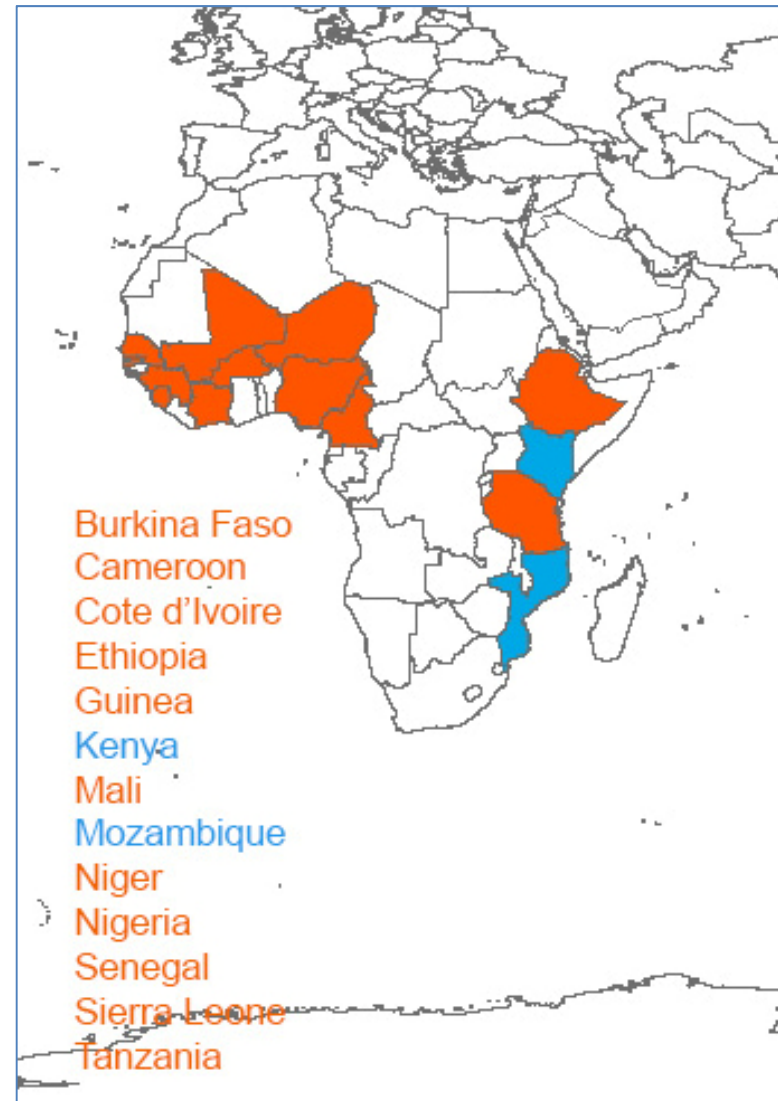


- **Established in 1915**
- **Mission: to save and improve the sight and lives of the world's vulnerable by combating the causes and consequences of blindness, poor health and malnutrition**
- **120 programs in 20 African, Asian countries and US**
  - Many of these focus on preventing blindness and vision loss and controlling/eliminating NTDs: cataract surgery, vision correction, vitamin A supplementation, screening and treatment for diabetic retinopathy, trichiasis surgery, LF hydrocele surgery, lymphedema care and mass treatment for LF, onchocerciasis, SCH, STH and trachoma
  - Funds from USAID, DFID, End Fund, Hilton Foundation etc

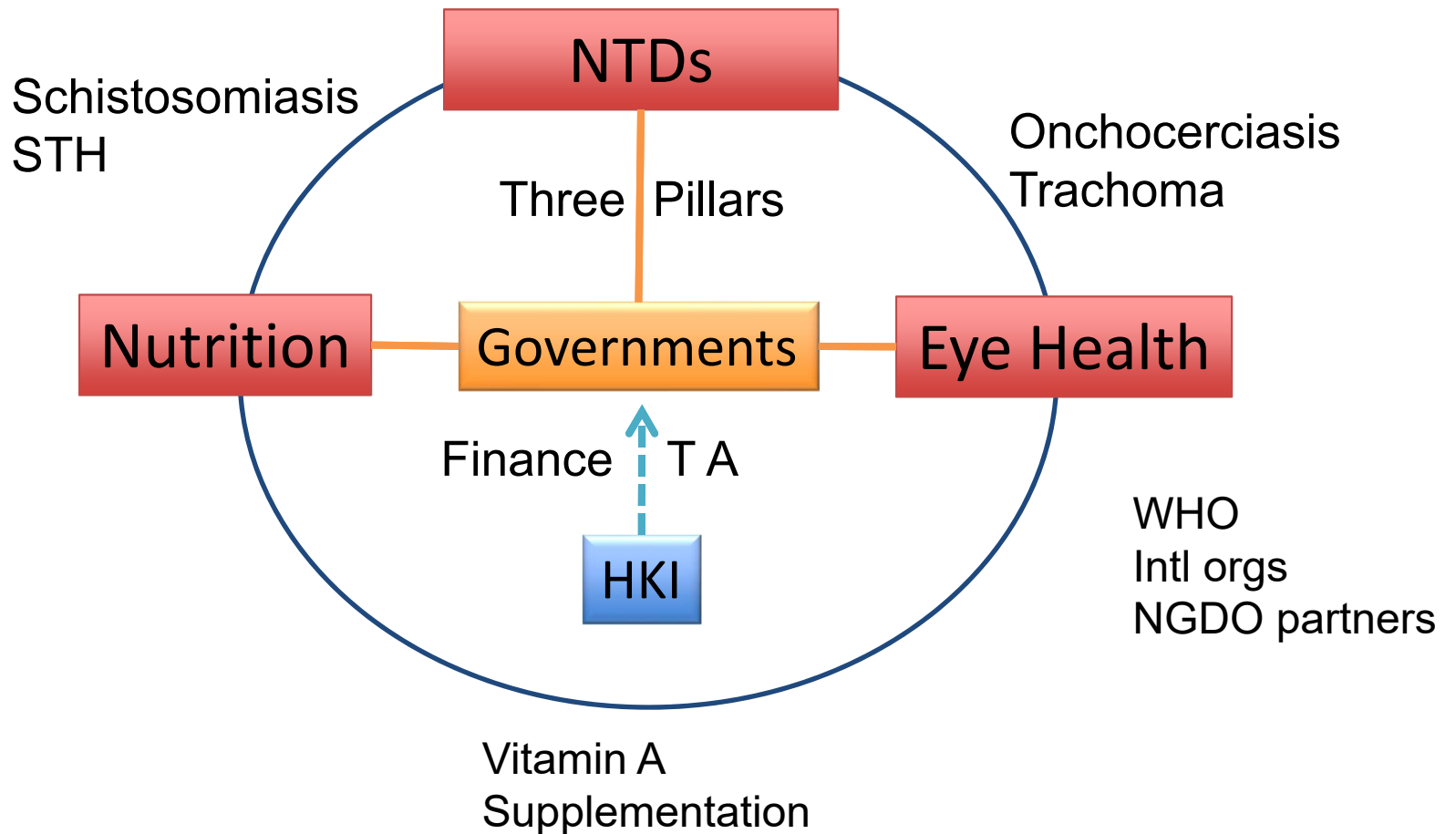
# HKI AFRO CURRENT NTD PROGRAMS



- **Integrated NTD programs**
  - Lead implementer: Burkina Faso, Cameroon, Guinea, Mali, Niger, Sierra Leone, and Nigeria (Adamawa, Akwa Ibom, Borno, Katsina)
  - Co-implementer: Cote d'Ivoire
- **Morbidity management and disability prevention (MMDP)**
  - Burkina Faso, Mali, Niger, Nigeria (3 states), Tanzania – trachoma TT surgery
  - Burkina Faso, Cameroon, Ethiopia (via RTI) and Mali – LF hydrocele surgery and lymphedema care



# HKI'S ROLES IN SUPPORTING COUNTRIES





## SECTION 2. SCHISTOSOMIASIS IN AFRICA

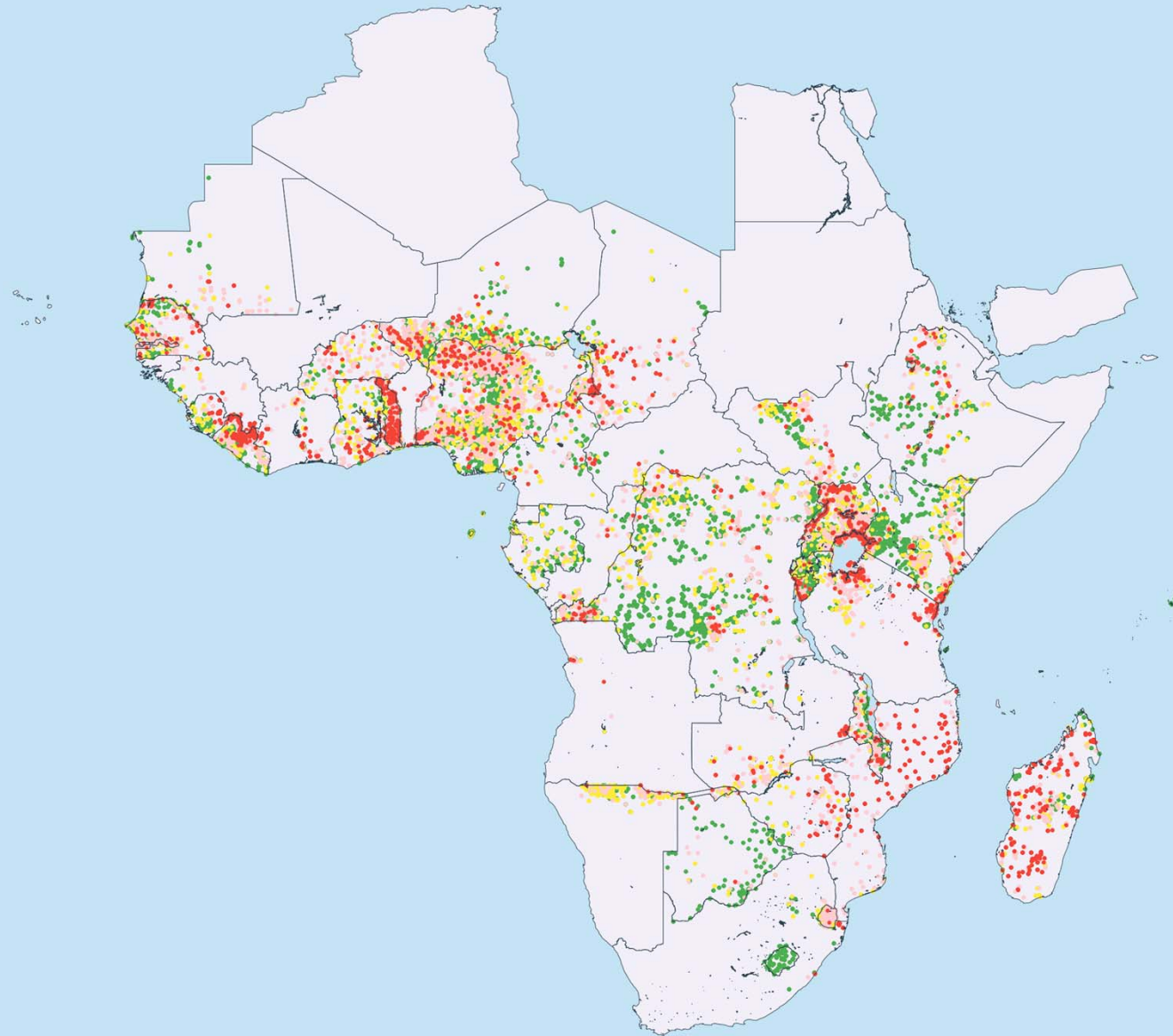
- **Schistosomiasis endemicity in Africa (AFRO)**
  - *Schistosoma haematobium*
  - *Schistosoma mansoni*
  - *Schistosoma guineensis*, *S. intercalatum*
- World Health Organization Guidelines
- Donation
  - Praziquantel: Merck, 250 million tablets each year
  - Fund for implementation: USAID, DFID, GiveWell, End Fund, etc



# SCHISTOSOMIASIS MAPPING



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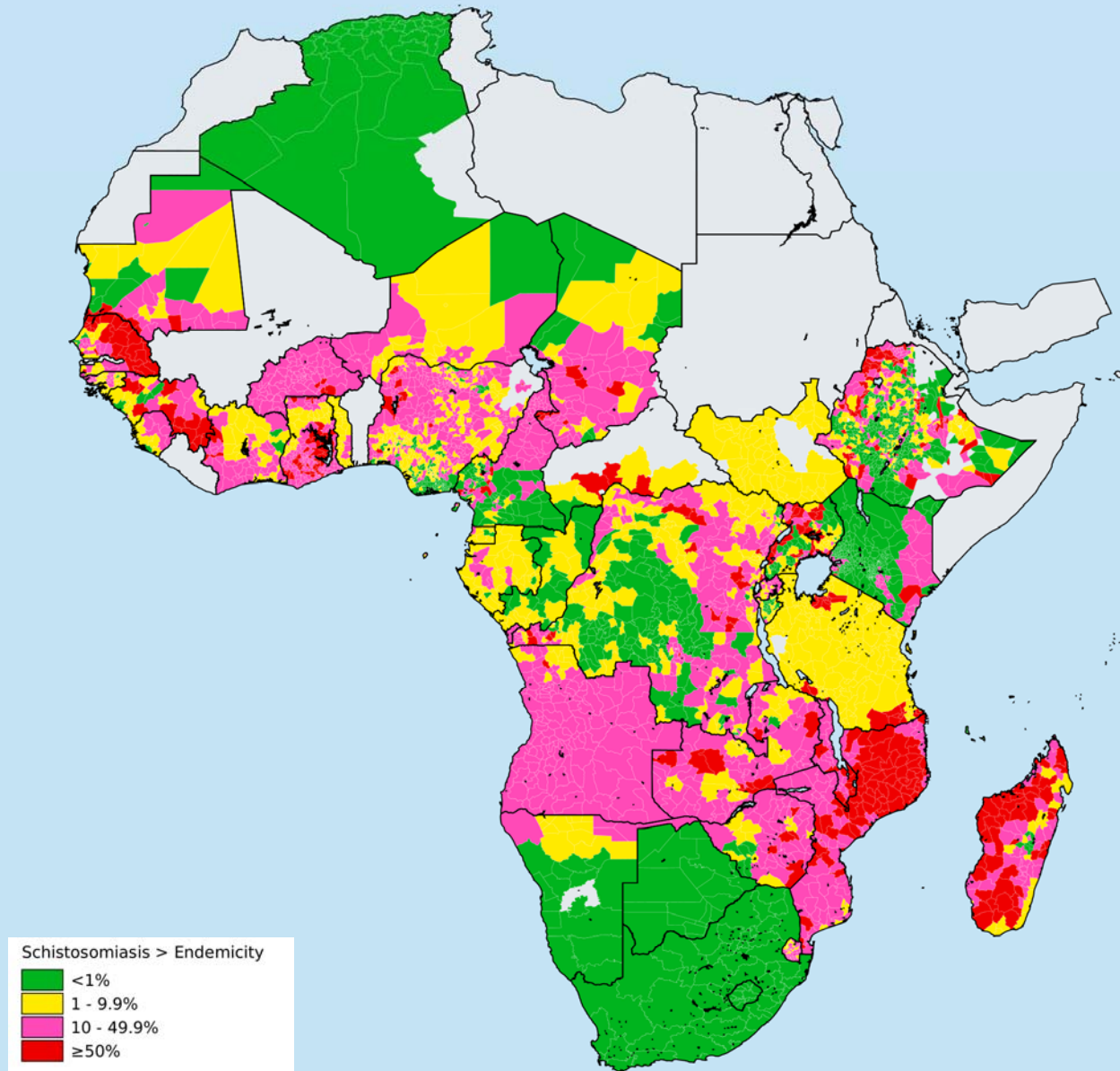


<http://espen.afro.who.int/regions/who-african-region-afro>

# SCHISTOSOMIASIS ENDEMICITY 2017



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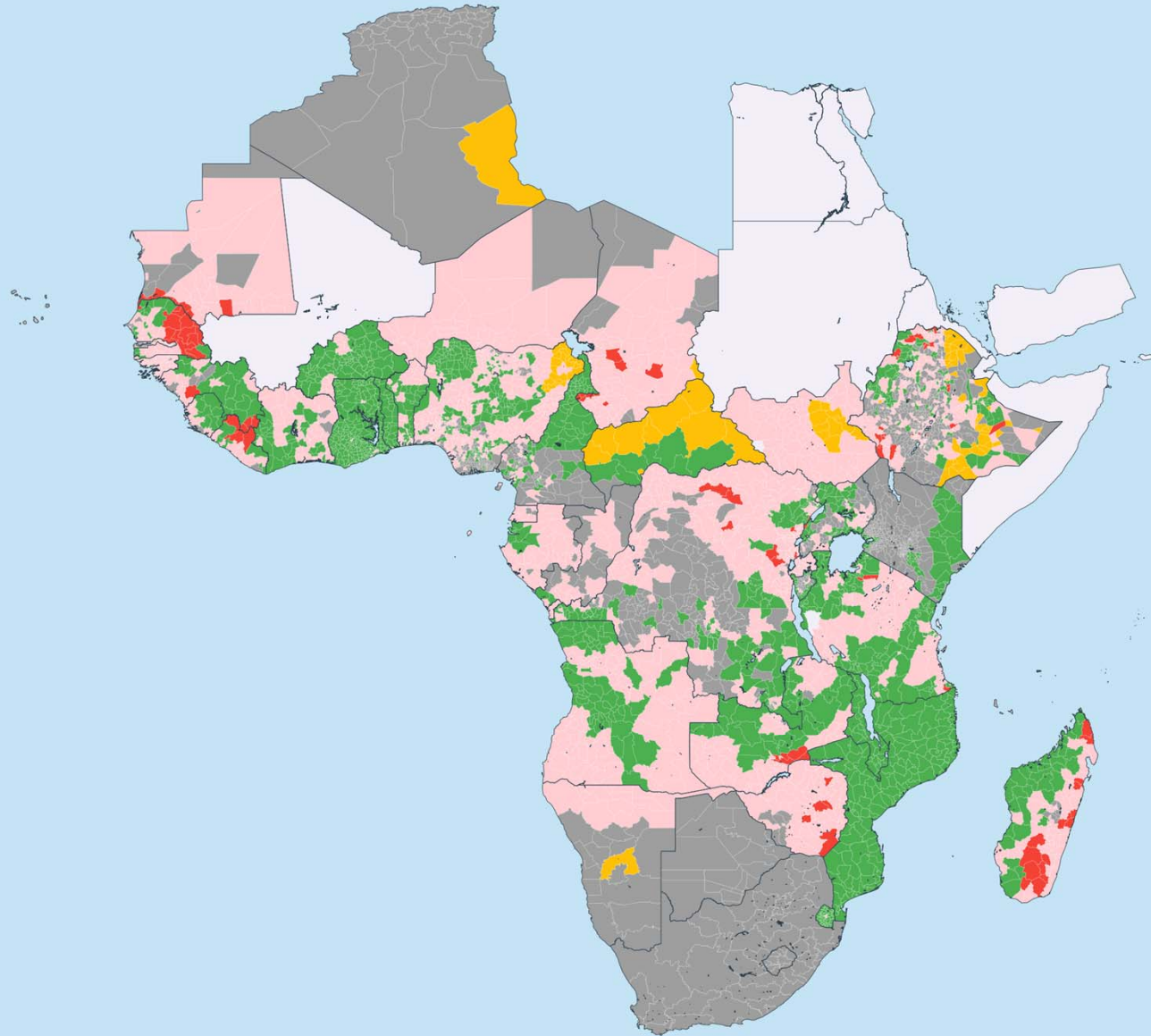
<http://espen.afro.who.int/regions/who-african-region-afro>



# MDA GEOGRAPHICAL COVERAGE 2016



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<http://espen.afro.who.int/regions/who-african-region-afro>

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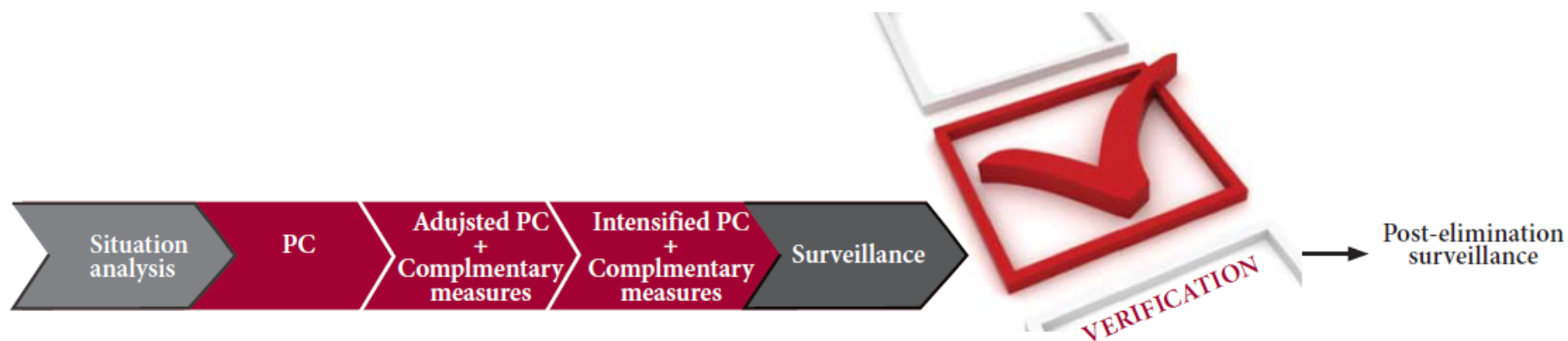
# WORLD HEALTH ORGANIZATION GUIDELINES



- World Health Organization. Preventive chemotherapy in human helminthiasis: coordinated use of anthelmintic drugs in control interventions. 2006
- World Health Organization. Helminth control in school-age children: a guide for managers of control programmes. 2011
- World Health Organization. Schistosomiasis: progress report 2001-2011 and strategic plan 2012-2020. 2012
- World Health Organization. Field use of molluscicides in schistosomiasis control programmes. 2017



Figure 3.1 Programmatic steps to control and eliminate schistosomiasis



Vision	A world free of schistosomiasis
Goals	<p>To control morbidity due to schistosomiasis by 2020</p> <p>To eliminate schistosomiasis as a public-health problem by 2025</p> <p>To interrupt transmission of schistosomiasis in the Region of the Americas, the Eastern Mediterranean Region, the European Region, the South-East Asia Region and the Western Pacific Region, and in selected countries of the African Region by 2025</p>
Objectives	<p>To scale up control and elimination activities in all endemic countries;</p> <p>To ensure an adequate supply of praziquantel and resources to meet the demand</p>





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GROUP	1. Countries eligible for control of morbidity	2. Countries eligible for elimination as a public-health problem	3. Countries eligible for elimination (interruption of transmission)		4. Countries that have achieved elimination
Goal	Control of morbidity	Elimination as a public-health problem	Elimination (interruption of transmission)	<b>V E R I F I C A T I O N</b>	Post-elimination surveillance
Recommended intervention	Preventive chemotherapy  Complementary public-health interventions, where possible	Adjusted preventive chemotherapy Complementary public-health interventions strongly recommended	Intensified preventive chemotherapy in residual areas of transmission  Complementary public-health interventions essential		Surveillance to detect and respond to resurgence of transmission and to prevent reintroduction (schistosomiasis should be made notifiable)
Target	100% geographical coverage and at least 75% national coverage  Prevalence of heavy-intensity infection <5% across sentinel sites <sup>a</sup>	Prevalence of heavy-intensity infection <1% in all sentinel sites	Reduction of incidence of infection to zero		Incidence of infection remains zero (no autochthonous cases)
Group progression (1 to 4)	Up to 5–10 years from joining the group	Up to 3–6 years from joining the group	Up to 5 years from joining the group		Until all countries have interrupted transmission

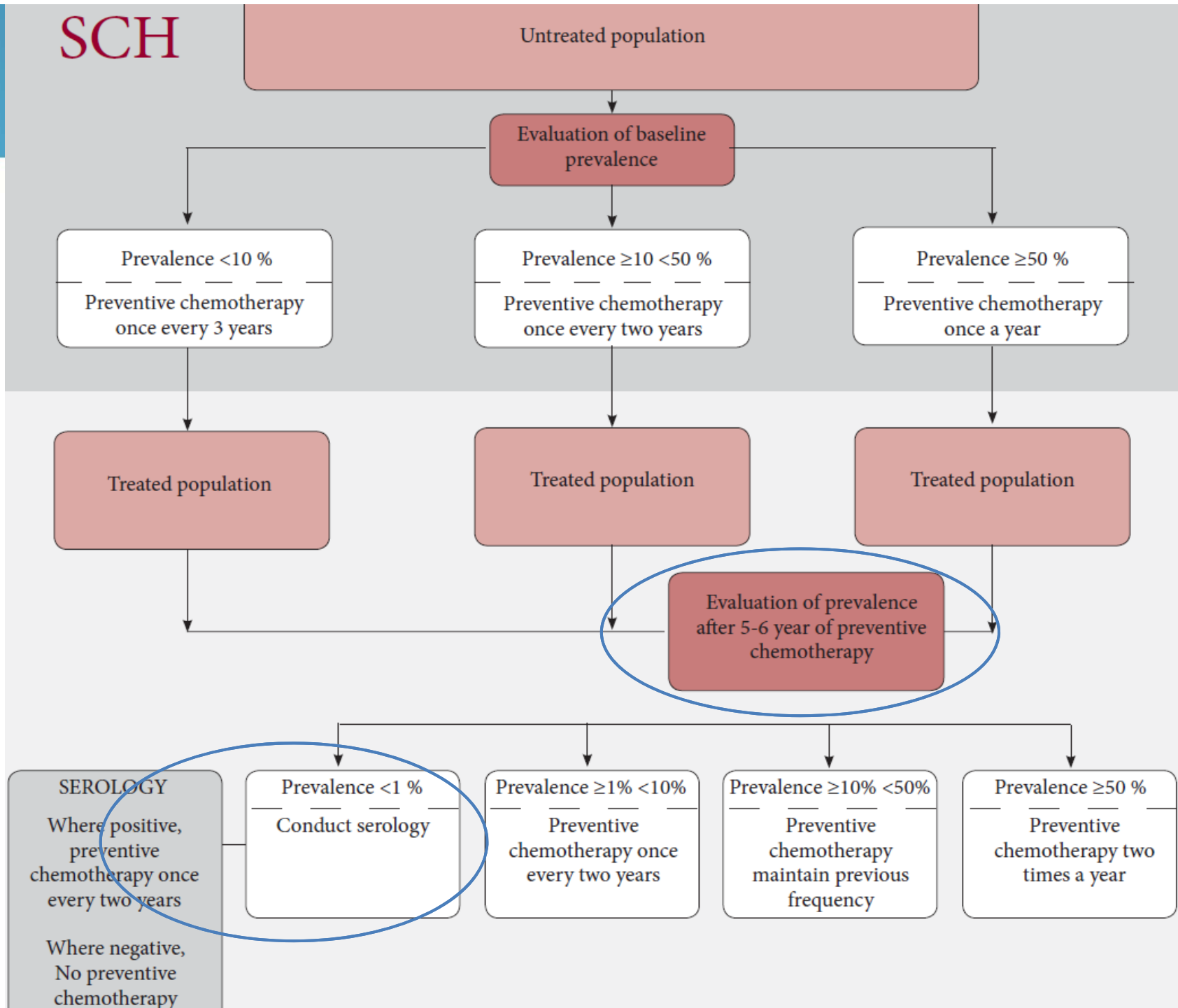


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Category	Prevalence among school-aged children	Action to be taken	
High-risk community	$\geq 50\%$ by parasitological methods (intestinal and urinary schistosomiasis) or $\geq 30\%$ by questionnaire for visible haematuria (urinary schistosomiasis)	Treat all school-age children (enrolled and not enrolled) once a year	Also treat adults considered to be at risk (from special groups to entire communities living in endemic areas; see Annex 6 for details on special groups)
Moderate-risk community	$\geq 10\%$ but $< 50\%$ by parasitological methods (intestinal and urinary schistosomiasis) or $< 30\%$ by questionnaire for visible haematuria (urinary schistosomiasis)	Treat all school-age children (enrolled and not enrolled) once every 2 years	Also treat adults considered to be at risk (special risk groups only; see Annex 6 for details on special groups)
Low-risk community	$< 10\%$ by parasitological methods (intestinal and urinary schistosomiasis)	Treat all school-age children (enrolled and not enrolled) twice during their primary schooling age (e.g. once on entry and once on exit)	Praziquantel should be available in dispensaries and clinics for treatment of suspected cases



# SCH



# SECTION 1: SITUATION



- **Schistosomiasis endemicity in Africa (AFRO)**
  - *Schistosoma haematobium*
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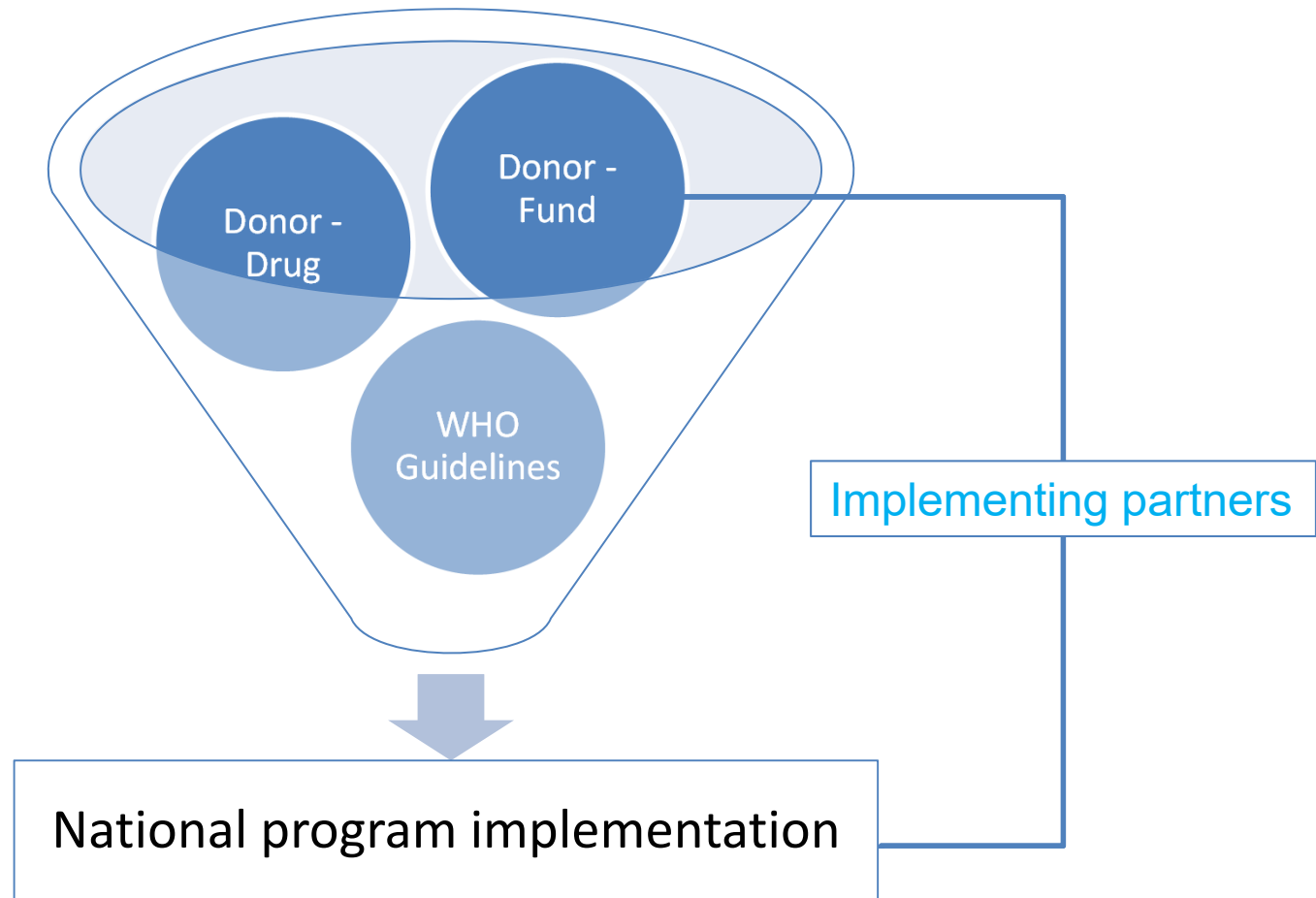
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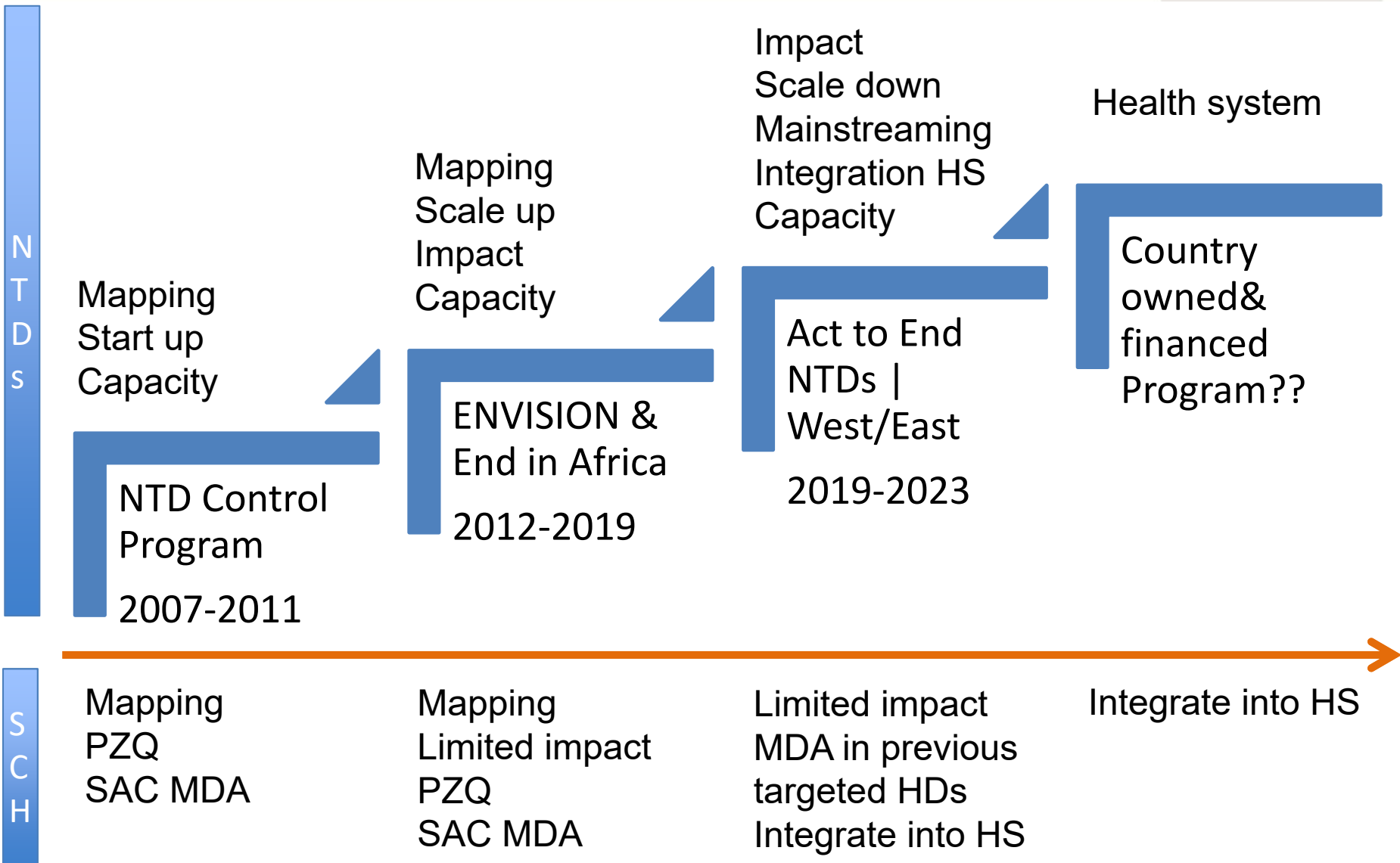
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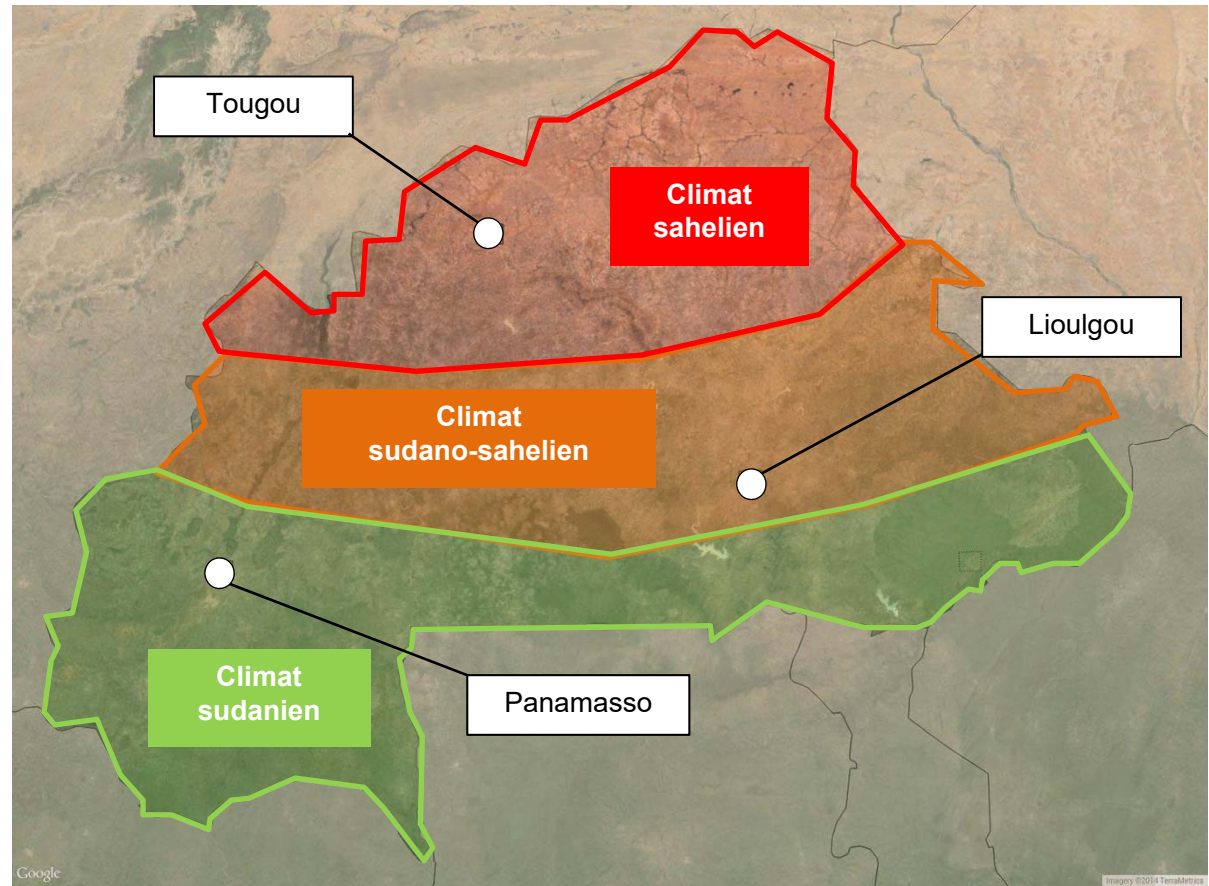
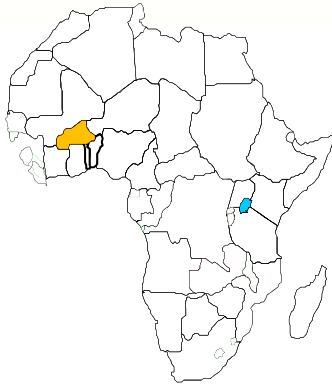
## SECTION 3. USAID SUPPORT AND BURKINA FASO CASE STUDY

# USAID NTD PROGRAM





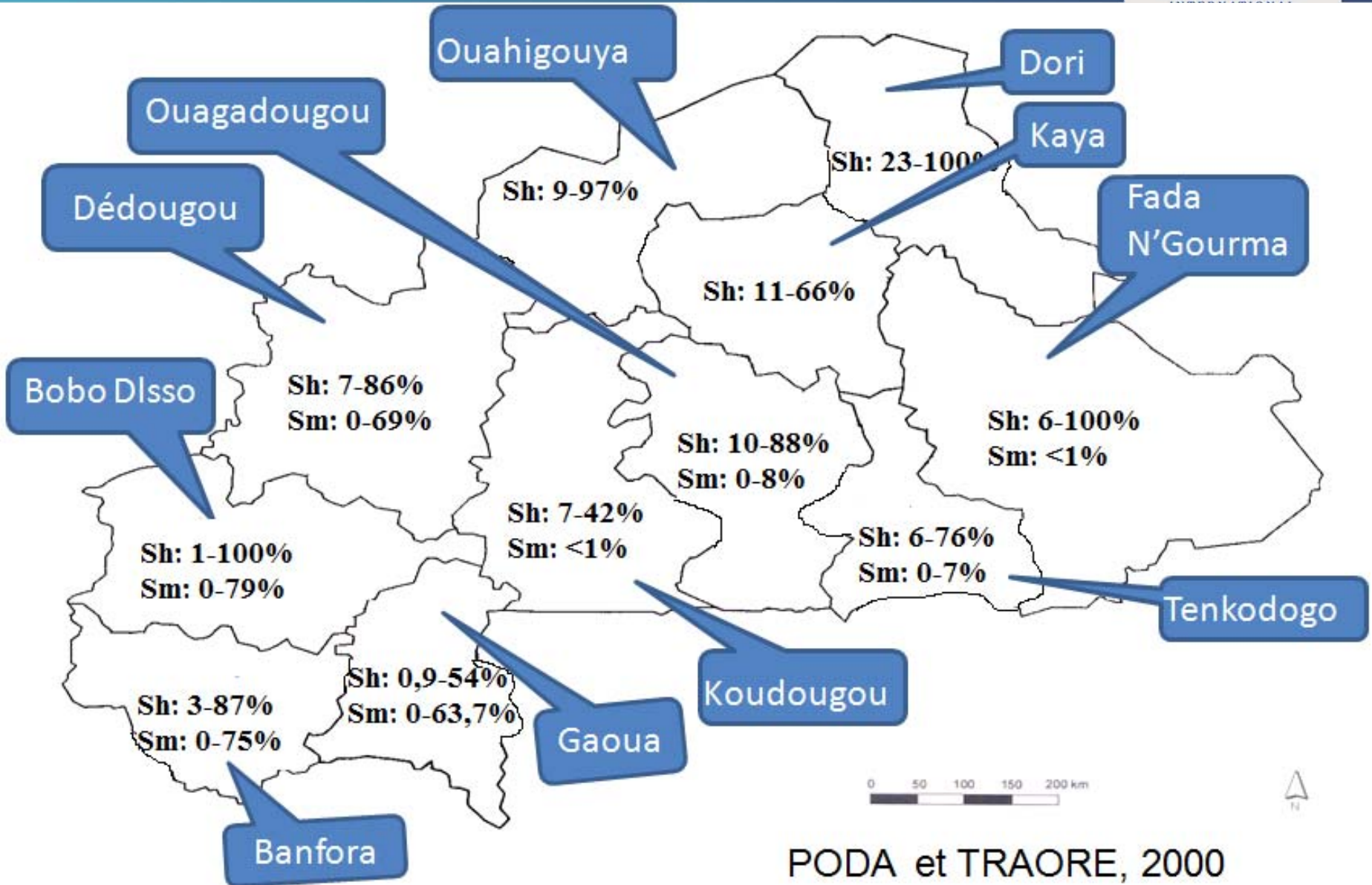
# BURKINA FASO – CASE STUDY



- West African country with ~20 million people



# SCH BEFORE INTERVENTION



PODA et TRAORE, 2000



# SCH ENDEMICITY

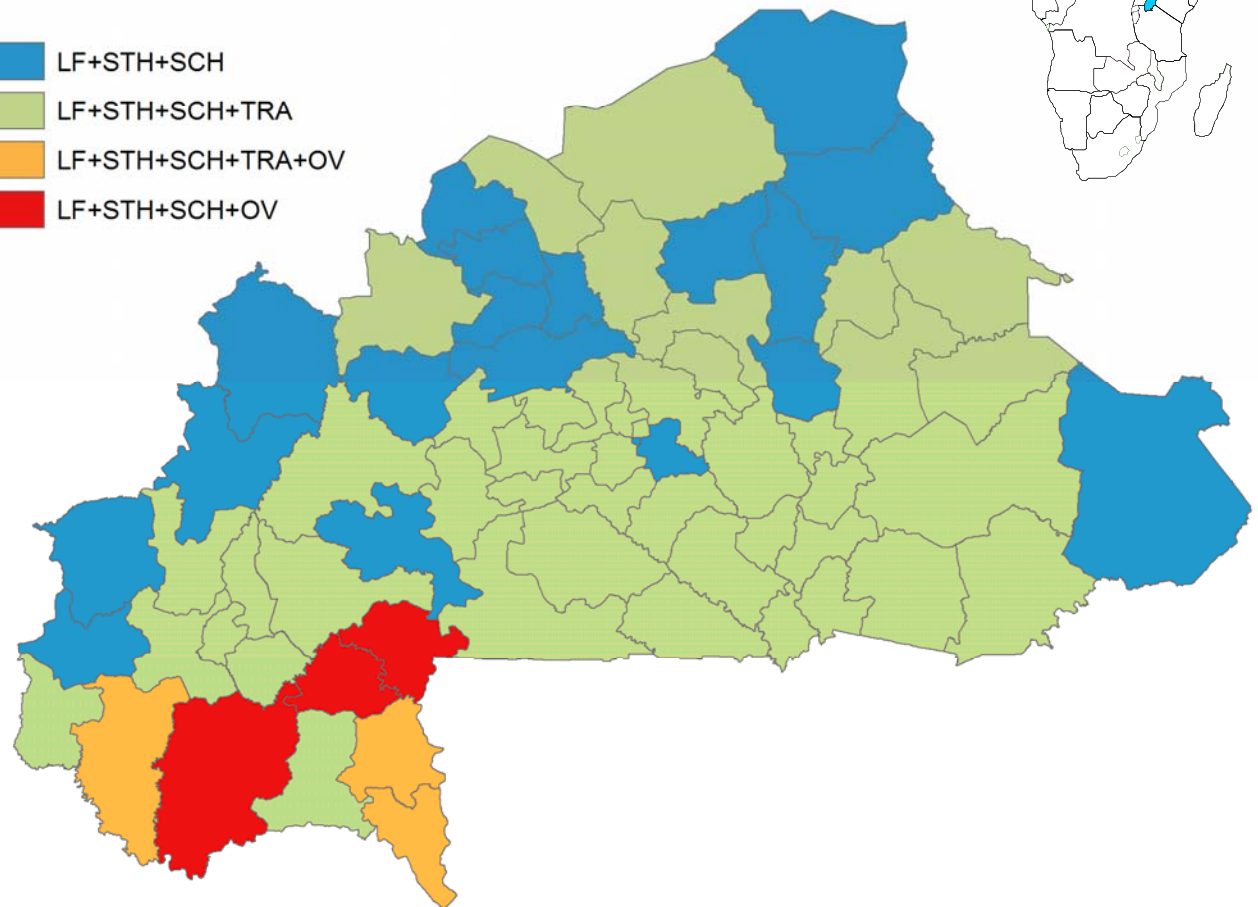
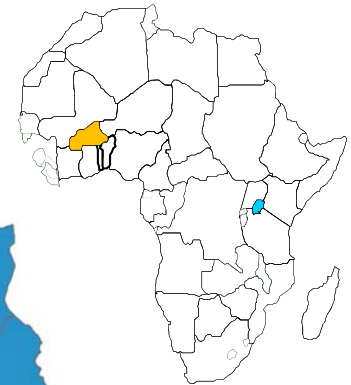


- 13 health regions
- 70 health districts
- 1904 health centers
- 8228 villages

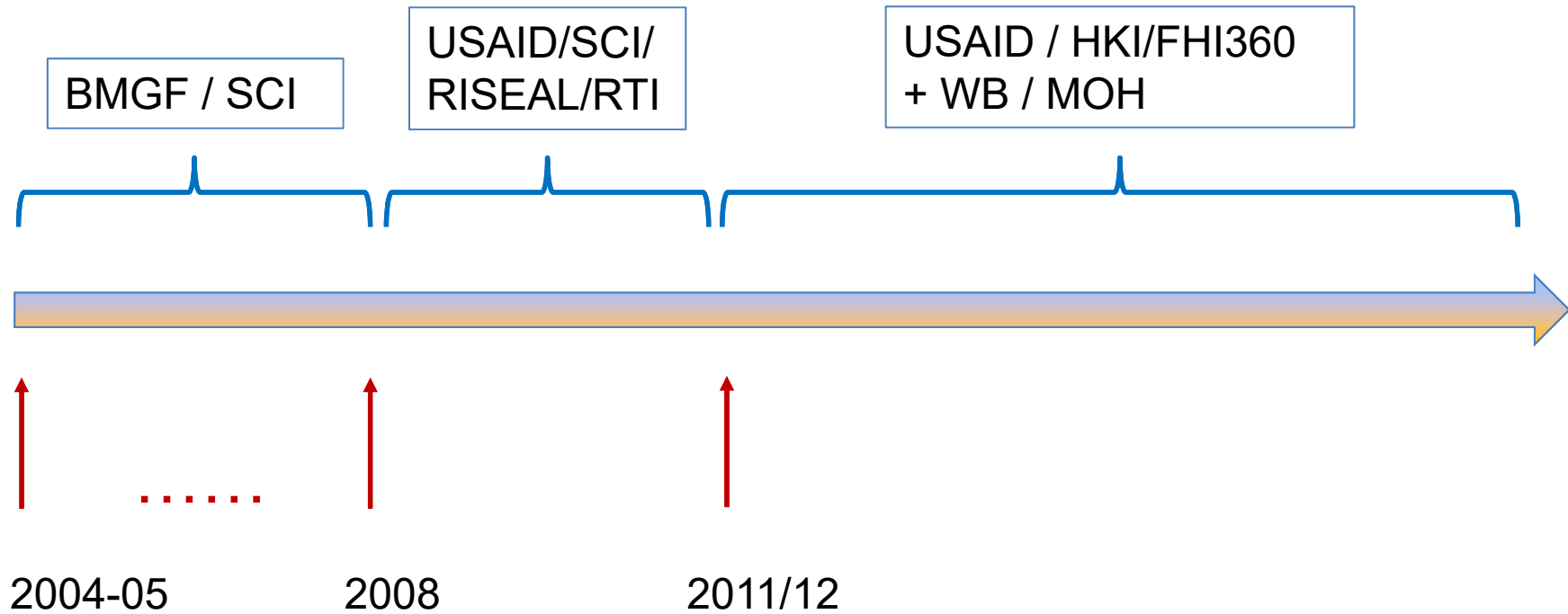
## Legend

### Coendemicity

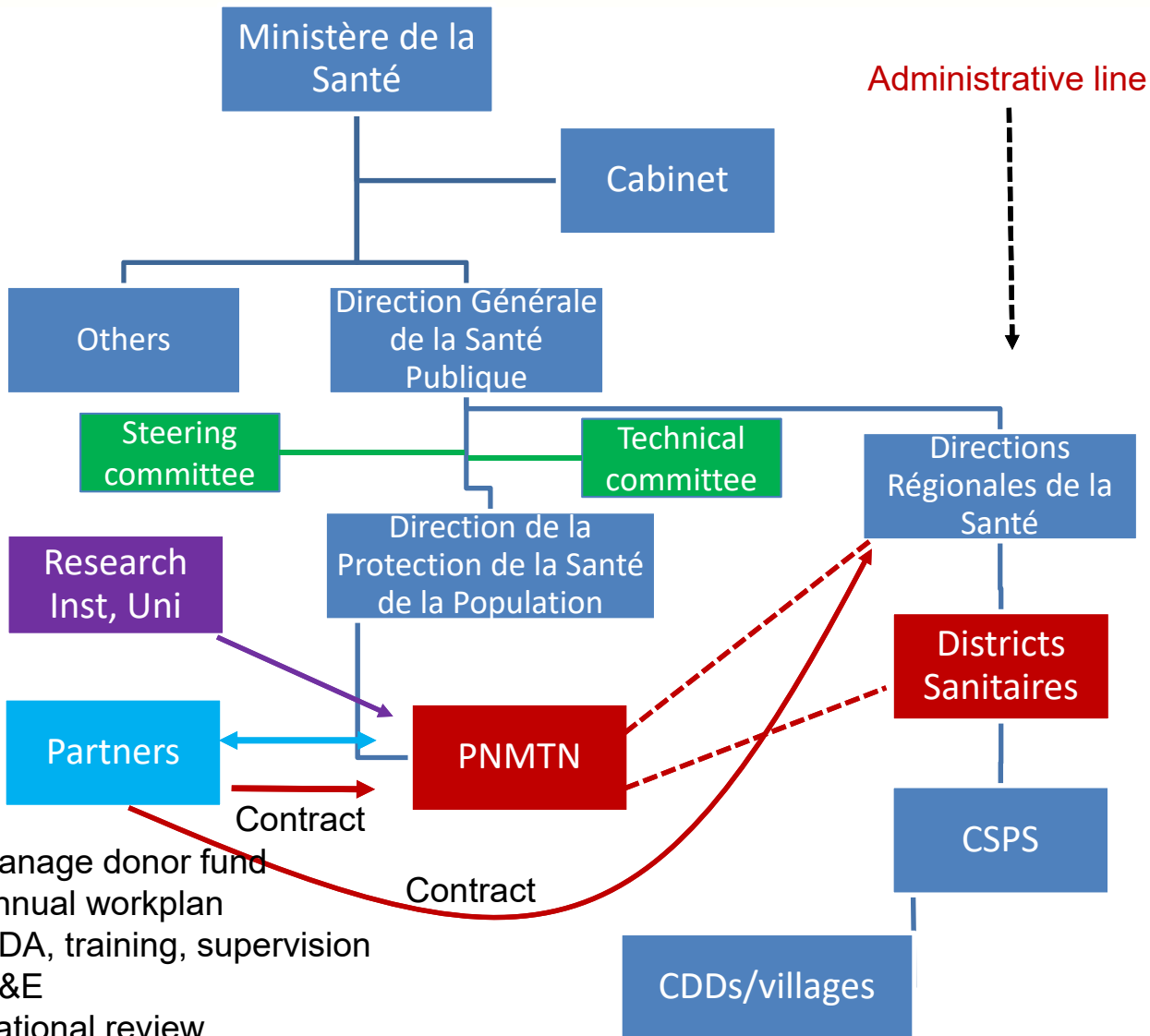
- LF+STH+SCH
- LF+STH+SCH+TRA
- LF+STH+SCH+TRA+OV
- LF+STH+SCH+OV



# BURKINA FASO PROGRAM TIMELINE

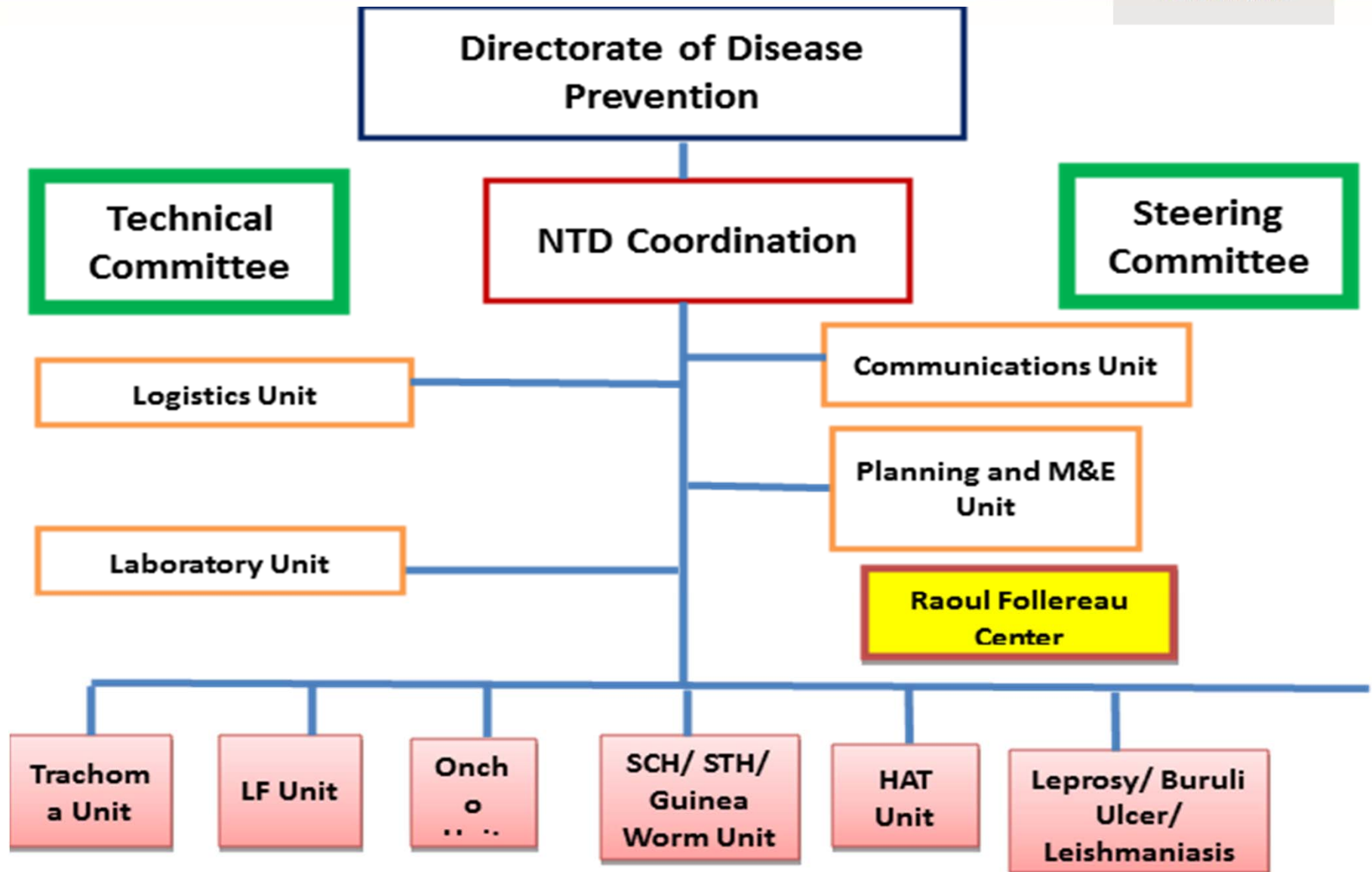


# NTD PROGRAM STRUCTURE

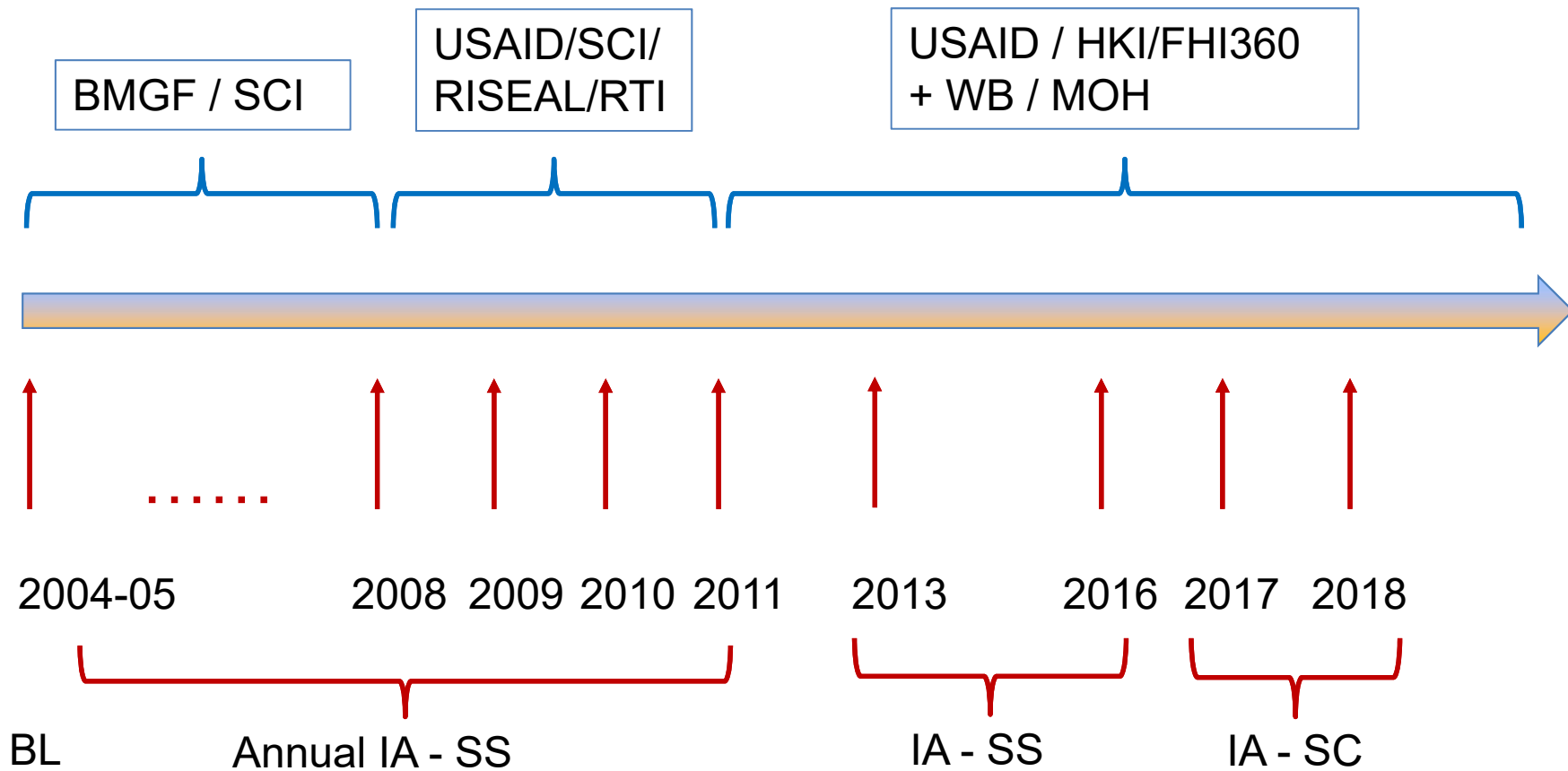


- Manage donor fund
- Annual workplan
- MDA, training, supervision
- M&E
- National review
- Dissemination





# PROGRAM AND ASSESSMENT TIMELINE



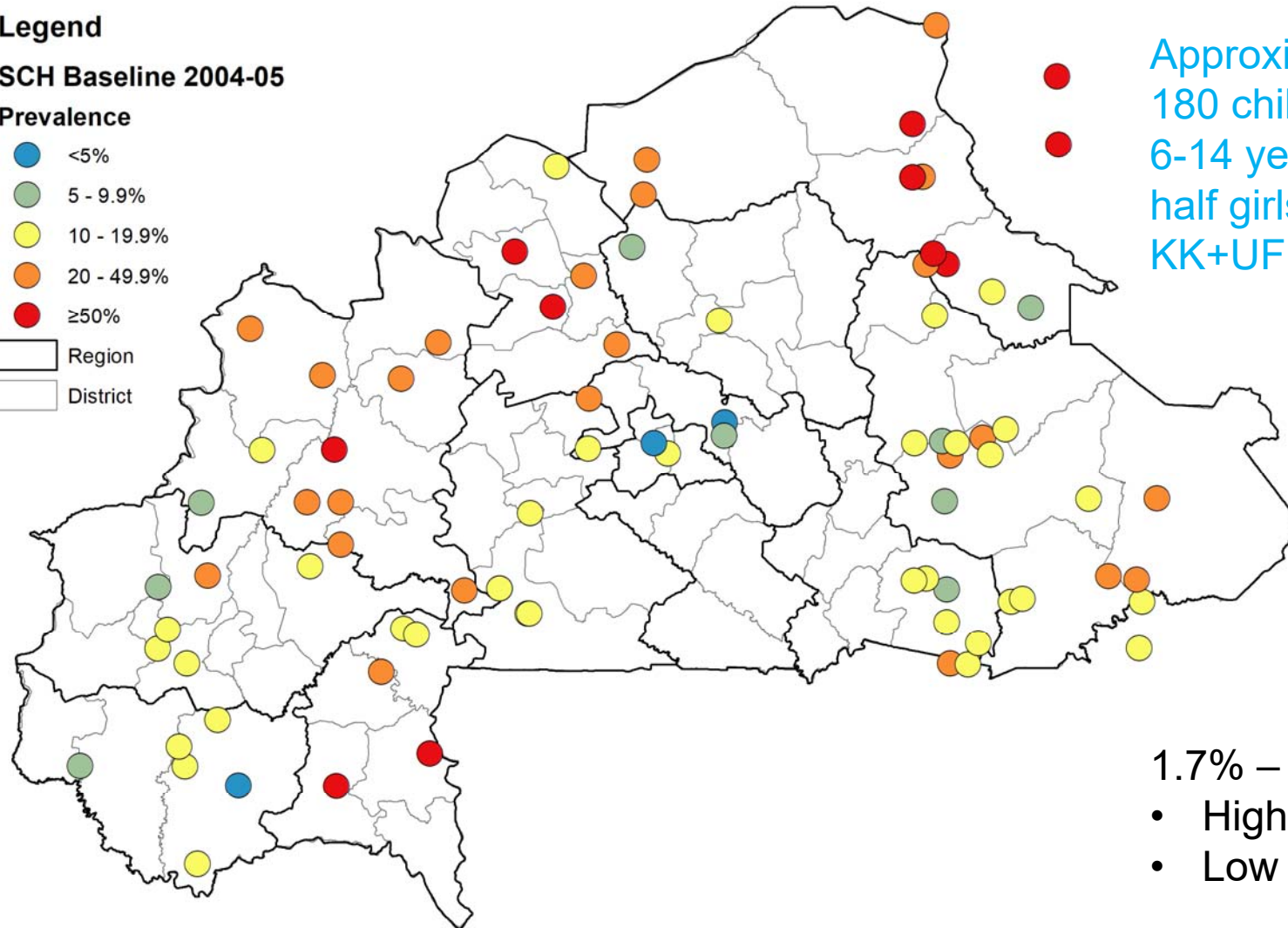
# SCHISTOSOMIASIS AT BASELINE



## Legend

### SCH Baseline 2004-05

#### Prevalence



Approximately:  
180 children per school  
6-14 years old  
half girls and half boys  
KK+UF

1.7% – 81.7% in 86 sites

- High endemicity zone
- Low endemicity zone

BMGF funded SCI support





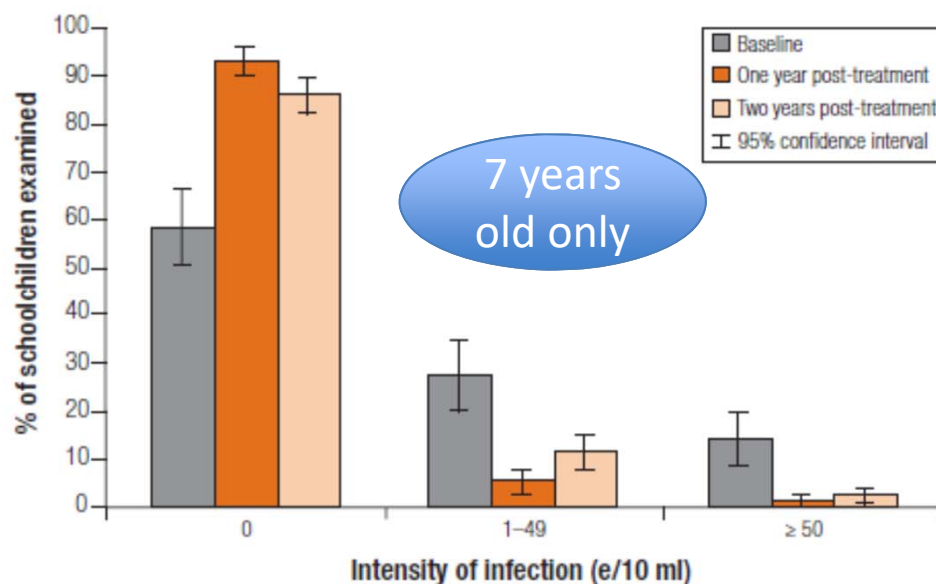
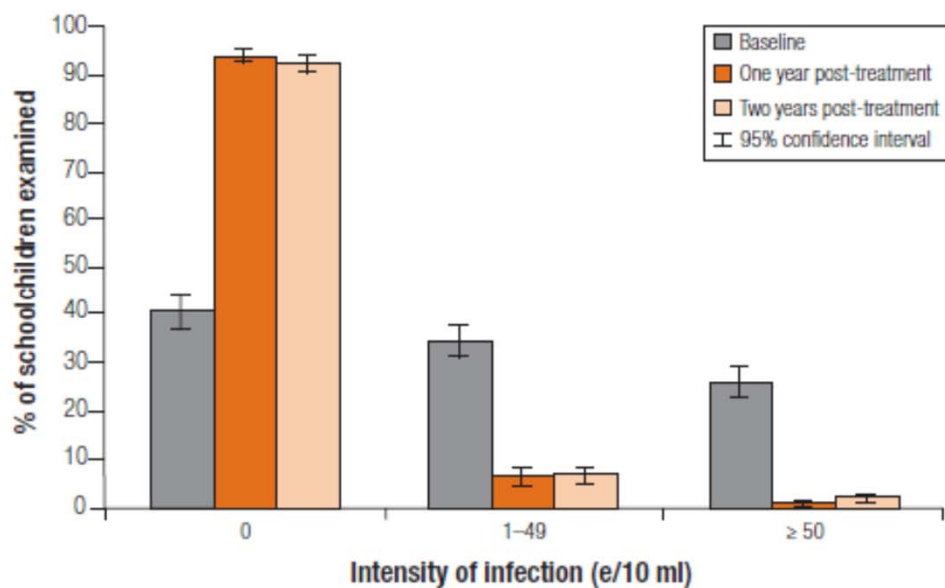
- Treatment once every two years with district as IU
- School age children (school going and out of school)
- School-based then expanded to both school- and community-based
- Training of trainers
- Training of supervisors
- Training of drug distributors

National – Regional – District – Health Centers – CDDs



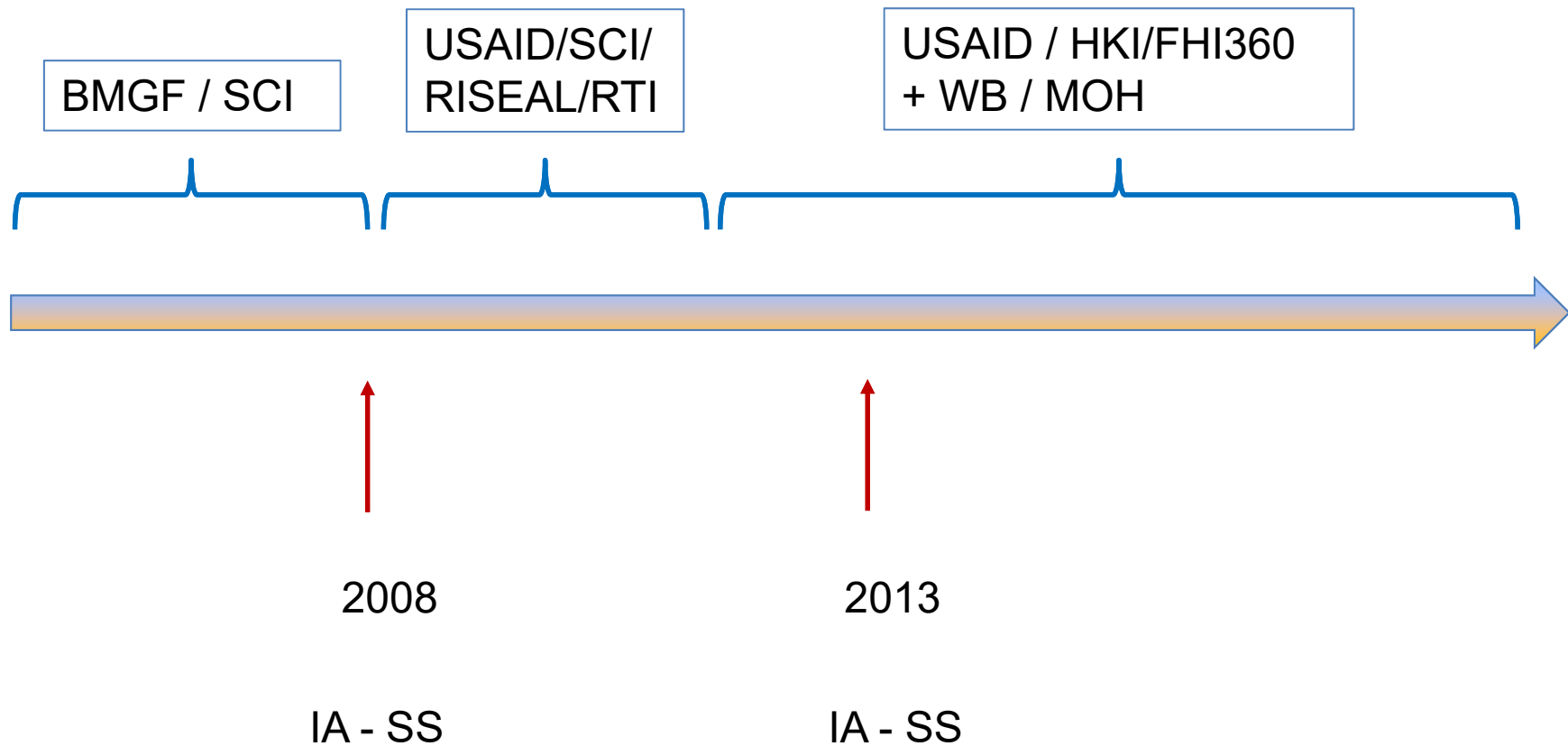
Variable	Baseline (95% CI)	1 year post-treatment (95% CI)	2 years post-treatment (95% CI)	Overall reduction in %
<b>Prevalence in %</b>				
<b>Overall prevalence (n= 763)</b>	59.6 (56.2–63.1)	6.2 (4.5–7.9)	7.7 (5.8–9.6)	87.1
<b>By region</b>				
Boucle du Mouhoun (n= 238)	48.3 (42.0–54.7)	8.4 (4.9–11.9)	12.2 (8.0–16.3)	74.7
Nord (n= 259)	53.7 (47.6–59.7)	0.8 (0.0–1.8)	2.3 (0.5–4.1)	95.7
Sahel (n= 199)	89.4 (85.2–93.7)	12.1 (7.5–16.6)	11.6 (7.1–16.0)	87.0
Sud Ouest (n= 67)	34.3 (23.0–45.7)	1.5 (0.0–4.4)	1.5 (0.0–4.4)	95.6
<b>By sex</b>				
Boys (n= 403)	64.3 (59.6–68.9)	7.7 (5.1–10.3)	11.4 (8.3–14.5) <sup>b</sup>	82.3
Girls (n= 360)	54.4 (49.3–59.6)	4.4 (2.3–6.6)	3.6 (1.7–5.6)	93.4

## Results from the initial two-year cohort follow up in high zone





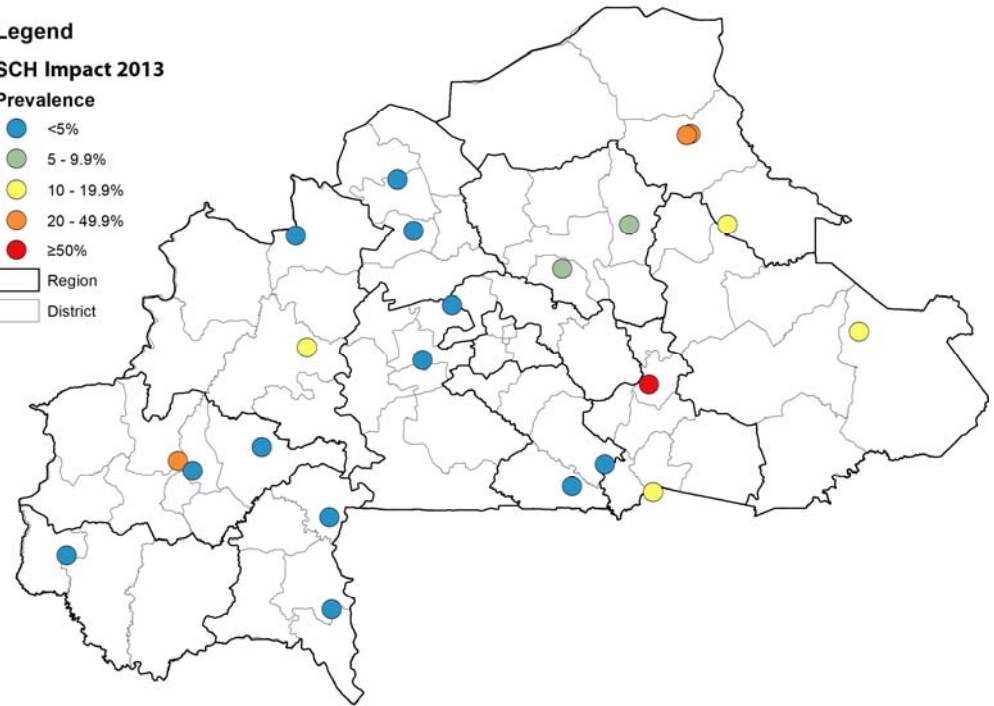
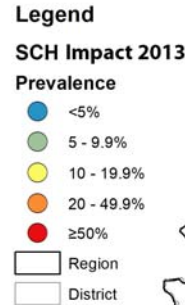
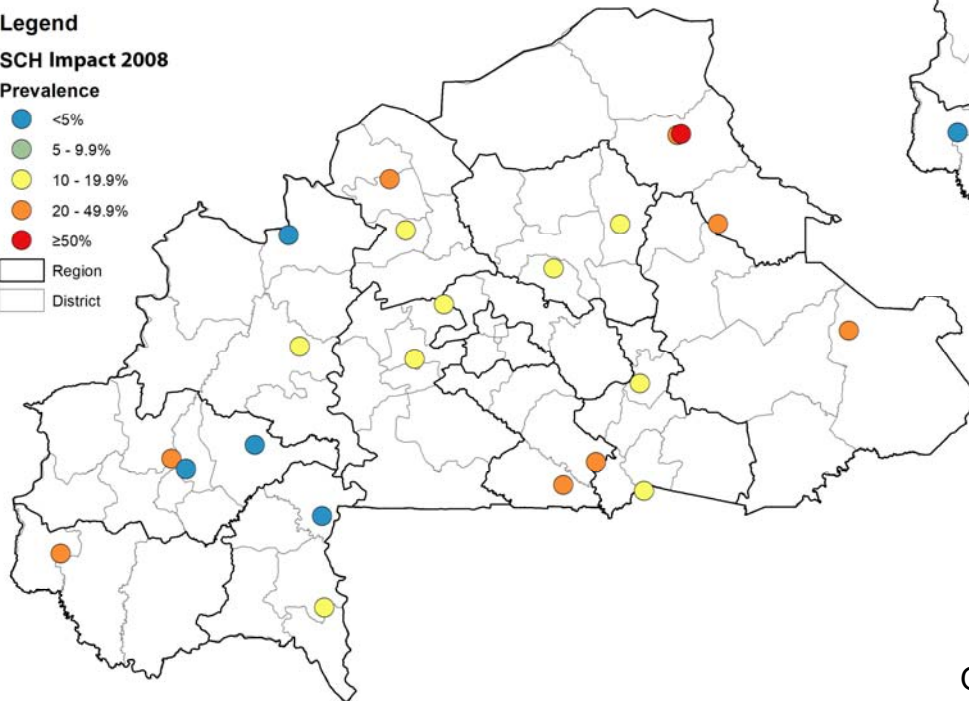
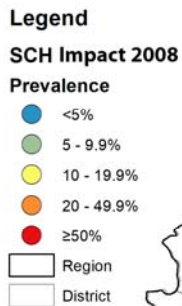
# PROGRAM AND ASSESSMENT TIMELINE



# SCHISTOSOMIASIS IN 2008 AND 2013

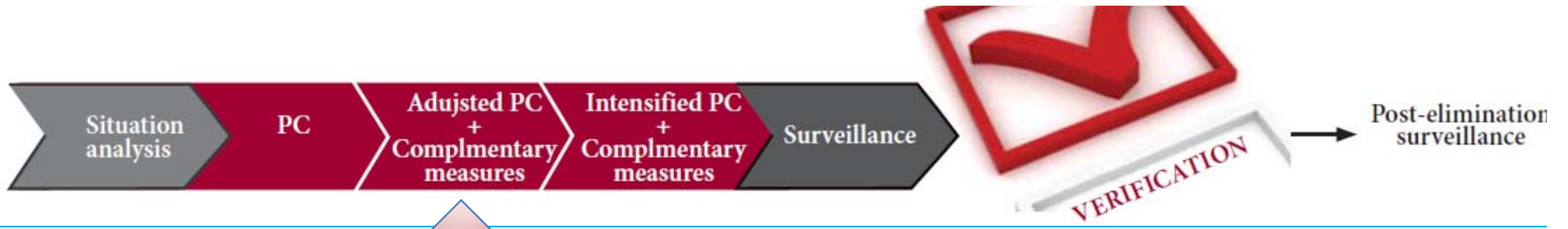


## Comparison of sentinel site results

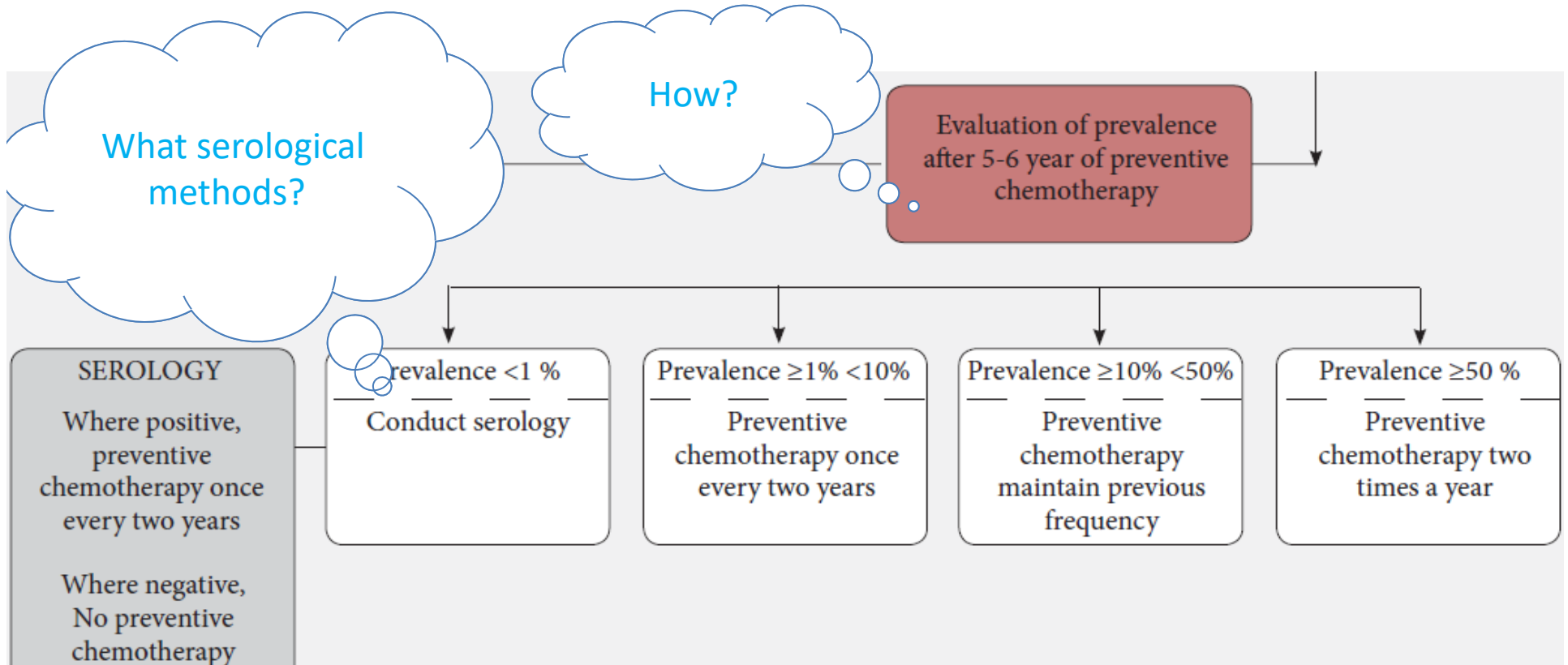


Approximately:  
 160 children per school  
 7-11 years old  
 half girls and half boys  
 KK+UF

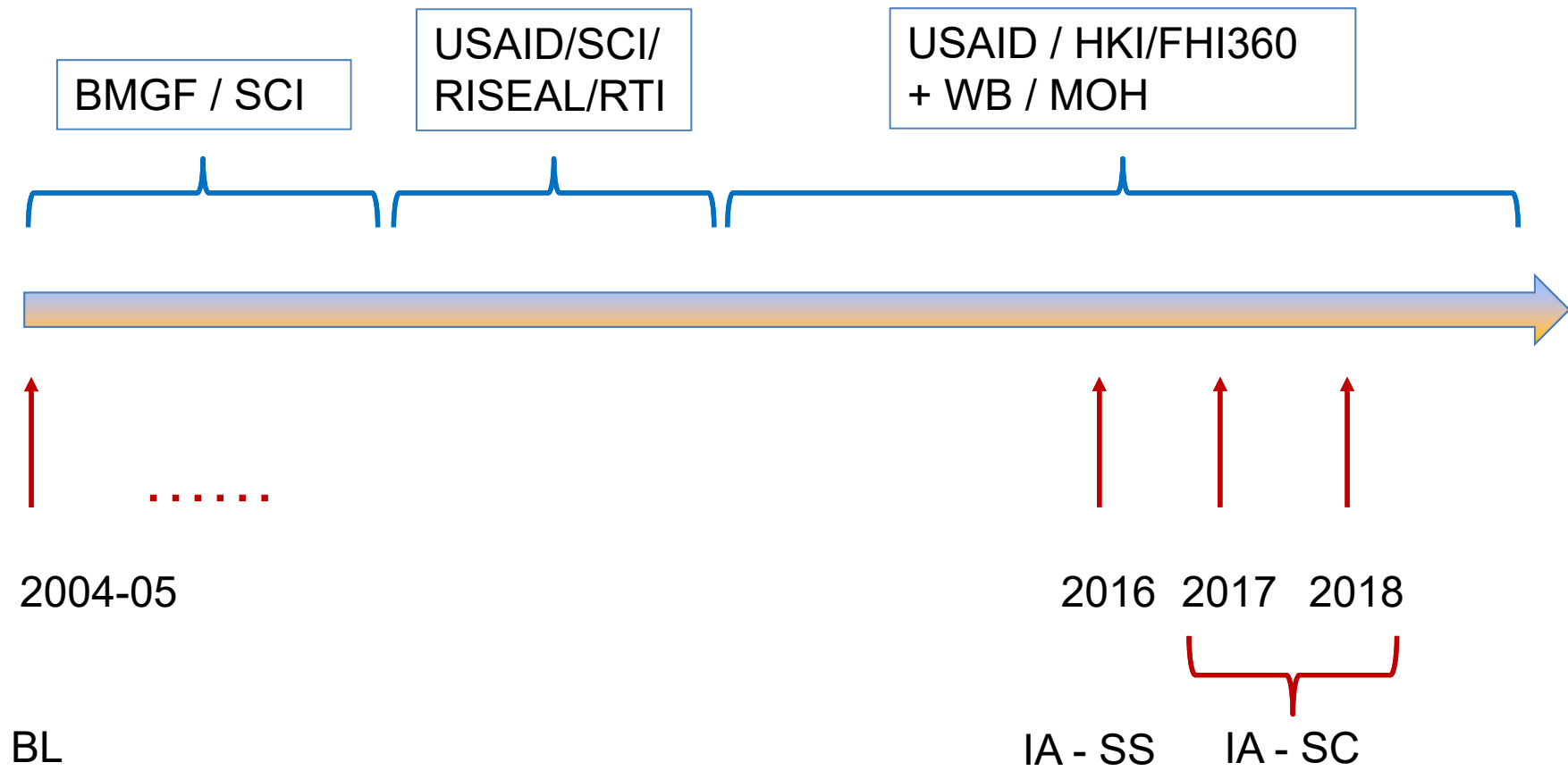
Schistosome, region	No. of children investigated	No. Infected	Prevalence of Infection, % (95% CI)	No. heavily Infected <sup>a</sup>	Prevalence of heavy Infection, % (95% CI)	Mean egg count <sup>b</sup> (95% CI)
<b><i>Schistosoma haematobium</i></b>						
Boucle du Mouhoun	320	20	6.25 (4.08–9.46)	11	3.44 (1.93–6.05)	9.86 (2.84–16.88)
Cascades	160	0	0.00 (0.00–2.34)	0	0.00	–
Centre-Est	320	110	34.38 (29.38–39.74)	28	8.75 (6.12–12.36)	20.08 (10.39–29.77)
Centre-Nord	320	16	5.00 (3.10–7.97)	3	0.94 (0.32–2.72)	1.72 (0.62–2.83)
Centre-Ouest	320	4	1.25 (0.49–3.17)	1	0.31 (0.06–1.75)	0.68 (0.00–1.84)
Centre-Sud	320	7	2.19 (1.06–4.45)	4	1.25 (0.49–3.17)	1.37 (0.15–2.59)
Est	314	57	18.15 (14.28–22.79)	10	3.18 (1.74–5.76)	6.60 (3.22–9.98)
Hauts Bassins	480	0	0.00 (0.00–0.79)	0	0.00	–
Nord	320	5	1.56 (0.67–3.60)	1	0.31 (0.06–1.75)	1.11 (0.00–3.08)
Sahel	320	67	20.94 (16.84–25.73)	37	11.56 (8.51–15.53)	24.47 (14.33–34.60)
Sud-Ouest	320	1	0.31 (0.06–1.75)	0	0.00	0.10 (0.00–0.30)
<b><i>Schistosoma mansoni</i></b>						
Boucle du Mouhoun	320	0	0.00	0	0.00	–
Cascades	160	0	0.00	0	0.00	–
Centre-Est	320	0	0.00	0	0.00	–
Centre-Nord	320	0	0.00	0	0.00	–
Centre-Ouest	320	0	0.00	0	0.00	–
Centre-Sud	320	1	0.31 (0.06–1.75)	0	0.00	0.15 (0.00–0.45)
Est	314	0	0.00	0	0.00	–
Hauts Bassins	480	42	8.75 (6.54–11.62)	1	0.21 (0.04–1.17)	7.7 (4.18–11.22)
Nord	320	0	0.00	0	0.00	–
Sahel	320	0	0.00	0	0.00	–
Sud-Ouest	320	0	0.00	0	0.00	–
All investigated	3514	43	1.15 (0.84–1.55) <sup>c</sup>	1	0.03 (0.01–0.16) <sup>c</sup>	1.00 (0.26–1.75) <sup>c</sup>



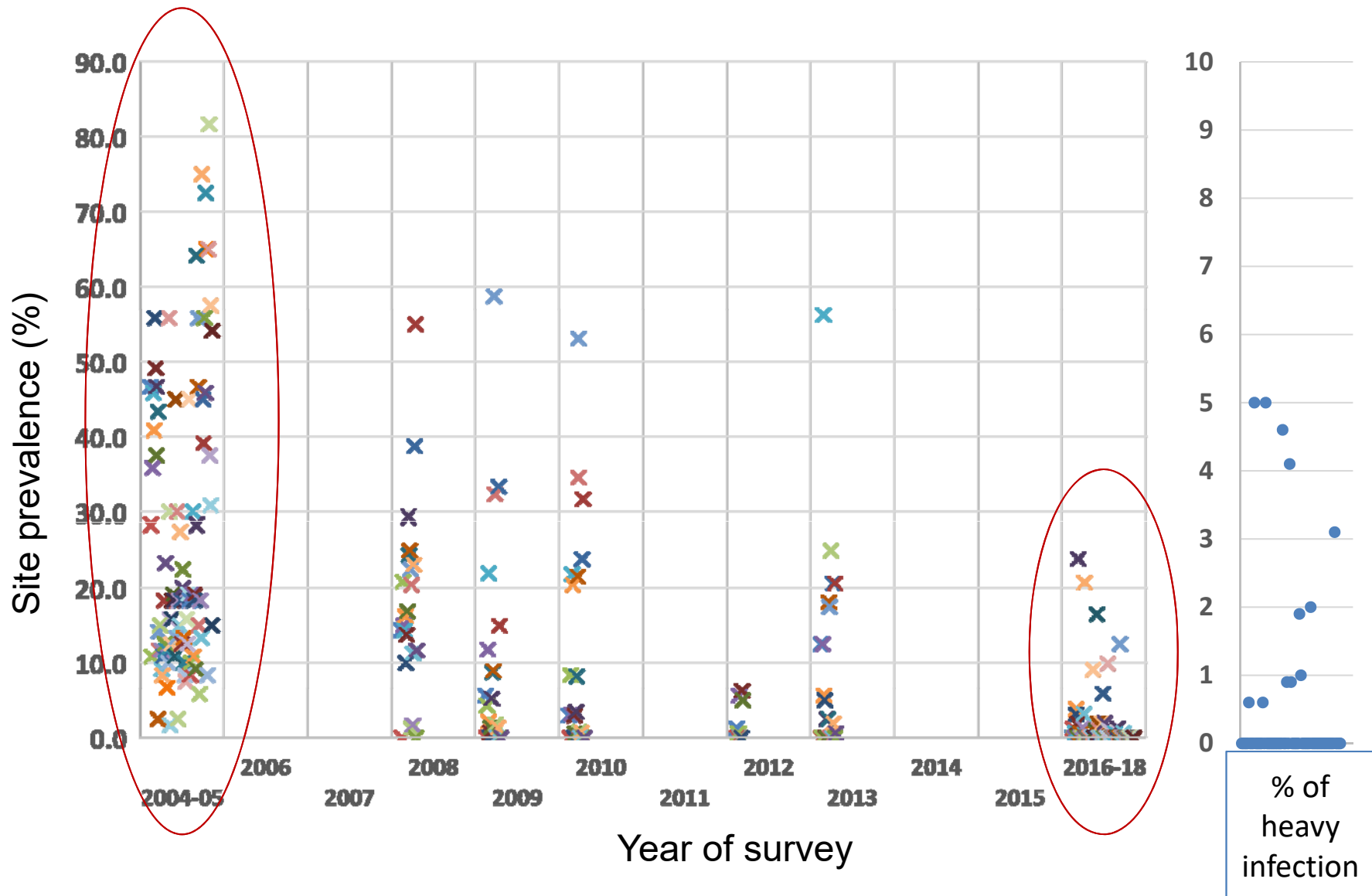
2015 national review and adjust treatment strategy



# PROGRAM AND ASSESSMENT TIMELINE

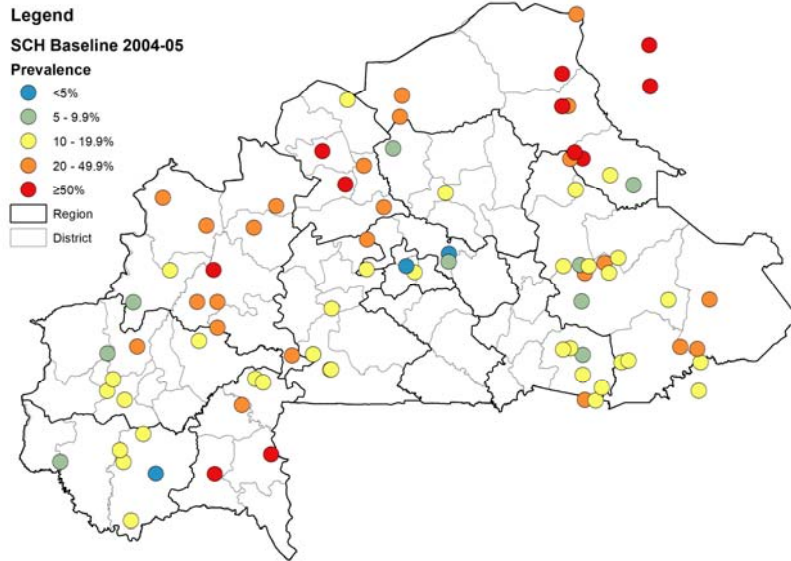


# SCHISTOSOMIASIS IN 2016-18

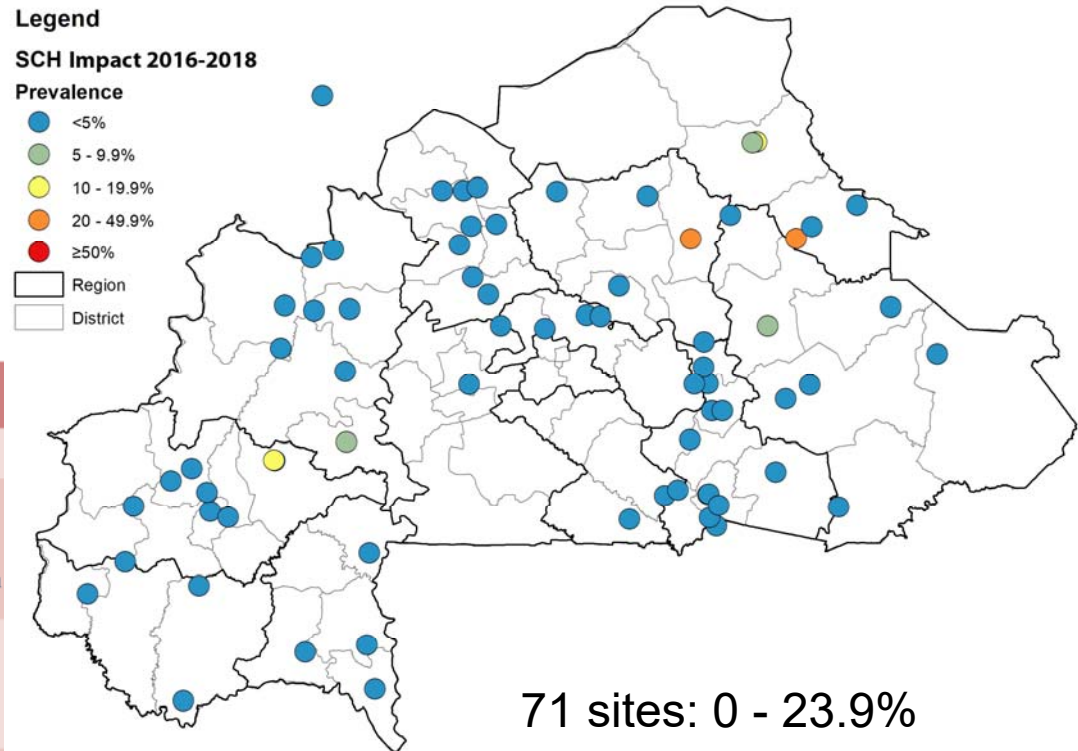




# SCHISTOSOMIASIS IN 2016-18



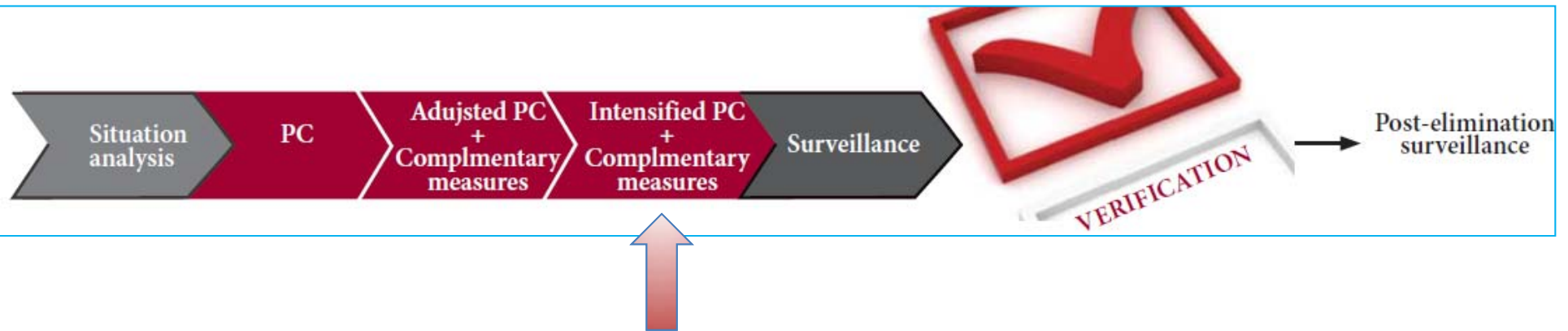
- Morbidity is under control
- Perhaps eliminated as PHP in the majority of the country



71 sites: 0 - 23.9%

GROUP	1. Countries eligible for control of morbidity	2. Countries eligible for elimination as a public-health problem	3. Countries eligible for elimination (interruption of transmission)	4. Countries that have achieved elimination
Goal	Control of morbidity	Elimination as a public-health problem	Elimination (interruption of transmission)	Post-elimination surveillance
Recommended intervention	Preventive chemotherapy Complementary public-health interventions, where possible	Adjusted preventive chemotherapy Complementary public-health interventions strongly recommended	Intensified preventive chemotherapy in residual areas of transmission Complementary public-health interventions essential	Surveillance to detect and respond to resurgence of transmission and to prevent reintroduction (schistosomiasis should be made notifiable)
Target	100% geographical coverage and at least 75% national coverage Prevalence of heavy-intensity infection <5% across sentinel sites*	Prevalence of heavy-intensity infection <1% in all sentinel sites	Reduction of incidence of infection to zero	Incidence of infection remains zero (no autochthonous cases)
Group progression (1 to 4)	Up to 5-10 years from joining the group	Up to 3-6 years from joining the group	Up to 5 years from joining the group	Until all countries have interrupted transmission

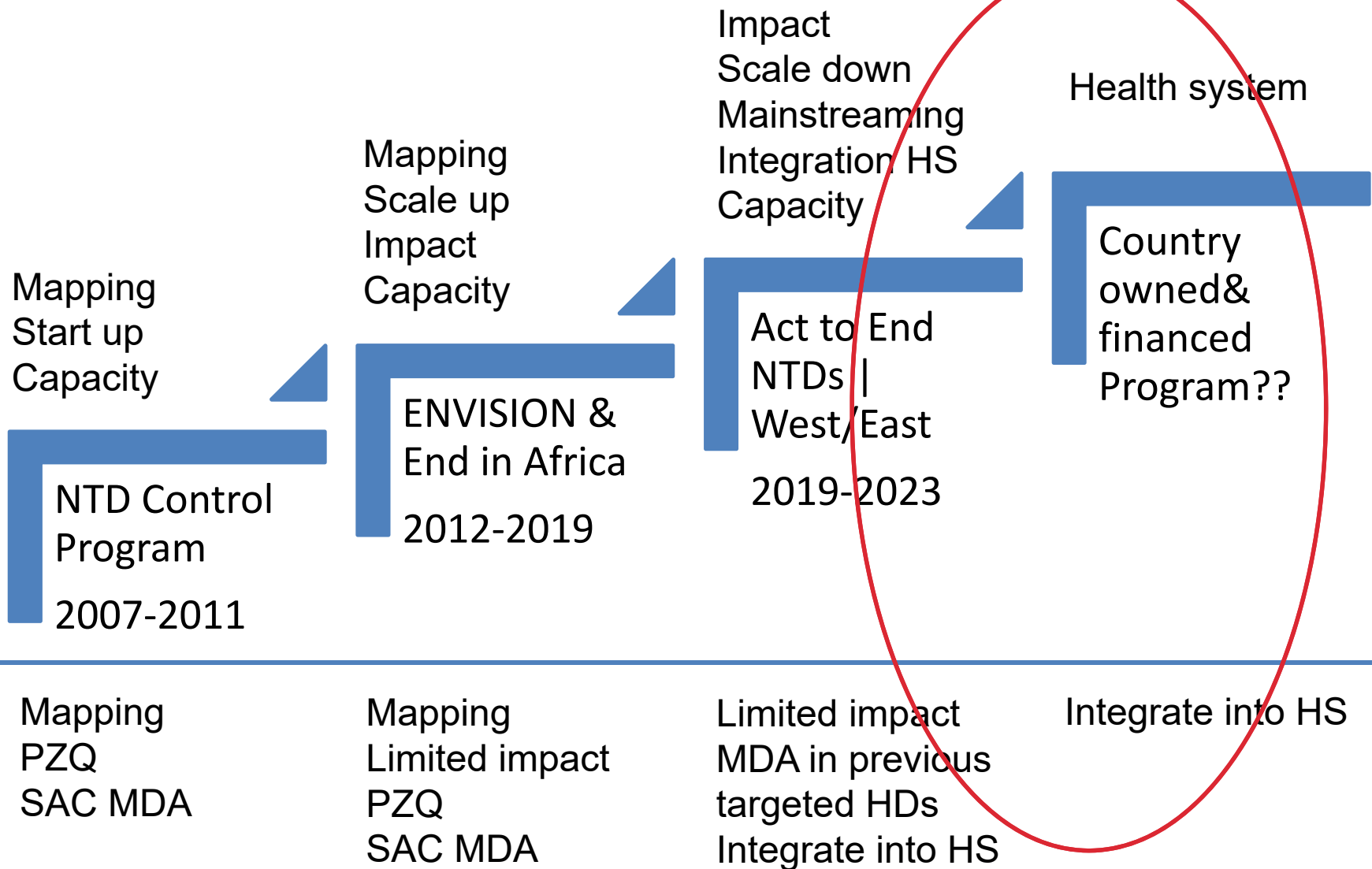
# THEN WHAT?



- Next phase: target for interruption of transmission?
  - Intensify mass treatment
  - Health education
  - Access to clean water
  - Sanitation improvement
  - Environmental snail control and focal mollusciciding



# USAID NTD PROGRAM





## SECTION 4. CHALLENGES AND OPPORTUNITIES

# CHALLENGES / OPPORTUNITIES



- **Funding**

- Will support treatment at least until the end of the current project
- Will support Burkina Faso to have an SCH Expert Committee to steer the way forward, but USAID funding will diminish
- Who will take over? Is the Gov ready?

- **Intensified treatment**

- PZQ for other groups, particularly adults? Is the current donation enough?
- District level to sub-district level treatment - remapping/assessment at sub-district level / health center level.
- WHO is working on survey protocols to provide more granular data. Who is going to fund this?

- **WHO elimination guidelines**

- New guidelines yet to be published. When?
- Elimination indicators yet to be agreed. When?

# CHALLENGES / OPPORTUNITIES



- **Other measures**

- WASH: need for safe water and sanitation is huge. Who funds these and how to maintain?
- Snail control: nothing is ongoing. Funds and how?
- Behavior Change Communications (BCC): not easy

- **New NTD Roadmap 2030**

- Integrated cross cutting approach to include all NTDs through integrated platforms: infrastructure capacity? HR capacity?

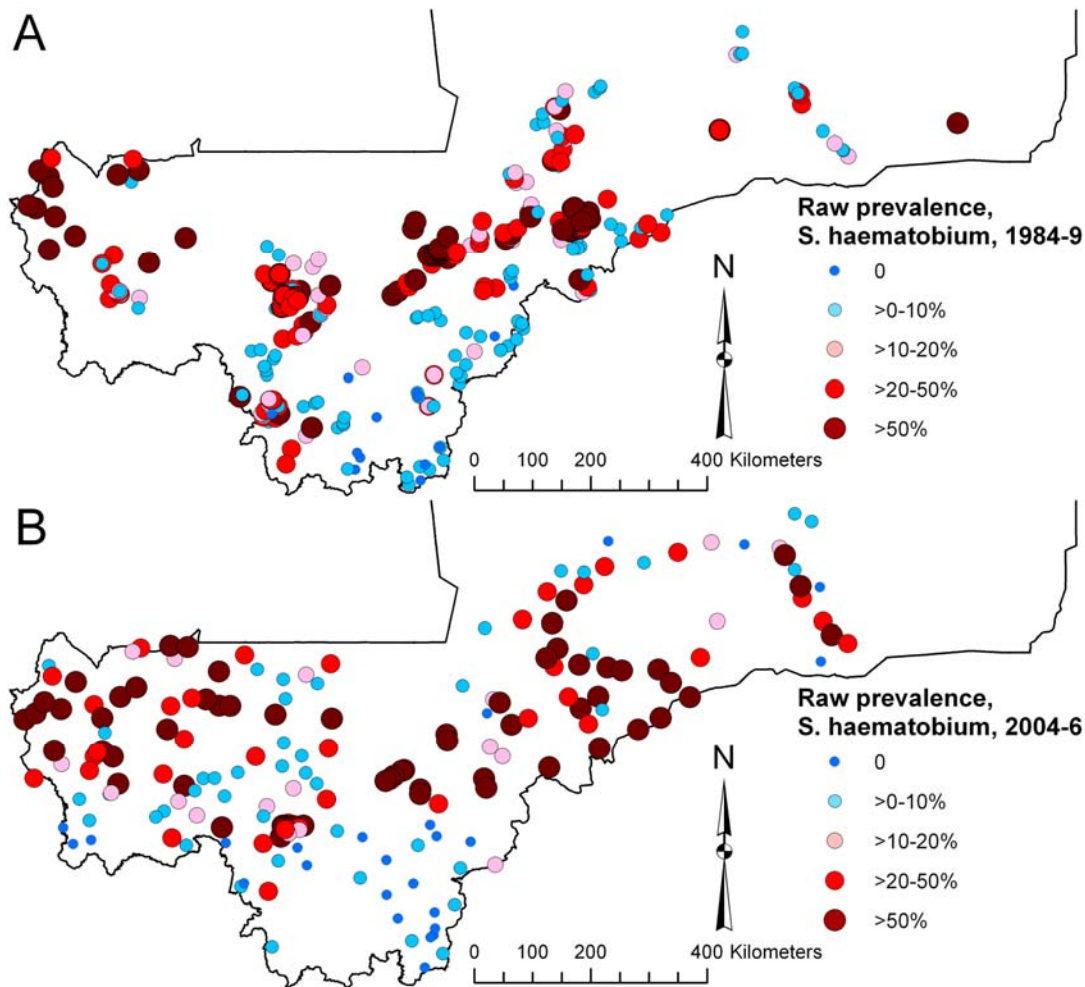




# LESSONS FROM HISTORY – MALI



Raw prevalence of *S. haematobium* infection (A) in 1984–1989 and (B) in 2004–2006, Mali,



- **Program supported by WHO and GTZ in 1980s**
  - *S. haematobium* prevalence from 58.9 to 26.8% & heavy infection from 18.4 to 3.8%
  - *S. mansoni* prevalence from 49.0 to 48.1% & heavy infection from 10.6 to 8.9%
- **GTZ support stopped in 1992 and gov taking over financial responsibility**
  - No implementation
- **SCI supported started in 2004 then USAID until now**





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- **Questions and discussions**





**THANK YOU.**

*“Although the world is full of suffering, it is also full of overcoming it.”  
-Helen Keller*