

Global situation of schistosomiasis: epidemiology and control, results and impact, gaps and challenges, New Roadmap targets and perspective

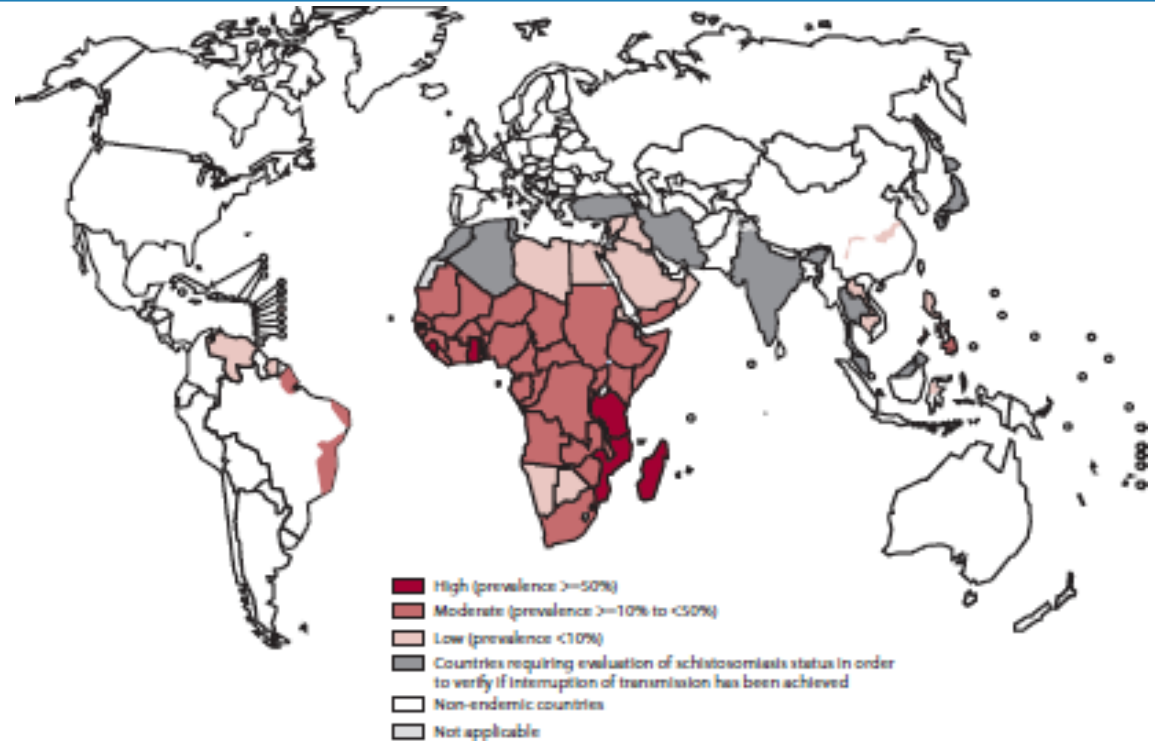
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**World Health
Organization**

Schistosomiasis

- 78 Endemic countries
- 52 countries needing Preventive Chemotherapy
- 206.4 Million people in need of preventive Chemotherapy (91.4% located in Africa)
- 54% are SAC



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>

Current status of countries in 2019

52 countries requiring Preventive chemotherapy

Status unknown	MDA not started	MDA started but not at scale or irregular	MDA scaled to all endemic IUs	Need evaluation to verify interruption of transmission
Djibouti, Lebanon, India, Thailand, Malaysia, Turkey, Libya, Myanmar	Equatorial Guinea, South Africa,	Angola, Brazil, Congo, Nigeria, Philippines, Somalia, Central African Republic, Chad, Gabon, Guinea-Bissau, Sao Tome and Principe, South Sudan, Venezuela (Bolivarian Republic of), Zambia, Botswana, Namibia	Benin, Burkina Faso, Burundi, Cambodia, Cameroon, China, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Ethiopia, Egypt, Gambia, Ghana, Guinea, Indonesia, Kenya, Liberia, Lao People's Democratic Republic, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Togo, United Republic of Tanzania, Uganda, Yemen, Zimbabwe	Algeria, Mauritius, Iran, Iraq, Jordan, Oman, Tunisia, Morocco, Syria, Saint Lucia, Surinam, Antigua and Barbuda, Dominican rep., Puerto Rico, Guadeloupe, Martinique, Montserrat, Saudi Arabia,
	2 (4%)	16 (31%)	34 (65%)	18

78 countries are endemic for schistosomiasis + 1 Myanmar TBC

Global status of preventive chemotherapy in 2017 – schistosomiasis

PC implementation	AFR SAC/Adults	AMR SAC	EMR SAC/Adults	SEAR SAC/Adults	WPR SAC/Adults	GLOBAL SAC/Adults
Number of countries requiring PC ¹	41	2	4	1	4	52
Number of people requiring PC	108.2M/90.6M	1.6M	9.8M/6.7M	4K/18K	0.6M/2.2M	120.7M/100.1M
Number of countries implemented and reported ²	31/15	1/1	4/4	1/1	3/3	40/24
Proportion (%) of districts implemented PC ³						
Proportion (%) of districts achieving effective coverage ⁴	83.8	0	67.1	0	53.3	82.6
Number of people treated	78.6M/12.1M	0.1K/3.2K	6.4M/3.4M	1K/5K	0.4M/1.3M	85.4M/16.9M
Coverage (%) ⁵	72.4/13.3	0.2	64.7/49.7	26.8/28.3	66.6/61.4	70.8/16.8

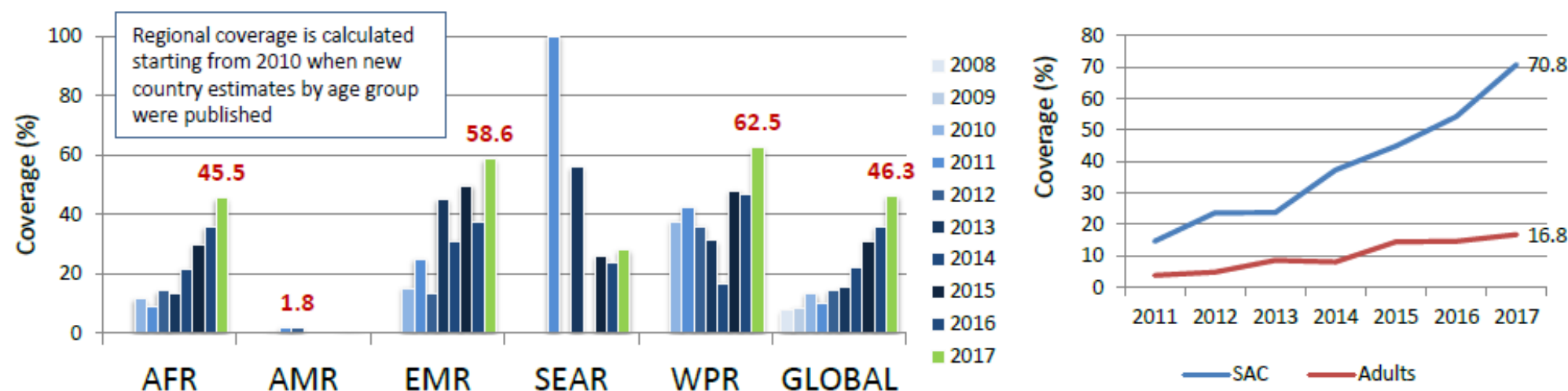
¹ Number of endemic countries moved to post-treatment surveillance stage is not included in total.

² Number of countries reporting data on PC implementation. Countries submitting blank reports are not included in total.

³ Proportion of known endemic districts implementing PC for SAC in countries that reported on PC interventions.

⁴ Proportion of districts implementing PC achieving the defined effective coverage of SAC population for the disease - $\geq 75\%$ for SCH.

⁵ Coverage is calculated as the number of people **in need of PC** and treated out of total population requiring PC.



AFR – African Region; AMR – Region of the Americas; EMR – Eastern Mediterranean Region; SEAR – South-East Asia Region; WPR – Western Pacific Region

Schistosomiasis: burden of disease and PC interventions - 2017

- Approximately **121 millions of children of school age (SAC)** et **100 millions of adults** live in areas requiring mass treatment for schistosomiasis, of which 108 and 91 millions, respectively, in the WHO African region (**90% of the total**)
- At global level, **85.4 million of SAC** and **16.9 millions of adults** were treated in 2017 (total 102.3 million, coverage=70.8% in SAC and **16.8% in adults**). In the African region the coverage of SAC treatment is even higher, **72.4%** .

Recommended strategy for controlling toward elimination schistosomiasis

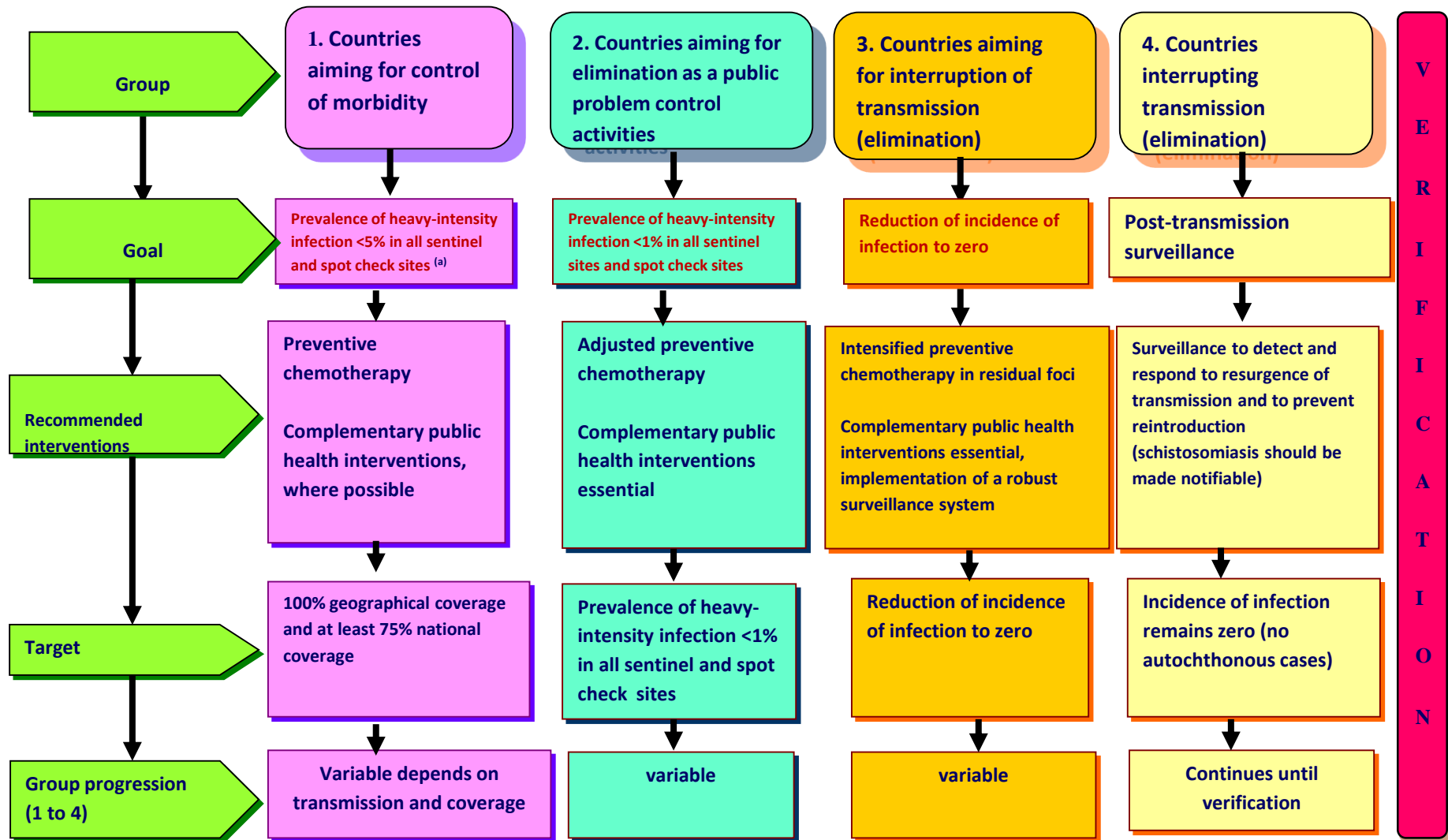
Category	Baseline prevalence among school-age children	Action to be taken		Additional interventions
High-risk community	≥ 50% by parasitological methods (intestinal and urogenital schistosomiasis) or ≥ 30% if based on questionnaires for history of haematuria	Treat all school-age children (enrolled and not enrolled) once a year	Also treat adults considered to be at risk (from special groups to entire communities living in endemic areas)	Water, sanitation Improve, hygiene education (WASH) snail control
Moderate-risk community	≥10% but <50% by parasitological methods (intestinal and urogenital schistosomiasis) Or <30% by questionnaire for history of haematuria	Treat all school-age children (enrolled and not enrolled) once every 2 years (essentially treat 50% of this age group each year)	Also treat adults considered to be at risk	Water, sanitation and hygiene education (WASH) snail control
Low-risk community	<10% by parasitological methods (intestinal and urogenital schistosomiasis)	Treat all school-age children (enrolled and not enrolled) twice during their primary schooling age (treat at least 33% of this age group each year)	Praziquantel should be available in dispensaries and clinics for treatment of symptomatic cases	Water, sanitation and hygiene education (WASH) snail control

At risk groups for schistosomiasis

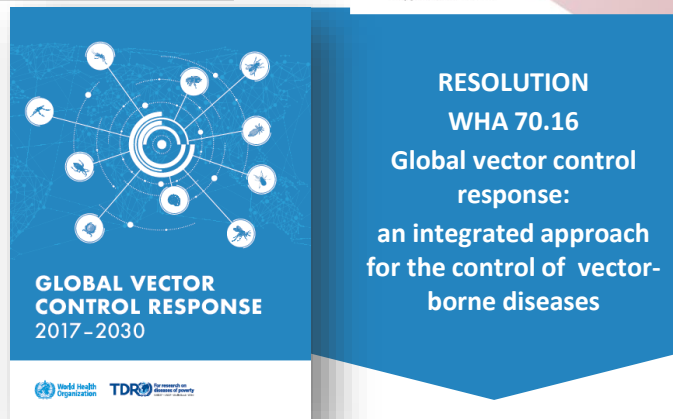
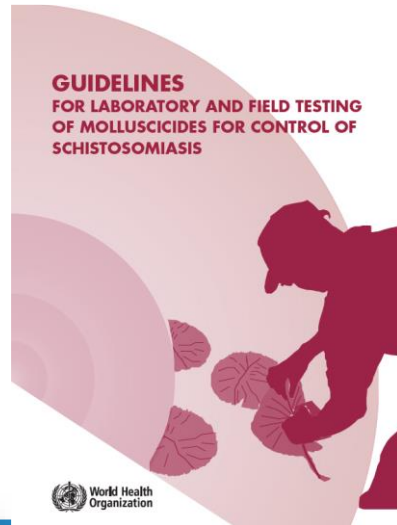
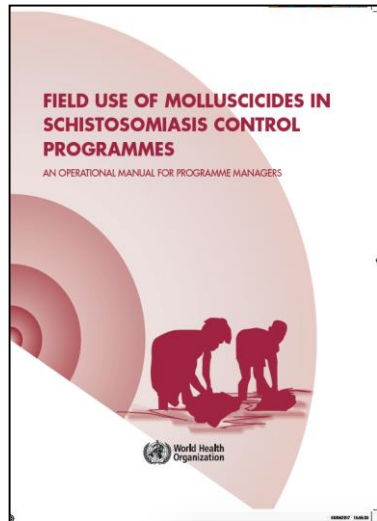
- School-age children (Primary and secondary schools / in community)
- Preschool-age children
- Adults considered to be at risk, from special groups (pregnant and lactating women; groups with occupations involving contact with infested water, such as fishermen, farmers, irrigation workers, or women in their domestic tasks)
- Entire community in high endemic areas

What research is needed to expand coverage to these groups?

Progression towards elimination



Snail control for the interruption of the transmission of schistosomiasis



- Chemotherapy alone rarely stops transmission of the parasite and additional interventions must be implemented to reduce reinfection, lower prevalence and move towards elimination
- Resolution WHA 65.21 on the elimination of schistosomiasis, recognized the progress made in some countries and the potential for the interruption of transmission in others
- Resolution WHA70.16 on Global control response and strategic plan 2020-2030 aimed to reduce mortality and case incidence of vector borne diseases (including schistosomiasis)
- Niclosamide is the only WHO approved molluscicides

Female genital schistosomiasis (FGS)

- New focus on **female genital schistosomiasis (FGS)**
 - Call for action:
 - Increased advocacy for treatment of FGS among adolescent girls and women, and more praziquantel to prevent FGS
 - Integration of schistosomiasis treatment in HIV prevention package. Use existing health-care delivery systems as a platform to expand FGS prevention, screening and treatment.
 - More research to provide evidence and impact of Schistosomiasis preventive chemotherapy on HIV and FGS prevention
- PC with PZQ for SAC to prevent lesions
 - PC with PZQ for WRA to prevent and treat lesions

FEMALE GENITAL SCHISTOSOMIASIS



For women and girls who present with urogenital symptoms and who have had contact with fresh water in countries endemic for schistosomiasis, the diagnosis of female genital schistosomiasis (FGS) must be considered.

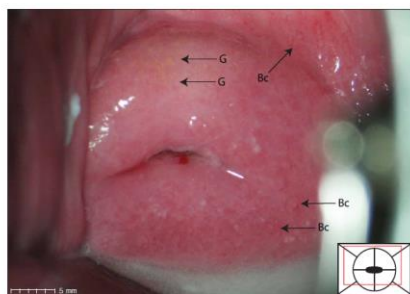
FGS is diagnosed by visual inspection of characteristic lesions on the cervix and vaginal wall. Visualization can be improved by using a digital camera or a colposcope. Current laboratory techniques are inadequate for diagnosing FGS. If one FGS case is seen, there are probably many others in the same area. All who have used the same source of water are at risk. It is especially important to identify children who may have early schistosomiasis.

The WHO-recommended treatment for schistosomiasis is PRAZQUANTEL 40 MG/KG AS A SINGLE DOSE.

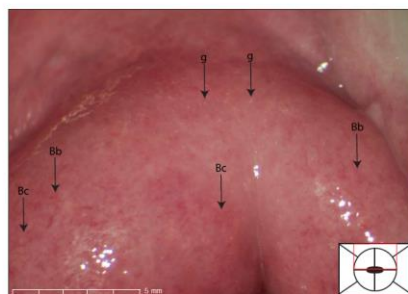
Regular treatment with praziquantel during preventive chemotherapy activities (mass drug administration) to communities and schools in endemic areas is an important public health intervention against FGS. Dosage is determined by measuring height using a dose pole.

Treatment kills the adult worms and prevents new FGS lesions.

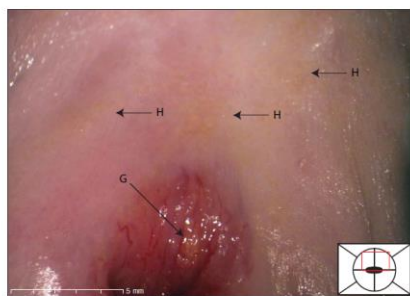
For further information and examples on FGS, please refer to the *WHO Female Genital Schistosomiasis Pocket Atlas* (2015).



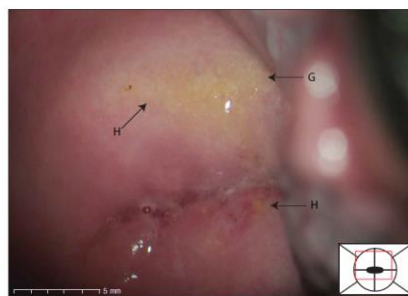
Grainy sandy patches (G). Widespread abnormal blood vessels: circular (Bc). The discharge shown is candidiasis.



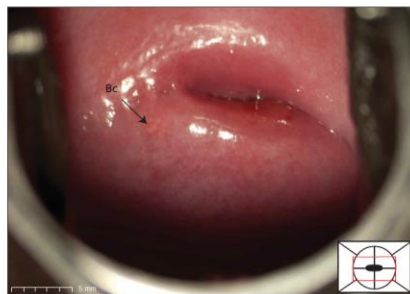
Sandy patch appearing as single grains (g). Widespread abnormal blood vessels: circular (Bc) and branched (Bb).



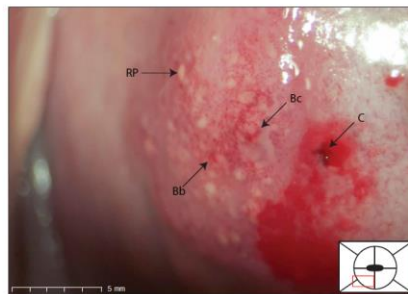
Homogeneous yellow sandy patches (H). Grainy sandy patches (G).



Homogeneous yellow sandy patches (H). Grainy sandy patches (G).

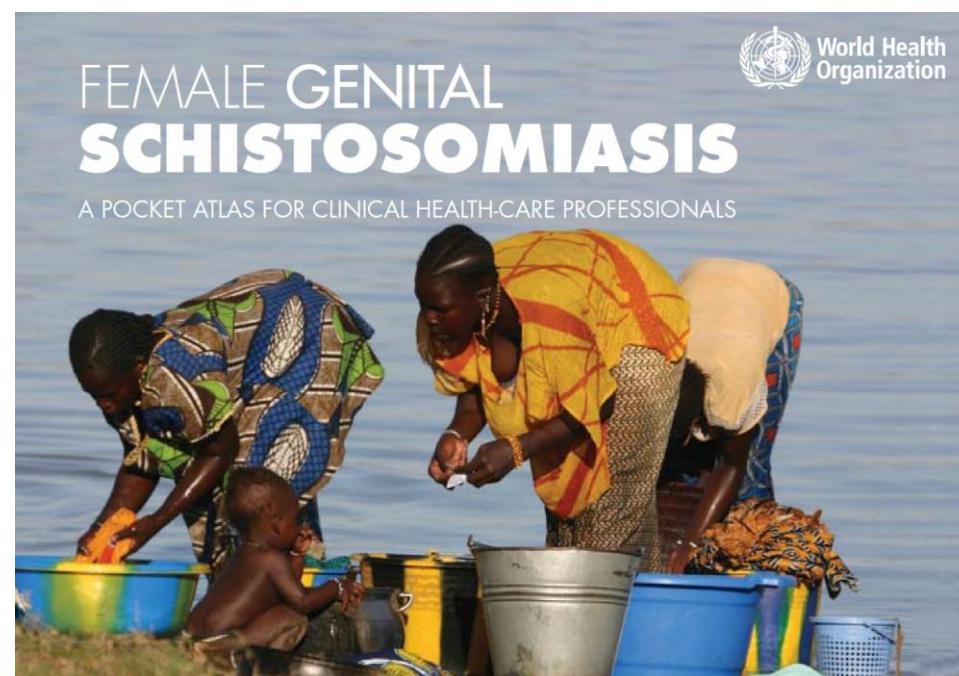


Widespread abnormal blood vessels: circular (Bc).



Rubbery papules (Rp). Abnormal blood vessels: circular (Bc) and branched (Bb). Contact bleeding (C).

FGS: capacity-building material for clinical health care staff



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Challenge I

the biggest gap for praziquantel

- Approximately 121 millions of children of school age (SAC) et 100 millions of adults live in areas requiring mass treatment for schistosomiasis- Total 221 Million people
- The amount of praziquantel needed is 603 Million tablets/year to treat SAC and Adults in need of PC
- Merck has made available 250 Million tablets /year for SAC in priority
- Pre-SAC are not include in PC due to the lack of suitable pediatric formation of Praziquantel

Challenge II

Sustaining high coverage for MDA

- Praziquantel efficacy- 80-90% cure rate (40mg/kg)
- Eggs still discharged after chemotherapy – maintaining transmission
- Chemotherapy compliance decreased year by year, (low coverage)
- Praziquantel side effects (fear of treatment)
- Sustainability of funding

Challenge III

Snail control is limited

- Low capacity in malacology and snail control
- Need of more sensitive methods for determination positive snails
- Only one molluscicide is WHO approved (Niclosamide)
- High cost of snail control using molluscicides
- Little experience on impact of new molluscicides use on environment modification for aquatic snails

Challenge IV

Sensitive and specific diagnostic tests

- Morbidity control – prevalence of heavy infections
 - Kato-Katz technique
 - Urine filtration/haematuria
- Elimination as a public health problem
 - Kato-Katz technique – indicator is < 1% of heavy infections
 - Hatching test – sensitive enough to detect a few miracidia
 - Antibody tests – to identify hot-spots of transmission
 - Antigen and parasite DNA detection tests
- Interruption of transmission
 - Antibody/**antigen** detection tests for humans and reservoir hosts
 - Tests to detect parasite DNA in human and snail intermediate hosts

Challenge V

Criteria for elimination and interruption of transmission

- Due to the different species, it is not easy to uniform standards
- Alone the prevalence is not enough to show really situation
- Distance from areas with the disease determine the risk of resurgence
- Movement of Hosts determine the risk of resurgence-Migration
- Economic development impact the achievement

Research need on morbidity of schistosomiasis in PSAC and their treatment with PZQ

- Need to develop a safety database on the use of crushed PZQ in PSAC.
- Need to conduct different PZQ dose trials in preschool children
- Need to expand the development and validation of POC diagnostics for PSAC
- Need to develop a method and technology to identify the high risk areas
- Need to conduct a multicentre study on the morbidity of schistosomiasis in PSAC using ultrasound and impact of PZQ in the reversal of lesions at different follow-up times.

Research on treatments of community

- Social science studies on reasons of non integration of pregnant and lactating women in PC for schistosomiasis and STH
- Strategies to reach PSAC, pregnant and lactating women through maternal and child health services
- Need of studies on efficacy of PZQ in genital schistosomiasis
- Need of strategies for treatment of SAC in Secondary schools
- Need of studies on strategies to reach occupational groups such as fishermen, farmers, irrigation workers, car washers



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2021-2030 SCH Road map goals and justification

- Endpoint goal:
 - Global Elimination of schistosomiasis as Public Health Problem
 - Interruption of transmission of Schistosomiasis in selected countries
- Justification:
 - WHA65.21 calling for the elimination of schistosomiasis
 - WHO Schistosomiasis: progress report 2001 - 2011, strategic plan 2012 – 2020 set the objective To eliminate schistosomiasis as a public-health problem by 2025.
 - Impact of preventive chemotherapy in reducing the morbidity due to schistosomiasis
 - Modelling of prevalence thresholds for preventive chemotherapy

Diseases targeted for elimination as a public health problem

Schistosomiasis

Goal: Elimination as a public health problem

Criteria to measure the achievement of the goal: Proportion of heavy intensity schistosomiasis infections <1%.

Milestone

Impact Indicator	2020	2023	2025	2030
Number of countries where interruption of transmission has been verified	2	10	19	25
Number of countries which have eliminated SCH as a public health problem	5	18	38	52

Is there a WHA resolution supporting the goal? Yes

Is a WHO guideline for achievement of goal published? To be published soon

Link to WHO guideline(s)

Is there a WHO process for validation/verification/certification? To be published soon

Link to WHO validation/verification/certification process: Yes

Goal attainment probability (High/Medium/Low):

Risks/Assumptions (towards attaining stated goal as measured): High

Target considers model predictions: Lack of political commitment and resources, insecurity, lack of praziquantel for adults and preschool-age children, infection in animals.

Key collaborator for modelling: Yes

Link to WHO fact sheet: University of Ghana and Università di Perugia-Italy

Diseases targeted for elimination as a public health problem

Schistosomiasis

Goal: Elimination as a public health problem

Criteria to measure the achievement of the goal: Interrupt transmission in selected countries: zero autochthonous infections in humans, snails and animals for at least 5 consecutive years in a previously endemic country.

Milestone

Impact Indicator	2020	2023	2025	2030
Number of countries where interruption of transmission has been verified	2	10	19	25
Number of countries which have eliminated SCH as a public health problem	5	18	38	52

Is there a WHA resolution supporting the goal? Yes

Is a WHO guideline for achievement of goal published? To be published soon

Link to WHO guideline(s)

Is there a WHO process for validation/verification/certification? To be published soon

Link to WHO validation/verification/certification process: Yes

Goal attainment probability (High/Medium/Low):

Risks/Assumptions (towards attaining stated goal as measured): Medium

Target considers model predictions: Lack of political commitment and resources, insecurity, lack of praziquantel for adults and preschool-age children, infection in animals, transmission by hybrids

Key collaborator for modelling: Yes

Link to WHO fact sheet: [University of Ghana and Università di Perugia-Italy](#)

Progression of Countries and Territories toward elimination of SCH as public health problem of the 78 countries endemic for schistosomiasis- WHO, TRS 830

2020	2023	2025	2030
<ol style="list-style-type: none"> 1. Japan 2. China 3. Cambodia 4. Laos 5. Malaysia 6. Thailand 7. Indonesia 8. India 9. Algeria 10. Mauritius 11. Iran 12. Iraq 13. Jordan 14. Oman 15. Syria 16. Tunisia 17. Saudi Arabia 18. Mauritius 19. Turkey 20. Antigua and Barbuda, 21. Dominican Republic, 22. Guadeloupe, 23. Martinique, 24. Montserrat, 25. Puerto Rico 26. St. Lucia 	<ol style="list-style-type: none"> 1. Surinam 2. Brazil 3. Venezuela 4. Philippines 5. Lao PDR 6. Cambodia 7. Lebanon 8. Djibouti 9. Egypt 10. Libya 11. Botswana 12. Burundi 13. Eritrea 14. Gambia 15. Malawi 16. Mauritania 17. Namibia 18. Rwanda 19. Sao Tome and Principe 20. Sierra Leone 21. Swaziland 22. Togo 23. Zimbabwe 	<ol style="list-style-type: none"> 1. Somalia 2. Sudan 3. Yemen 4. Benin 5. Burkina Faso 6. Cameroun 7. Chad 8. Congo 9. Cote d'Ivoire 10. Gabon 11. Guinea 12. Guinea Bissau 13. Kenya 14. Liberia 15. Madagascar 16. Mali 17. Mozambique 18. Niger 19. Senegal 20. Tanzania 	<ol style="list-style-type: none"> 1. Angola 2. CAR 3. DRC 4. Equatorial Guinea 5. Nigeria 6. Uganda 7. South Africa 8. Zambia 9. South Sudan
26/78 (33%)	49/78 (63%)	69/78 (88%)	78/78 (100%)

Progress of countries towards the target of interruption of transmission

Indicator	2020	Milestone 2023 (end of GPW13)	Milestone 2025	Target 2030
Number of countries verified for interruption of SCH transmission	<ol style="list-style-type: none"> 1. Mauritius 2. Dominican Republic 	<ol style="list-style-type: none"> 1. Morocco, 2. Tunisia, 3. Iran, 4. Iraq, 5. Jordan 6. Saint Lucia, 7. Puerto rico 8. Antigua and Barbuda 9. Montserrat 	<ol style="list-style-type: none"> 1. -Algeria 2. Oman 3. Saudi Arabia, 4. Libya, 5. Syria, 6. - Guadeloupe, 7. Martinique, 8. Lao, 9. – Cambodia 10. Surinam, 	<ol style="list-style-type: none"> 1. China 2. Indonesia, 3. Philippines 4. Egypt 5. Tanzania (Zanzibar) 6. Sao Tome and Principe
	2	11	21	26*

Thank you

