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Review Article

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Health epidemiological study: Prevalence and distribution of schistosomiasis in human

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Abstract

Schistosomiasis is one of the most widespread of all parasitic infections of humans and the most common parasite transmitted through contact with fresh water. Human schistosomiasis is one of the most common Neglected Tropical Diseases. Schistosomiasis is caused by infection with the parasite *Schistosoma*, which is a flat-worm or fluke. It is endemic in more than 70 countries affecting about 229 million people worldwide, of whom 92% are in Africa. Several species exist, of which the most prevalent are *Schistosoma mansoni*, *Schistosoma japonicum*, and *Schistosoma haematobium*. Left untreated schistosomiasis can cause serious long-term health problems such as intestinal and bladder disease. The construction of water schemes to meet the power and agricultural requirements for development has to lead to increased transmission, especially of *Schistosoma mansoni*. Increasing population and movement have contributed to increased transmission and introduction of schistosomiasis to new areas. Most endemic countries are among the least developed whose health systems face difficulties to provide basic care at the primary health level. Large-scale mass chemotherapy is the first step to reducing the burden of *Schistosoma*-related disease. The recommended strategy for schistosomiasis is mass treatment with praziquantel, which effectively clears the body of worms, but reinfection is common due to the nature of the parasites transmission and human behavior. Integrated control, targeting the life cycle, is the only approach that will lead to sustainability and future elimination. It should be noted that despite treatment success, the disease may prevalence again, high intensity of infection, and severe morbidity might ensue.

Keywords Schistosomiasis, Bilharzia, Snail Fever, Praziquantel, Africa

Introduction

Schistosomiasis (bilharzia or snail fever), is a parasitic disease caused by flukes (trematodes) of the genus *Schistosoma* that have a complex life cycle involving freshwater snails. After malaria and intestinal *helminthiasis*, *schistosomiasis* is the third most devastating tropical disease in the world, being a major source of morbidity and mortality for developing countries in Africa, South America, the Caribbean, the Middle East, and Asia (WHO, 2010). Schistosomiasis was discovered by Theodore Bilharz, a German surgeon working in Cairo, who first identified the etiological agent *Schistosoma hematobium* in 1851 (Nour, 2010). Left untreated schistosomiasis can cause serious long-term health problems

such as intestinal and bladder disease. Chronic schistosomiasis reduces the capacity of those infected to work and in some cases can result in death. In children, schistosomiasis can cause anemia, stunting, and a reduced ability to learn. A review of disease burden estimated that more than 200 000 deaths per year are due to schistosomiasis in sub-Saharan Africa (WHO, 2020; Chistulo et al., 2004).

Schistosomiasis prevalence worldwide

The estimated global prevalence of active infections is more than 229.2 million (WHO, 2020).

Schistosomiasis remains highly prevalent in many low-income and middle-income countries and a public health problem in several parts of the world, particularly in Africa where 92% of all the people requiring preventive chemotherapy for schistosomiasis live. Of the 78 countries considered endemic for schistosomiasis, only 52 countries have populations requiring preventive chemotherapy. The total number of people in need of preventive chemotherapy globally in 2018 was 229.2 million, of which 124.4 million were school-aged children. According to a WHO report in 2018 from 34

countries for the treatment of school-aged children and from 21 countries for the treatment of adults show that more than 95 million people received preventive chemotherapy for schistosomiasis globally, which is equivalent to 61% global coverage for school-aged children and 18% for adults (WHO, 2020). Table 1 indicates the numbers that requiring preventive chemotherapy for schistosomiasis, 2018, and table 2 shows the states of the endemic and non-endemic countries of the world with schistosomiasis by region in 2018 according to the world health organization.

Table 1. Estimated number of individuals in the region and global requiring preventive chemotherapy for schistosomiasis, 2018

Africa	Americas	Eastern Mediterranean	European	South-east Asia	Western pacific	Global
204 470 200	1 620 830	19 955 408	Not applicable	24 720	3 073 935	229 145 093

Table 2. Status of schistosomiasis in 2018

Africa	
Non-endemic	Cabo Verde, Comoros, Le Sotho, and Seychelles
Interruption of transmission to be confirmed	Algeria, and Mauritius
Requiring preventive chemotherapy	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo; Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Liberia, Madagascar, Malawi. Mali. Mauritania. Mozambique. Namibia. Niger. Nigeria. Rwanda. Sao Tom and Principe, Senegal, Sierra Leone, South Africa, south Sudan, Togo, Uganda, United republic of Tanzania, Zambia, and Zimbabwe
Americas	
Requiring preventive chemotherapy	Brazil, and Venezuela
Interruption of transmission to be confirmed	Antigua and Barbuda, Dominican Republic, Guadeloupe, Martinique, Montserrat, and Puerto Rico
Status of transmission to be confirmed	Saint Lucia, and Suriname
Non-endemic	Argentina, Bahamas, Barbados, Belize, Bolivia, Dominica, Ecuador, Canada, Chile, Colombia, Costa Rica, Cuba, Grenada, Guatemala, Guyana, El Salvador, French Guiana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Trinidad and Tobago, Uruguay, and United States of America
Eastern Mediterranean	
Non endemic	Afghanistan, Bahrain, Kuwait, Pakistan, Qatar, and United Arab Emirates
Requiring preventive chemotherapy	Yemen, Sudan, Somalia, and Egypt
Interruption of transmission to be confirmed	Djibouti, Iran, Jordan, Morocco, Tunisia, and Lebanon
Status of transmission to be confirmed	Syrian Arab Republic, Saudi Arabia, Oman, Iraq, and Libya
Europe	
Non endemic	Albania, Andorra, Arminea, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzgovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Latvia, Le Sotho, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of moldova, Republic of North Macedonia, Romania, Russian Federation, San Marino, Serbia, Slovakia, Slovenia, Spain,

	Sweden, Switzerland, Tajikistan, Turkmenistan, United Kingdom, Ukraine, and Uzbekistan
Interruption of transmission to be confirmed	Turkey
South-east Asia	
Non-endemic	Bangladesh, Bhutan, Democratic People's Republic of Korea, Maldives, Myanmar, Nepal, and Sri Lanka
Interruption of transmission to be confirmed	India, and Thailand
Requiring preventive chemotherapy	Indonesia
Western pacific	
Non-endemic	America Samoa, Australia, Brunei Darussalam, Fiji, Cook Islands, French Polynesia, Kiribati, Marshall Islands, Micronesia, Mongolia, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Republic of Korea, Samoa, Singapore, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Viet Nam
Interruption of transmission to be confirmed	Malaysia, and Japan
Requiring preventive chemotherapy	Cambodia, China, Lao People's Democratic Republic, and Philippines

Schistosome species

Schistosomiasis is one of the oldest recognized infections. Eggs of the parasite have been found in Egyptian mummies as old as 5,000 years, and evidence suggests that *Haematuria* was recognized and treated as far back as 1550 B.C. The three main species infecting humans are *Schistosoma haematobium*, *S. japonicum*, and *S. mansoni*. Three other species, more localized geographically, are *S. mekongi*, *S. intercalatum*, and *S. guineensis* (previously considered synonymous with *S. intercalatum*). There have also been a few reports of hybrid schistosomes of cattle origin (*S. haematobium*, x *S. bovis*, x *S. curassoni*, x *S. mattheei*) infecting humans. Unlike other trematodes, which are hermaphroditic, *Schistosoma* spp. are dioecous (individuals of separate sexes). Besides, other species of schistosomes, which parasitize birds and mammals, can cause cercarial dermatitis in humans but this is clinically distinct from schistosomiasis (Colley et al., 2014; CDC, 2019). In Africa, *S. mansoni* and *S. haematobium* are predominant throughout the continent, while *S. intercalatum* is found in certain areas of central and western Africa. *S. mansoni* is also found in Latin America and the Caribbean. *S. japonicum* and *S. mekongi* are mostly confined to Asia and the Pacific. Table 3. shows the number of individuals in the region requiring preventive chemotherapy for schistosomiasis during the period from 2011 to 2018. However, table 4, shows the numbers requiring preventive chemotherapy for schistosomiasis in different countries for the year 2018.

Transmission cycle of schistosomiasis

Adult schistosomes live in blood vessels draining either the bladder (*S. haematobium*) or the intestines (*S. mansoni*, *S. japonicum*, *S. mekongi*, or *S. intercalatum*) where adult female worms produce eggs that are passed through urine (in urinary schistosomiasis) or feces (in intestinal schistosomiasis). When the eggs contact water, free-swimming larvae, called miracidia, are released, and they infect freshwater snails. Once in the

snail, the miracidia divide, eventually producing thousands of new infective parasites called cercariae, which are released into the water. These infective cercariae penetrate the skin of a human host where they find their way into blood vessels via the circulatory system, thereby starting the process over again. (CDC, 2019; WHO, 2020). Cercariae transform and subsequently migrate through the lungs to the liver where they mature into adult worms. These adult worms move to the veins of the abdominal cavity or of the urinary tract. Most of the eggs produced are trapped in the tissues but a proportion escapes through the bowel or urinary bladder (Fig. 1). (Sturrock, 2001; WHO, (2020).

Different type of schistosome

Table 5 and fig. 2 show the geographical distribution of *Schistosoma* species (WHO, 2020).

Symptoms of schistosomiasis

Symptoms of schistosomiasis are caused by the body's reaction to the worms' eggs; Intestinal schistosomiasis can result in abdominal pain, diarrhea, and blood in the stool. Liver enlargement is common in advanced cases and is frequently associated with an accumulation of fluid in the peritoneal cavity and hypertension of the abdominal blood vessels. In such cases, there may also be enlargement of the spleen. The classic sign of urogenital schistosomiasis is haematuria (blood in urine). Fibrosis of the bladder and ureter and kidney damage is sometimes diagnosed in advanced cases. Bladder cancer is another possible complication in the later stages. In women, urogenital schistosomiasis may present with genital lesions, vaginal bleeding, pain during sexual intercourse, and nodules in the vulva. In men, urogenital schistosomiasis can induce pathology of the seminal vesicles, prostate, and other organs. This disease may also have other long-term irreversible

consequences, including infertility. The economic and health effects of schistosomiasis are considerable, and the disease disables more than it kills. In children, schistosomiasis can

cause anemia, stunting, and a reduced ability to learn, although the effects are usually reversible with treatment (WHO, 2020).

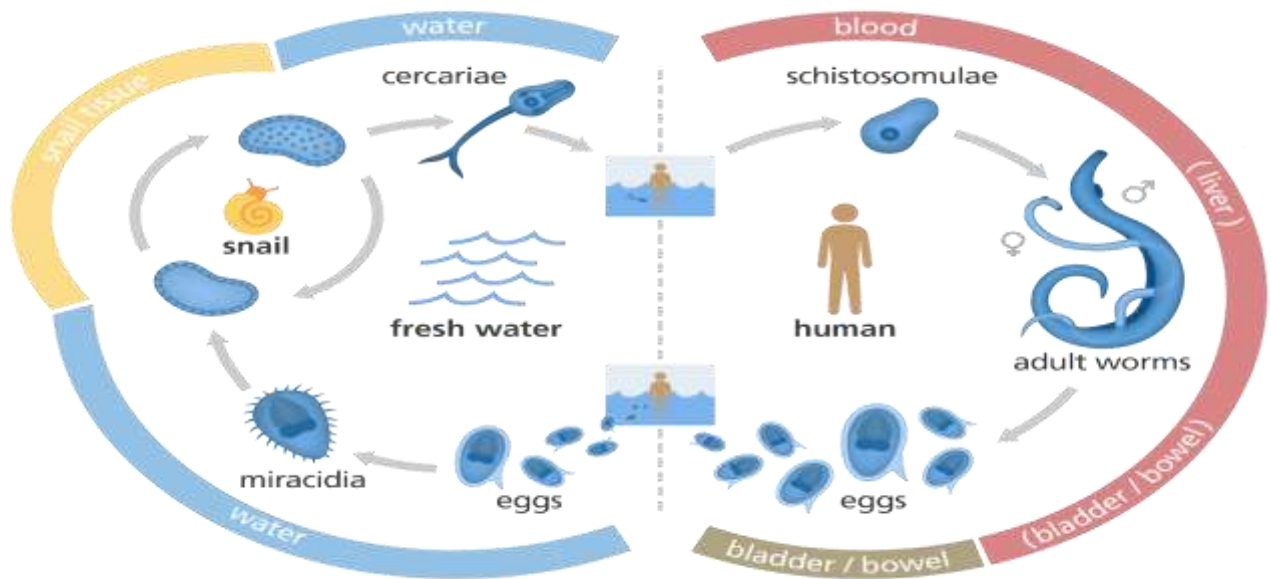


Fig. 1 Schistosomiasis life cycle

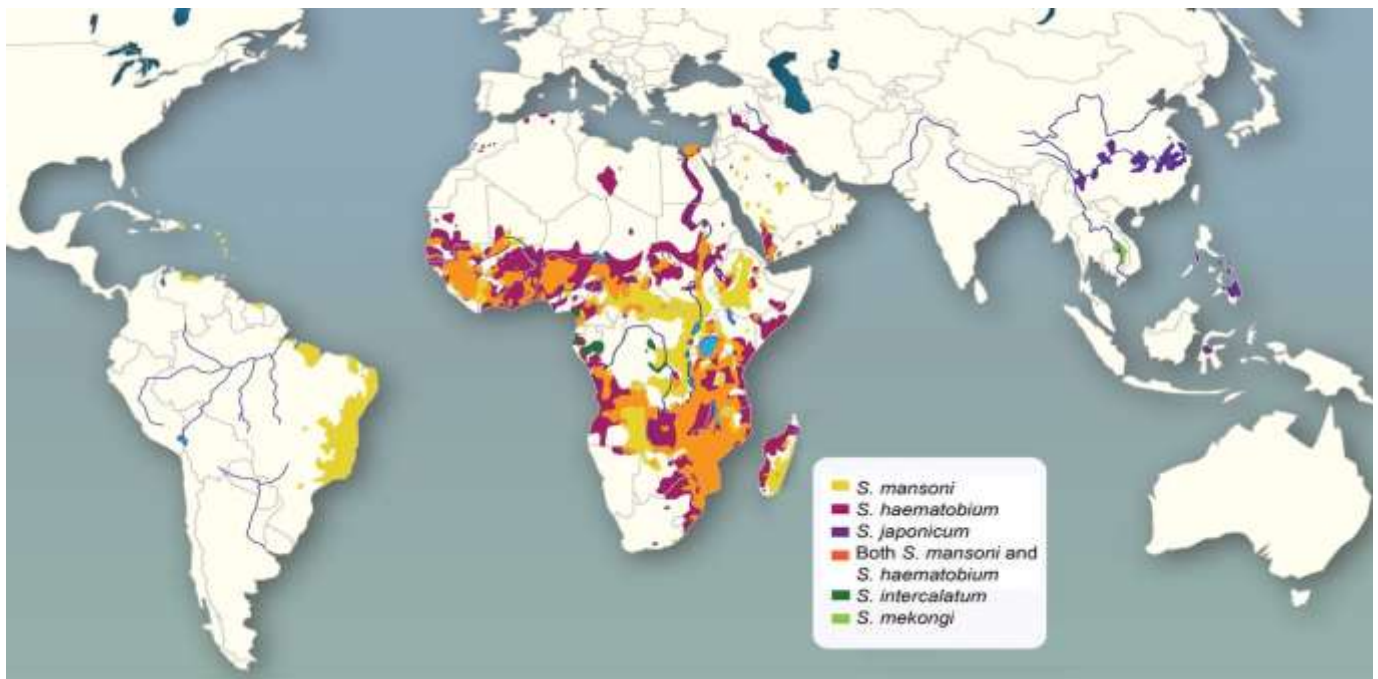


Fig. 2. Diagnosis of different types of schistosome of human

Table 3. Estimated number of individuals in the region requiring preventive chemotherapy for schistosomiasis annually from 2011: 2018. [https://apps.who.int/neglected_diseases/ntddata/sch/sch.html].

Region Year	Africa	Americas	Eastern Mediterranean	European	South-East Asia	Western Pacific	Global
2011	226 012 731	1 537 365	14 863 012	Not Applicable	2 968	626 531	243 042 607
2012	231 959 645	1 551 140	15 282 833	Not Applicable	2 998	635 658	249 432 274
2013	240 734. 571	1 564 885	18 060 129	Not Applicable	3 035	645 400	261 008 020
2014	236 590 060	1 578 304	18 462 304	Not Applicable	27 971	2 216 750	258 875 452
2015	200 713 465	1 592 255	12 545 418	Not Applicable	26 068	3 351 035	218 228 241
2016	191 343 661	1 605 674	12 852 265	Not Applicable	22 675	3 258 412	209 084 687
2017	199 612 090	1 623 107	16 652 623	Not Applicable	21 327	2 833 621	220 742 768
2018	204 470 200	1 620 830	19 955 408	Not Applicable	24 720	3 073 953	229 145 093

Table 4. Estimated number of individuals in different countries requiring preventive chemotherapy (PC) for schistosomiasis 2018.

	Country
>10million	Congo (15 793 249), Ghana (10 471 366), Ethiopia (13 411 391), Mozambique (15 353 813), Tanzania (16 155 207) and Nigeria (25 070 925)
5-9.9 million	South Aericia (5 603 448), Sudan (8 517 930), Angola (7 096 024), Burkina Faso (9 906 142), Uganda (7 298 379), Madagascar (9 650 552), Malawi (9 054 556), Mali (5 872 370) and Egypt (5 066 393)
1-4.9 million	Yemen (4 694 175), Zambia (4 756 368), Zimbabwe (3 828 849), Niger (3 681 910), Benin (2 272 045), Sierra Leone (1 031 377), Senegal (3 987 617), Rwanda (2 585 669), Somalia (1 676 910), South Sudan (2 480 862), Togo (2 505 057), Burundi (1 520,185), Cameroon (4 239 553), Chad (4 150 348), Côte d'Ivoire (4 454 931), Guinea (4 031 094), Kenya (2 759 968), Liberia (1 370 408), Philippines (2 731 233) and Brazil (1 556 890)
0.1-0.9 million	Central African Republic (951 992), Mauritania (916 692), Namibia (486 997), Gabon (208 406), Gambia (134 990), Swaziland (Eswatini; 155 779), Guinea-Bissau (439 899), Botswana (177 125), Congo (177 177), Eritrea (326 462) and China (156 162)
<0.1 million	Cambodia (88 851), Equatorial Guinea (62 864), Lao People's Democratic Republic (97 689), Sao Tome and Principe (38 155),Venezuela (63 940) and Indonesia (24 720)
Non-endemic	Afghanistan, Albania, American Samoa, Andorra, Argentina, Arminea, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladish, Barbados, Belarus; Belgium, Belize, bhutan, Bolivia, Bosnia and Herzgovina, Brunei Darussalam, Bulgaria, Cabo Verde, Canada, Chile, Colombia, Comoros, Cook Islands, Costa Rica, Croatia, Cuba, Cyprus, Czechia, Denmark, Dominica, Democratic People's Republic of Korea, Ecuador, El Salvador, Estonia, Fiji, Finland, France, French Guiane, French Polynesia, Georgia, Germany, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Hungary, Iceland; Ireland, Israel, Italy, Jamaica, Kazakhstan, Kiribati, Kuwait, Kyrgyzstan, Latvia; Le Sotho, Lithuania, Luxembourg, Malta, Marshall Islands, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Myanmar, Nauru, Nepal, Netherlands, New Caledonia, New Zealand, Nicaragua, Niue, Norway, Pakistan, Palau, Panama, Paraguay, Papua New Guinea, Peru, Poland, Portugal, Qatar, Republic of Korea, Republic of moldova, Republic of North Macedonia, Romania, Russian Federation, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Samoa, San Marino, Serbia, Seychelles, Singapore, Slovakia, Slovenia, Solomon Islands,Spain, Sri Lanka, Sweden, Switzerland, Tajikistan, Timor-Leste, Tonga, Trininat and Tobago, Turkmenistan, Tuvalu, United Arab Emirates, United Kingdom, United States of America, Uruguay, Uzbekistan,Vanuatu; Viet Nam, and Wallis and Futuna
No PC required	Antigua and Barbuda, Algeria, Djibouti, Dominican Republic, Guadeloupe, India, Iran, Iraq, Japan; Jordan, Lebanon, Libya, Malaysia, Martinique, Mauritius, Mont Serrat, Morocco, Oman, Puerto Rico, Saint Lucia, Saudi Arabia, Suriname, Syrian Arab Republic, Tajikistan, Thailand,Turkey and Tunisia

Table 5. Type of schistosome

	Species	Geographical distribution
Intestinal schistosomiasis	<i>Schistosoma mansoni</i>	Africa, the Middle East, the Caribbean, Brazil, Venezuela, and Suriname
	<i>Schistosoma japonicum</i>	China, Indonesia, and Philippines
	<i>Schistosoma mekongi</i>	Several districts of Cambodia and the Lao People's Democratic Republic
	<i>Schistosoma guineensis</i> and related <i>S. intercalatum</i>	Rain forest areas of central Africa
Urogenital schistosomiasis	<i>Schistosoma haematobium</i>	Africa, and the Middle East

Treatment

In pursuit of a world free of schistosomiasis, the current WHO roadmap sets goals to control morbidity by 2020, eliminate schistosomiasis as a public health problem by 2025, and to interrupt transmission in member states and selected African countries, by 2025 (WHO, 2013). Current control programs in sub-Saharan Africa, which are based on preventive chemotherapy or mass administration of the anthelmintic praziquantel, target only humans (primarily school-aged children) and ignore the potential role of zoonotic reservoirs and the obstacle that they might pose to the achievement of control and elimination goals (Toor et al., 2018; Webster et al., 2014).

Schistosomiasis is most often treated with praziquantel, which targets adult worms but does not protect the patient against reinfection (King and Mahmoud, 1989). Many schistosomiasis control programs have reduced disease prevalence. However, prevalence reduction has not been achieved in all treated communities (Wiegand et al., 2017; Kittur et al., 2017), also, at-risk areas often have a rebound of infection and disease prevalence after drug treatment efforts are stopped (Wang et al., 2012; Gray et al., 2010). More effective disease control might ultimately be achieved through environmental modifications that separate humans from contaminated water sources (Grimes et al., 2015), or through snail population reductions with molluscicides, as these immediately reduce local snail populations and thus snail-to-human transmission (Rollinson et al., 2013; Fenwick et al., 2006). In 2001, the World Health Assembly, in resolution 54.19 urged the Member States to ensure access to essential drugs against schistosomiasis infections in all health services in endemic areas for the treatment of clinical cases and groups at high risk of morbidities such as women and children, to attain a minimum target of regular administration of preventive chemotherapy to at least 75% and up to 100% of all school-aged children at risk of morbidity. This goal was endorsed in the 2012–2020 neglected tropical diseases roadmap for schistosomiasis and soil-transmitted helminth (WHO, 2019). The WHO strategy on the use of anthelmintic drugs makes it possible to control schistosomiasis in poor and marginalized communities. In highly endemic areas, severe morbidity due to schistosomiasis can be prevented by regular treatment of at-risk groups targeted based on community diagnosis. Praziquantel has been safely (WHO, 2020).

Praziquantel is the recommended treatment against all forms of schistosomiasis. It is effective, safe, and low-cost. Even though re-infection may occur after treatment, the risk of developing the severe disease is diminished and even reversed when treatment is initiated and repeated in childhood (WHO, 2020). Schistosomiasis control has been successfully implemented over the past 40 years in several countries, including Brazil, Cambodia, China, Egypt, Mauritius, Islamic Republic of Iran, Oman, Jordan, Saudi Arabia, Morocco, Tunisia, etc. In Burundi, Burkina Faso, Ghana, Niger, Rwanda, Sierra Leone, the United Republic of Tanzania, and Yemen. Over the past 10 years, there has been a scale-up of treatment campaigns in several sub-Saharan countries, where most of those at risk live (WHO, 2020). Preventive chemotherapy implementation in 2018, globally and by WHO region, is summarized in table 6. WHO recommends preventive chemotherapy consisting of periodic administration of praziquantel for schistosomiasis as a short-term measure for the control of morbidity associated with these infections preventive chemotherapy for schistosomiasis is required in 52 countries for a total of 229.2 million people, comprising 124.4 million school-aged children (SAC) and 104.8 million adults. Globally, the estimated number of preschool-aged children who required preventive chemotherapy rose from 273.1 in 2017 million to 310.5 million in 2018, and the number of school-aged children rose from 596.8 million to 762.4 million. The 23% increase in the denominator had a repercussion on global coverage and progress towards the 2020 goal of WHO, which is to treat at least 75% of school-aged children in all countries that require mass treatment for schistosomiasis and at least 75% of preschool-aged children and school-aged children in all countries endemic for soil-transmitted helminth. Numbers of people treated for schistosomiasis in 2018, 95.3 million people (76.2 million SAC and 19.1 million adults) received preventive chemotherapy for schistosomiasis, coverage of school-aged children with preventive chemotherapy was 61.2% for schistosomiasis (WHO, 2020). Globally, in 2018, an estimated 124.4 million school-aged children in 52 countries required preventive chemotherapy for schistosomiasis, representing 54.3% of all people requiring preventive chemotherapy for schistosomiasis globally. Of the 124.4 million, 76.2 million received treatment, corresponding to 61.2% global coverage. In total, 34 countries reported that they provided treatment for schistosomiasis in 2018, for a reporting rate of 65.4%.

African Region; Globally, the highest burden of schistosomiasis is in the WHO African Region, where 89.3% of the people who require preventive chemotherapy for schistosomiasis live. The number of treatments delivered represents 87.6% of all treatments with praziquantel. Of the 41 countries in which preventive chemotherapy is required for schistosomiasis, 27 reported data. A total of 69.1 million school-aged children were treated, representing coverage of

62.9%. **Region of the Americas;** Of the 2 countries in which preventive chemotherapy is required for schistosomiasis, only Brazil reported data: 3252 school-aged children and 6504 adults were treated. **South-East Asia Region;** In Indonesia, the only country in the Region endemic for schistosomiasis, all school-aged children require preventive chemotherapy received treatment in 2018. **European Region;** Preventive treatment for schistosomiasis is not required in this Region.

Table 6. preventive chemotherapy (PC) implementation in 2018, globally and by WHO region

WHO Region							
	African	The Americas	South-East Asia	European	Eastern Mediterranean	Western Pacific	Global
Number of countries requiring PC	41	2	1	0	4	4	52
School-aged children							
Number of countries reporting	27	1	1	0	2	3	34
Number of school-aged children requiring PC	109 849 676	1 614 326	5 053	0	11 885 621	1 056 326	124 411 002
Number of school-aged children requiring PC treated	69 057 175	3 252	5 053	0	6 544 161	584 030	76 193 671
Coverage (%)	62.9	0.2	100	0	55.1	55.3	61.2
Adults							
Number of countries reporting	14	1	1	0	2	3	21
Number of adults requiring PC	94 353 923	6 504	19 667	0	8 440 502	2 017 609	104 838 205
Number of adults requiring PC treated	14 421 972	6 504	14 500	0	1 038 048	1 038 048	19 086 403
Coverage (%)	15.3	100	73.7	0	42.7	51.5	18.2
Total number of people							
Number requiring PC	204 203 599	1 620 830	24 720	0	20 326 124	3 073 935	229 249 207
Total requiring PC treated	83 479 147	9 756	19 553	0	10 149 540	1 622 078	95 280 074
Coverage (%)	40.9	0.6	79.1	0	49.9	52.8	41.6

Table 7. Shows progress in countries requiring preventive chemotherapy for schistosomiasis in 2018 in provision for school-aged children, the age group for which drugs are donated

Countries not implemented preventive chemotherapy or nor reported for school-aged children in 2018	Countries not implemented preventive chemotherapy or nor reported for school-aged children in 2018	Countries implemented preventive chemotherapy for school-aged children in 2018 with >75% national coverage
Botswana, China, Congo, Egypt, Equatorial Guinea, Eritrea, Eswatini, Gambia, Ghana, Kenya, Madagascar, Namibia, Sierra Leone, Somalia, South Africa, South Sudan, Venezuela, and Zimbabwe	Angola, Brazil, Cameroon, Central African Republic, Chad, the Democratic Republic of the Congo, Mozambique, Nigeria, Philippines, Rwanda, Senegal, Uganda, Yemen, and Zambia	Benin, Burkina Faso, Burundi, Cambodia, Côte d'Ivoire, Ethiopia, Gabon, Guinea, Guinea-Bissau, Indonesia, Lao People's Democratic Republic, Liberia, Malawi, Mali, Mauritania, Niger, Sao Tome and Principe, Sudan, Togo, and United Republic of Tanzania
18	14	20

Eastern Mediterranean Region; Two countries (Sudan and Yemen) of the 4 that require preventive chemotherapy for schistosomiasis reported treatment in 2018. A total of 6.5 million school-aged children received preventive chemotherapy for schistosomiasis, for coverage of 55.1%. **Western Pacific Region;** Cambodia, Lao People's Democratic Republic, and the Philippines submitted reports on treatment for schistosomiasis in 2018. A total of 0.6 million school-aged children received preventive treatment, corresponding to a regional coverage of 55.3%.

Adults; Globally, as outlined in the WHO strategy, 11 adults at risk of schistosomiasis should also be treated. According to the reported prevalence, occupational groups, women who are in contact with infected water for domestic activities and entire communities in high-risk areas should receive treatment. In 2018, 19.1 million adults who required preventive chemotherapy for schistosomiasis were treated in 21 countries, representing a global coverage of 18.2%. **African Region;** Of the 41 countries in which preventive chemotherapy is required for schistosomiasis, 14 reported data on adults: 14.4 million adults who required preventive chemotherapy were treated, corresponding to a coverage of 15.3%. Most treatments were provided in Burkina Faso (4.2 million), Malawi (2.5 million), and Niger (2.3 million). **Region of the Americas;** Brazil reported treatment of 6504 adults for schistosomiasis. **South-East Asia Region;** In Indonesia, 14 500 adults were treated for schistosomiasis, representing coverage of 73.7%. **Eastern Mediterranean Region;** Of the 8.4 million adults targeted for the treatment for schistosomiasis in 4 countries, 3.6 million adults were treated in 2 countries, representing coverage of 42.7%. **Western Pacific Region;** In the 3 countries in the Region that reported data, 1 million adults were treated for schistosomiasis, corresponding to a coverage of 51.5%.

Authors' contributions

All authors have contributed significantly to the conception and design of the study, the interpretation of data, and the drafting and revision of the manuscript. All authors read and approved the final manuscript

Conflict of Interest

The authors hereby declare no conflict of interest.

Consent for publication

The authors declare that the work has consent for publication.

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