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## An Estimate of Global Needs for Praziquantel within Schistosomiasis Control Programmes

by

J.A. Utroska<sup>1</sup>, M.G. Chen<sup>2</sup>, H. Dixon<sup>3</sup>, S. Yoon<sup>4</sup>  
M. Helling-Borda<sup>5</sup>, H.V. Hogerzeil<sup>6</sup> and K.E. Mott<sup>7</sup>

World Health Organization  
1211 Geneva 27  
Switzerland

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- 1 Summer Intern, Schistosomiasis and Other Trematode Infections, Parasitic Diseases Programme, World Health Organization
  - 2 Medical Officer, Schistosomiasis and Other Trematode Infections, Parasitic Diseases Programme, World Health Organization
  - 3 Chief, Epidemiological and Statistical Methodology, Epidemiological Surveillance and Health Situation and Trend Assessment, World Health Organization
  - 4 Scientist, Schistosomiasis and Other Trematode Infections, Parasitic Diseases Programme, World Health Organization
  - 5 Scientist, Action Programme on Essential Drugs, World Health Organization
  - 6 Medical Officer, Action Programme on Essential Drugs, World Health Organization
  - 7 Chief, Schistosomiasis and Other Trematode Infections, Parasitic Diseases Programme, World Health Organization

*This document is a first attempt to provide an analytical framework for public health planners and administrators of endemic countries 1) to reassess estimates of the prevalence of schistosomiasis, 2) to determine the quantity of praziquantel needed to treat all infected persons with a single dose and 3) to propose a basis for longitudinal calculations of praziquantel needs in endemic countries. It emphasizes the limitations of current methodology and available data to calculate both the prevalence of schistosomiasis and the requirements of a single drug such as praziquantel.*

## 1. Introduction:

### 1.1 Schistosomiasis:

This water borne disease is estimated to affect 200 million people in 76 countries and approximately 600 million people have been estimated to be at risk of infection (25,36). Five of the 16 species of schistosomes infect man; they are Schistosoma mansoni, S. haematobium, S. japonicum, S. mekongi and S. intercalatum. Several of the endemic countries are affected by more than one species (36). Schistosomiasis is spread through contact by uninfected persons with fresh water which is contaminated with the excreta of infected persons. The parasite life-cycle also involves certain snail intermediate hosts as its vectors. The disease continues to spread and intensify with the expanding water resource projects which are needed to meet the increasing food demands in the endemic countries (34,36).

### 1.2 Control:

Control of schistosomiasis is achieved by a combination of approaches, including health education, water supply and sanitation, environmental management, control of the intermediate snail host, and effective diagnosis and treatment. The WHO Expert Committee has endorsed a realistic strategy of morbidity control aimed at reducing disease caused by heavy Schistosoma infection rather than trying to halt transmission entirely. Once the prevalence rate of the disease has been significantly reduced, a low prevalence level can be maintained with safe and effective modern antischistosomal drugs and simple diagnostic techniques. Significant positive results have been achieved in several national control programmes (32,33).

### 1.3 Chemotherapy:

Chemotherapy plays a vital role in all schistosomiasis control programmes. Oral antischistosomal drugs have been available for large scale use in national control programmes since 1975. These drugs' effectiveness have been well documented (36). Oxamniquine, (single oral dose), while only effective against intestinal schistosomiasis, S. mansoni, has been used successfully in Brazil. Metrifonate, which may be up to ten times less expensive (per unit cost), than praziquantel, is only effective against urinary schistosomiasis, S. haematobium; also, it must be given in three doses of 7.5-10 mg/kg, two weeks apart; it has a low rate of compliance for a full course of treatment and, generally, has a lower cure rate than praziquantel. (Based on data from the Congo, Korte et al. (13) showed that praziquantel was more cost-effective to achieve a prevalence of less than 5%, within the same period, compared with metrifonate given in three doses). Recently, praziquantel has become the most widely used of the antischistosomal drugs. Praziquantel is ideal because of its high efficacy, its low toxicity, and its ease of single, oral dose administration. It is effective against all species of Schistosoma, including mixed infections as well as some other human trematodes and cestodes<sup>1</sup>. Praziquantel is most effectively used on a large scale, in single doses, and administered repeatedly at intervals determined by the epidemiological criteria of initial prevalence, intensity of infection as well as the intensity of transmission. It has also been included in The WHO List of Essential Drugs.

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<sup>1</sup> Praziquantel is also effective against other trematodes (opisthorchiasis, paragonimiasis, clonorchiasis) and cestodes. However these are generally of low public health importance in countries where schistosomiasis is endemic.

#### 1.4 Currents concepts in public health use of antischistosomal drugs:

All the currently available antischistosomal drugs have been shown to effectively reduce morbidity. There has been concern that unless other interventions to reduce transmission (snail control, environmental management, etc.) are part of all control programmes, chemotherapy alone will be ineffective both in the short and long terms. The experience of large scale programmes in Brazil and Egypt and others is refining this view and the general conclusions are that 1) the return of prevalence and intensity to pretreatment levels is slower than expected and 2) even a single treatment reduces the risk of development and progression of disease. This apparently optimistic view should never be misinterpreted to mean that other interventions are unnecessary or ineffective. It means that epidemiological monitoring and surveillance is the principal basis for establishing retreatment schedules and effective use of other interventions.

Schistosomiasis is unlike other parasitic infections such as malaria, which tends to be clinically recurrent, or intestinal parasitic infections, in which rapid reinfection occurs, and may require more than one annual treatment for indeterminate periods. The first treatment of schistosomiasis will reduce the number of persons to be subsequently treated at the following year or later. Furthermore, the cure rates are higher and more sustained among adults than in children. Most importantly, the risk of developing disease is reduced. Thus, population based treatment requires different approaches to drug delivery for the younger and older segments of the population and the overall effect of a single treatment is beneficial to the individual as well as the community.

Where schistosomiasis control is a public health priority, the inclusion of antischistosomal drugs in national drug policy of importance. Control is a long term commitment and its maintenance will be commensurate with the degree to which it is integrated into the national health care system as part of the national health priorities. The registration, procurement, storage and delivery of these drugs are all integral aspects of the control of schistosomiasis as well as all other parasitic infections.

These concepts lead to the rationale and purpose of this document in assessing the potential needs for the first dose of praziquantel in each endemic country. As explained in section 6, the assumptions of the long term consumption of praziquantel will be based on the specific epidemiological characteristics which modify the response to treatment from one endemic area to another.

#### 2. Purpose:

Awareness of the existence of effective treatment for schistosomiasis is increasing among the peoples of endemic countries. This awareness leads to increased demand for treatment. Thus before any intensive health education or information activity related to schistosomiasis, public health administrators are well advised to assess the potential needs for antischistosomal drugs.

In the planning, budgeting, and implementation of national plans of action for schistosomiasis control, a methodology for estimating the global needs of a drug, like praziquantel, has not been previously attempted. Unfortunately, it has been 10 years since the global estimates of the prevalence of schistosomiasis have been reevaluated (12). Therefore this document attempts to bring together the most current information on the prevalence of schistosomiasis as a basis for calculation of the potential global needs for praziquantel. The objectives of this document are to:

- 1) initiate a reassessment of the data on the total population, population at risk, prevalence rates, and the population infected in the 76 countries where schistosomiasis is endemic;
- 2) estimate the global needs for praziquantel based on a single treatment of all infected persons;
- 3) propose a basis for calculations to estimate the global needs for praziquantel over a 10 year period.

This document is intended to be used in planning activities related to schistosomiasis control at global, regional, and national levels.

### 3. Methodologies for estimating drug requirements:

Estimating drug needs is an important activity within a primary health care (PHC) based delivery system. Since schistosomiasis control is now becoming increasingly integrated into PHC, the quantities of antischistosomal drugs, to meet the needs of a health care system, need to be known for proper and effective planning. Estimates of general drug needs would ideally be based on 1) accurate morbidity data at each level of the health care delivery system, and 2) selection of the appropriate treatment schedule to treat these conditions. Unfortunately, for most health care delivery systems morbidity data are not available for estimating drug needs. The WHO Action Programme on Essential Drugs, however, has experience with two approaches for estimating drug needs. These two methods are patient morbidity-standard treatment method and adjusted consumption method.

#### 3.1 Patient morbidity-standard treatment method:

Two sets of data are required for calculations based on this method, a) standard drug treatment schedules and b) data on absolute figures or relative frequency of each health problem.

Standard drug treatment schedules have been proposed and tested for many drugs used in developing countries. While these standard drug treatment schedules may not always provide accurate individual dosing, they may, nonetheless, be used for estimating drug needs and serve as a guide for training in the rational use of drugs.

Both the availability and the reliability of morbidity data are constraints within many health care systems. The data may only be available from hospitals. These data are subject to bias according to the probability of an individual seeking care at that level, the reliability of the diagnostic method, and the regularity of reporting. At lower levels of the health care system, these biases may be accentuated due to lack of resources and supervision. In spite of all these constraints to interpretation, the available data must be reviewed, discussed and used within its limits. Sound interpretation requires that the limitation of the data should be recognized rather than ignored.

##### 3.1.1 Calculations:

The calculation by patient morbidity-standard treatment method:

No. tablets for average treatment of "X" disease	X	No. treatments for "X" disease per 1000 treatment episodes	=	No. tablets for "X" disease per 1000 treatment episodes
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then:

No. tablets for "X" disease per 1000 treatment episodes	X	No. treatment <u>episodes/year</u> 1000	=	Tablets needed per year
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#### 3.2 Adjusted consumption method:

This method assumes 1) stability of the health care delivery system, 2) the rational use of essential drugs, and 3) a reliable and consistent drug delivery system. In many countries these assumptions are not tenable. Drug use is usually based on inconsistent prescribing, and drug supply tends to be intermittent and uncoordinated. Moreover, the actual records of drug use may not be available. The use of drugs in stock rather than the actual drugs required for treatment of the diseases seen in the health facility further distorts the meaning of drug consumption data. In spite of these limitations, past consumption of drugs can be used to predict future needs. Actual analysis of consumption data at the level of central medical stores or the central procurement agency could be done. However, there is usually no surveillance mechanism to 1) confirm that all the drugs ordered were used, or that 2) the drugs ordered corresponded to the pattern of morbidity observed in the health care system, or that 3) the drugs were used in a rational way.

The consumption method can also be based on information from a few selected health facilities, usually district hospitals. These data are then extrapolated to the entire region or country. The criteria for selection of these facilities now used in the WHO Drug Action Programme are:

- a. representative pattern of morbidity and patient attendance
- b. acceptable and rational prescription pattern
- c. uninterrupted supply of essential drugs
- d. accurate data on drug stocks and drug use
- e. accurate data on patient attendance
- f. acceptable levels of losses and wastage.

The consumption method has been used mainly to estimate the drug needs of general hospitals. As compared to peripheral health care units, data on actual usage of drugs are more reliable in hospitals. On the other hand, the morbidity data of hospitals tend to be rather complex due to the multiplicity of diagnoses; for this reason the morbidity method has limited application in hospitals.

### 3.2.1 Calculations:

The calculations by consumption method:

$$\begin{array}{r} \text{No. tablets for} \\ \text{"X" disease used} \\ \text{in one year} \end{array} \div \begin{array}{r} \text{No. treatment} \\ \text{episodes per} \\ \text{year} \end{array} \times 1000 = \begin{array}{r} \text{No. tablets for "X"} \\ \text{disease per 1000} \\ \text{treatment episodes} \end{array}$$

The data from at least four selected institutions are averaged.

Praziquantel is an example of a single drug used to treat one disease (see section 1.3). It can be assumed that if praziquantel is used in a health facility it will be only for treatment of schistosomiasis. Thus the consumption method could be expected to be a specific method of calculation for praziquantel needs.

## 4. Sources of data for global drug needs (see Annex):

Neither the patient morbidity-standard treatment method nor the adjusted consumption method were applicable to a global drug-need study. Many of the endemic countries did not have the necessary information to do such calculations therefore a careful assessment of the available data and educated estimations for missing data were used.

Each variable used in the calculations for this document has inherent limitations. The reference sources were unexpectedly limited and not recently updated. Undoubtedly, as this document is circulated to the endemic countries newer and more valid data will become available for updating the estimates of populations at risk, populations infected, and the drug needs. The Annex contains these initial calculations.

### 4.1 Area:

The Atlas of the Global Distribution of Schistosomiasis was published by the Centre des Études de Géographie Tropicale, Bordeaux, France, and the World Health Organization in 1987 (8). Using the Atlas, the extent of the endemic area was compared to the total area of the country in an attempt to confirm the estimated population at risk. Since the breakdown of distribution of the national population was not available in all instances, this approach was used infrequently.

### 4.2 Population:

The total population of each country was obtained from the Descriptive Map of the United Nations for 1986 (30). Population data from endemic areas was sometimes provided in the CEGET/WHO Atlas of the Global Distribution of Schistosomiasis (8). When available, population breakdown into provinces, districts, and regions was obtained from the Atlas (8), The World in Figures (29), and The Statesman's

Yearbook (18). In order to divide the infected populations into those under 15 years of age and those 15 years of age or above, the United Nations Demographic Yearbook (31) was used and the proportions of these two groups within the total country population were derived from its figures.

#### 4.3 Prevalence rates:

Epidemiological data on the prevalence of schistosomiasis are limited. Recent data are not usually available since large scale screening is not done systematically or at regular intervals. Since different diagnostic techniques have been used throughout the endemic countries, it is difficult to compare data from one area to another (whether this be between provinces, countries, and/or regions).

*When dealing with prevalence rates of schistosomiasis, it is imperative that the epidemiological importance of the focality of this disease be understood. Average prevalence rates of districts or localities as estimates for the endemic areas obscure the uneven distribution of the data.*

Most often, the district or regional prevalence estimates were derived from the Atlas (8), when available, and were averaged together to give the average prevalence rate for the endemic countries which were then used in the calculations. The national prevalence rate was sometimes provided in the Atlas (8). The country reports were the sources of other district and national prevalence rates (2,4-10,12-17,21-24,27-28). In order to update the district and regional population data (18,29) the original proportion of the total population was multiplied by the 1986 population according to the United Nations Map figures (30).

Minimum and maximum prevalence rates were established using either the Atlas (8), the country documents (2,4-10,12-17,21-24,27-28) or the latest data available from the WHO Parasitic Diseases Programme. When none of these data were available, a range of 25% lower and 25% higher than the national prevalence rate was used to establish the minimum and maximum prevalence rates. These same sources and methods were used to estimate the minimum and maximum populations at risk.

#### 4.4 Infected population:

The infected population was calculated on the basis of 1) the population at risk and 2) the average prevalence rate. This was further broken down as 1) under 15 years of age and 2) 15 years of age or older. In general the calculation of the population at risk was subject to error due to lack of 1) census data from the subdivisions of the country, 2) information on the focal distribution of schistosomiasis.

#### 4.5 Schistosoma type:

In any one endemic country a maximum of three types of schistosomiasis may occur. However, this document does not take into account how or where geographical overlap may occur. New information on the distribution of different species of Schistosoma will appear as diagnostic facilities become available in endemic countries. Recently, S. intercalatum has been confirmed to be widespread in Equatorial Guinea and transmission is suspected in Sao Tome & Principe and Mali.

#### 4.6 Weight:

Ideally, national height and weight data would be available from each endemic country. In absence of this specific data the weights for Africa, the Eastern Mediterranean, the Western Pacific, and Southeast Asia were estimated at 30 kg for the persons under 15 years, and 52 kg for those of and over 15 years of age. The weights for the South American and Caribbean countries were estimated at 36 kg for the population under 15 years, and at 58 kg for those of and over 15 years of age.

## 5. Calculations for global praziquantel needs:

The proposed calculation of needs of praziquantel assumes 1) a requirement only for the first treatment and 2) of all infected persons.

### 5.1 S. haematobium & S. mansoni

The total number of tablets needed for S. haematobium and S. mansoni were calculated for the infected populations using 40 mg/kg dosage.

$$\begin{aligned} \text{Population at risk} & \quad \times \quad \text{prevalence (\%)} & = & \text{Population infected} \\ \text{Population infected} & \quad \times \quad \text{average body weight (kg/person)} & = & \text{Total weight infected (kg)} \\ \text{Total weight infected (kg)} & \quad \times \quad 40 \text{ mg/kg} + 600 \text{ mg/tablet} & = & \text{Total tablets of praziquantel} \\ & & & \text{needed.} \end{aligned}$$

### 5.2 S. japonicum & S. mekongi

The total number of praziquantel tablets needed for persons infected with S. japonicum and S. mekongi were calculated for the infected population using 60 mg/kg dosage.

$$\begin{aligned} \text{Population at risk} & \quad \times \quad \text{prevalence (\%)} & = & \text{Population infected} \\ \text{Population infected} & \quad \times \quad \text{average body weight (kg/person)} & = & \text{Total weight infected (kg)} \\ \text{Total weight infected (kg)} & \quad \times \quad 60 \text{ mg/kg} + 600 \text{ mg/tablet} & = & \text{Total tablets of praziquantel} \\ & & & \text{needed.} \end{aligned}$$

*For actual calculations in national programmes, it is appropriate to add 10% of the total number of tablets to cover wastage and loss. This is not done in the calculations in the annex.*

### 5.3 Calculation:

The data from Gambia (Annex p. 31) illustrates the calculation of praziquantel needs for a single treatment of all infected persons. As mentioned previously, in order to calculate the number of tablets needed, the total weight of infected persons have to be calculated.

First, the number of infected individual is calculated from the average population at risk and the average prevalence rate.

$$\begin{array}{rclcl} 514,400 & \times & 37.7\% & = & 193,928.8 \\ \text{population at risk} & & \text{prevalence} & & \text{No. infected} \end{array}$$

Since there cannot be a fraction of a person, the decimal portion of the number infected is raised (.8 is greater than .5) to the nearest whole number, 193,929.

The number of infected individuals is then separated into two groups, persons below 15 years and above 15 years, and the two groups are multiplied by the corresponding weight to calculate the total weight for infected persons.



For population under 15 years of age:

$$\begin{array}{rclcl} 193,929 & \times & 42.0\% & = & 81,450.18 \\ \text{No. infected} & & \% \text{ below 15 years} & & \text{No. below 15 years infected} \end{array}$$

The number of person infected below 15 years of age also needs to be adjusted since the number has a fractional part. However, the fractional part of the number is .18, which is less than .5, and the number is lowered to the nearest whole number, 81,450.

$$\begin{array}{rclcl} 81,450 & \times & 30 & = & 2,443,500 \text{ kg} \\ \text{No. infected} & & \text{avg weight (kg)} & & \text{total body weight below 15 years} \\ \text{below 15 years} & & \text{below 15 years} & & \end{array}$$

For population over 15 years of age:

$$\begin{array}{rclcl} 193,929 & \times & 58\% & = & 112,478.82 \\ \text{No. infected} & & \% \text{ above 15 years} & & \text{No. above 15 years infected} \end{array}$$

Similar mathematics is performed to the fractional part .82, and the number is raised to 112,479.

$$\begin{array}{rclcl} 112,379 & \times & 52 & = & 5,848,908 \text{ kg} \\ \text{No. infected} & & \text{avg weight (kg)} & & \text{total body weight above 15 years} \\ \text{above 15 years} & & \text{above 15 years} & & \end{array}$$

Finally, divide the total weight by the proper dosage of praziquantel to arrive at total number of praziquantel tablets needed.

$$\begin{array}{rclcl} 2,443,500 \text{ kg} & \times & 40 & + & 600 & = & 162,900 \\ \text{total body weight} & & \text{treatment (mg)} & & \text{mg per} & & \text{tablets} \\ \text{below 15 years} & & \text{per kg body} & & \text{tablet} & & \\ & & \text{weight} & & & & \end{array}$$

$$\begin{array}{rclcl} 5,848,908 \text{ kg} & \times & 40 & + & 600 & = & 389,927.2 \\ \text{total body weight} & & \text{treatment (mg)} & & \text{mg per} & & \text{tablets} \\ \text{above 15 years} & & \text{per kg body} & & \text{tablet} & & \\ & & \text{weight} & & & & \end{array}$$

The fractional part of the number of tablets needed for the population over 15 years of age is dropped to the nearest whole number, 389,927.

Total                    552,827 tablets

*The above calculations were done using average population at risk and the average prevalence rate, which are believed to be the best estimates currently available from the available data. Although minimum and maximum population at risk, minimum and maximum prevalence rates and minimum and maximum infected population are given in the annex, in most instances they were estimated either by the authors or by the national government. The authors felt that by using estimates of minimum and maximum data of limited reliability to calculate a range of tablets required for a single treatment of all infected persons may not be useful for planning operational programmes.*

## 6. Longitudinal calculations for global praziquantel needs:

This document has not attempted to provide long-term projections on the requirements of praziquantel. A new set of assumptions would need to be applied to derive such estimates.

### 6.1 Treatment response:

At each treatment a 40% reduction in prevalence can be expected until the prevalence reaches 5%. At 5% prevalence or less the increment of change is expected to be low. Low prevalence will persist due to 1) new infections (incidence), 2) new arrivals (migration), and 3) persons who have always been infected but seek diagnosis and treatment for the first time.

### 6.2 Treatment intervals:

In general, school children will be treated at six month intervals (4x) and the community will be treated yearly (2x) for a two year period. Afterwards, diagnosis and treatment will be available through the general health services (36).

### 6.3 Maintenance:

Incidence in areas without prior control usually range from 10-20/100 children exposed/year. Assumptions on incidence may vary in areas where chemotherapy is used on a large scale.

## 7. Constraints imposed by limitations of data:

This review and the calculations in this document have not taken into account all possible variables which influence the distribution of schistosomiasis and the requirements for praziquantel. The data related to these variables are so limited that their inclusion in the actual calculations was not possible. The following constraints would ideally also be considered.

### 7.1 Coverage:

Due to economic constraints, limitations of the health care delivery system, available manpower, and accessibility of infected populations, the treatment coverage would never be 100%. A reasonable coverage could be estimated for each country but this would have to be done by an ad hoc review with national health authorities.

The WHO Action Programme on Essential Drugs has utilized a range of coverage estimates - the range usually being between 20-40% of the total population in developing countries. An average number of visits to a health facility by any one person is 3-4 per year; in refugee camps 4 visits per year is the average.

### 7.2 Age/sex/prevalence:

There are differences in the age-prevalence distribution between the different types of schistosomiasis. Prevalence of *S. haematobium* peaks within the 10-14 year age group, while prevalence of *S. mansoni* remains high in the older age groups. For both intestinal and urinary schistosomiasis peak intensity of infection is usually found in the 10-14 year age group. The prevalence rates according to sex may vary from one country to another. These differences are based on cultural habits and water contact patterns. However, for calculations of requirements of praziquantel these differences are probably not significant, and if they are, they are country-specific.

### 7.3 Migration:

Migration is an unpredictable but constant feature of all endemic areas. The proportion of the population which is migrating or nomadic will have a lower rate of access to treatment. In many endemic countries refugee populations place an increasing burden on the health care delivery system. Schistosomiasis is now recognized as a significant cause of morbidity among refugees.

## 8. Comparison of estimates for praziquantel by morbidity-standard treatment method vs. epidemiological Data in Democratic Yemen:

The WHO Action Programme on Essential Drugs has recently estimated the potential needs for praziquantel in Democratic Yemen among estimates for other essential drugs (11). A comparison of their estimates (by the morbidity-standard treatment method) and this study's estimates (by epidemiological data) were made to determine whether the epidemiological data method was indeed determining valid estimates of praziquantel needs.

As of May 1986, drug kits were being supplied monthly to all health units in Lahej governorate of Democratic Yemen. The drug supply system in Democratic Yemen has been carefully reviewed. The patient morbidity-standard treatment method was used to estimate the annual needs of essential drugs including praziquantel. The baseline data used to calculate the praziquantel requirements were:

1) Frequency of schistosomiasis (11, p.29): According to the reports of the health units, centers, and hospitals in Dhala and Tuban districts in Lahej governorate during 1985 and 1986, schistosomiasis was diagnosed in 4.2 of every 1000 outpatient visits (range: 0.9/1000 in children in Tuban to 4.4/1000 in adults in Dhala).

2) The standard drug regime: In this report the treatment calculations were three praziquantel tablets per adults for S. haematobium and six tablets per adult for S. mansoni infection, as well as one tablet of praziquantel for children with either infection.

Based on the recommendation that praziquantel be given only at health centers and hospitals, the annual requirement for the drug would be 90 tins (11, p.106) for outpatient treatments. In comparison to the estimate for praziquantel based on the epidemiological data, this represents about 10% (90 tins vs. 842 tins) of the requirement for treatment of all infected persons. The estimates for the outpatient requirement for treatment seem reasonable. In most endemic countries, data from outpatient reports and hospitals represent only 10% or less of the actual prevalence. In the maintenance phase of control, this projected drug requirement could be expected to be adequate.

Thus when formulating a national plan of action, the supply of praziquantel to the health centers and hospitals for the maintenance phase should be accurately estimated at the beginning of any control programme. The praziquantel requirement for the national programme would be more appropriately based on epidemiological data.

## 9. Cost:

The cost of praziquantel is a major consideration in planning for schistosomiasis control. Procurement of praziquantel is now facilitated by 1) support of bilateral agencies, 2) purchase through WHO, and 3) purchase through multilateral and NGO supply organizations.

In countries where schistosomiasis has been identified as a health problem, direct support for the purchase of praziquantel could be provided from those bilateral agencies which are supporting the agricultural or health projects. Within these projects national authorities must endorse the importance of control of schistosomiasis.

WHO Supply Services continues to serve as the purchasing agent for praziquantel at the lowest available price from the manufacturer. However, the current policy of the manufacturer is to negotiate directly with Ministries of Health for their specific requirements. Most recently, several other suppliers of pharmaceutical products to developing countries have included praziquantel among their available drugs.

**Agencies that supply drugs:****UNICEF UNICEF Procurement and Assembly Centre**

UNICEF Plads

Freeport

DK-2100 Copenhagen

Denmark

Telephone: 01-262444    Telefax: 01/269421    Telex: 19813

Praziquantel tab 600 mg, pack 100    Item number: 15 602 50

Praziquantel tab 600 mg, pack 1000    Item number: 15 602 55

**IDA International Dispensary Association**

P.O. Box 3098

1003 AB Amsterdam

The Netherlands

Telephone: 02903/3051    Telefax: 02903/1854    Telex: 13566

Praziquantel tab 600 mg, pack 1000    Item number: 1320

Agencies that issue periodically, free of charge, price comparisons between various non-profit suppliers of essential drugs:

**ATI Arzneimittelinformation Berlin GmbH**

Petzower Strasse 7

D-1000 Berlin 39

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**MSH Management Sciences for Health**

165 Allandale Road

Boston, MA 02130

USA

Telephone: 617-524-7799    Telefax: 617/524-2825    Telex: 4990154

**10. Conclusion:**

Using the limited epidemiological data available, the current schistosomiasis situation was reassessed. The global population at risk was estimated to be 555,047,573 persons; 149,553,509 persons are estimated to be infected by at least one of the five species of Schistosoma known to affect man. Of the people infected, 66,428,032 are children under the age of 15 years; 83,125,488 are adults age 15 or older (for explanation of the discrepancy between the total number of infected and the sum of infected under and over 15 years see page 92, Global estimates). These figures are near the previous schistosomiasis assessment according to the latest WHO Expert Committee estimates of 1984 (36). The estimated population at risk was 600 million persons of which 200 million persons were estimated to be infected. The decreased numbers estimated to be at risk and estimated to be infected currently corresponds with the impact of national control programmes which have been operational in the last 15 years.

On a global level, if a single dose of praziquantel were to be available to each infected person, 426,666,600 tablets would be required. This calculation does not take into account 10% wastage. However, it is difficult to state with absolute certainty the number of tablets required due to the limitations of the epidemiological data at the country level. Each country should attempt to confirm the accuracy of the estimates of 1) the age/sex distribution (section 4.2), 2) the population at risk (section 4.3) and 3) the prevalence - especially the focality of distribution (section 4.3) before utilizing the data in the document.

Methodology for longitudinal calculations of praziquantel needs was proposed. As experience from

national programmes is assessed, the accuracy of these predictions can be evaluated. Such calculations will be dependent on the reliability of the estimates of the infected population at the outset and monitoring and surveillance capacity of the national health care system.

*This document should be considered a working document to be revised and updated in each endemic country. Those persons using the document are encouraged to correspond with Chief, Schistosomiasis and Other Trematode Infections, Parasitic Diseases Programme, World Health Organization, 1211 Geneva 27, Switzerland.*

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Annex

Global Estimate of Praziquantel Needs

Region	Page
African Region .....	16
American Region .....	57
Eastern Mediterranean Region .....	67
European Region .....	81
Southeast Asian Region .....	83
Western Pacific Region .....	87
Global .....	92

*Although the following list has data referring to the minimum population at risk, maximum population at risk, minimum population infected and maximum population infected, only the average population at risk, along with the average prevalence rate and the percentage of population over and under 15 were used to calculate the tablets of praziquantel needed.*

*In most instances, the ranges of population at risk and population infected were estimated, either by the authors or by the national government. The authors felt that by using estimates of minimum and maximum data of limited reliability to calculate a range of tablets required for a single treatment of all infected persons may not be useful for planning operational programmes. The readers are encouraged to do their own calculations using the data provided and apply them to the control programmes in their own countries.*



Country : Algeria

Region : AFR

Schistosomiasis type(s) : S.h.

Population : 21,718,000                      Percent under 15 years : 46%    over 15 years : 54%

Population at risk :                          5,082,012

Minimum population at risk :              4,500,000

Maximum population at risk :              6,000,000

Prevalence : Average 32.00%              Minimum 24.00%                      Maximum 40.00%

Population infected (from Population at risk and Average prevalence) : 1,626,244

Minimum population infected:              1,080,000

Maximum population infected:              2,400,000

Infected population under 15 years :      1,080,000

Infected population over 15 years :       2,400,000

Weight of infected under 15 years :       22,442,160 kg

Weight of infected over 15 years :       45,664,944 kg

Tablets needed:                      Under 15 years:                      1,496,144 tablets

    Over 15 years:                      3,044,330 tablets

    Total :                                      4,540,474 tablets

Notes

Population at risk is derived by summing populations of endemic districts. Minimum and maximum population at risk are derived from available data in the Atlas (Reference 8). The average prevalence rate is from the Atlas. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence.

Country : Angola

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 8,754,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      8,754,000

Minimum population at risk :           6,565,500

Maximum population at risk :           8,754,000

Prevalence : Average 44.00%            Minimum 20.00%                      Maximum 60.00%

Population infected (from Population at risk and Average prevalence) : 3,851,760

Minimum population infected:           1,313,100

Maximum population infected:           5,252,400

Infected population under 15 years :   1,733,292

Infected population over 15 years :    2,118,468

Weight of infected under 15 years :    51,998,760 kg

Weight of infected over 15 years :     110,160,336 kg

Tablets needed:	Under 15 years:	3,466,584 tablets
	Over 15 years:	7,344,022 tablets
	<hr/>	
	Total :	10,810,606 tablets

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Notes

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population. Maximum population at risk is estimated to be the total population at risk. Prevalence rates are from the Atlas (Reference 8).

Country : Benin

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 3,932,100                          Percent under 15 years : 49%    over 15 years : 51%

Population at risk : 3,932,100

Minimum population at risk : 2,949,075

Maximum population at risk : 3,932,100

Prevalence : Average 35.50%                          Minimum 26.60%                          Maximum 44.40%

Population infected (from Population at risk and Average prevalence) : 1,395,896

Minimum population infected: 784,454

Maximum population infected: 1,745,852

Infected population under 15 years : 683,989

Infected population over 15 years : 711,907

Weight of infected under 15 years : 20,519,670 kg

Weight of infected over 15 years : 37,019,164 kg

Tablets needed:                          Under 15 years:                          1,367,978 tablets

Over 15 years:                          2,467,944 tablets

---

Total :    3,835,922 tablets

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Notes

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Population at risk is estimated to be the entire population. Minimum population at risk is 75% of the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are ± 25% of the average prevalence rate.

Country : Botswana

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 1,084,900                      Percent under 15 years : 48%    over 15 years : 52%

Population at risk : 1,084,900

Minimum population at risk : 833,675

Maximum population at risk : 1,084,900

Prevalence : Average 10.00%              Minimum 5.00%                      Maximum 15.00%

Population infected (from Population at risk and Average prevalence) : 108,490

Minimum population infected: 41,684

Maximum population infected: 162,735

Infected population under 15 years : 52,075

Infected population over 15 years : 56,415

Weight of infected under 15 years : 1,562,250 kg

Weight of infected over 15 years : 2,933,580 kg

Tablets needed:              Under 15 years:              104,150 tablets

Over 15 years:              195,572 tablets

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Total :                      299,722 tablets

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**Notes**

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Prevalence rates are estimated from revised PDP/SCH data and from the Ministry of Health.

Country : Burkina Faso

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 6,639,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      6,639,000

Minimum population at risk :            4,979,250

Maximum population at risk :           6,639,000

Prevalence : Average 60.00%            Minimum 40.00%                      Maximum 70.00%

Population infected (from Population at risk and Average prevalence) : 3,983,400

Minimum population infected:           1,991,700

Maximum population infected:           4,647,300

Infected population under 15 years :   1,792,530

Infected population over 15 years :    2,190,870

Weight of infected under 15 years :    53,775,900 kg

Weight of infected over 15 years :     113,925,240 kg

Tablets needed:            Under 15 years:            3,585,060 tablets

                                  Over 15 years:            7,595,016 tablets

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                                  Total :                      11,180,076 tablets

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Notes

Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. The average prevalence rate is calculate from the Atlas (Reference 8) prevalence rates. Minimum and maximum prevalence rates are estimated from available data.

Country : Burundi

Region : AFR

Schistosomiasis type(s) : S.m.

Population : 4,717,703                      Percent under 15 years : 44%    over 15 years : 56%

Population at risk :                      2,099,378

Minimum population at risk :            1,574,534

Maximum population at risk :            2,099,378

Prevalence : Average 30.00%            Minimum 22.50%                      Maximum 37.50%

Population infected (from Population at risk and Average prevalence) : 629,813

Minimum population infected:            354,270

Maximum population infected:            787,267

Infected population under 15 years :    277,118

Infected population over 15 years :    352,695

Weight of infected under 15 years :    8,313,540 kg

Weight of infected over 15 years :    18,340,140 kg

Tablets needed:	Under 15 years:	554,236 tablets
	Over 15 years:	1,222,676 tablets
	<hr/>	
	Total :	1,776,912 tablets

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**Notes**

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Population at risk is derived from populations of districts that are endemic. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Cameroon

Region : AFR

Schistosomiasis type(s) : S.m. S.h. S.i.

Population : 9,873,000                      Percent under 15 years : 43%    over 15 years : 57%

Population at risk :                              8,451,288

Minimum population at risk :                      6,338,466

Maximum population at risk :                      9,873,000

Prevalence : Average 26.50%                      Minimum 19.90%                      Maximum 33.10%

Population infected (from Population at risk and Average prevalence) : 2,239,591

Minimum population infected:                      1,261,355

Maximum population infected:                      3,267,963

Infected population under 15 years :              963,024

Infected population over 15 years :              1,276,567

Weight of infected under 15 years :              28,890,720 kg

Weight of infected over 15 years :              66,381,484 kg

Tablets needed:                      Under 15 years:                      1,926,048 tablets

Over 15 years:                      4,425,432 tablets

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Total :                                      6,351,480 tablets

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Notes

Population at risk is determined from populations of endemic districts. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is from the Atlas(Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Central African Republic

Region : AFR

Schistosomiasis type(s) : S.m. S.h. S.i.

Population : 2,607,800                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                              2,607,800

Minimum population at risk :                      1,955,850

Maximum population at risk :                      2,607,800

Prevalence : Average 10.00%                      Minimum 5.00%                      Maximum 25.00%

Population infected (from Population at risk and Average prevalence) : 260,780

Minimum population infected:                      97,793

Maximum population infected:                      651,950

Infected population under 15 years :                      117,351

Infected population over 15 years :                      143,429

Weight of infected under 15 years :                      3,520,530 kg

Weight of infected over 15 years :                      7,458,308 kg

Tablets needed:	Under 15 years:	234,702 tablets
	Over 15 years:	497,221 tablets
	<hr/>	
	Total :	731,923 tablets

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Notes

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are from PDP/SCH data.



Country : Chad

Region : AFR

Schistosomiasis type(s) : S.m. S.h. S.i.

Population : 5,018,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      3,964,220

Minimum population at risk :            2,973,165

Maximum population at risk :           4,955,275

Prevalence : Average 55.00%            Minimum 25.00%                      Maximum 60.00%

Population infected (from Population at risk and Average prevalence) : 2,180,321

Minimum population infected:           743,291

Maximum population infected:          2,973,165

Infected population under 15 years :   981,144

Infected population over 15 years :    1,199,177

Weight of infected under 15 years :    29,434,320 kg

Weight of infected over 15 years :      62,357,204 kg

Tablets needed:            Under 15 years:            1,962,288 tablets

                                  Over 15 years:            4,157,147 tablets

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                                  Total :                      6,119,435 tablets

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Notes

Population at risk is estimated from population in endemic areas. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The prevalence rates are from new data obtained by PDP/SCH.

Country : Congo

Region : AFR

Schistosomiasis type(s) : S.m. S.h. S.i.

Population : 1,740,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                              1,218,000

Minimum population at risk :                      913,500

Maximum population at risk :                      1,218,000

Prevalence : Average 45.00%                      Minimum 10.00%                      Maximum 50.00%

Population infected (from Population at risk and Average prevalence) : 548,100

Minimum population infected:                      91,350

Maximum population infected:                      609,000

Infected population under 15 years :                      246,645

Infected population over 15 years :                      301,455

Weight of infected under 15 years :                      7,399,350 kg

Weight of infected over 15 years :                      15,675,660 kg

Tablets needed:	Under 15 years:	493,290 tablets
	Over 15 years:	1,045,044 tablets
	<hr/>	
	Total :	1,538,334 tablets

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Notes

Population at risk is calculated from the Atlas (Reference 8) data. Minimum population at risk is 75% of the total population at risk. Average, minimum and maximum prevalence rates are from new data from the national schistosomiasis control programme.

Country : Côte d'Ivoire

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 9,810,000                      Percent under 15 years : 46%    over 15 years : 54%

Population at risk :                      9,810,000

Minimum population at risk :           7,357,500

Maximum population at risk :           9,810,000

Prevalence : Average 40.00%            Minimum 30.00%                      Maximum 50.00%

Population infected (from Population at risk and Average prevalence) : 3,924,000

Minimum population infected:           2,207,250

Maximum population infected:           4,905,000

Infected population under 15 years :   1,805,040

Infected population over 15 years :    2,118,960

Weight of infected under 15 years :    54,151,200 kg

Weight of infected over 15 years :     110,185,920 kg

Tablets needed:            Under 15 years:            3,610,080 tablets

                                  Over 15 years:            7,345,728 tablets

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                                  Total :                      10,955,808 tablets

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Notes

Population at risk is estimated to be the entire population in endemic areas. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are  $\pm 25\%$  of the average prevalence rate.

Country : Democratic Republic of Sao Tome and  
Principe

Region : AFR

Schistosomiasis type(s) : S.h.

Population : 108,163                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      20,000

Minimum population at risk :            15,000

Maximum population at risk :            25,000

Prevalence : Average 20.00%            Minimum 15.00%                      Maximum 25.00%

Population infected (from Population at risk and Average prevalence) :    4,000

Minimum population infected:            2,250

Maximum population infected:            6,250

Infected population under 15 years :    1,800

Infected population over 15 years :    2,200

Weight of infected under 15 years :    54,000 kg

Weight of infected over 15 years :    114,400 kg

Tablets needed:            Under 15 years:            3,600 tablets

                                  Over 15 years:            7,627 tablets

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                                  Total :                      11,227 tablets

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Notes

Population at risk is estimated from data available to PDP/SCH. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is estimated from available prevalence rates. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Equatorial Guinea

Region : AFR

Schistosomiasis type(s) : S.i.

Population : 392,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      78,400

Minimum population at risk :            50,000

Maximum population at risk :            200,000

Prevalence : Average 10.00%            Minimum 7.50%                      Maximum 12.50%

Population infected (from Population at risk and Average prevalence) : 7,840

Minimum population infected:            3,750

Maximum population infected:            25,000

Infected population under 15 years :    3,528

Infected population over 15 years :    4,312

Weight of infected under 15 years :    105,840 kg

Weight of infected over 15 years :    224,224 kg

Tablets needed:            Under 15 years:            7,056 tablets

                                  Over 15 years:            14,948 tablets

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                                  Total :                      22,004 tablets

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Notes

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Population at risk and prevalence rates are determined from PDP/SCH data and the Ministry of Health.

Country : Ethiopia

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 43,349,924      Percent under 15 years : 45%    over 15 years : 55%

Population at risk : 23,029,900

Minimum population at risk : 17,272,425

Maximum population at risk : 28,787,375

Prevalence : Average 13.40%      Minimum 10.10%      Maximum 16.80%

Population infected (from Population at risk and Average prevalence) : 3,086,007

Minimum population infected: 1,744,515

Maximum population infected: 4,836,279

Infected population under 15 years : 1,388,703

Infected population over 15 years : 1,697,304

Weight of infected under 15 years : 41,661,090 kg

Weight of infected over 15 years : 88,259,808 kg

Tablets needed:      Under 15 years:      2,777,406 tablets

Over 15 years:      5,883,987 tablets

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 Total :      8,661,393 tablets

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 Notes
 

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Population at risk is derived from PDP/SCH data. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is determined from PDP/SCH data. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.



Country : Gambia

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 643,000                      Percent under 15 years : 42%    over 15 years : 58%

Population at risk :                      514,400

Minimum population at risk :           385,800

Maximum population at risk :           514,400

Prevalence : Average 37.70%            Minimum 28.30%                      Maximum 47.10%

Population infected (from Population at risk and Average prevalence) : 193,929

Minimum population infected:           109,181

Maximum population infected:           242,282

Infected population under 15 years :   81,450

Infected population over 15 years :    112,479

Weight of infected under 15 years :    2,443,500 kg

Weight of infected over 15 years :      5,848,908 kg

Tablets needed:            Under 15 years:            162,900 tablets

Over 15 years:            389,927 tablets

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 Total :                      552,827 tablets

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 Notes
 

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Population at risk is population that lives along the main river, estimated to be 80% of the total population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm$  25% of the average prevalence rate.



Country : Ghana

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 13,588,000      Percent under 15 years : 45%    over 15 years : 55%

Population at risk : 13,588,000

Minimum population at risk : 10,191,000

Maximum population at risk : 13,588,000

Prevalence : Average 72.40%      Minimum 50.00%      Maximum 80.00%

Population infected (from Population at risk and Average prevalence) : 9,837,712

Minimum population infected: 5,095,500

Maximum population infected: 10,870,400

Infected population under 15 years : 4,426,970

Infected population over 15 years : 5,410,742

Weight of infected under 15 years : 132,809,100 kg

Weight of infected over 15 years : 281,358,584 kg

Tablets needed:      Under 15 years:      8,853,940 tablets

Over 15 years:      18,757,239 tablets

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Total :      27,611,179 tablets

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Notes

Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are determined considering the focality of transmission.

Country : Guinea

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 6,075,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      6,075,000

Minimum population at risk :           4,556,250

Maximum population at risk :           6,075,000

Prevalence : Average 25.00%            Minimum 18.80%                      Maximum 31.30%

Population infected (from Population at risk and Average prevalence) : 1,518,750

Minimum population infected:           856,575

Maximum population infected:           1,901,475

Infected population under 15 years :   683,438

Infected population over 15 years :    835,313

Weight of infected under 15 years :    20,503,140 kg

Weight of infected over 15 years :     43,436,276 kg

Tablets needed:            Under 15 years:            1,366,876 tablets

                                  Over 15 years:            2,895,752 tablets

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                                  Total :                      4,262,628 tablets

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Notes

Population at risk is estimated be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Guinea-Bissau

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 890,000                      Percent under 15 years : 44%    over 15 years : 56%

Population at risk :                      890,000

Minimum population at risk :           667,500

Maximum population at risk :           890,000

Prevalence : Average 30.00%            Minimum 22.50%                      Maximum 37.50%

Population infected (from Population at risk and Average prevalence) : 267,000

Minimum population infected:           150,188

Maximum population infected:          333,750

Infected population under 15 years :   117,480

Infected population over 15 years :    149,520

Weight of infected under 15 years :    3,524,400 kg

Weight of infected over 15 years :     7,775,040 kg

Tablets needed:                      Under 15 years:                      234,960 tablets

   Over 15 years:                      518,336 tablets

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   Total :                                      753,296 tablets

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Notes

Population at risk is estimated to be the entire population. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Kenya

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 20,333,275                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      20,333,275

Minimum population at risk :            15,249,956

Maximum population at risk :            20,333,275

Prevalence : Average 23.00%            Minimum 17.30%                      Maximum 28.80%

Population infected (from Population at risk and Average prevalence) : 4,676,653

Minimum population infected:            2,638,242

Maximum population infected:            5,855,983

Infected population under 15 years :    2,104,494

Infected population over 15 years :    2,572,159

Weight of infected under 15 years :    63,134,820 kg

Weight of infected over 15 years :    133,752,268 kg

Tablets needed:            Under 15 years:            4,208,988 tablets

Over 15 years:            8,916,818 tablets

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Total :                      13,125,806 tablets

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Notes

Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Liberia

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 2,189,033      Percent under 15 years : 41%    over 15 years : 59%

Population at risk : 1,751,226

Minimum population at risk : 1,313,419

Maximum population at risk : 1,970,130

Prevalence : Average 30.00%      Minimum 22.50%      Maximum 37.50%

Population infected (from Population at risk and Average prevalence) : 525,368

Minimum population infected: 295,519

Maximum population infected: 738,799

Infected population under 15 years : 215,401

Infected population over 15 years : 309,967

Weight of infected under 15 years : 6,462,030 kg

Weight of infected over 15 years : 16,118,284 kg

Tablets needed:      Under 15 years: 430,802 tablets

Over 15 years: 1,074,552 tablets

Total : 1,505,354 tablets

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**Notes**

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Population at risk is estimated to be 80% of the total population, which is the number of people involved in agriculture. Maximum population at risk is 90% of the total population since only estimated 10% of the population live on the non-endemic coast. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Madagascar

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 9,985,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk : 9,985,000

Minimum population at risk : 7,488,750

Maximum population at risk : 9,985,000

Prevalence : Average 55.00%                      Minimum 41.30%                      Maximum 68.80%

Population infected (from Population at risk and Average prevalence) : 5,491,750

Minimum population infected: 3,092,854

Maximum population infected: 6,869,680

Infected population under 15 years : 2,471,288

Infected population over 15 years : 3,020,463

Weight of infected under 15 years : 74,138,640 kg

Weight of infected over 15 years : 157,064,076 kg

Tablets needed:	Under 15 years:	4,942,576 tablets
	Over 15 years:	10,470,938 tablets
	<hr/>	
	Total :	15,413,514 tablets

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**Notes**

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.







Country : Mauritania

Region : AFR

Schistosomiasis type(s) : S.h.

Population : 1,888,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      1,888,000

Minimum population at risk :            1,416,000

Maximum population at risk :           1,888,000

Prevalence : Average 27.60%            Minimum 20.70%                      Maximum 34.50%

Population infected (from Population at risk and Average prevalence) : 521,088

Minimum population infected:           293,112

Maximum population infected:           651,360

Infected population under 15 years :   234,490

Infected population over 15 years :    286,598

Weight of infected under 15 years :    7,034,700 kg

Weight of infected over 15 years :    14,903,096 kg

Tablets needed:            Under 15 years:            468,980 tablets

Over 15 years:            993,540 tablets

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Total :                      1,462,520 tablets

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Notes

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Population at risk is estimated to be the entire population. The average prevalence rate is from the Atlas (Reference 8). Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.





Country : Namibia

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 800,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      100,000

Minimum population at risk :            75,000

Maximum population at risk :            125,000

Prevalence : Average 5.00%              Minimum 3.70%                      Maximum 6.30%

Population infected (from Population at risk and Average prevalence) : 5,000

Minimum population infected:            2,775

Maximum population infected:            7,875

Infected population under 15 years :    2,250

Infected population over 15 years :    2,750

Weight of infected under 15 years :    67,500 kg

Weight of infected over 15 years :    143,000 kg

Tablets needed:	Under 15 years:	4,500 tablets
	Over 15 years:	9,533 tablets
	<hr/>	
	Total :	14,033 tablets

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Notes

Population at risk is estimated population living in North Caprivi Strip where schistosomiasis is endemic. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Niger

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 6,115,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      6,115,000

Minimum population at risk :            4,586,250

Maximum population at risk :           6,115,000

Prevalence : Average 26.70%            Minimum 20.00%                      Maximum 33.40%

Population infected (from Population at risk and Average prevalence) : 1,632,705

Minimum population infected:            917,250

Maximum population infected:           2,042,410

Infected population under 15 years :   734,717

Infected population over 15 years :    897,988

Weight of infected under 15 years :    22,041,510 kg

Weight of infected over 15 years :    46,695,376 kg

Tablets needed:	Under 15 years:	1,469,434 tablets
	Over 15 years:	3,113,025 tablets
		<hr/>
	Total :	4,582,459 tablets

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Notes

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Nigeria

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 95,198,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                              86,387,000

Minimum population at risk :                      64,790,250

Maximum population at risk :                      95,198,000

Prevalence : Average 25.50%                      Minimum 19.10%                      Maximum 31.90%

Population infected (from Population at risk and Average prevalence) : 22,028,685

Minimum population infected:                      12,374,938

Maximum population infected:                      30,368,162

Infected population under 15 years :                      9,912,908

Infected population over 15 years :                      12,115,777

Weight of infected under 15 years :                      297,387,240 kg

Weight of infected over 15 years :                      630,020,404 kg

Tablets needed:                      Under 15 years:                      19,825,816 tablets

Over 15 years:                      42,001,360 tablets

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 Total :                                      61,827,176 tablets

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**Notes**


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Population at risk is estimated to be total population of endemic districts. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is the entire population. The average prevalence rate is from prevalence rates for each district from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Rwanda

Region : AFR

Schistosomiasis type(s) : S.m.

Population : 6,070,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      3,642,000

Minimum population at risk :            2,731,500

Maximum population at risk :           4,552,500

Prevalence : Average 10.00%            Minimum 5.00%                      Maximum 15.00%

Population infected (from Population at risk and Average prevalence) : 364,200

Minimum population infected:            136,575

Maximum population infected:           682,875

Infected population under 15 years :    163,890

Infected population over 15 years :    200,310

Weight of infected under 15 years :    4,916,700 kg

Weight of infected over 15 years :    10,416,120 kg

Tablets needed:            Under 15 years:            327,780 tablets

Over 15 years:            694,408 tablets

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Total :                      1,022,188 tablets

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#### Notes

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Population at risk is estimated from PDP/SCH data. Minimum population at risk is estimated to be 45% of the total population. Maximum population at risk is estimated to be 75% of the total population. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are from new PDP/SCH data.

Country : Senegal

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 6,444,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                              6,444,000

Minimum population at risk :                      4,833,000

Maximum population at risk :                      6,444,000

Prevalence : Average 15.00%                      Minimum 11.30%                      Maximum 18.80%

Population infected (from Population at risk and Average prevalence) : 966,600

Minimum population infected:                      546,129

Maximum population infected:                      1,211,472

Infected population under 15 years :                      434,970

Infected population over 15 years :                      531,630

Weight of infected under 15 years :                      13,049,100 kg

Weight of infected over 15 years :                      27,644,760 kg

Tablets needed:                      Under 15 years:                      869,940 tablets

Over 15 years:                      1,842,984 tablets

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Total :                                      2,712,924 tablets

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Notes

Population at risk is estimated to be the entire population. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.





Country : South Africa

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 32,392,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                              20,000,000

Minimum population at risk :                 15,000,000

Maximum population at risk :                 25,000,000

Prevalence : Average 17.50%                 Minimum 13.10%                              Maximum 21.90%

Population infected (from Population at risk and Average prevalence) : 3,500,000

Minimum population infected:                 1,965,000

Maximum population infected:                 5,475,000

Infected population under 15 years :         1,575,000

Infected population over 15 years :         1,925,000

Weight of infected under 15 years :         47,250,000 kg

Weight of infected over 15 years :         100,100,000 kg

Tablets needed:                      Under 15 years:                      3,150,000 tablets

Over 15 years:                      6,673,333 tablets

    Total :                                      9,823,333 tablets

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**Notes**

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Population at risk and infected population are determined from PDP data and country file figures and prevalence rates. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of population at risk. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of average prevalence rates.

Country : Swaziland

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 647,415                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      647,415

Minimum population at risk :            485,561

Maximum population at risk :            647,415

Prevalence : Average 25.00%            Minimum 18.80%                      Maximum 31.30%

Population infected (from Population at risk and Average prevalence) : 161,854

Minimum population infected:            91,285

Maximum population infected:            202,641

Infected population under 15 years :    72,834

Infected population over 15 years :    89,020

Weight of infected under 15 years :    2,185,020 kg

Weight of infected over 15 years :    4,629,040 kg

Tablets needed:                      Under 15 years:                      145,668 tablets

Over 15 years:                      308,603 tablets

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Total :                                      454,271 tablets

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Notes

Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence is estimated from PDP/SCH data. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Togo

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 2,960,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      2,960,000

Minimum population at risk :           2,220,000

Maximum population at risk :           2,960,000

Prevalence : Average 25.00%            Minimum 18.80%                      Maximum 31.30%

Population infected (from Population at risk and Average prevalence) : 740,000

Minimum population infected:           417,360

Maximum population infected:           926,480

Infected population under 15 years :   333,000

Infected population over 15 years :    407,000

Weight of infected under 15 years :    9,990,000 kg

Weight of infected over 15 years :    21,164,000 kg

Tablets needed:	Under 15 years:	666,000 tablets
	Over 15 years:	1,410,933 tablets
	<hr/>	
	Total :	2,076,933 tablets

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**Notes**

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence rate is from PDP/SCH data. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.





Country : Zaire

Region : AFR

Schistosomiasis type(s) : S.m. S.h. S.i.

Population : 30,362,751                      Percent under 15 years : 46%    over 15 years : 54%

Population at risk :                              23,691,690

Minimum population at risk :                      17,768,767

Maximum population at risk :                      29,614,613

Prevalence : Average 36.20%                      Minimum 27.20%                      Maximum 45.30%

Population infected (from Population at risk and Average prevalence) : 8,576,392

Minimum population infected:                      4,833,105

Maximum population infected:                      13,415,420

Infected population under 15 years :              3,945,140

Infected population over 15 years :              4,631,252

Weight of infected under 15 years :              118,354,200 kg

Weight of infected over 15 years :              240,825,104 kg

Tablets needed:                      Under 15 years:                      7,890,280 tablets

    Over 15 years:                      16,055,007 tablets

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    Total :                                      23,945,287 tablets

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Notes

Population at risk is determined by summing population of endemic regions. Minimum and maximum populations at risk are estimated to be  $\pm 25\%$  of population at risk. The average prevalence rate is determined from the Atlas (Reference 8). Minimum and maximum prevalence rates are  $\pm 25\%$  of the average prevalence rate.

Country : Zambia

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 6,666,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      6,666,000

Minimum population at risk :           4,999,500

Maximum population at risk :           6,666,000

Prevalence : Average 26.50%            Minimum 19.90%                      Maximum 33.10%

Population infected (from Population at risk and Average prevalence) : 1,766,490

Minimum population infected:           994,901

Maximum population infected:           2,206,446

Infected population under 15 years :   794,921

Infected population over 15 years :    971,570

Weight of infected under 15 years :    23,847,630 kg

Weight of infected over 15 years :    50,521,640 kg

Tablets needed:            Under 15 years:            1,589,842 tablets

Over 15 years:            3,368,109 tablets

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Total :                      4,957,951 tablets

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Notes

Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the entire population. The average prevalence rate was determined from Atlas (Reference 8) prevalence rates for the provinces. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.



Country : Zimbabwe

Region : AFR

Schistosomiasis type(s) : S.m. S.h.

Population : 8,300,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                              8,300,000

Minimum population at risk :                      6,225,000

Maximum population at risk :                      8,300,000

Prevalence :    Average 40.00%                      Minimum 30.00%                      Maximum 50.00%

Population infected (from Population at risk and Average prevalence) :    3,320,000

Minimum population infected:                      1,867,500

Maximum population infected:                      4,150,000

Infected population under 15 years :    1,494,000

Infected population over 15 years :    1,826,000

Weight of infected under 15 years :    44,820,000 kg

Weight of infected over 15 years :    94,952,000 kg

Tablets needed:	Under 15 years:	2,988,000 tablets
	Over 15 years:	6,330,133 tablets
	<hr/>	
	Total :	9,318,133 tablets

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Notes

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence rate is determined from the Atlas (Reference 8) data. Minimum and maximum prevalence rates are determined to be  $\pm 25\%$  of the average prevalence rate.

Country : Antigua and Barbuda

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 80,000                      Percent under 15 years : 30%    over 15 years : 70%

Population at risk :                      400

Minimum population at risk :            300

Maximum population at risk :            500

Prevalence : Average 26.00%            Minimum 17.00%                      Maximum 35.00%

Population infected (from Population at risk and Average prevalence) : 104

Minimum population infected:            51

Maximum population infected:            175

Infected population under 15 years :    31

Infected population over 15 years :    73

Weight of infected under 15 years :    1,116 kg

Weight of infected over 15 years :    4,234 kg

Tablets needed:                      Under 15 years:                      74 tablets

Over 15 years:                      282 tablets

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Total :                                      356 tablets

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Notes

Population at risk and prevalence rates are obtained from Ministry of Health through the WHO regional office (PAHO). Minimum prevalence rate is the rate determined from parasitological examination. Maximum prevalence rate is the rate determined from serological examination.

Country : Brazil

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 135,564,000      Percent under 15 years : 40%    over 15 years : 60%

Population at risk : 30,000,000

Minimum population at risk : 22,500,000

Maximum population at risk : 37,500,000

Prevalence : Average 20.00%      Minimum 15.00%      Maximum 25.00%

Population infected (from Population at risk and Average prevalence) : 6,000,000

Minimum population infected: 3,375,000

Maximum population infected: 9,375,000

Infected population under 15 years : 2,400,000

Infected population over 15 years : 3,600,000

Weight of infected under 15 years : 86,400,000 kg

Weight of infected over 15 years : 208,800,000 kg

Tablets needed:      Under 15 years:      5,760,000 tablets

Over 15 years:      13,920,000 tablets

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Total :      19,680,000 tablets

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Notes

Population at risk is determined by summing population of endemic districts. Minimum and maximum population at risk are  $\pm 25\%$  of the total population at risk. The average prevalence rate is from PDP/SCH data, considering the success of extensive national control programme. Minimum and maximum prevalence rates are  $\pm 25\%$  of the average prevalence rate.

Country : Dominican Republic

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 7,012,367      Percent under 15 years : 48%    over 15 years : 52%

Population at risk : 4,161,777

Minimum population at risk : 3,121,333

Maximum population at risk : 5,202,221

Prevalence : Average 5.00%      Minimum 3.80%      Maximum 6.30%

Population infected (from Population at risk and Average prevalence) : 208,089

Minimum population infected: 118,611

Maximum population infected: 327,740

Infected population under 15 years : 99,883

Infected population over 15 years : 108,206

Weight of infected under 15 years : 3,595,788 kg

Weight of infected over 15 years : 6,275,948 kg

Tablets needed:	Under 15 years:	239,719 tablets
	Over 15 years:	418,397 tablets
	<hr/>	
	Total :	658,116 tablets

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**Notes**


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Population at risk and minimum and maximum prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (PAHO). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk.



Country : Martinique

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 315,000                      Percent under 15 years : 28%    over 15 years : 72%

Population at risk :                      55,125

Minimum population at risk :           10,000

Maximum population at risk :           100,000

Prevalence : Average 7.60%              Minimum 3.60%                      Maximum 11.70%

Population infected (from Population at risk and Average prevalence) :    4,190

Minimum population infected:           360

Maximum population infected:           11,700

Infected population under 15 years :    1,173

Infected population over 15 years :    3,017

Weight of infected under 15 years :    42,228 kg

Weight of infected over 15 years :    174,986 kg

Tablets needed:	Under 15 years:	2,815 tablets
	Over 15 years:	11,666 tablets
	<hr/>	
	Total :	14,481 tablets

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Notes

Population at risk and prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (PAHO). Minimum population at risk takes into consideration the fact that children under 10 years of age are not infected.

Country : Montserrat

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 11,200                      Percent under 15 years : 30%    over 15 years : 70%

Population at risk :                      145

Minimum population at risk :            108

Maximum population at risk :           181

Prevalence : Average 17.50%            Minimum 10.00%                      Maximum 25.00%

Population infected (from Population at risk and Average prevalence) : 25

Minimum population infected:           11

Maximum population infected:           45

Infected population under 15 years : 8

Infected population over 15 years : 18

Weight of infected under 15 years : 288 kg

Weight of infected over 15 years : 1,044 kg

Tablets needed:            Under 15 years:            19 tablets

                                  Over 15 years:            70 tablets

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                                  Total :                      89 tablets

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Notes

Population at risk and prevalence rates are from data obtained from the Ministry of Health through WHO regional office (PAHO). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. Average prevalence is the average of minimum and maximum prevalence rates. Minimum prevalence rate is the rate from parasitological examination. Maximum prevalence rate is the rate from serological examination.

Country : Puerto Rico

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 3,410,000                      Percent under 15 years : 32%    over 15 years : 68%

Population at risk :                              682,000

Minimum population at risk :                      511,500

Maximum population at risk :                      852,500

Prevalence : Average 2.00%                      Minimum 1.00%                      Maximum 3.00%

Population infected (from Population at risk and Average prevalence) : 13,640

Minimum population infected:                      5,115

Maximum population infected:                      25,575

Infected population under 15 years :                      4,365

Infected population over 15 years :                      9,275

Weight of infected under 15 years :                      157,140 kg

Weight of infected over 15 years :                      537,950 kg

Tablets needed:                      Under 15 years:                      10,476 tablets

Over 15 years:                      35,863 tablets

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Total :                      46,339 tablets

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Notes

Population at risk and prevalence rates are estimated from new data available to PDP/SCH. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk.



Country : Saint Lucia

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 130,000                      Percent under 15 years : 30%    over 15 years : 70%

Population at risk :                      15,860

Minimum population at risk :            11,895

Maximum population at risk :            19,825

Prevalence : Average 0.60%              Minimum 0.10%                      Maximum 1.00%

Population infected (from Population at risk and Average prevalence) : 95

Minimum population infected:            12

Maximum population infected:            198

Infected population under 15 years :    29

Infected population over 15 years :    67

Weight of infected under 15 years :    1,044 kg

Weight of infected over 15 years :    3,886 kg

Tablets needed:            Under 15 years:            70 tablets

                                  Over 15 years:            259 tablets

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                                  Total :                      329 tablets

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Notes

Population at risk and prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (PAHO). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. Minimum prevalence rate was estimated from predicted number of cases for 1984.

Country : Suriname

Region : AMR

Schistosomiasis type(s) : S.m.

Population : 375,000

Percent under 15 years : 39% over 15 years : 61%

Population at risk : 34,000

Minimum population at risk : 25,500

Maximum population at risk : 42,500

Prevalence : Average 10.00%

Minimum 7.50%

Maximum 12.50%

Population infected (from Population at risk and Average prevalence) : 3,400

Minimum population infected: 1,913

Maximum population infected: 5,313

Infected population under 15 years : 1,326

Infected population over 15 years : 2,074

Weight of infected under 15 years : 47,736 kg

Weight of infected over 15 years : 120,292 kg

Tablets needed: Under 15 years: 3,182 tablets

Over 15 years: 8,019 tablets

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 Total : 11,201 tablets

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 Notes

Population at risk and prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (PAHO). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.



Country : Egypt

Region : EMR

Schistosomiasis type(s) : S.m. S.h.

Population : 52,689,136                      Percent under 15 years : 40%    over 15 years : 60%

Population at risk :                              45,689,136

Minimum population at risk :                      34,266,587

Maximum population at risk :                      52,689,136

Prevalence : Average 20.00%                      Minimum 15.00%                      Maximum 25.00%

Population infected (from Population at risk and Average prevalence) : 9,137,827

Minimum population infected:                      5,139,988

Maximum population infected:                      13,172,284

Infected population under 15 years :                      3,655,131

Infected population over 15 years :                      5,482,696

Weight of infected under 15 years :                      109,653,930 kg

Weight of infected over 15 years :                      285,100,192 kg

Tablets needed:	Under 15 years:	7,310,262 tablets
	Over 15 years:	19,006,679 tablets
	<hr/>	
	Total :	26,316,941 tablets

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Notes

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Population at risk and prevalence rates were obtained from the Ministry of Health through the WHO regional office (EMRO). Egypt had an overall prevalence rate of up to 55.1% until recently.



Country : Iraq

Region : EMR

Schistosomiasis type(s) : S.h.

Population : 15,898,000                      Percent under 15 years : 49%    over 15 years : 51%

Population at risk :                              4,184,742

Minimum population at risk :                      3,138,556

Maximum population at risk :                      5,230,927

Prevalence : Average 0.46%                      Minimum 0.10%                      Maximum 1.00%

Population infected (from Population at risk and Average prevalence) : 19,250

Minimum population infected:                      3,139

Maximum population infected:                      52,309

Infected population under 15 years :                      9,433

Infected population over 15 years :                      9,818

Weight of infected under 15 years :                      282,990 kg

Weight of infected over 15 years :                      510,536 kg

Tablets needed:	Under 15 years:	18,866 tablets
	Over 15 years:	34,036 tablets
	<hr/>	
	Total :	52,902 tablets

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Notes

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Population at risk and prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (EMRO). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk.

Country : Jordan

Region : EMR

Schistosomiasis type(s) : S.h.

Population : 3,515,000                      Percent under 15 years : 44%    over 15 years : 56%

Population at risk :                      20,000

Minimum population at risk :           15,000

Maximum population at risk :           25,000

Prevalence : Average 0.10%              Minimum 0.00%                      Maximum 0.10%

Population infected (from Population at risk and Average prevalence) : 20

Minimum population infected:           0

Maximum population infected:           25

Infected population under 15 years : 9

Infected population over 15 years : 11

Weight of infected under 15 years : 270 kg

Weight of infected over 15 years : 572 kg

Tablets needed:                      Under 15 years:                      18 tablets

   Over 15 years:                      38 tablets

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   Total :                                      56 tablets

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Notes

Population at risk and prevalence rates are determined from PDP/SCH data and country file. Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the population at risk.

Country : Lebanon

Region : EMR

Schistosomiasis type(s) : S.h.

Population : 2,668,000                      Percent under 15 years : \*\*%    over 15 years : 0%

Population at risk : 0

Minimum population at risk : 0

Maximum population at risk : 0

Prevalence : Average 0.00%              Minimum 0.00%              Maximum 0.00%

Population infected (from Population at risk and Average prevalence) : 0

Minimum population infected: 0

Maximum population infected: 0

Infected population under 15 years : 0

Infected population over 15 years : 0

Weight of infected under 15 years : 0 kg

Weight of infected over 15 years : 0 kg

Tablets needed:              Under 15 years:              0 tablets

Over 15 years:              0 tablets

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   Total :                      0 tablets

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**Notes**

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No reported cases lately. No recent information available to PDP/SCH.



Country : Libyan Arab Jamahiriya

Region : EMR

Schistosomiasis type(s) : S.m. S.h.

Population : 3,605,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                      1,202,000

Minimum population at risk :           901,500

Maximum population at risk :           1,502,500

Prevalence : Average 15.00%            Minimum 11.30%                      Maximum 18.80%

Population infected (from Population at risk and Average prevalence) : 180,300

Minimum population infected:           101,870

Maximum population infected:           282,470

Infected population under 15 years :   81,135

Infected population over 15 years :    99,165

Weight of infected under 15 years :    2,434,050 kg

Weight of infected over 15 years :    5,156,580 kg

Tablets needed:            Under 15 years:            162,270 tablets

                                  Over 15 years:            343,772 tablets

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                                  Total :                      506,042 tablets

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Notes

Population at risk is estimated from the Atlas (Reference 8). Minimum population at risk is estimated to be 50% lower than population at risk. Maximum population at risk is estimated to be 25% higher than population at risk. The average prevalence rate is estimated from PDP/SCH data. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.



Country : Saudi Arabia

Region : EMR

Schistosomiasis type(s) : S.m. S.h.

Population : 11,542,000      Percent under 15 years : 45%    over 15 years : 55%

Population at risk : 1,965,683

Minimum population at risk : 1,817,865

Maximum population at risk : 3,029,775

Prevalence : Average 5.10%      Minimum 21.50%      Maximum 1.40%

Population infected (from Population at risk and Average prevalence) : 100,250

Minimum population infected: 390,841

Maximum population infected: 42,417

Infected population under 15 years : 45,113

Infected population over 15 years : 55,138

Weight of infected under 15 years : 1,353,390 kg

Weight of infected over 15 years : 2,867,176 kg

Tablets needed:      Under 15 years:      90,226 tablets

Over 15 years:      191,145 tablets

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Total :      281,371 tablets

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Notes

Population at risk and prevalence rates are obtained from Ministry of Health through the WHO regional office (EMRO). The low average prevalence rate of Saudi Arabia is due to an effective national control programme.





Country : Syrian Arab Republic

Region : EMR

Schistosomiasis type(s) : S.h.

Population : 10,267,000                      Percent under 15 years : 49%    over 15 years : 51%

Population at risk :                              983,000

Minimum population at risk :                      737,250

Maximum population at risk :                      1,228,750

Prevalence : Average 0.20%                      Minimum 0.12%                      Maximum 0.25%

Population infected (from Population at risk and Average prevalence) :    1,966

Minimum population infected:                      885

Maximum population infected:                      3,072

Infected population under 15 years :              963

Infected population over 15 years :              1,003

Weight of infected under 15 years :              28,890 kg

Weight of infected over 15 years :              52,156 kg

Tablets needed:                      Under 15 years:                      1,926 tablets

    Over 15 years:                      3,477 tablets

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    Total :                                      5,403 tablets

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Notes

Population at risk and prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (EMRO). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk.

Country : Tunisia

Region : EMR

Schistosomiasis type(s) : S.h.

Population : 7,816,000      Percent under 15 years : 40%    over 15 years : 60%

Population at risk : 350,000

Minimum population at risk : 262,500

Maximum population at risk : 437,500

Prevalence : Average 0.05%      Minimum 0.00%      Maximum 0.10%

Population infected (from Population at risk and Average prevalence) : 175

Minimum population infected: 0

Maximum population infected: 438

Infected population under 15 years : 70

Infected population over 15 years : 105

Weight of infected under 15 years : 2,100 kg

Weight of infected over 15 years : 5,460 kg

Tablets needed:      Under 15 years:      140 tablets

Over 15 years:      364 tablets

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Total :              504 tablets

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Notes

Population at risk and prevalence rates are obtained from the Ministry of Health through the WHO regional office (EMRO). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. Low prevalence rates are due to an effective national control programme.

Country : Yemen Arab Republic

Region : EMR

Schistosomiasis type(s) : S.m. S.h.

Population : 6,849,000                      Percent under 15 years : 45%    over 15 years : 55%

Population at risk :                              6,849,000

Minimum population at risk :                      6,164,100

Maximum population at risk :                      6,849,000

Prevalence : Average 14.60%                      Minimum 11.00%                      Maximum 18.30%

Population infected (from Population at risk and Average prevalence) : 999,954

Minimum population infected:                      678,051

Maximum population infected:                      1,253,367

Infected population under 15 years :                      449,979

Infected population over 15 years :                      549,975

Weight of infected under 15 years :                      13,499,370 kg

Weight of infected over 15 years :                      28,598,700 kg

Tablets needed:	Under 15 years:	899,958 tablets
	Over 15 years:	1,906,580 tablets
	<hr/>	
	Total :	2,806,538 tablets

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**Notes**

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Population at risk is estimated to be the entire population. Minimum population at risk is estimated to be 75% of the total population at risk. Maximum population at risk is estimated to be the total population at risk. The average prevalence rate is from the Atlas (Reference 8). Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.



Country : Yemen, Democratic

Region : EMR

Schistosomiasis type(s) : S.m. S.h.

Population : 2,293,910      Percent under 15 years : 45%    over 15 years : 55%

Population at risk : 1,000,000

Minimum population at risk : 750,000

Maximum population at risk : 1,250,000

Prevalence : Average 13.10%      Minimum 1.80%      Maximum 22.00%

Population infected (from Population at risk and Average prevalence) : 131,000

Minimum population infected: 13,500

Maximum population infected: 275,000

Infected population under 15 years : 58,950

Infected population over 15 years : 72,050

Weight of infected under 15 years : 1,768,500 kg

Weight of infected over 15 years : 3,746,600 kg

Tablets needed:      Under 15 years: 117,900 tablets

Over 15 years: 249,773 tablets

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Total : 367,673 tablets

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Notes

Population at risk and prevalence rates were obtained from the Ministry of Health through the WHO regional office (EMRO). Minimum and maximum population at risk are  $\pm 25\%$  of population at risk.

Country : Morocco

Region : EUR

Schistosomiasis type(s) : S.h.

Population : 21,941,000      Percent under 15 years : 45%    over 15 years : 55%

Population at risk : 650,000

Minimum population at risk : 487,500

Maximum population at risk : 812,500

Prevalence : Average: 8.00%      Minimum: 6.00%      Maximum 10.00%

Population infected (from Population at risk and Average prevalence) : 52,000

Minimum population infected: 29,250

Maximum population infected: 81,250

Infected population under 15 years : 23,400

Infected population over 15 years : 28,600

Weight of infected under 15 years : 702,000 kg

Weight of infected over 15 years : 1,487,200 kg

Tablets needed:      Under 15 years:      46,800 tablets

Over 15 years:      99,147 tablets

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 Total :                      145,947 tablets

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**Notes**

Population at risk is estimated from the Atlas (Reference 8). Minimum and maximum population at risk are estimated from PDP/SCH data considering current control programmes. The average prevalence rate is from the Atlas. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate.

Country : Turkey

Region : EUR

Schistosomiasis type(s) : S.h.

Population : 49,272,000      Percent under 15 years : 29%    over 15 years : 71%

Population at risk : 50,000

Minimum population at risk : 37,500

Maximum population at risk : 63,000

Prevalence : Average 1.00%      Minimum 0.80%      Maximum 1.30%

Population infected (from Population at risk and Average prevalence) : 500

Minimum population infected: 300

Maximum population infected: 819

Infected population under 15 years : 145

Infected population over 15 years : 355

Weight of infected under 15 years : 5,220 kg

Weight of infected over 15 years : 20,590 kg

Tablets needed:      Under 15 years:      348 tablets

Over 15 years:      1,373 tablets

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Total :      1,721 tablets

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Notes

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Population at risk is estimated from the Atlas (Reference 8). Minimum and maximum population at risk are estimated to be  $\pm 25\%$  of the total population at risk. The average prevalence rate is from the Atlas. Minimum and maximum prevalence rates are estimated to be  $\pm 25\%$  of the average prevalence rate. AMRO figures were used for weight.

Country : India

Region : SEA

Schistosomiasis type(s) : S.h.

Population : 750,900,000      Percent under 15 years : 44%    over 15 years : 56%

Population at risk : 912

Minimum population at risk : 600

Maximum population at risk : 1,500

Prevalence : Average 2.00%      Minimum 0.10%      Maximum 3.00%

Population infected (from Population at risk and Average prevalence) : 18

Minimum population infected: 1

Maximum population infected: 45

Infected population under 15 years : 8

Infected population over 15 years : 10

Weight of infected under 15 years : 240 kg

Weight of infected over 15 years : 520 kg

Tablets needed:      Under 15 years:      16 tablets

Over 15 years:      35 tablets

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Total :      51 tablets

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Notes

Population at risk and prevalence rates are estimated from the PDP/SCH country file. Minimum and maximum population at risk and prevalence rates are estimated from PDP/SCH data.

Country : Indonesia

Region : SEA

Schistosomiasis type(s) : S.j.

Population : 163,393,250

Percent under 15 years : 40% over 15 years : 60%

Population at risk : 8,000

Minimum population at risk : 6,000

Maximum population at risk : 10,000

Prevalence : Average 2.20%

Minimum 1.50%

Maximum 2.80%

Population infected (from Population at risk and Average prevalence) : 176

Minimum population infected: 90

Maximum population infected: 280

Infected population under 15 years : 70

Infected population over 15 years : 106

Weight of infected under 15 years : 2,100 kg

Weight of infected over 15 years : 5,512 kg

Tablets needed: Under 15 years: 210 tablets

Over 15 years: 551 tablets

Total : 761 tablets

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Notes

Population at risk and prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (SEARO). The current low prevalence rates are due to a successful control programme.





Country : China

Region : WPR

Schistosomiasis type(s) : S.j.

Population : 1059,521,000      Percent under 15 years : 34%    over 15 years : 66%

Population at risk : 54,106,607

Minimum population at risk : 40,579,955

Maximum population at risk : 54,106,607

Prevalence : Average 1.76%      Minimum 1.00%      Maximum 2.00%

Population infected (from Population at risk and Average prevalence) : 952,276

Minimum population infected: 405,800

Maximum population infected: 1,082,132

Infected population under 15 years : 323,774

Infected population over 15 years : 628,502

Weight of infected under 15 years : 9,713,220 kg

Weight of infected over 15 years : 32,682,104 kg

Tablets needed:	Under 15 years:	971,322 tablets
	Over 15 years:	3,268,210 tablets
	<hr/>	
	Total :	4,239,532 tablets

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**Notes**

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Population at risk and prevalence rates are from published national data from the Ministry of Public Health.



Country : Democratic Kampuchea

Region : WPR

Schistosomiasis type(s) : S.mek.

Population : 7,284,000                      Percent under 15 years : 40%    over 15 years : 60%

Population at risk :                      500,000

Minimum population at risk :           375,000

Maximum population at risk :           625,000

Prevalence : Average 10.00%            Minimum 7.50%                      Maximum 12.50%

Population infected (from Population at risk and Average prevalence) : 50,000

Minimum population infected:           28,125

Maximum population infected:           78,125

Infected population under 15 years :   20,000

Infected population over 15 years :    30,000

Weight of infected under 15 years :    600,000 kg

Weight of infected over 15 years :    1,560,000 kg

Tablets needed:	Under 15 years:	60,000 tablets
	Over 15 years:	156,000 tablets
	<hr/>	
	Total :	216,000 tablets

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Notes

Population at risk and prevalence rates are estimated from PDP/SCH data. Minimum and maximum population at risk and prevalence rates are  $\pm 25\%$  of the total population and average prevalence rate.

Country : Japan

Region : WPR

Schistosomiasis type(s) : S.j.

Population : 120,754,335      Percent under 15 years : \*\*%    over 15 years : 0%

Population at risk : 0

Minimum population at risk : 0

Maximum population at risk : 0

Prevalence : Average 0.00%      Minimum 0.00%      Maximum 0.00%

Population infected (from Population at risk and Average prevalence) : 0

Minimum population infected: 0

Maximum population infected: 0

Infected population under 15 years : 0

Infected population over 15 years : 0

Weight of infected under 15 years : 0 kg

Weight of infected over 15 years : 0 kg

Tablets needed:      Under 15 years:      0 tablets

Over 15 years:      0 tablets

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 Total :              0 tablets

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 Notes
 

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No new cases has been reported since 1978. No recent transmission.

Country : Lao People's Democratic Republic

Region : WPR

Schistosomiasis type(s) : S.mek.

Population : 4,117,000                      Percent under 15 years : 40%    over 15 years : 60%

Population at risk :                      400,000

Minimum population at risk :            60,000

Maximum population at risk :           450,000

Prevalence : Average 25.00%            Minimum 15.00%                      Maximum 40.50%

Population infected (from Population at risk and Average prevalence) : 100,000

Minimum population infected:           9,000

Maximum population infected:          182,250

Infected population under 15 years : 40,000

Infected population over 15 years : 60,000

Weight of infected under 15 years : 1,200,000 kg

Weight of infected over 15 years : 3,120,000 kg

Tablets needed:            Under 15 years:            120,000 tablets

                                  Over 15 years:            312,000 tablets

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                                  Total :                      432,000 tablets

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Notes

Population at risk and prevalence rates are from data obtained from the Ministry of Health through the WHO regional office (WPRO).

Country : Philippines

Region : WPR

Schistosomiasis type(s) : S.j.

Population : 54,377,993                      Percent under 15 years : 39%    over 15 years : 61%

Population at risk :                      5,000,000

Minimum population at risk :            3,000,000

Maximum population at risk :           5,000,000

Prevalence : Average 6.90%              Minimum 4.00%                      Maximum 12.00%

Population infected (from Population at risk and Average prevalence) : 345,000

Minimum population infected:            120,000

Maximum population infected:           600,000

Infected population under 15 years :   134,550

Infected population over 15 years :    210,450

Weight of infected under 15 years :    4,036,500 kg

Weight of infected over 15 years :    10,943,400 kg

Tablets needed:	Under 15 years:	403,650 tablets
	Over 15 years:	1,094,340 tablets
	<hr/>	
	Total :	1,497,990 tablets

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**Notes**

Population at risk and prevalence rates are from data supplied by Ministry of Health through the WHO regional office (WPRO). Due to the effective control programme, the prevalence rate has declined from high of 21.9% in 1975.

Global

Population :		3,097,108,971
Population at risk :		555,047,573
Minimum population at risk :		420,246,128
Maximum population at risk :		609,417,890
Population infected :		149,553,509
Minimum population infected:		81,533,287
Maximum population infected:		199,537,681
Infected population under 15 years :		66,428,032
Infected population over 15 years :		83,125,488
Weight of infected under 15 years :		2,007,986,262 kg
Weight of infected over 15 years :		4,345,081,382 kg
Tablets needed:	Under 15 years:	134,384,143 tablets
	Over 15 years:	291,282,457 tablets
		<hr/>
	Total :	426,666,600 tablets

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Notes

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There are differences in numbers due to rounding. For example, the sum of infected population under 15 years and infected population over 15 years does not equal the figure given as population infected. The reason is that 11 countries (Gabon, Guinea, Iraq, Madagascar, Malawi, Monserrat, Saint Lucia, Saudi Arabia, Sudan, United Republic of Tanzania and Zambia) have differences between the sum of infected population under and over 15 years and population infected due to rounding. Therefore, the sum of infected population under 15 years and infected population over 15 years is greater than population at infected by 11 persons.