

# Schistosomiasis Control in a Primary Health Care System

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*The successful implementation of a Primary Health Care System (PHC) in any country depends primarily on the ability to adapt its concepts and principles to the country's culture and development stage. Thus, the PHC system should reflect a balanced interaction between available resources, such as health manpower capabilities, and the nature and magnitude of the health problems. In addition, PHC should be viewed as the inlet to a multi-level pyramidal health system which caters to both community and individual needs in a balanced way. The adage that Ministries of Health should "work with and for the people" in health development, is especially true in the area of PHC, and hence, the health policy should aim to integrate health services in community development and involve people in its planning, implementation and evaluation.*

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In relation to schistosomiasis control, a PHC approach means the utilization of persons from the community who are trained to explain, interpret and undertake a control programme. This approach is flexible and adaptable to the conditions of each endemic country according to epidemiological, social and cultural characteristics. Experience is now demonstrating that the control of schistosomiasis is optimal when specific control tasks are carried out within the PHC system. Thus, wherever possible, schistosomiasis control should be integrated with health services, and decentralization of decision-making will add an important new dimension in disease control allowing greater community involvement.

## THE PRIMARY HEALTH CARE SYSTEM IN EGYPT

*The Regional Distribution of PHC* - The PHC pyramid of units consists of Rural Health Units, Rural Health Centers, Rural Hospitals, Endemic Disease Hospitals and District General Hospitals. The distribution of the Rural Health Units is such that there is one unit for every 5,000 population.

*Services provided by PHC* - The terms of reference for the PHC system include the prevention and control of communicable diseases, family planning, Maternal and Child Health (MCH), curative medical care, control of endemic diseases (including schistosomiasis), forensic medicine, and improved environmental sanitation.

*Feasibility of PHC Approach to Schistosomiasis Control* - In Egypt, schistosomiasis control measures have been carried out long before the current ongoing National Programme began. Chemotherapy - by Tartar Emetic - started as early as 1920; Snail Control - by Copper Sulphate - commenced in 1927. In 1928, the Health Department which was then attached to the Ministry of Inte-

rior, established a special Department for Endemic Diseases Control, and started a project for mobile hospitals to treat endemic diseases. When the Ministry of Health (MOH), was established as a specialized Ministry in 1936, the Endemic Diseases Control Department (EDCD) was one of the four departments. Initially all administration was carried out centrally, however, as local Governments developed and increasing numbers of field units were established, decentralization proceeded to Intermediate (Governorate) level and then Local (District) level. The staffing of the various administrative levels should be according to the load of work needed.

The control measures carried out through the PHC system to date have been successful due to the available organization, existing facilities, laboratory equipment and trained personnel. Thus any individual from the catchment population who contacts the PHC for other services, should be directed for schistosomiasis screening, and treatment if positive. The community participation ideals in the PHC system can be utilised to initiate and support community participation in the schistosomiasis control programme.

The capability of the PHC system to carry out control activities has been facilitated by (i) the easy Health Education process, (ii) relatively simple diagnostic techniques, (iii) the availability of a safe, easily administered and effective drug, and (iv) the location of snail-control field units in PHC's.

## ADMINISTRATION IN PHC

*Organization of Schistosomiasis Control - Administrative Aspects* - The General Administration components are staff management, the supply system, and fiscal management. The Control components are chemotherapy, snail-control, health education, and morbidity management. The Su-

pervision depends on quality control, monitoring system, and assessment of PHC performance. The Control Activities are developed through training personnel (offering guidelines and obstacle identification), defining strategies, carrying out field trials, and improving facilities, equipment and techniques. The Progress is evaluated through data management, evaluation, and control of problems. Technical Support is essential, and there should be mobile teams for specific areas with identified high prevalence, with new *Schistosoma mansoni* or changing pattern in mixed infections, with frequent serious morbidity, with a dense population, or distant settlements.

#### SUPPORT SYSTEM IN PRIMARY HEALTH CARE APPROACH

*Community Participation* - Schistosomiasis is a man-made disease through water pollution and water contact, and so community participation is regarded as an essential element of any schistosomiasis control programme. A detailed knowledge and understanding of community structure is a prerequisite if community participation is to be achieved. Health education activities must result in culturally acceptable responses and mobilization of the community to support the programme. Community participation has the potential to achieve a reduction of water pollution and water contact, high community coverage in laboratory examination and treatment, and co-operative participation in habitat modification and installation of water supply and sanitary appliances. Community participation may decline with time, and so continuous monitoring is recommended so that weakness can be investigated and corrected.

*Integration with Endemic Diseases Hospitals* - It is important that the work in the Rural Health Units be integrated with the higher units in the PHC system. Co-ordination is achieved by periodic visits by District Endemic Diseases Hospital physicians to the morbidity clinics in PHC Units. PHC staff are called for periodic meetings in Endemic Diseases Hospitals at which there are case discussions. There is a Case Referral System from PHC Units to Rural and Higher Hospitals to confirm diagnosis, case assessment and treatment. PHC physicians visit hospitals to follow-up cases referred to hospital or cases identified in hospital surveys. The reverse referral from Hospital to PHC Unit may occur for follow-up after treatment, and for further treatment (if within the scope of PHC). The District Hospitals are equipped with mobile facilities, e.g. Sonography - for a morbidity case finding programme.

*Intersectoral Co-ordination* - Co-ordination is achieved at all stages of the PHC system. The Rural Council coordinates with Local Government at

village level by having the PHC physician as a member of the council.

A special Health Care Physician is responsible for School Health, while Habitat Modification is the responsibility of the Agricultural society at the village level.

Water Supply & Sanitation improvements are achieved through local co-operation through the Village Community Development Society.

In each governorate, a local Schistosomiasis Committee is headed by the Governor and includes the Rural Council and the Governorate Authority.

#### OBSTACLES AND DEFICIENCIES

*Identification of Obstacles Encountered in Primary Health Care* - There are several factors which may limit the success of the PHC in schistosomiasis control: (i) Accessibility: there may be a number of satellite villages and hamlets served by any one PHC unit; (ii) Environmental: there may be a higher probability of water contact related to area irrigated by different stretches of water courses; (iii) Geographical Accessibility: the distance between satellite villages and hamlets and unit's services may be large. Generally coverage is higher in nearby villages and lower in distant villages; (iv) Competition with other Programmes: PHC Units provide a variety of services that may compete for resources during different seasonal work loads. eg emergency activities, new programmes may be introduced; e.g.: mass vaccination, communicable disease control, and examination of school children; (v) Size of Population served per unit: the population size has a high effect on coverage rate, effectiveness, and level of performance especially with the standard facilities, personnel, and working hours; (vi) Multiplicity of Duties: multiple services performed according to population size are not usually carried out on a full time basis. Hence, most of PHC personnel may carry out more than one job; (vii) Lack of continuity of personnel: most PHC personnel regularly shift to other jobs or are transferred to carry out the same job in a main city; (viii) There may be a decline in personnel vigilance, enthusiasm, morale, attitudes and continued interest.

All these points need to be monitored, early diagnosed, motivated and corrected.

#### STRATEGY OF SCHISTOSOMIASIS CONTROL IN PRIMARY HEALTH CARE APPROACH

*Selective Population Chemotherapy* - Praziquantel, the drug of choice is administered orally at 40 mg/kg as a single dose. Its ease of administration, effectiveness against both *S. haematobium* and *S. mansoni*, and safety, mean that it is capable, even if used alone, of achieving excellent short-term results. Unfortunately, unless combined with

other measures these results would not be sustainable long-term. Praziquantel achieves a high cure rate, a high reduction of intensity, as measured by the reduction of number of eggs passed by individuals and at the community level, and if early and properly used should prevent development of morbidity. Health Education is an important ingredient in control, and in chemotherapy, because only when the community are well educated in the disease, its effects, its mode of transmission and means of control will a control campaign be successful.

*Snail Control* - The role of PHC in Snail Control is crucial. Snail Control units are located in PHC field units from where they are responsible for routine snail surveys, identification of transmission sites, and mollusciciding at village level. Where possible they will also recommend and coordinate habitat modification through agricultural cooperative societies, for field canals and drains. Trained staff are necessary for identifying the criteria for identification of transmission sites. These include learning the ability to recognize water contact sites, sites of pollution, intermediate hosts, sites with infected snails both within villages and outside where many people are infected or at risk.

The current snail control strategy is to select sites meriting control by application of molluscicides. When the human prevalence rate is low, molluscicide treatments are limited to sites in which infected snails have been found. However when human prevalence is high (say over 25%), then snail control should cover all water contact and potential transmission sites. The timing of the applications is every 4-6 weeks (equivalent to the parasite incubation period in *Biomphalaria* and *Bulinus* respectively), during the transmission season of March - October.

The strategy of only carrying out focal mollusciciding is due to the high cost of blanket treatment, the proven focal nature of transmission sites, the undesirable effects specially on fish population, and the lack of proof of the control of transmission by blanket control.

*Health Education in PHC Approach* - A major role of the PHC worker is liaison between community and specialists, to inform, motivate, and encourage the community and leaders to join to improve their health. Meanwhile using the Mass Media, a national TV campaign has been used to increase the community awareness towards the problem. Short (two minute) films using characters from local communities, typical water contact sites, shots in PHC Units, each discourage water pollution and water contact and encourage periodic visits to PHC's for stool and free urine laboratory examination, and treatment if positive.

Face to face health education is capable of more in depth and wider information dissemination, for

example through health classes in PHC Units, health visits calling for examination and treatment, and during school health activities.

Community Organizations participate through Rural Council (local government) and co-operative societies to develop community participation in habitat modification and installation of water supply and sanitation facilities.

*Morbidity Management in PHC Approach* - The PHC system plays an important role in morbidity management through chemotherapy of symptomatic morbidity. Symptomatic treatment at the PHC Unit is the first line of attack and therefore ultimately responsible for the disease maintenance phase thus justifying the reinforcement of PHC Units. In the absence of a parasitological diagnosis, schistosomiasis may be diagnosed from clinical signs and symptoms thus (i) *S. haematobium* could be assumed from hematuria, dysuria, and/or frequency of urination, and (ii) *S. mansoni* is associated with dysenteric symptoms, enlarged liver and spleen and haematemesis.

Each PHC should have a specially arranged Morbidity Clinic, to be regularly visited by Endemic Hospital staff. This should ensure that clinical or symptomatic cases are dealt with properly in earlier stages of disease, thus preventing serious morbidity.

Thus within the PHC system the strategy would be: (i) Passive case finding supported where possible by active measures (house calling); (ii) Intensive treatment, if indicated, in areas with high prevalence and intensity and (iii) In areas with frequent serious morbidity, supplementary measures may be necessary.

#### FOLLOW-UP

*Assessment of Performance* - The assessment of the performance of the PHC system can be through the following measurements: (1) Contact Rate - Number of people who contacted PHC/Target Population (2) Screening Rate - Number received laboratory examination/Number made contact (3) Treatment Rate - Number received treatment/Number of positive cases (4) Follow-up Rate - Number who received follow-up examination/Number received treatment (5) Continuity Product - Contact Rate x Screening Rate x Treatment Rate x Follow-up Rate.

Each indicator (Rate) is based on the assumption that if each person successfully passes the proceeding element of care he proceeds to the succeeding step.

#### USING CONTINUITY PRODUCT

The Continuity Product expresses the probability of an individual to contact PHC, be screened, treated and followed-up. The continuity product

could be examined to identify the points of weakness and intervention could be introduced.

**Monitoring System** - A household census is to be carried out, and all houses numbered. The houses are then grouped into 10 sectors for future sampling (a through j), thus (a) 1 - 11 - 21 etc.; (b) 2 - 12 - 22; (c) 3 - 13 - 23; (d) 4 - 14 - 24; (e) 5 - 15 - 25; (f) 6 - 16 - 26; (g) 7 - 17 - 27; (h) 8 - 18 - 28; (i) 9 - 19 - 29; (j) 10 - 20 - 30.

Subsequently each sector is to be called and examined in a specific period of time. Prevalence is estimated after correction for: age, sex, and sample size, and Compliance Rate is to be estimated from number attended.

### PROGRESS ESTIMATION

**Evaluation** - The indices of the status of the disease are the prevalence of infection, the intensity of infection as measured by egg output, the incidence of new infections (transmission) and the morbidity in the population; (i) Prevalence: the prevalence is quoted as percentage infection in age specific groups; (ii) Intensity: *S. haematobium*: % No. of individuals with: - less than 50 eggs per 10 ml urine or - more than 50 eggs per 10 ml urine; *S. mansoni*: % No. of individuals with: - less than 100 eggs per gm stool or - more than 100 eggs per gm stool; (iii) Incidence: the incidence is defined as the number of negative cases who revert to being positive in a subsequent examination during a period of (say) one year. This gives a measure of transmission, and highlights the need for further snail control; (iv) Morbidity: *S. haematobium*: (a) Hematuria: (1) % No. of individuals who have bloody urine at the time of examination and within the last month; (2) % No. of individuals who have bloody urine in the past (more than one month and less than six months ago); (3) % No. of individuals who have hematuria by reagent strips at time of examination. (b) Dysuria - Percentage of individuals with Dysuria in the last six months; (c) Frequency of urination - Percentage of young individuals urinating more than four times a day. *S. mansoni*: (a) Percentage of individuals with history of haematemesis; (b) Percentage of school age children with hepatic & splenic enlargement.

### PROBLEMS ENCOUNTERED

(a) **Increasing Prevalence** - In some areas, there is a rising prevalence & intensity in identified foci. The factors which may have caused this increase are - (i) The Operational Approach: with chemotherapy as the main method used, leading to good short term results, but a relapse after initial treatment; (ii) No substantial change achieved in either water supply, sanitation, snail population and/or habitat modification; (iii) PHC Characteristics: the PHC system may have been ineffective due to the focus being distant from the PHC services, a

oversize population being served limiting population coverage; (iv) Personnel and Community Attitudes may not be cooperative due to a declining Community Participation spirit or reduced personnel vigilance.

In order to improve these situations, better management is needed and PHC activities should be supported through mobile central teams (at district level), more frequent chemotherapeutic treatment offered and increased targeted treatment for school children.

(b) **Changing Schistosomiasis Pattern** - In countries with both *S. haematobium* and *S. mansoni*, the balance of the two species may change due to ecological changes: (i) In some areas, with previously high prevalence of *S. haematobium* and low *S. mansoni* infection, the pattern have been reversed as *Biomphalaria alexandria* infestation increases and *Bulinus truncatus* decreases; (ii) Another possibility is that *S. mansoni* starts to appear in areas where *S. haematobium* had been the only prevalent species. Again this is usually linked with the spread of the host snail *B. alexandria*.

Action in these cases must be decisive and PHC activities are to be supported with teams at district level. Initially, population mass survey & treatment of positive cases is recommended and this should be supplemented by surveys of water-courses, mollusciciding of feeding canals and all branches of drainage; tributaries and main drains. Finally a follow-up of both human and snail surveys should be carried out.

Other areas requiring special attention are those with frequent serious morbidity. The indicators of these areas are - (i) High prevalence and intensity; (ii) Inadequate water supply and sanitation; (iii) Water contact sites with high snail populations and infected snails; (iv) Ineffective community participation; (v) Obstacles with PHC utilization.

The recommended measures in areas of high morbidity are an intensive active case finding programme, in which maximum coverage is needed, and concurrent snail control using mollusciciding and habitat modification. Health Education should be initiated to correct and sustain community participation, and if possible initiate improvement of water supply and sanitation through local authorities and community co-operation.

Where there are cases of high morbidity, then it is important to initiate immediately active case finding, diagnosed on symptomatic and simple laboratory examination. This should be followed by early and proper treatment. To assess the degree of morbidity, the use of sonography is essential. This will allow assessment and follow-up of cases, and morbidity clinics are to be visited by specialized physicians from district hospitals for consultation.