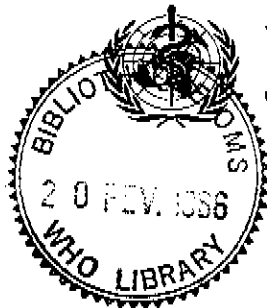


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WORLD HEALTH ORGANIZATION
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WHO Parasitic Dis. Prog.

PDP/85.1
ENGLISH ~~ONLY~~

GENERAL STRATEGIES FOR PREVENTION AND CONTROL
OF INTESTINAL PARASITIC INFECTIONS (IPI)
WITHIN PRIMARY HEALTH CARE (PHC)¹

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¹ This document is one in a series of papers (PDP/85.2 - 85.5) which have been prepared by the WHO Parasitic Diseases Programme and which are intended to provide up-to-date information on technical aspects of intestinal parasitic infections control. According to the advances in technology and as experience accumulates in national control programmes, these documents will be revised. Inquiries and comments may be directed to Director, Parasitic Diseases Programme, World Health Organization, 1211 Geneva 27, Switzerland.

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1. INTRODUCTION

The general objective of this paper is to discuss the strategies for the prevention and control of intestinal parasitoses and the best ways that they can be integrated into the PHC system.

This is done by first reviewing the global situation in intestinal parasitoses and pointing out the links between intestinal parasitoses and PHC. Then guidelines are provided on how to prevent and control intestinal parasitoses through appropriate selection and use of epidemiologic, diagnostic, chemotherapeutic and sanitation resources. These guidelines are general in character and must be adapted by public health authorities to fit their local epidemiologic situation and available resources.

This paper is the first of the WHO Parasitic Diseases Programme documents on prevention and control of intestinal parasitic infections within Primary Health Care (PHC). The other documents are:

- PDP/85.2 Diagnostic techniques for intestinal parasitic infections (IPI) applicable to primary health care (PHC) services⁽¹⁾;
- PDP/85.3 Planning, implementation, monitoring and evaluation of the control of intestinal parasitic infections (IPI) programmes⁽²⁾;
- PDP/85.4 Surveillance and survey methodology for intestinal parasitic infections (IPI)⁽³⁾;
- PDP/85.5 Chemotherapy of intestinal parasitic infections (IPI)⁽⁴⁾.
(in preparation)

1.1 Global situation in intestinal parasitoses.

The mortality and morbidity due to intestinal parasitic infections are relatively low when expressed as percentages of infected people, but because of their high prevalences the total number of deaths and cases of disease are rather high in relation to bacterial, viral or other parasitic infections.^(5,6)

Three intestinal parasitic infections (hookworm infections, amoebiasis and ascariasis) have been estimated to be among the twenty infectious diseases that kill the greatest number of people in the developing world⁽⁶⁾.

MORTALITY DUE TO MAJOR INFECTIONS
IN AFRICA, ASIA & LATIN AMERICA IN 1977-1978⁽⁶⁾

| <u>Rank</u> | <u>Thousands of deaths/yr</u> | <u>Disease</u> |
|-------------|---------------------------------|----------------------------|
| 1-10 | TEN LEADING INFECTIOUS DISEASES | |
| 11/12 | 50 to 60 | <u>HOOKWORM INFECTIONS</u> |
| 11/12 | 50 to 60 | DIPHTHERIA |
| 13 | 20 to 50 | ONCOCERCIASIS |
| 14/15 | 30 | MENINGITIS |
| 14/15 | 30 | <u>AMOEBIASIS</u> |
| 16 | 25 | TYPHOID |
| 17 | 20 | ASCARIASIS |
| 18 | 10 to 20 | POLIOMYELITIS |
| 19/20 | 5 | LEISHMANIASIS |
| 19/20 | 5 | AFRICAN TRYPANOSOMIASIS |

Four intestinal parasitoses (hookworm infections, amoebiasis, ascariasis and giardiasis) have been estimated to be among the 20 infectious diseases that cause the greatest number of ill people in the developing world.⁽⁶⁾

Mortality, morbidity and complications from the less common intestinal infections (e.g. *T. solium* taeniasis/cysticercosis, strongyloidiasis) are also important in many parts of the world.^(5,7,8)

So far, intestinal parasitoses are much neglected in many countries because (i) the affected people are unaware of, or not motivated to undertake, preventive measures; (ii) the past health service systems were not very community-oriented; (iii) simple diagnostic techniques, effective drugs, are not widely used; (iv) necessary surveys and optional programmes are not organized; (v) skilled personnel are not available; and finally (vi) financial support for preventive measures is inadequate.

1.2 Links between intestinal parasitoses, PHC and other WHO programmes.

Intestinal parasitoses are common infections and should be linked with several basic health protection programmes; they can be best prevented and controlled within the PHC system.

| |
|--|
| <p>INTESTINAL PARASITOSSES IN WHO PROGRAMMES</p> <p>Primary Health Care</p> <p>Education for Health</p> <p>Water Supply and Sanitation</p> <p>Nutrition and Food Safety</p> <p>Maternal and Child Health</p> <p>Worker's Health (agriculture, mines)</p> <p>Control of Diarrhoeal Diseases</p> <p>TDR (research and training in epidemiology, social and economic research)</p> <p>Control of Endemic Diseases including zoonoses</p> <p>Essential Drugs</p> |
|--|

Intestinal parasitic infections provide highly appropriate subjects to start health education because people know about and dislike "worms".

The transmission of most of the intestinal parasitoses reflects the local level of sanitation and the availability and quality of water. A high prevalence of ascariasis, for example, is a good indicator of improper faecal disposal and a high prevalence of giardiasis frequently reflects the lack of water or its poor quality.⁽⁹⁾

Some intestinal parasitoses interfere with nutrition (hookworm anaemia, malnutrition due to giardiasis) and several others are spread in unsafe food (taeniasis)⁽¹⁰⁾. Several intestinal parasitoses cause diarrhoea.^(11,12,13)

The common intestinal parasitoses can create problems in the most vulnerable segments of the population, i.e. giardiasis in children under 5 years, or among the most productive segment of the population, i.e. hookworm infections in agricultural workers and miners.

The control of intestinal parasitoses may also help national health programmes in building up national strategies for Health for All 2000 programme, in strengthening the national health infrastructure, in promoting community cooperation on their health problems, and in monitoring and evaluating the progress in general development. In fact, the control of a visible helminthiasis such as ascariasis was found to be a good entry point to gain the cooperation of communities in such health protection programmes as nutrition, sanitation or family planning. (14,15,16)

2. STRATEGIES FOR THE CONTROL OF INTESTINAL PARASITOSEs.

2.1 General targets for control.

A realistic target for control is the reduction of the prevalence and intensity of intestinal parasitoses to the level of insignificant public health importance. Eradication of intestinal parasitoses is not a realistic goal in most cases.

| TARGETS FOR CONTROL (1) | | |
|-------------------------|--------|------------------|
| <u>ERADICATION</u> | versus | <u>REDUCTION</u> |
| unrealistic | | possible |

For many intestinal parasitic infections (ancylostomiasis, necatoriasis, amoebiasis) controlling the disease would be a satisfactory target. There are a few parasitoses in which a single parasite may become fatal (T. solium taeniasis/cysticercosis, ascariasis); in these conditions emphasis should be put on the control of both the disease and the infection.

| TARGETS FOR CONTROL (2) | | |
|---|----|-------------------------------------|
| <u>CONTROL OF DISEASE & INFECTION</u> | or | <u>CONTROL OF DISEASE ONLY</u> |
| ascariasis taeniasis | | hookworm infections trichuriasis |

For specific targets of control see Section 2.4.

2.2 Tactics of control.

The diagnosis, treatment, prevention and control of the common intestinal parasitoses requires a horizontal approach (through PHC). However, in certain local situations, vertical interventions by special projects or epidemic control may be justified (such as waterborne giardiasis, high prevalence of T. solium taeniasis, highly endemic soil-transmitted helminthiasis).

Theoretically, intestinal parasitic infections can be effectively prevented by proper sanitation, but in practice this is a process which may take decades and require comprehensive social, economic and educational development in order to be successful.

Where the organizational facilities and economic standards are adequate enough - then community-oriented chemotherapy is a potent tool, and it offers more immediate results. In the future, community-oriented chemotherapy schemes should replace uncoordinated individual treatment and self-medication, both of which have limited impact on the population of parasites in any given area.

| TACTICS OF CONTROL | | | |
|--------------------|---|--------|--|
| (1) | <u>HORIZONTAL APPROACH</u> | and | <u>VERTICAL INTERVENTIONS</u> |
| | through Primary Health Care or other existing health services | | special projects or control of epidemics |
| (2) | <u>BY SANITATION</u> | and/or | <u>BY CHEMOTHERAPY</u> |
| | - latrines - safe food & water - personal hygiene (shoes) | | - community-oriented - individual-oriented - switch from individual treatment into community oriented chemotherapy |

2.3 Selection of infections for control

The tactics for controlling major helminthic intestinal infections may differ with each disease and each country.

The selection of intestinal parasitoses for control should be based on the results of a national survey and on the perceived needs of the people themselves. Major protozoan intestinal infections, such as amoebiasis, giardiasis, cryptosporidiosis, should be prevented and controlled within the activities of the Diarrhoeal Disease Control Programme since control measures for these infections are basically the same as for bacterial and viral infections causing diarrhoea.⁽¹¹⁾ The guidelines for control of these are available from the CDD and PDP Programmes^(12,13).

Control measures for major helminthic infections such as ascariasis and hookworm are discussed in detail in several papers^(1,2,3,4,17). The principles of prevention and control of taeniasis/cysticercosis are presented in a recent WHO document.⁽⁸⁾ Guidelines for the control of other intestinal helminthic infections, such as trichuriasis, enterobiasis, strongyloidiasis, capillariases, have not yet been elaborated by WHO. These problems, if shown to be important in a country, should be solved by seeking consultancy of experts.

2.4 The objectives of IPI control activities

Intestinal parasitoses are caused by various aetiological factors, and they differ in their geographical distribution and epidemiological patterns as well as in clinical expression of infection. Therefore, the objectives of control activities should be defined separately for each infection. Examples of desirable objectives for the intestinal parasitic infections are as follows:

- 2.4.1 in ascariasis - lowering of the prevalence and intensity of infection to the level of low public health significance through the improvement of sanitation and community-oriented chemotherapy interventions;
- 2.4.2 in hookworm infections - control of hookworm anaemia through an organized and regular treatment of cases with intensive infections;
- 2.4.3 in amoebiasis - lowering of the mortality rate due to amoebic dysentery and liver abscesses through the improvement of sanitation and quality of water as well as through the proper diagnosis and treatment of amoebiasis in individuals;
- 2.4.4 in giardiasis - lowering of the morbidity rate due to Giardia infection through the improvement of sanitation, quality of water and better personal hygiene;
- 2.4.5 in T. solium taeniasis/cysticercosis - lowering of the mortality and morbidity rates due to human cysticercosis through the improvement of general sanitation, including meat inspection and early detection and treatment of human taeniasis;
- 2.4.6 in strongyloidiasis - better understanding of transmission patterns and pathogenic mechanisms responsible for a high mortality rate in infants infected with S. fülleborni, and the inducement of proper control measures;
- 2.4.7 in hymenolepiasis - control of epidemics in children, institutions and refugees camps.

2.5 Strategies for case management

Several kinds of people with intestinal parasitic infections may require individual case management. For example, infants, undernourished children, immunosuppressed individuals and pregnant women are more likely to suffer ill effects from intestinal parasitic infections and should, therefore, be promptly treated. The most productive segment of society - young adults - are the ones who are most likely to manifest hookworm anaemia, amoebic liver abscesses and neurocysticercosis, and they too, may require individual case management.

In the periphery of the PHC system there are frequently limitations on the diagnostic facilities that are available to diagnose these conditions in individuals. However, individual diagnosis can partly be replaced by population based surveys undertaken by national or regional reference centres (1,3). The results of the survey can be used as the basis for standard case management designed at the national level by a team representing health administrators, parasitologists, epidemiologists and clinicians.

Some examples of standard case management at the PHC level, where laboratory diagnostic facilities are deficient, are as follows:

- (i) anthelmintic treatment of any case of ascariasis and taeniasis diagnosed by worms or proglottids being spontaneously expelled;
- (ii) anthelmintic and iron treatment of any case of chronic anaemia in hookworm endemic regions;
- (iii) treatment with metronidazole of any case of diarrhoea lasting longer than 10 days, in endemic areas where amoebiasis or giardiasis are most likely to be the cause.

2.6 Control of epidemics

Epidemic outbreaks and/or the highly endemic spread of intestinal parasitic infections require an immediate response from health authorities in the form of sanitary or chemotherapeutic interventions. Examples of these are as follows:

- waterborne outbreaks of amoebiasis or giardiasis need epidemiologic investigation and sanitary interventions to stop the further spread of infection and eventual prophylactic treatment of those heavily exposed;
- intensive hookworm infections among plantation workers indicates the need for better sanitary facilities on plantations, more active health education as well as specific treatment of those heavily infected;
- foci of T. solium taeniasis and cysticercosis created by the importation of infected pigs need epidemiologic investigation and coordinated interventions of medical and veterinary services.

3. THE ROLE OF NATIONAL SURVEY AND SURVEILLANCE.

3.1 Objectives of survey and surveillance.

National survey and surveillance are basic tools for planning, implementation and evaluation of a national control programme^(3,5).

GENERAL OBJECTIVES OF NATIONAL SURVEY AND SURVEILLANCE
ARE TO ASSIST HEALTH ADMINISTRATORS TO

1. define the problem
2. organize specific community-oriented interventions
3. implement diagnosis, treatment, prevention and control of intestinal parasitoses into the PHC system, and
4. assess changes in IPI patterns and their public health importance

A survey programme should collect basic data on the prevalence, intensity, distribution and public health importance of intestinal parasitoses (frequency of hookworm anaemia, intestinal obstructions due to ascariasis, etc.). The survey team should also be prepared to study social phenomena (changing human behaviour, the effects of the control programme on social integration) and collect economic data (cost of treatment of intestinal infections in hospitals and outpatient clinics, amount and cost of anthelmintics used privately).

A survey should be followed by action-oriented responses, e.g. elaboration of the standard management of intestinal parasitoses by PHC and community-oriented interventions.

Surveillance as a continuous process should be used for monitoring and evaluating the control programme as well as for assessing changes in IPI local health importance.

3.2 Methodology of a survey.

The general methodology of a survey for intestinal parasitic infections is presented in the WHO/PDP document on Surveillance and Survey Methodology for Intestinal Parasitic Infections (IPI)⁽³⁾.

The selection of the population to be covered by a national survey should take into account country ecological zones, and stratifications due to demographic, economic and educational factors. Sample design, size and techniques of studies should be standardized. Variables should be clearly defined in a protocol, they should be reproducible and as many as are essential, but as few as possible.

A national survey or surveillance activity are continuous and complex processes and ideally should be done by a team consisting of a parasitologist, an epidemiologist, a clinician, a health services administrator and technicians. The team would be best located in a reference centre, i.e. in the Institute of Public Health or a local Medical Faculty (students may be helpful in carrying out field studies and would benefit from these practical activities).

Some of the results of a national survey programme should be immediate interventions (treatment of detected cases of *T. solium* taeniasis and hookworm anaemia, prevention of further epidemic spread of waterborne giardiasis). As a rule, the final results of the survey should be regularly presented to local health authorities and used for planning health service activities.

4. DIAGNOSIS OF INTESTINAL PARASITOSEs

The diagnosis of intestinal parasitoses is based mainly on microscopical examination of faecal material; only a few parasitic infections can be diagnosed by macroscopic examination (ascariasis, taeniasis, enterobiasis). There is no universal technique for faecal examination, that could be applied to both protozoan and helminthic infections. For these reasons, reliable laboratory diagnosis of intestinal parasitoses at PHC level may not always be available.^(1,11) The possible diagnostic activities at different PHC levels are proposed in the PDP/85.2 document on Diagnostic Techniques for Intestinal Parasitic Infections (IPI) applicable to Primary Health Care (PHC) services⁽¹⁾.

At the community level it is possible to macroscopically diagnose ascariasis, enterobiasis and *T. saginata* taeniasis, as well as observe some clinical signs of severe hookworm infection (anaemia) or severe amoebiasis (dysentery). In areas where individual diagnosis is not available to all people a good community or regional survey may provide sufficient justification for (1) a chemotherapeutic test (treatment of suspected cases that are not confirmed by individual laboratory examination) justified in symptomatic amoebiasis, or hookworm anaemia and (2) a community-oriented chemotherapeutic intervention programme, e.g. control of hookworm anaemia in a region.

TYPES OF DIAGNOSTIC ACTIVITIES

1. Individual diagnosis
 - for treatment of individual cases.
2. Community or regional survey
 - justifying standard management in suspected individual cases
 - justifying chemotherapeutic or sanitary interventions at the community level

5. CHEMOTHERAPY OF INTESTINAL PARASITOSEs.

Chemotherapy is a potent tool in the control of intestinal parasitoses. There are new, effective, and safe anthelmintics, as well as increasing experience derived from community-oriented therapeutic projects⁽⁴⁾.

5.1 Basic drugs.

ESSENTIAL DRUGS FOR INTESTINAL PARASITOSEs(18):

- mebendazole or other benzimidazoles
- piperazine
- praziquantel
- pyrantel
- thiabendazole
- metronidazole or other nitroimidazoles

In addition to the above-mentioned essential drugs some others (niclosamide, bephenium, levamisole, tetrachlorethylene) are still widely used in various regions.

The dosage, indications and contra-indications for essential anthelmintics are summarized in the PDP/85.5 document on Chemotherapy of Intestinal Parasitic Infections (IPI)⁽⁴⁾. All these drugs, except thiabendazole, can be used at the lowest health services level, i.e. by responsible PHC workers with only some basic training. However, community-oriented therapeutic projects should be designed, supervised and evaluated by a district health officer.

The cost of chemotherapeutic interventions varies widely depending on the cost of the drug (imported or national product, imported in bulk or in finished form, amount of drug used and the cost of delivery). The cost of a single treatment can be as low as US \$0.05 or as high as US \$1.00. Proper selection of the drug, dosage and timing, as well as continuous monitoring of the results can make the cost/ effectiveness ratio more favourable.

5.2 Tactics for chemotherapy

Chemotherapeutic interventions will vary widely in different circumstances⁽⁴⁾.

In many countries a substantial amount of anthelmintics is used privately for occasional treatment of individuals, with little effect on the local transmission of soil-transmitted parasites. Wherever the social structure and active community involvement permit, uncoordinated self-therapy should be replaced by organized community-oriented treatment (e.g. targeted treatment).

TACTICS FOR CHEMOTHERAPY

- (1) uncoordinated self-therapy of individuals
(little or no effect on the population of parasites)
- (2) community-oriented chemotherapy
 - whole population
(mass or blanket treatment)
 - infected people only
(selective treatment)
 - people most likely to be infected
(targeted treatment)

Mass-chemotherapy of the whole population is justified as the first chemotherapeutic intervention when the prevalence of infection in an area exceeds a certain level, i.e. 60-70% in cases of ascariasis, 2% in cases of *T. solium* taeniasis. Later, when the prevalence is reduced treatment should be given only to infected people (selective chemotherapy) or to those expected to be heavily infected (targeted chemotherapy).

Selective chemotherapy is possible only in those areas (such as South Korea) where technical and financial bases for mass coproscopical examination exist.

Targeted chemotherapy for the segment of the population most heavily infected is the most economical way of lowering the prevalence and intensity of soil-transmitted helminthiases in an area. In hookworm infection, the most heavily infected people are usually anaemic; in ascariasis the target group (pre-school, school children, or both) can be defined by a coproscopical survey.

6. SANITATION AND WATER SUPPLY.

The spread of intestinal parasitoses depends mainly on inefficient disposal of human faecal material.^(19,20) Very high prevalences of particular intestinal parasitic infections could be an indicator of defective systems of faecal disposal, lack of safe water, or food contamination that requires specific interventions. The prevalence of some infections (ascariasis) can be also used to monitor the effectiveness of the sanitation projects in a given area.

There are many examples of the prevalence and intensity of several intestinal parasitoses declining substantially due to improvement in sanitation. However, improvement of sanitation is a generally slow process which depends on social integration, economic welfare and general education, and usually takes decades to give visible results. Despite these limitations, an attempt to improve sanitation should be an integral part of any project aimed at the control of intestinal parasitoses.

Inadequate supply and quality of water is frequently responsible for high prevalences of amoebiasis, giardiasis, hymenolepiasis and some other intestinal helminthiases. An improvement in water supply can reduce the morbidity due to amoebic dysentery or ascariasis by 40-50%.⁽²¹⁾

| DEFECTS IN SANITATION, WATER SUPPLY AND FOOD HYGIENE: | MOST LIKELY INFECTION PATTERN: |
|---|---|
| 1. <u>FAECAL DISPOSAL</u> | <u>HIGH ENDEMICITY OF</u> |
| Indiscriminate defecation | |
| - around the houses | - ascariasis in children under 5 |
| - around the village | - hookworm infections and ascariasis in all ages |
| - in the fields | - hookworm infections in farmers |
| Use of night soil for gardening | - all soil-transmitted helminthiases in all ages |
| 2. <u>WATER</u> | <u>HIGH ENDEMICITY OR EPIDEMICS OF</u> |
| Inadequate amount of water | - all intestinal parasitoses especially giardiasis, amoebiasis and hymenolepiasis |
| Contaminated water | - epidemics of giardiasis and amoebiasis |
| 3. <u>FOOD</u> | <u>MODERATE ENDEMICITY OF</u> |
| Contaminated with soil | - all soil-transmitted helminthiases in all ages |
| Contaminated with faecal material (flies, hands) | - amoebiasis in adults and giardiasis in children |
| Infected meat | - taeniasis in adults |

7. ACTIVITIES AND RESPONSIBILITIES AT DIFFERENT PHC LEVELS.

The activities and responsibilities for the control of intestinal parasitoses summarized in Annexes 1 and 2 are grouped in the following categories:

- (i) diagnosis, treatment, prevention and control;
- (ii) individual-oriented and community-oriented actions;
- (iii) information flow, situation analysis and response.

Because the diagnosis of intestinal parasites requires a trained microscopist, simple laboratory equipment (microscope) and basic materials (chemicals, slides, etc.), it can be carried out only in hospitals or some health centres. Mass-examination at the community level will require skilled personnel, equipment and materials from higher units of the PHC system, i.e. district health officer or reference centre.

Individual treatment of intestinal parasitoses solves individual health problems but usually has little impact on the control of infections because it covers only a small portion of the human and parasite population. However, some effect on the parasite population may be achieved by individual treatment for (i) patients with hookworm anaemia who are usually the most heavily infected and the most important in spreading hookworm eggs and (ii) patients with rare but potentially fatal and/or easily spread infections (i.e. *T. solium* taeniasis, giardiasis, hymenolepiasis). Elaboration of the standard management of intestinal parasitoses (laboratory tests, drugs, dosage) for health centres and hospitals is a responsibility of reference centres.

REFERENCE CENTRES ARE RESPONSIBLE FOR

- the technical expertise
- national survey
- training

AND HELPFUL TO HEALTH ADMINISTRATIONS IN

- taking decisions,
- implementing programmes, and
- monitoring and evaluating the activities.

Community-oriented chemotherapy may effectively control intestinal infections such as endemic ascariasis. At the present time, it is not possible to control amoebiasis and giardiasis by community-oriented chemotherapy.

The quickest and most effective way to control major intestinal helminthiases is by community-oriented chemotherapy, however, the best long-term results in the prevention and control of intestinal parasitoses can be achieved by health education and by improved sanitation.

Personnel at every level of the PHC system are obliged to educate others, e.g. specialists from reference centres - district health officer - peripheral PHC workers - members of the community. This is a "flow-down" of information. The information "flow-up" from the community to the higher level of the PHC system is also important for data collection and situation analysis, as well as for deciding upon a proper response (Annex 2).

Improvement in sanitation usually requires some help from the outside, at least technical, if not financial. Keeping sanitary installations in use is the responsibility of the community, but it needs constant supervision.

THE DISTRICT HEALTH OFFICER IS THE FOCAL POINT
OF COMMUNITY-ORIENTED CHEMOTHERAPEUTIC PROJECTS.

The responsibilities of the district health officer are (i) to analyse the situation based on information from peripheral health centres or a special survey; (ii) establish priorities and objectives for an intervention, i.e. reduce the frequency of hookworm anaemia; (iii) devise strategies, e.g. improvement of sanitation, chemotherapeutic interventions; (iv) plan and prepare interventions, i.e. coordination with other activities, giving instructions to the personnel involved, providing anthelmintics; and (v) supervise the field activities and periodically evaluate the results. The reference centre should advise the district health officer on technical aspects (selection of drugs, dosage, timing, optimal laboratory techniques).

MAJOR ACTIVITIES OF A COMMUNITY HEALTH WORKER:

- to improve local sanitation
- to carry out health education
- to link the community with health services (diagnosis and treatment, information flow, chemotherapeutic and sanitary interventions).

In any case, whenever the upper levels of PHC organize activities to be performed at the periphery, the peripheral PHC workers should be involved.

In some countries, where there is no PHC structure, responsibilities for control may be undertaken by a paramedical organization or volunteers.

8. SUMMARY.

Intestinal parasitoses remain prevalent in many countries because (i) the affected people are unaware of, or not motivated to undertake, preventive measures; (ii) the past health service systems were not very community-oriented; and (iii) simple diagnostic techniques, effective drugs, are not widely used; (iv) necessary surveys and optional programmes are not organized; (v) skilled personnel are not available, and finally (vi) financial support for preventive measures is inadequate.

The primary health care system offers new perspectives for effective prevention and control of major intestinal parasitoses in developing countries. Annex 1 summarizes the proposed activities and responsibilities at different PHC levels.

In most countries a reference centre is needed for (i) national or regional surveillance; (ii) elaboration of standard management in major intestinal parasitoses in health centres and hospitals; (iii) programming national or regional community-oriented chemotherapeutic or sanitary projects.

Standard management instructions and adequate drug supply will greatly help to solve the problems of treatment of intestinal parasitoses in individual cases, even if laboratory diagnosis remains undeveloped.

The District Health Officer is the best focal point for the implementation and supervision of community-oriented chemotherapeutic or sanitary programmes. He is also the most appropriate officer for coordinating parasite control with other health protection programmes at the district level.

The responsibility of community-health workers is to improve local hygienic standards, to undertake health education as well as to link communities with health services involved in the diagnosis and treatment of individuals and in control projects at the community level.

There are several examples showing that the control of intestinal parasites increases community cooperation in other health programmes. This is an additional justification for implementing the prevention and control of intestinal parasitoses into the PHC programme.

9. REFERENCES.

1. WORLD HEALTH ORGANIZATION. Diagnostic techniques for intestinal parasitic infections applicable to primary health care (PHC) services (PDP/85.2)
2. WORLD HEALTH ORGANIZATION. Planning, implementation, monitoring and evaluation of the control of intestinal parasitic infections (IPI) programmes (PDP/85.3)
3. WORLD HEALTH ORGANIZATION. Surveillance and survey methodology for intestinal parasitic infections (IPI) (PDP/85.4)
4. WORLD HEALTH ORGANIZATION. Chemotherapy of intestinal parasitic infections (IPI) (PDP/85.5 in preparation)
5. WORLD HEALTH ORGANIZATION. Intestinal protozoan and helminthic infections. Report of WHO Scientific Group. Technical Report Series, 666, Geneva, 1981
6. WALSH, J.A. & WARREN, K.S. Selective primary health care: an interim strategy for disease control in developing countries. New England Journal of Medicine, 301 (18):967-974, 1979
7. FLISSER, A. et al. (eds). Cysticercosis: Present state of knowledge and perspectives, Academic Press, 1982
8. FAO/UNEP/WHO. Guidelines for the surveillance, prevention and control of taeniasis/cysticercosis. (VPH/83.49) WHO, 1983
9. JAKUBOWSKI, W. & HOFF, J.C. (eds). Waterborne transmission of giardiasis. US Environmental Protection Agency, 1979
10. WORLD HEALTH ORGANIZATION. The role of food safety in health and development. Technical Report Series, 705, Geneva, 1984
11. WORLD HEALTH ORGANIZATION. Parasite-related diarrhoeas. WHO Scientific Working Group. Bulletin of the World Health Organization, 58 (6):819-830, 1980
12. WORLD HEALTH ORGANIZATION. Informal meeting on strategies for control of amoebiasis (PDP/84.5, CDD/PAR/84.2) 1984
13. WORLD HEALTH ORGANIZATION. Guidelines for prevention and control of giardiasis. (PDP/85 - in preparation)
14. WHO/UNICEF/JOICFP/JAPC. The proceedings of the seminar on parasite control in the prevention of malnutrition. Tokyo, Japan, 1-5 December 1980
15. TRAINER, E.S. Mass parasite control as an approach to stimulate community acceptance of environmental sanitation. JOICFP Review, 6: 13-24, 1983
16. KUNII, C. Parasite control strategies in the integrated family planning, nutrition and parasite control programme. In: The WHO/UNICEF/JOICFP/JAPC proceedings of the seminar on parasite control in the prevention of malnutrition, Tokyo, Japan, 1-5 December 1980, pp. 86-101

17. PAWLOWSKI, Z.S. Strategies for the control of ascariasis. Annales de la Societ  Belge de M decine Tropicale, 64, 125-134, 1984,
18. WORLD HEALTH ORGANIZATION. The use of essential drugs. Report of a WHO Expert Committee. Technical Report Series, 685, Geneva, 1983
19. FEACHEM, R.G. et al. (eds). Sanitation and disease. Health aspects of excreta and wastewater management. World Bank. Wiley 1983
20. WORLD HEALTH ORGANIZATION. Maximizing benefits to health. An appraisal methodology for water supply and sanitation projects. (ETS/83.7), 1983
21. BRADLEY, D.J. Health aspects of water supplies in developing countries, In: Feachem et al. Water, Wastes and Health in Hot Climates, Wiley, London, 1977.

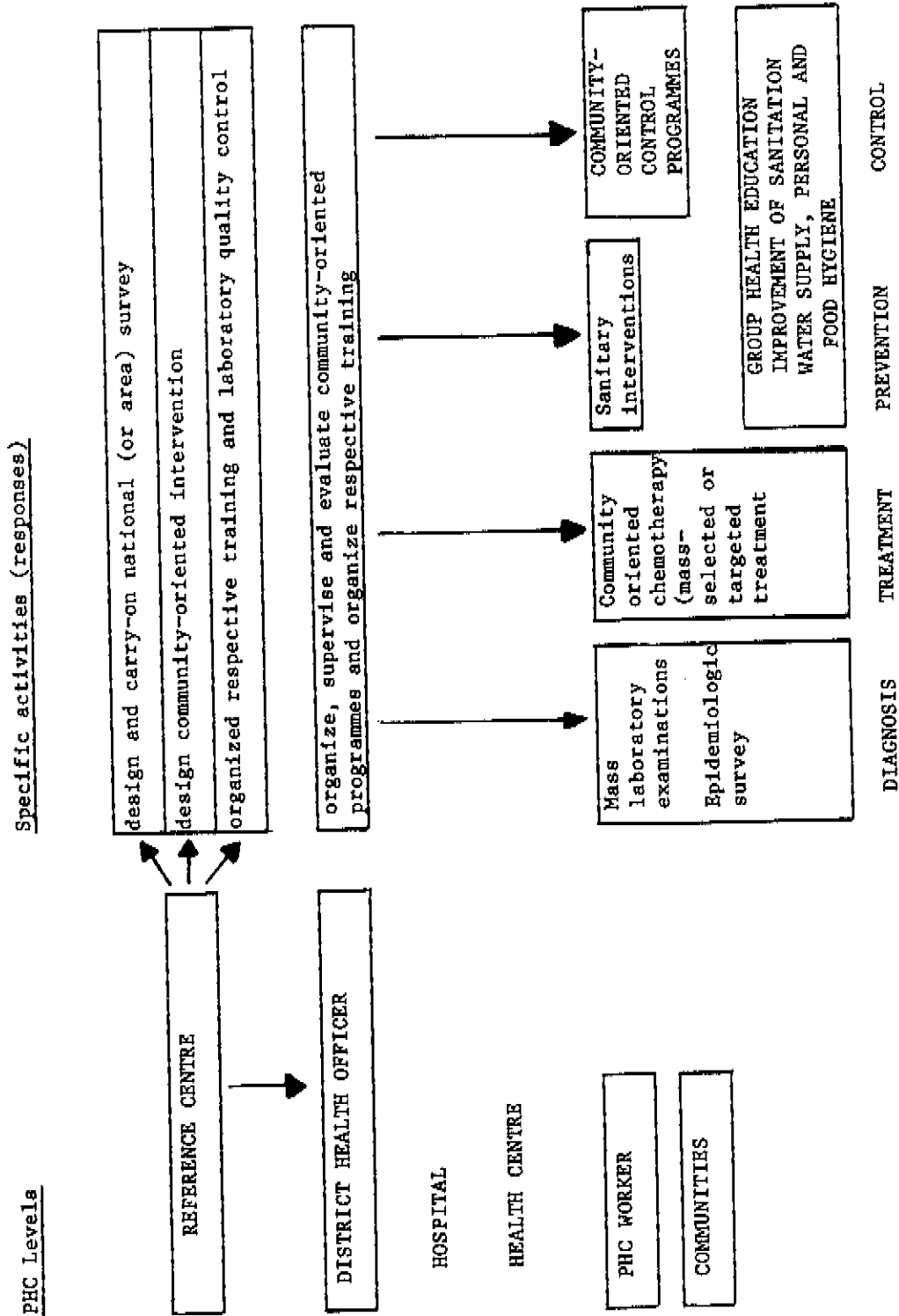
INTESTINAL PARASITOSE IN THE PHC SYSTEM

ACTIVITIES AT DIFFERENT PHC LEVELS

| <u>LEVELS</u> | <u>DUTIES</u> |
|----------------------------------|---|
| 1. COMMUNITY LEVEL | |
| Community Health Worker | <ul style="list-style-type: none">- to improve the local level of hygiene (personal and food hygiene, water supply and sanitation);- to carry out basic health education;- to collect observations on "wormy" and anaemic people, and on cases of diarrhoea and to pass on the data to the health centre;- to assist people in obtaining proper diagnosis and treatment (from health centre);- to cooperate with district health officer in carrying out local surveys and interventions. |
| 2. FIRST LEVEL HEALTH FACILITIES | |
| Health Centre Staff | <ul style="list-style-type: none">- to diagnose and treat most of the common parasitic intestinal infections in individual (hookworm anaemia, ascariasis, taeniasis, amoebiasis, giardiasis);- to assist district health officer in carrying out local surveys and interventions. |
| 3. FIRST REFERRAL LEVEL | |
| Rural or District Hospital | <ul style="list-style-type: none">- to diagnose and treat parasitic intestinal infections in individuals (as above plus strongyloidiasis and hymenolepiasis);- to pass to district health officer data on mortality and morbidity due to intestinal parasitoses; |

INTESTINAL PARASITOSEs IN THE PHC SYSTEM

(2) COMMUNITY-ORIENTED ACTIONS AND INVENTIONS



INTESTINAL PARASITOSEs IN THE PHC SYSTEM

(3) CARE OF INDIVIDUALS

