

CHAPTER 2

REVIEW OF RELATED LITERATURE



SECTION A: Onchocerciasis

2.1 Geographical distribution of onchocerciasis in the African Program for Onchocerciasis control

2.1.1 Rapid epidemiological mapping

Before a control program can begin, we need to know where the high risk communities are and who to treat. In most areas we do not yet know who is at risk. As well, the distribution of onchocerciasis is not uniform but clustered, depending on, among other things environmental conditions and socioeconomic circumstances. In order to control the disease on a large scale, therefore, it is necessary to pinpoint the communities in greatest need of control interventions – it is necessary to diagnose communities rather than individuals. Hence the emergence of rapid epidemiological mapping techniques.

Rapid epidemiological mapping of onchocerciasis (REMO), as developed by TDR, is a key tool for the control of onchocerciasis. Its development was one of the first activities under TDR's Applied Field Research component. With REMO it is possible to assess quickly and cheaply which communities are high risk of onchocerciasis and where they are located. TDR works together with WHO Regional Office for Africa and WHO's Division of Control of Tropical Diseases on REMO activities and the tool is being used to provide basic information for rational planning of control activities in the APOC countries.

Basically, REMO works by using geographical information, particularly the presence of river basins, in relation to these high-risk communities likely to be at high risk. A sample of these high-risk communities, representing only 2-4% of all villages in the area, is then rapidly assessed for the presence of onchocerciasis by feeling for nodules in 50 adults per village. More than 40 of 50 adults with nodules mean treatment is urgent; 20-40% with nodules means that treatment is highly desirable. Results from the small village samples are then extrapolated to whole areas. Mapping has been completed in Benin and is being completed in most other APOC countries.

REMO does not depend on a computer, making it a suitable tool for use in the field. It allows a rapid and low-cost vision of the distribution of the disease to be developed. There are limitations associated with such a system however, including for example the fact that the amount of information, which can be included or integrated, on a map is limited by the size of the map. Results of REMO may be collated and analyzed in a geographical information system (GIS)

2.1.2 Geographical information systems

The development of GIS for onchocerciasis in Africa is being undertaken with the Health Mapping unit of WHO/CTD. This GIS will enable identification of high-risk zones as well as estimation of the total population at risk and need of ivermectin treatment. So far, the GISs for Nigeria and Cameroon have been completed and are being used to update national plans for onchocerciasis control.

Training is being organized to ensure that all REMO teams are able to use the GIS for analysis of REMO data and for planning of control. So far, two workshops have been held one in Lagos for teams from Nigeria and Cameroon, and one in Uganda and Tanzania. Another is planned for francophone countries included Benin.

So far, the use of GIS tool indicates that previous estimates of onchocerciasis prevalence in APOC countries are in fact underestimates and that the real prevalence is significantly higher than previous thought, At least in Nigeria and Cameroon as well as Benin.

2.2 Structure, functional organization and operations of OCP

The overall authority for policy-making, planning, programming, implementation and financing of OCP operations is vested in the Joint Program Committee (JPC) composed of representatives of the Participating Countries, of the Donors and of the Sponsoring Agencies.

The Expert Advisory Committee (EAC) with a membership of not more than 12 scientists carries out annual, independent evaluations of OCP operations and gives technical and scientific advice to JPC and to the Program Director. The five members Ecological Group, a sub-committee of EAC, monitor the effect of the vector control on the aquatic environment. Representatives of UNDP, FAO, WHO and the World Bank meet several times a year as the Committee of Sponsored Agencies (CSA) to monitor program operations, consider management issues and review documentation for JPC. The committee also supports socio-economics development of the oncho-controlled zones.

National Onchocerciasis Committees (NCOs) in the Participating Countries promote OCP – sponsored activities, such as devolution. The program structure (illustrated in tables 3 and 4) describes the composition, terms of reference, functions and development over time of each of the components.

Table 3: The four-tier structure of OCP

Level	Functions	
1	Determination of the Program policy, Overall directives concerning program Implementation and decision on budget levels	Joint program committee
2	Recommendations on scientific, technical and Operational matters	Expert Advisory Committee
3	Support and collaboration : - Monitoring, scrutiny of documents, preparation for JPC sessions, support to management of OCP budget and to socio-economic development - Mobilization of funds and Trust Fund administration - Administrative support - Collaboration with donors - Collaboration with participating countries	Committee of Sponsoring Agencies World Bank WHO headquarters and Regional office for Africa Donors' meetings National Onchocerciasis Committees
4	Planning, programming, implementation of, and Reporting on, field operations developed on the Basis of EAC recommendations and approved by JPC. Budget preparation.	OCP staff

ต้นฉบับ หน้าขาดหาย

expected to be made available as a result of onchocerciasis control cover approximately 150,000 km² within the original program area, 50,000 km² in the southern extension area, and another 50,000 km² in the western extension area, a total of 250,000 km² (25 million hectares) for the entire program area.

2.4 Control operations

2.4.1 Interruption of transmission

The basic strategy of the program consists of bringing the blackfly population to a level where transmission of microfilariae is excluded and maintaining that level until the macrofilariae in humans die out. This is achieved by aerial application of insecticides to breeding sites of blackfly larvae in the rivers, regularly and over a period of 14 years.

To ensure the absence of ecologically damaging effects of the insecticides, invertebrates and fish populations in the rivers are under constant surveillance by the OCP and national hydrobiology teams. Another problem threatening the success of OCP was the emergence during the 1980s of resistance of the blackfly to the commonly used insecticide. This potentially dangerous situation was successfully overcome by developing and applying several insecticides in rotation.

2.4.2 Treatment with ivermectin

Until ivermectin (Mectizan* Merck) became available for use in humans in the late 1980s, drug therapy of onchocerciasis on a large scale was impracticable as the compounds then available could only be dispensed under strict medical control, given their potentially serious side effects.

Making ivermectin available for the treatment of onchocerciasis in humans was the result of a joint effort by WHO/OCP and Merck & Co., Inc. This is an illustration of fruitful collaboration with pharmaceutical industry. Furthermore, Merck & Co., Inc. provides ivermectin free of cost, for the treatment of onchocerciasis "for as long as necessary".

Ivermectin kills the microfilariae. It is given orally, usually once a year, and brings the microfilarial load to a very low level, lasting a few months, before again approaching the pre-treatment level within one year. There are no serious side effects and the drug therefore lends itself eminently to a large-scale distribution.

The clinical effects include alleviation of discomforts such as itching and, most importantly, a significant early reduction in the risk of developing eye lesions. Ivermectin does not reduce transmission of onchocerciasis to a significant extent and has therefore to be given annually over many years.

2.4.3 Modeling

Control programs for onchocerciasis have benefited greatly in the recent years from the development of the ONCHOSIM model – a computer program which has been used extensively to inform decision-making (for example, about whether to stop or resume control activities). ONCHOSIM simulations have indicated:

- What the long – term impact of a microfilaricide would be and whether the eradication of onchocerciasis would be feasible.
- That on basis of ivermectin being predominantly a microfilaricide with some macrofilaricide activity (quantified at around 30%), it would take up to 50 years with annual ivermectin treatment alone at a coverage rate of 65% of the total population, or more than 15 years with 6-monthly treatment, to achieve eradication.

SECTION B: Theoretical framework (review of previous work)

2.5 Ability and Willingness to pay

Economists have a powerful concept to examine ability to pay (ATP), namely demand, defined as willingness and ability to pay. Consumers are assumed to be able to afford whatever they are willing to pay, because they know best how to allocate their resources. The affordability of essential services like health care has become a critical policy issue in many developing countries because people are expected to contribute more from their own pockets as a result of health sector financing reforms (e.g. user fees, community financing). In this review we assume the health care to be affordable even if the family would have to sacrifice some food for some more health services; but only if the family can do within their budget. It should be though that they still can afford as long as the sacrifice will not make the food consumed too little than the daily requirement. It is just the matter of money allocation of the consumer responding the change in the relative prices of goods and services.

Steven (1996), in a review article described the concepts and evidence of ability to pay for health care in developing countries. The author stated that most policy debates and research on cost recovery have focussed on willingness to pay (WTP) for essential services, and have tended to assume that willingness to pay is synonymous with ability to pay. This article questions this assumption, and suggests that WTP may not reflect ATP. Households may persist in paying for care, but to mobilize resources they may sacrifice other basic needs such as education and food with serious consequences for the household or individuals within it. From the few study available, common household responses to payment difficulties are identified, ranging from borrowing to more serious distress sales of productive assets (e.g. land), delays to treatment and, ultimately, abandonment of treatment.

Consumers are assumed to be able to afford whatever they are willing to pay, as they know best how to allocate their scarce resources. In the case of health care this principle is not true. A couple of studies conducted in developing countries have shown that willingness to pay for health care was not influenced by household income.

The studies of Heller (1982), Akin et al (1986) and Hancock (1993) concluded that willingness to pay for outpatient services was not influenced by household income.

Many studies assessing utilization pattern before and after the introduction of user charges reported considerable decline in utilization after the introduction of user charge. The studies of Yoder (1989), Waddington and Enyimayew (1989) in Ghana; Thomason (1994) in Papua New Guinea; and Mwabu et al (1995) in Kenya revealed that people are not willing to utilize the services after the introduction of user charges. These studies also confirmed that unwillingness to use health care was not necessarily related to affordability.

In contrast to the above findings, Soucat et al in Benin and Guinea (1992), Alihonou E. in Benin (1987), and Litvark in Cameroon (1992) have shown that the introduction of user fee with revenue kept at health center level, associated with improved quality of services and local management has radically increase the utilization. In Mali, Ghana and Cameroon, comparisons between different districts or different types of health facilities in the same country have revealed both increase and decrease in utilization rates following price changes. The critical elements determining utilization rates are the size of the price increase, the targeting and timing of improvements in the services offered and the improvement of availability of drugs. However health care is likely to be purchased despite financial difficulties when illness is perceived to be severe. A few studies based on household surveys explored families sources of health care financing founded on the ability principle. Ettlting et al (1994) showed that very poor income households, with an average annual income of \$ 68, carried a disproportionate share of the economic burden of malaria, with total direct and indirect costs of malaria among these households consuming 32% of annual income (quoted in Njoumeni, 1996). The poor families adopt different coping strategies when payment difficulties arise; seeing that a study done by Waddington and Enyimayed (1989) in Ghana, have shown that people mobilized resources for health borrowing from kin and friends and by selling their belongings, livestock and farm products essential to current consumption.

These above studies reveal that the factors which influence a person's decision to spend, or not to spend on health care are complex and it is difficult to determine if payment or non payment is due to ability to pay or any other factors. Spend on health care is thus determined not only by income or price of care, but others factors such as perceived quality of care, distances to the health quality etc. This is confirmed by Njoumemi (1996) who said the family ability to pay for malaria treatment costs is response to changes in income, saving productive assets ownership (e.g. land) etc. In case of onchocerciasis, the ability to pay may be depend on the perceived benefit of ivermectin, the level of knowledge about the disease etc.

Many studies in related field of ability and willingness to pay used contingent valuation methods or traditional economic methods. These studies however, were only used for research purposes and did not to arrive at a definite conclusion on peoples' ability and willingness to support health care services. A study by Obina (1995) tried

to measure ability and willingness to pay using a multi-dimensional index of consumer choice. Although it not reveal the true value of willingness and ability to pay, however, the study stands out clearly as the only one where the result can be used to arrive at definite policy guidelines.

2.6 Community involvement

The concept of “community” implies a group of people sharing something in common. However, communities are rarely easy to define. Geographical communities inevitably comprise a population with varying class, and age composition, and are unlikely to be homogeneous in their views about health-care needs. Seeking views or decisions from communities carries implications in terms of the weight given to one group compared to another. It is all too easy in developing community participate structures to reinforce existing power structures that may be exploitative of various groups such as women. Indeed, community participation can be subverted into an extremely manipulative process.

The second principle underlying PHC (Primary Health Care) is that of community participation. A variety of different interpretations as to what is meant by the term have emerged since Alma-Ata. These include:

- The individual’s responsibility for her/his own health;
- Individual or community involvement in decisions about health care; and
- The individual’s contribution to resources or community “self-help” schemes.

While all above can be detected in the Alma-Ata Declaration, varying emphases have been placed on these. For example, the last of them has been increasingly used by proponents of community financing of health care as a justification for such initiatives as the World Bank’s policies in health care financing and UNICEF’s Bamako Declaration.

Within the framework of Bamako Initiative (B.I) in Africa, the community should participate in the micro planning of health activities and monitoring of the progress. These have helped involve community members in the exploration of problem areas and identification of effective solutions.

Participatory micro planning represents an effective management tool used within the framework of BI. Micro planning is adopted to facilitate:
The definition of specific health objectives judged feasible in the light of the selected actions;

- The design of operational strategies;
- The preparation of detail district coverage plans
- The reorientation of services base on the results from the monitoring of health systems performance.

Alternative participatory problem solving approaches have been developed and applied not only in the field of health, but also in other fields including nutrition, water

and sanitation. Within the framework of BI the methods tested and adapted to context-specific circumstances range from “Assessment-Analysis-Action”

Donor resistance and the government incapacity to cover local recurrent costs require finding other financing sources. Experiences have shown that community contributions to the financing of the health care can generate sufficient revenue not only for restocking of drugs, but also for covering certain local operating costs. The community must be involved in decision-making, strategy choice, and financing management and control of the health services. This active participation by the community is one guarantee of the system’s sustainability, since the population, which helps finance it, is also partner in assuring its functioning (Knippenberg, 1990)

Experience with BI in west and Central Africa shows that community financing concerns primarily essential drugs. This financing model satisfies one of the greatest direct needs of the population. The need for drugs explains their support for community-financed health center systems and is a strong guarantee of their sustainability as long as complementary activities ensure adequate functioning

2.7 Sustainability

Sustainability, a neologism drawn from “sustainable” is defined as the capacity of a thing to be kept up, prolonged, or carried on. In the context of development, it is usually used to define the capacity of a project, a program or a set of actions to continue over time without major interruptions. Synthesizing the literature, there seems to be a growing consensus around the key concepts composing sustainability. A certain output is produced without breaks, the required inputs for producing this output being continuously available. “What” is going on, “How much does it cost”, and “are resources available” are thus three inherent dimensions of sustainability.

In line with the above, we propose to define *the sustainability of PHC as the production of health outputs and outcomes at optimized efficiency with uninterrupted inputs.*

Three main dimensions are part of this definition of sustainability:

* Effectiveness of the system is the first, central dimension of sustainability. Whether it is in the context of the Bamako Initiative in west Africa, the issue of financial viability of any system is logically only considered relevant if related to a specific output to be produced. The study of Ebrahim M. Samba(1994), (The Onchocerciasis Control Programme in West Africa) is an example of effective public health management. The author showed that the fact that the Program has been in existence now more than two decades and has kept the unwavering support of all its partners – participating countries, donors and sponsoring agencies alike – testifies to its considerable achievements. The effectiveness of OCP is incontestable seeing that the first part of the Program’s objective – to remove onchocerciasis as a disease of

public health importance and an obstacle to socioeconomic development has been achieved in all of the eleven Participating Countries.

* Efficiency of services is the second of the main dimensions of sustainability. Efficiency is imperative for a sustained public health system as it has to provide a large spectrum of public health interventions. To be able to offer the less “profitable interventions the system has to be especially efficient in the more profitable ones.

* Financial viability is the third and most recognized dimension of sustainability. Under funding is mentioned in most if not all of the studies. In the context of severe economic constraints and uncertainty with regard to governmental funding, most PHC systems in West Africa are permanently on the brink of bankruptcy. In most of these countries, health services often just stopped functioning, when an economic crisis in the 1980s led to a dramatic decrease of public spending. In this context, restoration of interrupted resources availability is a sine qua non condition to implement any functioning PHC system.

The Onchocerciasis Control Program providing sustainable services can therefore be defined as a program that produces as an end result:

- “effectiveness over time”, providing a given level of output
- “efficiency over time”, working at the best level of efficiency possible
- “financial viability over time”, in which revenue from diverse sources are equal or higher than the cost of services. Obviously this end result can only be achieved if a minimum of enabling conditions is fulfilled.