Multi-sectoral and integrated approach in the control of vector-borne diseases

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Abstract: Tanzanians are burdened by many health problems, the most leading ones being vector-borne diseases such as malaria, schistosomiasis, filariasis, onchocerciasis and tick-borne relapsing fever. Control strategies of these diseases are hindered by meagre allocations of scarce resources to control agencies by the Ministry of Health. Where control strategies have been initiated for specialized disease control, most of them usually by donor agencies, have failed to operate sustainably when donor support ceases. This paper examines and explains the role of multi-sectoral and integrated approaches that are cost-effective in the control of vector-borne diseases.

Introduction

Vector-borne diseases are a group of diseases that are transmitted by animals or insects that harbour pathogenic micro-organisms and convey them to other animals or humans who become infected. They are often attributed to poor socio-economic conditions. They may also be associated with different development projects such as construction of dams for hydroelectric power generation, irrigation systems, man-made water impoundments and flood control. These diseases are of public health importance to many communities as they cause physical incapacity, loss of days at school and work, reduced agricultural production, chronic morbidity and finally death.

Trends of vector-borne diseases in Tanzania

Accurate data on the prevalence and distribution of vector-borne diseases in Tanzania is limited to few areas. However, these groups of diseases are on the increase and becoming more common to-date than ever before in both urban and rural areas. Factors contributing to the increase of vector-borne diseases are environmental degradation, poor health services and lack of appropriate control measures. The former has promoted clinical changes and favourable habitats for increased vector breeding thus resulting into high population densities. For example the East Usambara Mountains in Tanga were known to be malaria free until the early 1960s. Deforestation activities in the area have now promoted the exogenous development of malaria parasites, thus accelerating malaria transmission and prevalence. Where as the latter is due to the deteriorating economic condition of the country since early 1980 (*1*), hence directly affecting the health and other sectors responsible for the prevention and control of these disease sustainably. As a result, the quality of health services i.e. lack of necessary equipment and drug supply (*2*) and lack of skilled manpower at peripheral health delivery services has declined since the 1970's (*3*).

Lack of access to timely and effective health care systems characterized by different sets of factors such as too far from home, too few trained health care providers, too poorly equipped to identify or handle disease complications and geographical location of health centres have also greatly contributed to this trend. This has therefore resulted into an inverse proportionality of health services improvement and control strategies of these diseases towards the current developments.

Epidemiological records from health facilities in Tanzania indicate that malaria is the leading cause of outpatient attendance and that proportions of admissions and deaths are increasing yearly (*4*). Yet, these records are only a fraction of the true rates as they indicate only the cases attended in health facilities. There are numerous unreported cases, for example, those who seek treatment somewhere else such as local medical stores and shops.

Bancrofiatian filariasis is in steady increase in urban areas of the afro-tropical regions, Tanzania being part of it (*5*). This is due to unchecked urbanization resulting into dense urban populations, increasing unsanitary conditions, tolerance of the vector to available insecticides. Water development projects (fishing ponds, irrigation canals, hydroelectric systems) in the rural areas greatly account for the increase in the densities of anopheline vectors leading to transmission of the disease in rural communities. There was no any control programme in areas where the disease is endemic until recently when the national filariasis control programme was set up.

Schistosomiasis is one of the leading causes of severe morbidity in several foci in Africa, Asia, and South America.

The distribution of the disease in Tanzania mainland has been described by Rugemalila (*6*). Swimming, bathing, washing, water collection, animal husbandry and fishing contribute to humans being exposed to the infecting agent. The ever increasing exploitation and utilization of water resources, particularly for irrigation projects, hydroelectric power generation, man-made water impoundments for both domestic and recreational uses, increases the exposure risk to the disease as well as its prevalence since there is no national control programme existing to date apart from the few school deworming programme whose execution is mainly focal.

Although public health importance of schistosomiasis has been demonstrated nationally, recommended control interventions and strategies are difficult to implement because of their high costs and lack of a national control policy for the disease (*7*).

Onchocerciasis or "river-blindness", is a disease that results from infection with the thread-like nematode, *Onchocerca volvuuls*. Maegga (*8*) has described the distribution and prevalence of onchocerciasis vectors in Tanzania. This disease produces dermal nodules, lymphatic and systemic complications and severe onchocercal lesions of the eyes which eventually lead to blindness despite its long existence in the country, no much has been done so far on its clinical and socio-economic effects. Control measures are limited to few foci in Tanzania. Available control strategies in areas where the disease is endemic are mass treatment through community directed treatment with ivermectin (CDTI) which is spearheaded by the National Onchocerciasis Control Programme (NOCP) of the Ministry of Health. Communities are involved in decision-making process about the programme execution, selection of drug distributors and attendance at health education sessions thus enhancing the perception of programme ownership.

Constraints in controlling vector-borne diseases in Tanzania

The control of vector-borne diseases has in the past been the responsibility of specialized health agencies. And in most cases, control measures are directed to one disease and are centrally managed so that communities, let alone other agencies participating independently in the development process, have no linkage with the activities undertaken and consequently the best use of resources is not achieved (*3*).

As if this was not enough, community participation through local political groups, women's groups, non-governmental organizations and voluntary organizations was inadequately integrated with control activities. In other words most these programs were implemented vertically. Furthermore such programmes were not implemented in all endemic areas or at national level. For example, malaria vector control and eradication projects have been implemented in Mwanza Municipality (*1*) and in Zanzibar respectively. The Mwanza malaria vector control project was not sustainable and was interfered by the 1972 decentralization programme (*9*), inadequate funds and reallocation of personnel to other sectors. When the malaria eradication programme in Zanzibar was discontinued for political reasons and the subsequent funds cut-off by the donor, the disease prevalence almost rose back to pre-treatment levels. Due to severe financial constraints to meet the cost of purchasing chemicals and equipment plus payment of locally trained manpower in vector control, these projects failed to last longer. Therefore, vector control has been limited to active and able individual families who learnt from experience the importance of vector control for their own health and that of their families.

Alternative Strategies

There is neither a single and cost-effective method which is sufficient in preventing and controlling vector-borne diseases in general, nor is the control of these diseases the sole responsibility of the health sector. It should be recognized that measures of mitigation and their control should be a shared responsibility of different multi-sectoral/inter-sectoral, public and private organizations. Given the socio-economic profile of our country, the allocation of man-power and financial resources made available to the health sector for the control of a single disease towards the 21st Century is a short sighted approach if alternative measures can not be considered or included.

Multi-sectoral and inter-sectoral collaboration for increased disease control should be envisaged as an essential planning goal rather than an option. Multi-sectoral collaboration is a key principle of primary health care and thus an important feature of many control programmes. Inter-sectoral collaboration fosters information exchange and dialogue with other sectors to determine their priorities.

In this approach, sectors which can be involved range from the community, governmental and non-governmental organizations including ministries,

local authorities, religious organizations, voluntary organizations, bilateral or international agencies, to mention a few. It is necessary to know what they are doing; and where their interests overlap with those of the Ministry of Health.

An integrated approach, of course, calls for closer cooperation at governmental and intergovernmental levels. This approach should aim towards the spirit of co-existence between two or more strategies applied concurrently towards the control of a single disease provided no one is harmful to the other. An integrated approach strategy reduces duplication in personnel, expenditure and ensures the maximal and economic use of scarce resources (*10*). To achieve these, the Ministry of Health should consider establishing and promoting a policy of multi-sectoral and integrated approach, which should address the advent and control of vector borne diseases as these remain to be the most dramatic and reliable indicator of the negative health impact of development programmes of our people. In establishing this policy, the ministry should clearly define the role of various (actors) sectors on the control of vector-borne diseases to ensure compliance, co-ordination and efficiency in implementing this approach.

The fight against vector-borne diseases will be difficult to manage and to sustain for long periods if the community is not involved in this struggle. Community participation entails the formation of an active partnership between community members and health workers to solve their local problems (*11*). The community must be involved in the assessment of the situation, definition of problem and setting of priorities. They should be made to learn to identify their health problems and setting of priorities for environmental and health linked issues surrounding them. They should also be made to learn how to solve health problems (*11,12*). Therefore, steps have to be taken to ensure free and enlightened community participation so that individuals, families and communities assume greater responsibility for their own health and welfare.

Experience from other countries

Experience from other countries has shown that the control of vector-borne diseases is feasible, affordable, and cost-effective through a multi-sectoral and inter-sectoral approach. For example, in many parts of China and Morocco (*10*), community involvement in filling canals and other snail habitats have been successful in controlling schistosomiasis. In the Philippines health education was used as a strategy to encourage community members to refrain from swimming in snail infested streams. Inter-sectoral approaches have shown excellent progress in El Salvador (*10,12*) in vector control with considerable community participation in drainage projects. In India, biological and environmental management practice in the control of malaria transmission was successfully carried out involving about ten (*9*) different sectors where each sector contributed financially in the control measures implemented. This has resulted in the reduction of controlling costs and hence in harmony with other development projects.

In Oman (*10*), reduction of mosquito breeding sites by means of drainage and distribution of larvivorous fish was successfully achieved through involvement of villagers and inter-sectoral co-operation. In Djibouti, village health committee of religious, administrative, social and educational leaders have successfully co-operated in the reduction of vector breeding places, through rearing and distribution of larvivorous fish (*3*). In Mali, where schistosomiasis (both intestinal and urinary) is one of the most common health problem associated with man-made lakes and irrigated areas, control strategies using a combination of chemotherapy, health education, provision of clean water and focal snail control in transmission sites resulting in a reduction of its prevalence by 50%. In Swaziland (*12*), control of schistosomiasis in three irrigation estates where prevalence was initially high, was achieved through several intervention approaches such as provision of adequate and safe domestic water; construction of communal toilets, laundry facilities, agricultural and irrigation practices of high standard, including the use of concrete lined canals, subsoil drainage, and appropriately increased water flow rates in lined or realigned canals.

Control of human onchocerciasis through community directed treatment with ivermectin (CDTI) has shown to be effective in 39 projects located in 19 countries of Africa (*14, 15, 16*). Communities were involved in large-scale distribution of ivermectin where endemic communities are empowered to take the full responsibility for the drug distribution process, decision on how and when treatment should be administered and oversee its implementation and follow-up. To ensure the sustainability of this programme, CDTI activities were integrated into the existing primary health care systems where the programme will benefit from the resources of the of the health service while at the same time the health

service will take advantage of the community orientation. In areas where health services are inadequate, CDTI has been used to disseminate health information and hence serves as vehicle for communities to convey their health needs to government and other agencies.

In conclusion, in view of the above cited examples and regarding the experiences in multi-sectoral and integrated approaches adopted by different countries in the control of these diseases, the Ministry of Health has to take into account the possibility of adopting a multi-sectoral and integrated approach in the control of vector-borne diseases. These are important strategies that we should opt for as alternative control methods.

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