The Role of Health Systems in Malaria Prevention and Control

Introduction

Ever since 1897, when it was discovered that malaria was transmitted by mosquitoes, vigorous control efforts have been deployed to complement treatment of the disease. The fight against malaria recorded huge successes in the early 1930s and 1940s with the use of DDT and synthetic insecticides. In subsequent decades, emphasis was placed on malaria eradication. However, despite these earlier successes, there was a resurgence of malaria in the 1970s and the focus shifted to control rather than eradication.1

WHO, working with countries and other partners, developed a global strategy for malaria control which was adopted by a global ministerial conference in Amsterdam, the Netherlands, in 1992. In 1995, the WHO Regional Committee for Africa adopted the Regional Director’s initiative for accelerated implementation of the Regional Strategy for the period 1996-2001.2 In October 1998, the Roll Back Malaria (RBM) initiative was launched at the United Nations in New York. All of these endeavours relied on early diagnosis and treatment, preventive measures (such as vector control, research, early detection), and control and prevention of epidemics. RBM placed special emphasis on strengthening national health systems as a major strategy for controlling malaria. It also encouraged both human and financial investments for strengthening health systems.

Despite these efforts at the national and global levels, malaria continues to be a major cause of morbidity and mortality, especially in Africa which accounts for 90% of the world’s cases and over 90% of the more than one million deaths attributed to the disease every year. Some writers have described malaria as “Africa’s silent tsunami”.3

Linking health systems to prevention and control

Considerable success in control of malaria was achieved in the early 1960s. A number of factors were responsible for this. They included the availability of effective and affordable treatment, stable and functional health infrastructure, strong political commitment, and strong vector control measures such as insecticide spraying and clearing mosquito breeding sites.

Over time, malaria prevention and control experienced a number of challenges. Among these were the development of resistance of mosquitoes to residual insecticides, parasite resistance to medicines in use, and relative inaccessibility to alternative medicines that were effective, acceptable, affordable and safe, even when available. In addition, health service delivery systems, which have been affected by inadequate financing, shortage of skilled health personnel, poor or inexistent diagnostics, and poor management, have placed prevention, treatment and care for malaria beyond the reach of the majority of the people. The poor, who are more likely to encounter mosquitoes and are thus more vulnerable to infection, are unable to afford preventive measures like insecticide-treated nets (ITNs). They often cannot pay for care and treatment when they fall ill, especially in the absence of free or subsidized care and treatment at public health facilities.

The role of health systems in malaria prevention and control can be appreciated by reviewing the characteristics of a prevention and control programme. The success of such a programme depends on how well it interferes with the life-cycle of the protozoa (i.e. how well it can prevent contact between the parasite-laden mosquito and people), how well it can detect infection and how quickly infected persons can obtain appropriate and effective treatment and care.
Various methods are now available to facilitate prevention or reduction of contact between the mosquito and its human victims. They include reducing the population of the vector through insecticide spraying; removal of breeding sites; ensuring proper environmental management; and reducing contact of the vector with people through the use of ITNs, screens and repellents.

Other preventive methods include chemoprophylaxis and research into the development of a possible malaria vaccine. For persons who are unavoidably in contact with mosquitoes, early detection of their disease condition is desirable so that timely and appropriate treatment and care may be provided. This is crucial as it could mean the difference between life and death, especially in children, women and the elderly.

Clearly, therefore, the status of health systems makes all the difference. Appropriate interventions require availability of commodities (ITNs, medicines, logistics, equipment) in the right quantities and at the right times. This, in turn, requires proper procurement, storage and distribution systems.

Integrating prevention and control with overall health policy and plans

Like any other health programme, malaria prevention and control needs to be an integral part of the national health policy and strategic plan so that it not only benefits from the national guidance on technical approaches but also from overall health investment planning. It is becoming increasingly clear that there is an urgent need to put in place treatment policies, especially with the advent of drug resistance and emerging malaria medicines. The implementation of the programme should be guided by a national strategy that outlines what needs to be done at all levels, what structures are required, and a clear definition of the expected roles and responsibilities of all the different partners and stakeholders, from the central level to communities and households.

Programme management

Management of malaria control programmes has always been taken for granted. Clear assignment of responsibility to key players is crucial, as are management skills.

Poor management, both at national and operational levels, may often be responsible for inefficiency in programme implementation. For example, management skills could help programme managers make sound judgments on how best to integrate malaria prevention and control interventions into other health programmes and decide on how best to use and deploy available resources.

Health systems in the African Region are faced with severe shortages of health workers such that a significant proportion of the peripheral health facilities are run by untrained personnel. Getting the best out of such a situation calls for training these cadres in proper case management. Supervision of such cadres is also important. Simplification attempts have been made to avail such personnel with malaria management protocols based on symptoms and signs exhibited by patients with malaria.

Financing

Health financing as a whole is inadequate in the Region. Most of the countries are still far below the minimum per capita financing of the essential health package estimated at US$ 34. Increasing financial burdens are falling on households in the form of out-of-pocket expenditure for basic health services.

With regard to malaria, the issue of how best to avail ITNs to the populations, especially the poor, remains unresolved. In some cases, attempts have been made to subsidize the cost of ITNs, while some vulnerable target populations receive them free-of-charge. Despite these efforts, ITNs still remain out of reach of many. Bearing in mind the serious impact malaria has on people, a deliberate financing mechanism for ITNs would go a long way in ameliorating the situation. These commodities should be financed from the public treasury.

The cost of treatment is bound to significantly increase as the relatively affordable medicines (chloroquine and sulphadoxine-pyrimethamine) are replaced by far more costly artemisinin-based combination therapies (ACTs). Forging partnerships with global health initiatives and drug companies may bring the cost of such new medicines to affordable levels.

Information management and monitoring

Reliable information on the burden of malaria is not always readily available in countries. That which is available, captured in routine health information systems, is an underestimation.
of the real burden of the disease as more and more people tend to either undergo self-treatment or obtain treatment in private health facilities.

An appropriate monitoring system is required to improve the quality of routine information captured from the private sector. A periodic survey that would capture trends in communities is also desirable.

Augmentation of some existing community-based structures, such as drug distribution outlets and other community resource persons, could help capture information on malaria prevention and control. Capturing surveillance trends on morbidity and liaising with weather forecasting departments could improve early warning and detection. It is also necessary to monitor drug resistance so as to inform practice and policy on treatment.

**Ensuring quality treatment and care**

Quality of treatment and care for malaria could greatly be improved by developing laboratory and diagnostic capacity at all levels. A simple blood slide should be available at peripheral health facilities to help diagnose malaria. Currently, very few of these facilities have a microscope and a microscopist in place. As a result, a large number of cases are diagnosed as malaria merely on clinical grounds.

With the improvement in technology, equipment for rapid malaria test is readily available on the market; if it were available in health facilities; it could go a long way in improving the quality of management of the disease.⁸ There is also the need to support laboratory services in hospitals. An opportunity for improving laboratory services is provided by on-going investment in laboratories dedicated to diseases such as tuberculosis and leprosy. These facilities can be used by technicians for better diagnosis and treatment of several diseases.

Quality care in malaria requires an effective referral system. Home-based management of fever should be backed by assurance of a health facility in the vicinity for further management. Likewise, health facilities should be linked and able to offer comprehensive care. This calls for appropriate skills at each level, better communication and transport facilities for a more efficient and effective referral system, in addition to appropriate information, education and communication.

**Research and development**

Research and development have played a great role in malaria prevention and control. Efforts such as those by the Malaria Medicines Venture (MMV) to fund and manage the discovery, development and registration of new medicines for the treatment and prevention of malaria in endemic countries are encouraging. Operational research has identified bottle necks in the implementation of malaria interventions, and research into new medicines has brought forth the artemisinin derivatives and other synthetic medicines.

A new vaccine tested among children 14 years old for a period of six months in Mozambique has shown positive results in paediatric trials against malaria.⁹ Although researchers realize that the vaccine will never achieve 100% effectiveness, the paediatric trial will soon enter Phase 2, and market authorization may be possible by 2010. Research and development in vaccine and medicine development as well as vector biology is a cornerstone in the search for a long-lasting solution to malaria.

**Conclusion**

Over the last half century, serious interventions, including global and regional strategies and partnerships, have contributed to malaria prevention and control. Malaria still remains a major health threat, particularly to populations in sub-Saharan Africa. One of the major bottlenecks is weak health systems. Strengthened health systems and malaria prevention and control programmes will provide the required services to the people who need them the most. Strengthened research and development will result in effective medicines and vaccines to rescue the suffering masses in Africa. The most important lesson to remember is that health systems can save the malaria-vulnerable populations in the Africa Region.

**References**

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* Dr Tumusiime is the Regional Advisor for District Health Systems at the Regional Office.