Malaria Elimination in Iran, Importance and Challenges

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ABSTRACT

Background: The aim of study is to assess the importance and challenges of Malaria elimination (ME) in Iran's health system.

Material: Opinion of experts from Ministry of Health and Medical Education and the chancellors of medical universities affected by malaria were gathered using Focus Group Discussions and in-depth interviews. We asked them about the importance and main challenges of ME in Iran.

Results: Main factors on importance of ME were: it's a struggle to reach to equity in the poorest regions of county, prevention of emerging disease in susceptible regions, lowering the cost of control and its effects on the region's socioeconomic condition. Main challenges were Iran's long border with malaria-endemic countries Pakistan and Afghanistan and illegal immigrants, underdevelopment in rural areas, system's insensitivity and diagnosis problem due to reduction of cases.

Conclusion: Quantitative and holistic researches are needed for assessing the consequences of ME.

Keywords: Malaria, Prevention and control, Iran, Impact

INTRODUCTION

A declining trend has been noted in the number of malaria cases in Iran in the past few years; based on the 2009 World Health Organization (WHO) malaria report, Iran is in pre-elimination phase.[1] Some characteristics of this phase are: A significant reduction of affected cases, and the disease is not considered as a heavy burden on the society. The final goal of this stage is when there is nolocal transmission for malaria.[2,3] Latest figures revealed the disability-adjusted life year (DALY) for malaria to be 0.6 per 100,000 population.[4] Its rank is about 180th among all other diseases in Iran. It should be noted that these statistics date back to 2002 and since then there has been a considerable decline in the number of malaria cases so that the incidence rate reached to 0.24 in 100000 in 2007, [Figure 1][5] furthermore it is limited to three province in south east of Iran [Figure 2]. Considering these facts and the changes in the country's action plans, one should argue about the importance of ME and its challenges in Iran.

According to WHO2009 report, many of the countries in the

elimination phase, including Azerbaijan, Turkmenistan, Oman, Georgia, Turkey, Uzbekistan, Armenia and Kyrgyzstan, are the neighboring countries of Iran and have similar conditions. As a result, one could conclude that achieving such a phase would not be impossible in Iran.[1] In addition, elimination programs are often set up in areas where a really low rate of malaria transmission is reported and therefore such a goal would be achievable, so Iran is among countries where implementing appropriate plans could lead to the elimination of the disease.[2]

The different methods used to estimate the cost-effectiveness of malaria control measures are not useful in the elimination phase.[6] This is mainly due to reduced number of cases; as a result, alternative techniques should be set to point out the importance of ME. The present study is therefore, designed to assess the importance of ME and its possible challenges.

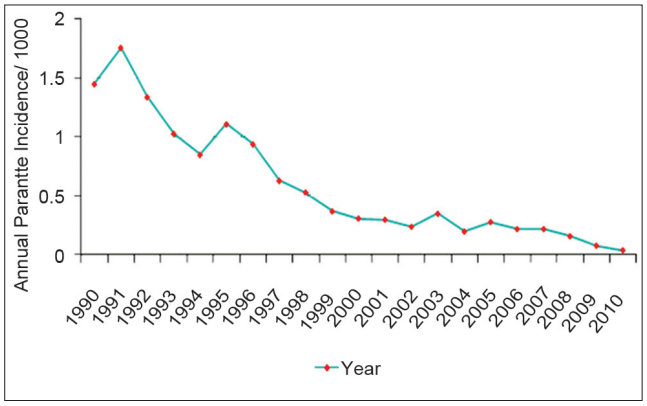

Figure 1: Trend of malaria cases in Iran 1990-2010

METHODS

The present qualitative study was designed to gather the point of view of the chancellors and their vice-chancellors of three provinces in South-East of country (Sistan and Bluchestan, Hormozgan, and, Kerman), as well as the chancellor of Boushehr University of Medical Sciences, the first three province are main malaria-involved provinces and Bushehr was involved with malaria problem in a few years ago. All of the chancellors were specialist in genetic, pediatrics, infectious diseases and dentistry. All of their vice chancellors were general fractioned. It is worthwhile to mention that in Iran the medical universities are the main responsible authorities for health system in each province. Nine focal points and healthcare providers from the provinces involved in malaria-control programs also attended the interviews, three of them were from Kerman, three of them from Sistan and

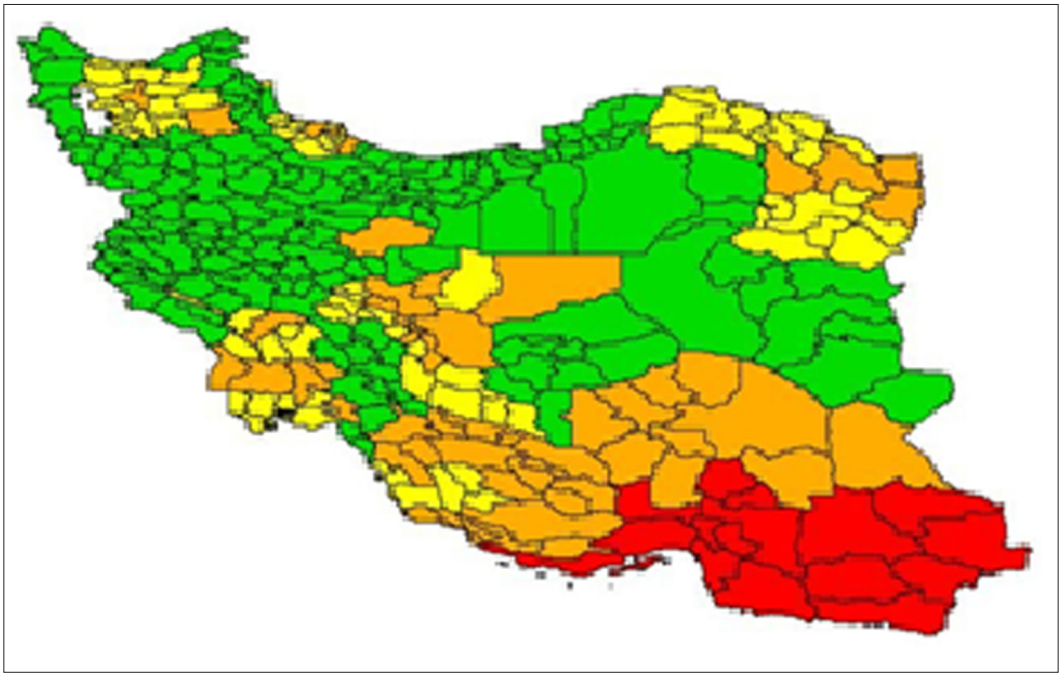

Figure 2: Malaria map in Iran according to the districts classification.
(Red) with Malaria transmission; (Orange) without transmission, but high risk; (Yellow) without transmission and low risk; (Green) free malaria districts.

Baluchestan and three of them from Hormozgan province, they were infectious disease control and malaria prevention program experts and coordinator of malaria program in their province. All of them wereDirector General of Center for Disease Prevention and Control and malaria control department were also attended to the interview session.

We gathered information through focused group discussions (FGDs) and personal interviews. Two FGDs (with four and five persons) and seven interviews were conducted in this study. A videoconference or telephone interviews were deployed for long-distance discussions. While personal interviews lasted for an hour, telephone interviews were no longer than 15 min.

We asked two questions, first we asked them about the importance of ME in Iran? Then, we asked them about the most important challenges of ME in Iran.

The main themes of the interviews and FGDs were extracted. The opinion was reported anonymously.

RESULTS

The main themes, extracted from the recorded interviews, were categorized based on the two questions, the importance of ME and the possible challenges. Table 1 outlines the summary of the themes.

The importance of malaria elimination

The majority of the individuals attended the FGD believe malaria elimination is achievable. One of the health vice-chancellors mentioned to interruption of malaria transmission in Bashagard, a high transmission area in Kerman province, he said "despite the heavy rain falls, there were no reports of malaria in our region yet (September 2011)." He added that this finding points out the competence of the region's health system in malaria control, stressing that any decline in the number of malaria cases in the low socio-economic areas region indicates the efficacy of patients care provided by the healthcare system. The chancellors of these universities also agreed on the fact that the Iranian healthcare system is capable of paving the way for achieving ME. "The status of malaria in our country is comparable with that of polio. We now have the required technical and economical capabilities to achieve such a goal," one of the university chancellors said.

He further added that the skilled and trained personnel of the healthcare system, who are aware of different aspects of malaria case detection, treatment and prevention, are valuable resources for achieving the elimination goal. He also added that we should benefit from this opportunity.

The country's healthcare system would earn a reputation if it achieves the elimination. One of the chancellors stressed that "it is not good for our country to be struggling with malaria." He added that ME would improve healthcare and political prestige of the country.

The successful experience of other provinces was also discussed in the FGDs. One of the participants stated that "a considerable decline is noted in the incidence of malaria in Kerman, where a high number of affected cases had been reported in the past years. There would be no sign of falciparum malaria in the coming years."

One of the chancellors pointed out the great support of the Iranian Ministry of Health and Medical Education, particularly the minister, for the malaria-elimination program. He went on to say that this provides a strong motivation for achieving such a goal.

One of the participants highlighted low socioeconomic economic condition of people living in malaria-endemic areas, adding that these

Table 1: Extracted themes on the importance and challenges of malaria elimination

Importance of malaria elimination	Possible challenges
Malaria elimination is an achievable goal	The decline noted in the number of affected cases leads to decreased cost-effectiveness, problem in diagnosis
Global reputation of achieving elimination phase and receiving World Health Organization certificate	Stability of policies
Being more prevalent in poor regions, ME a struggle toward equity	Neighboring with to endemic malaria countries, Pakistan and Afghnistan
Successful experiences in other countries	

individuals benefit the most from these programs. Other participants of the FGD agreed with him. Another participant, referring to the socioeconomic condition of individuals living in underdeveloped and poor areas, said "many of these individuals live in huts and have no direct and easy to healthcare." He stressed that such programs should target poor population.

One of the chancellors said that certain areas in the country are vulnerable to malaria and not launching ME program in these provinces would lead to the spread of the disease in other parts of the country. Talking in particular about Khozestan, he stressed that the province is receptive to reintroduction of malaria and launching an effective program in this region would act as a barrier, protecting the other parts of the country against the resurgence of disease. He also added that ME in this province would, similarly, guarantee the elimination of the disease in other regions. He said appropriate control of malaria outbreak in Assalouyeh (a natural gas region in Bushehr province) had an important positive effect on economic projects in that region.

One of the vice-chancellors reported that, raised that IRS is no longer used in the some regions as the transmission rate of malaria has declined considerably. The cost of spraying has, therefore, reduced. Due to the elimination achievement, there would be a considerable decrease in the cost of fighting the disease.

Possible challenges

The majority of the participants considered the affected cases entering the country from Pakistan and Afghanistan as the major challenge for the program. One of the vice-chancellors added that illegal travelers and the tribes traveling across the border pose a serious threat to the program. He explained that some Iranians brought malaria to Iran after returning from a wedding party in the neighboring countries.

One of the participants highlighted the insecticide resistance. This came while the other attendees did not considered insecticide or drug resistance as an important problem in this regard. The participants also claimed that the sensitivity to the issue would be reduced as the number of affected cases declines. He added that a patient has recently died from malaria as the condition was not diagnosed on time.

The future of the personnel specifically employed for the malaria program was another concern mentioned in the discussions. One of the participants expressed his concerns about the future of the microbiologists working in this program as the number of affected cases decline. Others said that the next year's budget dedicated to fighting malaria is a cause of concern. They added that the future of the program is not clear.

Avice-chancellor added that the skill of the microbiologists decreases as the number of affected cases decline, he told "we tried to solve this problem by sending all specimen to one center by using a motorcycle delivery system"he believed this solution is very successful.

DISCUSSION

Iran that is now in the pre-elimination phase is classified among countries capable of achieving ME. Similar to other health programs, launching the measure needs many resources, all of which would improve the quality of health in the society. This is mainly important for the policymakers responsible for determining the priorities and health policies. The present study, which aimed to determine the importance of ME in Iran, showed that the country is capable of achieving such a goal and this could be a strong motivation in this regard. It also highlighted Iran being a neighbor to Afghanistan and Pakistan as the main challenge for achieving ME.

ME as an achievable goal

Our study showed that the majority of the participants believed that ME is not impossible and that the current structure of the healthcare system and available trained forces have paved the way for achieving the goal. They added that in the absence of the required resources, walking toward the goal would be a waste of resources and cause hopelessness.

While eliminating a disease literally signifies having no locally transmitted cases.[2] There are controversial interpretations about the definition of elimination.[3] In other words, eliminating a disease does not imply that no new cases of the disease are being reported; this mainly focuses on controlling the transmission of the disease and malaria management system.[7] Malaria is not eliminable in areas such as Africa in the near future and this is because of technical problems rather than irresponsibility and malfunction.[2] Moreover,

strong evidence shows that eliminating malaria falciparum in Africa and vivax in Asia is not possible in short-term and new strategies are needed to fight the disease in these areas.[2] The declining trend of the disease and the epidemiologic nature of the disease in highlands of Iran indicate that Iran is among countries in which ME is achievable.[1]

Global reputation, obtaining WHO certificate

ME is an important international goal and many countries are making all their effort to be classified in malaria-free nations and receive WHO certificates. Nowadays, the pattern of certain disease affects the country's foreign prestige. The countries are classified based on these patterns. Such classifications are not only health-related but also may affect the economic and tourism status of the country. ME, therefore, may positively affect the reputation of a country.

Possibility for malaria outbreak

Malaria had affected many parts of the countries not long ago and many regions in country have high potential for malaria transmission. This was mainly noted in regions such as Khozestan province, which have a hot and humid climate providing a suitable environment for larvae to develop. This can provide a potential habitat for the growth of anopheline mosquitoes. Despite the reduction of malaria cases, there have been reports of malaria outbreaks in different parts of the country. Considering the nature of the disease, any failure in the malaria program can lead to malaria outbreak in these regions, a condition which has frequently been reported in other countries.[8]

Focus of malaria in poor provinces

Malaria is also known as the disease of poverty, this disease is mainly seen in poor nations and areas[9,10] Poor families are mainly the very last individuals benefiting from public services such as malaria control programs. In consequence, these peoplesseem to be the main group advantaging from malaria-elimination programs and establishing such programs would lower inequality in the society[11]

Highly capable and skilful personnel

Malaria is among the first diseases for which control measures and independent offices for fighting the disease have been established.[12] A structured health system and skilled personnel are required to set up efficient programs to eliminate malaria in highly affected regions. Having reliable stakeholders and policymakers are also important in achieving such a goal in Iran.

Successful experiences

Many regions were struggling with malaria in the past 50 years;[12] similar conditions, however, is still being reported in Iran.[5] Moreover, considering the reports from successful countries, it could be stated that Iran has a better socioeconomic condition in comparison.[1] Many evidences showedthat success of ME programs does not depend on the socioeconomic status of the country as there are regions, like Lebanon and Taiwan that have achieved to ME despite their poor economic condition.[6]

Lowering the cost of malaria program

Not long ago, malaria program was adopted across the country. Today, however, considering the decline in parasites reservoir, necessity of spraying insecticides has decreasedand its use is now only limited to active and potential foci, thereforeIt is expectable to decrease some malaria program cost in elimination phase[13] but It should be added that despite the reduction in vector control, surveillance activity must be intensified. Based on requirements mentioned by WHO for awarding ME certificates, malaria management system needs to conduct a wide range of time-consuming and pricy measures in this regard.[7] The main objective is to run an efficient system for rapid diagnosis and treatment of the disease along with preventing the spread of malaria in its first stages. It should, however, keep in mind that controlling disease transmission has always been an important part of measures adopted in regions where ME programs had reported to be successful.[14] In consequence, despite the lesser need to vector control in ME, they are indispensable in health systems.

Challenges of ME in Iran

Surveillance system plays a more important role in ME phase;[7] this requires accurate and rapid diagnosis of the disease. Blood smear-tests, the gold standard for malaria diagnosis, are available in the majority of health centers; thus, the diagnosis of

malaria in all Iranian cases was confirmed based on laboratory studies. It should be noted that the decline reported in the number of affected cases may lower the activity of these individuals, a condition which not only is waste of human resources but also may lower their skill levels as being accurate in diagnosing needs practice and regular exposure to malaria blood smears. The reduction in affected cases, hence, lowers the diagnostic accuracy of the personnel and the sensitivity of the management system in detecting new cases. Several strategies, such as rapid diagnostic test that has an acceptable accuracy, have been proposed for this problem. Moreover, certain healthcare centers have used a motorcycle to send their blood tests to an equipped laboratory; preparing a blood smear is simple and can be carried out in any health center.

Stable policies

ME needs political and social stability of the country.[2] Policymakers easily appreciate control programs in its first stages because of the considerable decline noted in the number of affected cases at this step; later on, however, it could need great efforts.[2]

The success of a ME program in many countries depends on their economic risk acceptance, which needs paradigm shift towards malaria investment.[15] Many studies have shown that policymakers should not expect short-term economic results while running ME programs.[6] The main point which should be addressed before starting any control or elimination program is the fact that the cost of adopting such strategies is high and would remain high even when the number of cases affected with the disease has reduced considerably. It should be noted that costs even increase, a change which is mainly because of the additional surveillance costs. As a result, long-term liability of policymakers is needed before implementing such programs. It should also be kept in mind that ME may take decades[2] and the main reason behind the failure of any malaria control program has been the governments' negligence in this regard.[16]

Neighboring two Malaria-endemic countries

Malaria has natural borders defined by latitude and longitude and sometimes successful man-kind strategies in fighting malaria;[17] this is while political and natural borders are not considered as a limitation for the disease. Iran neighbors Afghanistan and Pakistan, both are malaria-endemic countries. The long border of more than 1900 km with these two countries,[18] the entrance of foreigners into and out of the country andthe Iranians travelling to these high-risk areas may lead to preservation of parasites reservoir mainly in borderline areas. Neighboring with malaria-endemic region is among themain problems in malaria program.[13] There are successful experiences of border control; for instance, Saudi Arabia-Yemen border control project, in which half of the cost of malaria control in Yemen is paid by Saudis.[19] However, considering this lengthy border such a program seems very difficult.

Our study aimed to identify the reasons supporting the importance of ME in Iran from the policymakers' and stakeholders' point of view. Malaria is a complicated disease with several stakeholders, therefore a broader look is needed to assess the whole problem and we need a more holistic outcome for measuring effect of ME for convincing policy maker for supporting ME program.

CONCLUSION

ME is a national goal for the Iranian health system. For assessing the effects of ME, one should study its influence both on the healthcare and the country's socioeconomic status and this needs gathering information based on cost-benefit studies. Considering the current status of Iran, the health system's motivation behind this aim is the main factor toward ME.

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