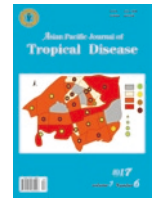


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## Role of behavioural communication change in integrated vector management against vector borne diseases especially dengue in Punjab, Pakistan

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Dear editor,

Prevention and control of vector-borne diseases especially dengue comprises of seven major components: 1) Selectively integrated vector mosquito control by involving the community, inter and intra-sectorial participation and other national and international stakeholders; 2) Active disease and vector surveillance; 3) Prompt diagnosis and case management; 4) Capacity building (in-service professional training); 5) Emergency preparedness and management; 6) Research and training in medical entomology and disease vectors; 7) Community behavior change and mobilization. Vector-borne diseases and their control represent one of the greatest global public health challenges of the 21st century. Vector-borne diseases and now Zika significantly increase the global burden of diseases and mostly affect poor people living in developing countries of tropical and sub-tropical regions. Vector control has an important and key role in reducing the burden of vector-borne diseases, adding resilience on the disease management and giving high priority to prevention. Vector control is very well suited for integrated approaches because some of the vectors are responsible for multiple diseases and some interventions are well effective against several vectors. Integrated vector management (IVM) is not a new concept and the basic principles of IVM have been used over the past century for mosquito control[1-9]. The concept of IVM was developed as a result of lessons learned from agriculture sector as they use the concept of integrated pest management (IPM). IVM aims to use the resources and tools in optimized and rationalized way for vector control especially for developing countries[10]. For implementation of IVM one should know about the characteristic features of IVM, including: Selection of control methods based on knowledge of factors influencing local vector biology, disease

transmission and morbidity; Use of a range of evidence-based interventions and control methods, often in combination and synergistically to avoid any kind of resistance, all activities should be carried out with collaboration within the health sector and with other public/private sectors that impact on vectors; Engagement with local communities and stakeholders[11]. Strategic framework is merely a first step in the process leading to the implementation of IVM. The effective control of vector-borne diseases can be achieved with the collaborative work of health sector with other allied sectors *e.g.*, environment sector. To achieve these goals and create strong and effective support for IVM, World Health Organization (WHO) should strengthen the existing associations and harmonization with Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP), and other agencies, many of which already support programs based on IVM. For the effective IVM program strong strategic framework should be developed. WHO should also take the actions necessary to formally endorse the IVM approach for the control of vector-borne diseases[12]. Dengue is now one of the biggest problems in Pakistan, where *Aedes* mosquitoes are very much dense in the urban populations, especially in areas that are ideal for larval and pupal breeding of the dengue (*Aedes aegypti*) mosquitoes. In the past few years, rapid urbanization is one of the factors which has influenced the environmental risk factors responsible for the increased dengue vector population. Environmental factors like unsafe household water storage, inadequate solid waste disposal, poor housing conditions, uncovering water containers and the climatic changes are common determinants of the vector density and longevity in urban and rural settings. All these risk factors increased dengue vector density which is due to insufficient

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knowledge, attitude, and practices (KAP) about the dengue prevention at the community level[13-18]. There is an evidence of dengue control through community participation; though the sustainability of this community-based dengue control intervention is debatable due to weak methodological approaches and vague outcome indicators for the evaluation of the intervention. Some studies have shown the effectiveness of community participation in reducing the density and longevity of the *Aedes aegypti*[19,20]. The effectiveness of community-based dengue control intervention can be countered with the use of better study designs showing the temporal relationship and use of more appropriate entomological indicators, like pupae per inhabitant to determine vector density and risk of dengue transmission[19]. To assess the effectiveness of community-based environmental management strategy for dengue control KAP and entomological surveys both are important variables[21]. Political commitment is very much necessary for any control program[22]. Political commitment plays a vital role in the control of dengue. Despite failing economies and dwindling programme resources, several countries have demonstrated that, with strong political commitment, well-planned and researched social mobilization and communication strategies can have a positive impact, not just on reducing vector populations but also on programme philosophy and the availability of resources[23]. Thus the success in the Punjab dengue control program reflects Punjab Government commitment based strategy that is geared up by a strong political monitoring system, bureaucratic bridging and the technocratic involvement in Punjab that has ultimately brought the disease to low level with few number of deaths as compared to 2011 epidemic. Here are just a few examples, some using COMBI, is actually communication for behavioral impact others using very similar planning frameworks[24]. In Punjab for education, every possible medium was used to educate the community about dengue even there is a whole chapter in school books.

### Conflict of interest statement

We declare that we have no conflict of interest.

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