Operational Efficiency of Malaria Programme and Treatment in Rural and Urban Baroda

Chapter 2

Perceptions of Field Workers and Community Leaders Regarding Vector Control Activities in Urban Vadodara: Excerpts from the Field

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Abstract

Background: Malaria is a major public health problem in our country affecting all spheres of human life, with *Plasmodium falciparum* mortality being high. The outbreak proportions are quite alarming in urban areas, although the Urban Malaria Scheme was launched in 1971 to focus on Urban Malaria.

Methodology: A Qualitative study was devised to get an in-depth understanding of the overall functioning of the Urban Malaria Scheme run by Vadodara Mahanagar Seva Sadan using Qualitative semi-structured study instruments over a period of 8 months from November 2008 to June 2009. The study was conducted in 12 ward areas of the city. To get first hand information on overall malaria control activities in the city, Focus group discussions were conducted with malaria inspectors, suervision and field workers, while in-depth interviews were conducted with the medical officer-health, biologist, insect collector and local representation through one community leader from each ward. Data entry was done using Weft QDA software and emerging themes were analyzed using group codes.

Results: Shortage of manpower was evident among all cadres of vector control staff, though availability of commodities and maintenance of equipments was satisfactory. The discussions highlighted a need for refresher training, attention required on part of engineering branch to curb illegal sewage line with storm water drainage. One-third of the community leaders were aware of vector control activities, almost none were aware about anti-larval activities while less than half were aware about

source reduction activities. Half of the community leaders were aware of IEC activities for vector borne diseases.

Conclusion: There is an urgent need to increase staff strength and enact civic bylaws for vector control activities. Inter-departmental co-ordination with the Engineering and Sanitation branch and training of the different work cadres should be considered

Keywords: Malaria; Vector control; Qualitative study; Field notes

Abbreviations: FGD: Focus Group Discussion; IDI: In-depth Interviews; IDSP: Integrated Disease Surveillance Project; IEC: Information, Education and Communication; MOH: Medical Officer Health; MPO: Modified Plan of Operation; NMEP: National Malaria Eradication Program; NVBDCP: National Vector Borne Disease Control Programme; *P.falciparum: Plasmodium falciparum*; UMS: Urban Malaria Scheme; VMSS: Vadodara Mahanagar Seva Sadan

1. Introduction

Malaria is a major public health problem in our country since ancient times, affecting all spheres of human life and contributing to 75 million cases and 0.8 million deaths the year before launching on National Malaria Control Program in 1953 [1,2]. Considering the recommendations of the Health Survey and Development Committee of Government of India (1946) and also keeping in view the widespread adverse effect of malaria on the National Health, economy, industrial and agricultural growth in the country, the Planning Commission accorded highest priority to a nation-wide Malaria Control Program [3].

In 2013, 0.88 million cases have been recorded, of which, *P. falciparum* caused 53% and *P. vivax* caused 47% of the infections [4,5]. The incidence of malaria in India accounted for 58% of cases in the South East Asia Region of WHO. Presently, in India, as per NVBDCP, 0.7-1.6 million confirmed cases and 400-1000 deaths occur annually [5]. The proportion of *P. falciparum* responsible for mortality has gone up to about 50%. It still continues to afflict children, pregnant women and malnourished individuals in higher numbers. In many states of India, it continues to occur in outbreak proportions [6].

Though the malarial incidence is high in rural areas, it has increased significantly after 1963 in towns and cities, with nearly one lakh cases of malaria being reported every year form urban and peri-urban areas. Global warming and climatic changes lead to increase in population susceptibility to malaria; as well as favorable temperature for mosquito breeding in urban cities like Vadodara [7]. The complex epidemiology of malaria leads to major challenges in the design and delivery of prevention and control strategies, in light of rapid social and environmental changes occurring in cities [8].

The control of malaria in the urban areas was thought to be an important strategy complimentary to the National Malaria Eradication Program (NMEP). Modified Plan of Operation (MPO) was designed and submitted to the Cabinet to tackle malaria in both urban and rural

areas simultaneously. Under this, anti-larval and anti-parasitic control measures were considered as the mainstay to abate malaria transmission in urban areas. Malaria, at one time a rural disease, has diversified into various ecotypes. These ecotypes have been identified as forest malaria, urban malaria, rural malaria, industrial malaria, border malaria and migration malaria. Other problems viz. vector resistance to insecticides, extensive vector breeding grounds created principally by the water resource development projects, urbanization and industrialization add to challenges of malaria control [9].

In Vadodara city, there is considerable amount of construction activity going on since last few years, owing to the urbanization and industrialization. Even in the area with environmental conditions conducive to its transmission, malaria-a disease largely influenced by the local environmental conditions, can be kept in check if the local health staff puts in maximum efforts and carries out responsibilities assigned to them in earnest manner. Efficient vector control measures are the key to reducing malaria incidence. Proper knowledge and activities centered towards vector control can help reduce malaria and its impact on overall development. There are hardly any operational research studies conducted hitherto in India to cover the entire malaria control program in urban areas comprehensively [10].

Although introduced late to the area of public health research, the concept of qualitative research yields rich information. The qualitative component helps to add on to the statistical data, by trying to find the core problems, and its possible suggestions, through logical and analytical inference; from the workers' or service providers' perspective. So, operational research was undertaken to qualitatively analyze the vector control activities under the Urban Malaria Scheme in the VMSS area, the difficulties faced in implementing the same and the awareness of the local community regarding these activities.

2. Methodology

2.1. Study design

Exploratory cross-sectional qualitative study

2.2. Study setting

The study was carried out in Vadodara city. Vector control activities done in the 12 wards of the city was assessed using qualitative research methodology by means of Focus Group Discussion (FGD) and In-depth interviews (IDIs).

2.3. Study period

The study was conducted over a period of 8 months from November 2008 to June 2009.

2.4. Study population and sample size

There are 4 biologists, 13 sanitary inspectors, 48 supervisors, 219 field workers and 1 insect collector posts sanctioned. Though it was possible to assess the performance of man-power involved in vector control operations quantitatively, in order to focus upon the complex interpersonal and social phenomena operating alongside the quantitative the following participants were interviewed. The following Cadres of health staff were included in the study (**Table 1**).

3. Data Sources and Data Collection

Focus group discussions were conducted with malaria inspectors, supervisors and field workers, while in-depth interviews were conducted with the medical officer-health, biologist, insect collector and local representation through one community leader from each ward. Semi-structured qualitative instrument containing questions on vector control activities in the wards was used both for the FGDs and IDIs. Written consent was taken from the participants (both the working staff and the community representatives), who were selected to give equal representation from each of the ward areas. 3 FGDs and 4 IDIs were conducted with the various functionaries working under the UMS. Each IDI lasted for about 45 minutes while FGDs lasted for 120-150 minutes.

The interviews and FGDs focused on the following areas:

- To review current status of Urban Malaria Scheme implementation and get an idea of functionaries regarding vector control activities

- To understand facilitating factors, impending factors and barriers in implementing the scheme

- To suggest plausible ways to improve the scheme

Table 1: Study population and sample size

Cadre	Number of post filled	Number interviewed/Method of interview
MOH	1	In-depth Interview
Biologist	3	2 (In-depth Interview)
Sanitary Inspector	4	4 (One FGD)
Supervisors	23	10 (One FGD)
Field Workers	133	11 (One FGD)
Insect Collector	1	In-depth Interview

4. Data analysis

The qualitative interview field notes were transcribed verbatim on the same day by the principal investigator and translated into English. The notes were coded using Weft QDA software. The qualitative interview field notes and data from the FGD were transcribed and trans lated on the same day. The qualitative data entry and analysis was done using Weft QDA 0.9.4-qualitative analysis tool, using group categories and sub-themes which were later re-grouped to get an idea of emerging trends and patterns [11]. Non-verbal responses and communications were also noted. Descriptive quotes relevant to each of the themes were mentioned to exemplify the themes and range of responses.

5. Results

The qualitative methods included a mix of FGDs and IDIs, which were analyzed using 'Grounded theory approach', and the emerging themes were broadly categorized into 'Current Scenario related to Vector Control Activities', 'Facilitating factors', 'Impeding factors' and 'Suggestions to improve vector control activities' (**Figure 1**).

6. The Current Scenario

6.1. Manpower: The single post of insect Collector was vacant, with almost half the sanitary inspector, supervisor and field worker posts being vacant. FGDs with field workers revealed shortage of functionaries at their level, which was bound to worsen owing to retirements and vacant posts. Field supervisors also mentioned this as one of the main causes of decreased quality of work. This led to multiple works being done by single person. "We have to do many activities right from official work to picking up the dirt"

Such was the report from the malaria inspectors too; who experienced this problem firsthand, with there being 4 inspectors looking after 13 wards of the city. This, as per them, led to substandard work on filed. Frequent transfers of sanitary inspectors also exaggerated this condition, with more time being consumed to train freshly appointed candidates. Similar problem was voiced by the biologist and the insect collector. The Medical Officer Health (MOH) mentioned the administrative policy for cutting down expenses, which led to lack of recruitment of new staff. The vertical staffing pattern of urban malaria scheme was considered as one of the causes of inadequate manpower.

Availability of commodities: Availability of machinery, fogging equipment was adequate on the whole. All the field workers, supervisors and inspectors were satisfied with the functioning of the older machines. They however; mentioned that functioning would be much smoother if the number of machines for each activity were to increase. The insect collector did not get the equipments as per requirement and was concerned about the quality of products

received. Insecticides such as Abate and Fenthion supplied by the Government of Gujarat are indented in April, based on the previous year's consumption. The flow of these occurs through the Corporation which procures the required insecticides from the Capital. They are supplied twice or thrice a year, with no shortage being faced anytime. There was adequate Chloroquine supply, with no 'stock outs' in any of the dispensaries till date.

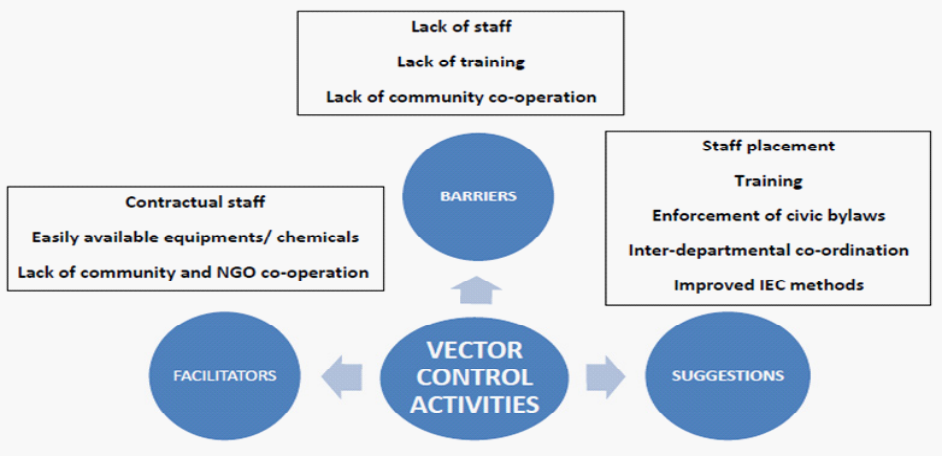

Figure 1: Vector control activities-Facilitators, Barrlers and suggestions

Contradictory to these findings, one of the literature review studies shows that malaria elimination was difficult due to lack of sufficient commodities for vector control [12]. Training of workers: There was no training given to the field workers or malaria inspectors any time during their working period. The insect collector was trained only once at the time of recruitment, while field supervisors were trained once for around 3 days. It was assumed by the biologist that training was not required by the field workers because they were guided by field supervisors in day-to-day activities. Training was the 'felt need' of all the cadres interviewed, with the MOH being aware of the need of training and refresher courses.

Vector control activities: The heart of anti-malaria efforts; vector control activities are the responsibility of every cadre of workers. Vector control activities, are the mainstay of a good malaria control programme [13]. The biologist who is the main functionary in conducting these vector control activities mentioned that anti-larval measures by chemical methods are the main vector control activities. "If Antilarval activities are done 100%, there is no need for anti-adult measures."

Sanitary inspectors also believed that source reduction is the best, as mentioned in their FGD. Major and minor engineering methods, biological control, treatment, active and passive surveillance are other activities. Antilarval activities; intradomestic (house-house visits) and peri-domestic (treatment of holes, pits, fountains etc are done weekly). Biological measures such as Gappi and Gambusia fish and Bacillus thuringiensis (biolarvicide) are used. Fogging with 2% Pyrethrum is done in places where microscopically confirmed cases were reported. Fogging is done in 50-100 houses surrounding the house of confirmed malaria and 200 houses surrounding house of confirmed dengue and chickungunya cases. Field workers and supervisors map all breeding places along with regular check on tanks, coolers and air conditioners to

check for mosquito breeding. Abate is used in breeding places.

Malaria inspectors take daily attendance of field workers, crosscheck and supervise their activities on field and perform minor engineering procedures and biological measures. They help prepare spray solution for fogging; Temephos for intra-domestic spray and Fenthion for peri-domestic spray. Fogging is done in areas surrounding houses where confirmed cases are notified; information of which is taken from private hospitals by the workers.

The insect collector looks for and collects mosquitoes from areas guided by the biologist. This is done on a daily basis; with 12 houses being examined for 15 minutes each-2 houses where cows and buffaloes are reared, 2 where goat and sheep are reared, 2 with no such cattle and the remaining 6 being selected randomly. IEC activities: Monsoon being the malaria transmission season, June is acknowledged as Malaria Eradication Movement Month. Pamphlets on malaria awareness are displayed and distributed, puppet shows in slum areas and schools (above 5th Standard) are organized, announcements on malaria information are organized in religious places along with important malaria messages printed on dairy pouches and income tax papers. Electronic media and radio are used for IEC activities. Slogans are used to capture attention, such as: "Where there is water, there are larvae, where there are larvae, there are mosquitoes, where there are larvae, there spreads malaria" Majority of the participants felt that despite many cases occurring in particular area, people do not realize that it is the larvae found in water that cause malaria. It was suggested that celebrity endorsements for the same would help.

Records, meetings and feedback: Malaria Inspector maintain records of field activities, consumption of larvicides, use of instruments and number of cases detected. They prepare and compile ward wise reports to the biologist, who send it to MOH and director NVBDCP Gandhinagar on a daily basis.

Reporting of malaria under IDSP is done every Monday while monthly reporting includes data regarding insecticide use, biological activities and IEC. Meeting of malaria supervisors and Laboratory Technicians takes place every second and third week of the month respectively.

Training is given to the workers for spread of IEC, as mentioned by the biologist. "We train workers to give a particular message. So while they are visiting homes, they are used to show larvae present in open tanks. They also inform people that these larvae are going to be mosquitoes"

7. Facilitating and Impeding Factors

Manpower, Commodities and Community participation and NGO participation are some

of the facilitating factors in conducting vector control activities. Contractual worker appointments speed up the field work, adequate and timely supply of material helps in regularizing vector control activities and IEC activities increase community awareness and thereby; community co-operation and positive attitude towards vector control activities and working staff. Even children in school are aware of this. "Malaria people have come; now, they will kill the larvae" Though discussed as a facilitating factor, few of the participants mentioned that though the contractual workers are helpful, they are not a substitute to the permanent staff. The field workers norms have not changed over the years and there is no proportionate increase in the number of field workers relative to the increasing households. The workload of biologists has increased due to increased coolers and air conditioners.

Sanitary inspectors are deputed as Malaria inspectors for a short time, thereby increasing their time for orientation towards their duties. Lack of staff and frequent transfers leads to lack of active malaria surveillance activity. Similarly in the community, there is a group of people from the very low and high socio-economic society who do not comply with the field workers to enter their houses. They sometimes call the police, thus causing them embarrassment and time-loss. "The (hi-fi) people from effluent families do not let us check (houses) for breeding places. These are the areas where Malaria, dengue (cases) occur." Lack of knowledge regarding malaria control may deter community participation in the malaria control activities. Similar findings were seen in a study in Kenya [14].

In the slums, people misinterpret them as sanitary and water department personnel and blame them for poor services. Few instances of manhandling were reported. "When there is dearth of water, where is the question of purifying it?" People in the slum connect housing drainage to rain water drainage, thereby causing blockage and pollution. Few people think that antilarval activities cause toxicity of drinking water. One of the field workers said, "People in slums are big hindrances since they thought that, scrap (kachara) causes mosquito breeding and not water so they use to argue with us and don't let us drain or purify their water" Lack of departmental co-ordination was also one of the impeding factors for the vector control activities. Such findings were also evident in a study done by the APMEN to identify vector control capacities, needs and activities [13]. Construction sites make breeding ground. So do uneven areas causing water logging. However, there is no coordination between the engineering and sanitation department in trying to solve these problems. People however, feel that, malaria workers are responsible for this. "The public only recognizes us as the malaria people. They blame us for the other problems like water logging." Most of the field workers agreed to this. "There is no activity undertaken to level the water areas, as a result it stays stagnant. This is the worst pollutant. This is the responsibility of the engineering department. But people only know us as the people responsible for controlling malaria." The engineering department has not succeeded in curbing illegal sewage connections; thereby increasing Culex breeding. Hence,

more time, money and manpower is wasted on Filariasis control. People, on the other hand, tend to store more water due to inadequate water supply, which leads to mosquito breeding. Scanty funds, unfilled vacancies and political pressure are some of the administrative level problems that have come to light during these discussions.

8. Suggestions

Appointment of adequate staff, permanent post of Malaria Inspectors, training and refresher courses for the staff, increase celebrity endorsements for IEC activities for malaria, civic bylaws targeting construction sites and scrap yards, improved interdepartmental co-ordination, use of new and more efficient machines, internet facilities and data entry operators for analysis of data, identity cards to field workers and increased grant release for anti-malaria activities were few of the suggestions given by the workers to improve vector control activities. These suggestions could be recommended at the policy and planning level to improve vector control activities in the city. Interviews with the community leaders yielded that only one-third of the community leaders were aware of vector control activities, almost none were aware about anti-larval activities while less than half were aware about source reduction activities. Half of the community leaders were aware of IEC activities for vector borne diseases. Almost one third of them got this information from posters in clinics.

9. Conclusion

Manpower shortage was evident at all cadres of vector control staff. Training was lacking among all the staff cadres. Facilitating factors were introduction of contractual staff, adequate and timely supply of materials, NGO support. Suggestions to improve the activities included increasing manpower, improving training, intensifying IEC activities, implementing civic bylaws and interdepartmental co-ordination. Only half of the Community leaders were aware about vector control activities and IEC activities in their area.

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