Case Study 9

Dengue Prevention in Mérida, Yucatán, Mexico: Use of Formative Research to Refine an Education/Communication Intervention Targeting Household Management of Key *Aedes aegypti*-producing Containers

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Abstract

The project described in this paper reflects on the use of ongoing formative research to identify and test appropriate household-based control methods for key *Aedes aegypti*-producing containers and the creation of an education/communication strategy for the dissemination of highly specific messages for the key containers.

Keywords: DF/DHF, key containers, communication strategy, Mexico.

Country setting and background

Mérida is the capital of the state of Yucatán; located in the southeastern region of Mexico. It lies eight meters above sea level and is the largest city in the Yucatán peninsula. Beginning in 1991, the Mexican Ministry of Health received funding from the Rockefeller Foundation to investigate and test appropriate community-based approaches for the household management of *Aedes aegypti*-producing containers. Staff with the Ministry of Health worked in partnership with the State and Municipal Health Departments and local professionals with expertise in the social sciences.

Planning innovation for dengue prevention and control

During the first phase of the project (1991-1994), the focus of community-based activities was on domestic hygiene, and the "Waste management, domestic hygiene and community participation in dengue control" project was established in 1991. The objectives were to: (i) describe and analyse the environmental conditions necessary for the development of the *Ae. aegypti* mosquito; (ii) analyze waste management practices at the household and community levels; (iii) identify possible alternative solutions to hygiene problems in the community;

(iv) develop educational materials to increase community understanding of dengue and its relationship with the environment; (v) identify appropriate communication channels for disseminating the messages and materials; and (vi) evaluate the impact of the intervention[1,2].

The project was conducted by a local team of social scientists, with participation of vector control staff from the State Health Department for the entomological surveys. Team members had expertise in anthropology, sociology, communications and epidemiology. Formative research was conducted, and included in-depth interviews, focus groups, structured observation studies of waste and water management practices at the household level, and pre- and post-intervention KAP and entomological surveys. Research on community networks and resident participation in community organizations revealed that there were few organized community groups and that residents in general did not belong to such groups. A "Mosquito Hunters" children's group ("*los Cazamosquitos*") was formed in 1992 by project staff, with a companion group formed for their parents in 1993. Most of the intervention activities were carried out by the children involved with the Mosquito Hunters group, with some participation from the parental group. Results of the intervention demonstrated that although the project had a positive impact on knowledge levels of individuals who participated in community meetings organized by the Mosquito Hunters, there were no significant differences in larval indices between the neighbourhood where the intervention was carried out and a control neighbourhood. The goal of encouraging residents to assume responsibility for neighbourhood surveillance of fever cases and *Aedes* breeding sites was not realized. Project staff attributed this to a loss of enthusiasm by group participants as a result of few tangible successes, a lack of perceived need for such surveillance by the community, and a lack of institutional support.

A reflection process on Phase I activities and results was carried out by project staff. Through this reflection process, staff identified factors that either facilitated or hindered the development of the project[1]:

Facilitating Factors	Barriers
• integrated analysis of the "problem" (i.e., dengue) • funder flexibility in project development • interest and availability of the children • interest of parents in their child's activities • personal growth through project activities	• lack of organizations through which large-scale community mobilization activities could be organized • dengue was not considered to be a problem by residents • weak and sporadic assistance from institutions for resident-led activities • adults did not view the children as legitimate sources of information or providers of a "service" (e.g., home inspections) • lack of motivation of adult participants • little to no response from institutions to problems viewed as priorities by residents

Using data collected through formative research and conclusions from the reflection process, Phase II of the project was developed[3]. Given that low levels of affiliation to community groups had also been found in other studies[1], the southern sector of the city was selected for a large-scale education/communications intervention that used mass media and interpersonal communication carried out through house visits and neighbourhood-level special activities. The southern sector was identified as the priority sector of the city due to the number of dengue cases, high entomological indices, and large numbers of key *Aedes*-producing containers.

Additional formative research was conducted to: (i) identify the key, productive containers using pupal indices in order to better target household efforts to the most productive containers, (ii) better understand specific behaviours linked with the presence of *Aedes*-producing containers on household premises and the management of these containers, and (iii) identify existing behaviours that could be modified to make them "mosquito proof". The four most productive containers, classified by function, targeted through the education/communication activities were animal water dishes (e.g., plastic containers, tires cut in half, old kitchen pots), diverse water storage containers (e.g., *piletas*, plastic buckets), tires, and miscellaneous containers with a future, undefined use[3]. Women were selected as the primary target audience given their key role in household water and waste management, as well health care responsibilities.

Implementing the new approach

Working with women, behaviours were field tested for feasibility, acceptance and efficacy. Once the final set of behaviours was selected, the benefits and costs for each were identified and slogans that summarized the key benefit of the recommended behaviours were tested with residents; the slogan selected through this pre-testing phase was "The serenity of your family is close at hand… and is in your hands." A key motivator for the women was the recognition and acknowledgement, by their family, of their many efforts to keep the household healthy. Using several data collection methods (review of Phase 1 results, focus groups, a media consumption survey), information preferences were identified including the characteristics of the spokesperson, specific shows and times for radio and television, and spokesperson qualities for effective interpersonal communication. As a result, the spokesperson selected was "Lela", a puppet representing a Yucatecan woman of Mayan descent known for her pointed and humorous commentaries on everyday life. The key to the spots was the humorous interaction between Lela and a physician, through which the action to be taken was demonstrated and described twice.

Over a period of five months, the communications/education campaign was conducted with one behaviour introduced every 4 to 6 weeks, depending upon the complexity of the behaviour; the final month of the campaign was dedicated to dissemination of a reinforcing message. On average, 24 radio spots per day were transmitted over three stations during the morning and 14 TV spots per week were transmitted on the leading national television station during the most popular soap operas in the evening. More complex messages were addressed through interpersonal contacts during school-based activities with fourth grade students and home visits. While the same messages were promoted, a variety of

materials and activities were used to enhance self-efficacy by skill building and discussion.

Monitoring and evaluation of the approach

Phase 2 was evaluated using a mix of qualitative and quantitative methods. KAP and entomological surveys were conducted pre- and post-intervention, and an in-depth qualitative analysis of interview and survey data was carried out. In general, a decline was seen post-intervention across all three entomological indices (house, container and Breteau); a decline that was also seen when only examining the key containers. A composite behaviour score was created to more accurately reflect whether the behaviour had taken place. There was a positive increase in the behaviour scores post-intervention, with a significant increase in the self-report of the behaviour for tyres (use of lime, 0.6% to 13%) linked with no mosquito breeding in tyres.

Lessons learned

This project developed a methodology for working with community residents in the identification and development of effective and practical household-based mosquito control methods. A key lesson learned is that as interventions are developed, the cost-benefit ratio of the intervention must be calculated taking into consideration not only the actual cost of the intervention but also the broader economic costs associated with dengue, such as work absenteeism due to illness, primary and tertiary care for individuals with dengue or DHF, and vector control efforts. *Ae. aegypti* control is not a problem that can be resolved by the health sector on its own; rather it is a problem of "shared responsibilities". The participation of municipal government and the education system along with household responsibility for domestic containers is vital for effective, sustained *Ae. aegypti* control.

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References

[1] Gómez Dantes H, Rivas Gutiérrez L, Canto Celis S, Capetillo Pasos M and Pacheco Can G. Waste management, domestic hygiene and community participation in dengue control. Mérida, Yucatán, Mexico 1991-1994. Project report submitted to the Rockefeller Foundation, 1994.

[2] Gómez DH and Rivas Gutiérrez L. "Domestic hygiene promotion and *Aedes aegypti* control", in Halstead SB and Gómez-Dantes H (Ed): Dengue: a worldwide problem, a common strategy. Mexico City: Ministry of Health. 1992.

[3] Méndez Galván J, Rivas Gutiérrez L, Nájera Vázquez R, Inette Burgos M, Canto Celis S, Sabido Montoya F. *Proyecto de Prevención y Control del Dengue.* Mérida, Yucatán, Mexico 1995-1996. Proceedings from the workshop on recent advances in community-based prevention and control of dengue: Honduras and Mexico, submitted to the Rockefeller Foundation. 1996.