Eco-bio-social Factors of Vector Density in Developing an Effective Approach to Dengue Control in the Philippines

Dengue is a disabling, acute infectious disease that is a leading cause of death among children in Southeast Asia. In the language used to describe how it is transmitted, a “vector,” or an organism that can carry a disease-causing agent (i.e. a virus) without itself succumbing to the disease, passes on this agent to a “host,” or a living being (such as humans) that can be infected by the disease. This study thus looks into factors that contribute to sustaining vectors and how they can be managed to decrease the incidence of dengue in the Philippines. Specifically, it has sought to determine the extent to which eco-biological and social factors affect dengue vector density in congested urban areas; how they contribute to the increase in the occurrence of dengue cases; and, given such information, how a rational strategy for dengue control can be formulated.

Message from the New Director

For an academic research institution like the Social Development Research Center (SDRC), every school year unfolds a new dynamism for the organization. As our readers will see in the pages of this issue of UPDATE, this dynamism may come from many sources and directions.

The principal source of SDRC’s dynamic life stems, of course, from its research projects, particularly those that are newly undertaken and completed. New projects allow the Center to continue in its mandate to contribute to the creation of new knowledge that deepens our understanding of social issues and problems affecting Philippine society. Completed projects enable the Center to share research evidences with concerned sectors, so that knowledge is bridged with social development policies and actions.

In this issue of UPDATE, we also provide the public with a glimpse of the other activities undertaken by SDRC Fellows, Researchers, and Staff—the people behind the Center’s dynamic life. Finally, we dedicate the issue to Ms. Aurora “Yoyie” Esquejo, whose unexpected demise was a great loss to the organization she served for several decades.

MA. ELENA CHIONG-JAVIER, Ph.D.
Funded by the World Health Organization/TDR, the study used a selective, inter-sectoral approach to dengue vector control aimed at epidemiologically important key containers identified by entomological surveys, and applied during critical periods of dengue transmission. It is expected that such an approach can result in long-term source reduction and effective dengue control in the Philippines. For the first phase of the study, the ecosystem of dengue in an urban setting was described within the following domains: vector ecology, socio-behavioral, and control program and activities. The association of these factors with varying levels of vector density as measured by pupa/person index, and reported dengue incidence, were analyzed. These served as a basis for identifying, through participatory processes, appropriate interventions that consider the influence of these factors on vector density. The intervention’s effect on vector density was analyzed and documented, and recommendations to the National Dengue Control and Prevention Program were developed from observations and experiences.

Two entomological surveys on households selected by cluster sampling were made. The first was conducted during the rainy season (September to November 2007), and the second during the dry season (April 2008). The data for estimating pupa/person index, and for the socio-behavioral component, was collected from households as follows: a) through knowledge, attitudes, practice (KAP) and demography surveys of households in the first entomological survey; b) through focus group discussions (FGDs) and key informant interviews (KII); and c) through analysis of influence of gender on dengue risk and exposure, domestic water management and usage, pest control, and waste disposal. Local vector control activities were observed during these two periods; interviews were made with key control program and local government officials and personnel. A temporal and geographical representation of vector density, socio-behavioral factors, and vector control activities was constructed. Lastly, crude analysis of the eco-bio-social model of pupal abundance was presented to communities in which the surveys were conducted.

Simultaneous with the first entomological survey, a KAP survey of about 1200 randomly selected household heads was conducted. Topics covered were dengue transmission, prevention, and practices for control. Observations of household practices among selected households for water collection, usage, and storage were made. A combination of open-ended, semi-structured interviews with health and local barangay officials and dengue control program field personnel, together with observations of dengue control activities, enabled the researchers to identify control program strategies and actual practices, as well as frequency of control activities and coverage among the barangays. Interviews with city health and political officials were conducted to define decision-making processes regarding program operations, and also included discussions on the programs’ constraints and how the officials would evaluate the said programs.

The project site for the first phase of the study was Muntinlupa City, one of the 17 cities of the National Capital Region (NCR) of the Philippines. The city is located along the western banks of Laguna Lake and south of the metropolitan Manila area. The seasons in this area are wet and dry. In 2007, the average range of temperature, relative humidity and total rainfall was 26 to 33°C, 73.3%, and 1,965 mm, respectively. It is a fast-growing city with a population of almost half a million, and a density of 9,568 per km² in 2005. It is composed of 10 barangays (villages) and has industrial,
commercial, and residential areas. Some of the residential areas are temporary dwellings for migrants from rural areas, and mobile population from other urbanized areas in metropolitan Manila. It has active health referral and surveillance systems for dengue among its primary, secondary and tertiary health care facilities. Dengue has been reported in the city for more than 20 years. The dengue incidence in 2007 was 184.6 per 100,000 population. From January to April 2008, there were 3,798 reported cases of dengue in NCR sentinel hospitals; this was 165% more than cases reported during the same period in 2007. In Muntinlupa there were 182 cases reported; this was three times more than the same period in the previous year.

**Findings** of the entomological and KAP surveys during rainy and dry seasons, and feedback from KIIIs and FGDs, support selective, inter-sectoral approaches to dengue vector control aimed at epidemiologically important key containers. The main assumption for Phase I was that the ecological, biological and social factors in Muntinlupa City affect dengue vector density (measured by pupa per person index). This was then the reason for stratifying the areas for cluster selection by reported dengue incidence and crowding: pupa density is higher in areas where more dengue cases are reported and where there is crowding of building structures (i.e. houses). But the entomological surveys rendered unexpected results, particularly in clusters characterized as having low dengue incidence and being relatively less crowded than the other clusters.

The pupa survey during the rainy season revealed that pupa per person index (PPI) in San Jose Subdivision, Mintcor-Rizal, and Intercity Homes were above the median. These values were higher than those of clusters with higher dengue incidence. In addition, more than half of the water-holding containers inspected in public spaces of San Jose Subdivision and Intercity Homes contained pupa. The former had the highest house index (for pupa) in addition to having the second highest PPI among the 12 clusters. Despite the large number of water-holding containers during each season, the proportion of containers with pupa in all clusters was small. During rainy and dry seasons, key containers (drums, tires and pails) with any of the following characteristics tended to have higher pupa counts compared to other containers: a) rain water; b) contents used for more than a weekly basis; and c) during the rainy season, located outdoors (i.e. public spaces).

In summary, the findings of Phase I show that the approach to dengue vector control in Muntinlupa city is complex. There are focal hotspots in the clusters for pupa positive water-holding containers. There are also seasonal differences in number of water-holding containers with pupa, location of these containers, and pupa per person index. Further, during the rainy season, the distribution of houses with water-holding containers is skewed (San Jose Village and drums, respectively). The contribution of water-holding containers in public spaces to pupa productivity during the rainy season is also important.

Though the description of the background of the clusters stratified by dengue incidence and aerial density is similar, the PPI of the clusters within these sub-groups differ. Fortunately, the patterns of responses to KAP are similar in all clusters; however, this will not guarantee a predictable involvement in, and response to, dengue control interventions.

Lastly, community observations underscore the need for consensus building (e.g. stakeholder analysis) as part of control strategies.
A meeting of the SDRC Research Fellows was held on February 13, 2009 at Conference Room B of La Salle Building. Among the highlights of the meeting were a discussion on new projects at the Center including a study on “Consumer Psychology of the Philippine Entertainment Industry” headed by Psychology faculty member Marshall Valencia; upcoming plans for the publications program which include the dissemination of working papers, and the possible publication of an “SDRC Historical Profile” (the text of which was presented to the fellows for assessment) and reports from completed projects including the Center-Assisted CLA project “Paths to Social Integration and Participation for the Youth in the Philippines”; the possible utilization of findings from completed reports in the syllabi of courses being offered in the future; nominees for the next SDRC Director; and plans for the Center’s 30th Anniversary program.

In cooperation with the practicum program of the Political Science Department of the College of Liberal Arts, SDRC recently accommodated two students as interns for the “Assessment of the Child and the Family Welfare System in the Philippines” project headed by research fellow and CLA Dean Exaltacion Lamberte. The students, Ernest Levanza and Monica Ruth Anne Dazo, rendered 120 hours of internship beginning January 2009. Working under the Child and Family Welfare System project allowed them to practice what they learned in policy studies and governance, as well as produce a research output stemming from their internship, for submission to the Political Science faculty.

The practicum program undertaken by Political Science majors is designed to give students the opportunity to experience the dynamics of the policy process and local governance. To realize this goal, students are assigned to selected government branches, departments or agencies, NGOs, and Local Government Units within Metro Manila.
Fellows’ Movements and Activities

Several among the SDRC Research Fellows were appointed to key administrative positions during Academic Year (AY) 2008-2009. They were Jesusa M. Marco as Associate Vice Chancellor for Research and Learning; Exaltacion E. Lamberte as Dean of the College of Arts; Madelene A. Sta. Maria as Director of the University Research Coordination Office; and Ma. Elena Chiong-Javier as Director of SDRC.

Dr. Marco also chaired an organized panel for DLSU-M during the parallel sessions of the 8th Inter-University Conference on Social Development of the Association of Southeast Asian Nations (ASEAN) held from May 28 to 31, 2008 at the Century Park Sheraton Hotel, Manila. Research Fellow and Political Science Department faculty member Antonio Contreras also participated in the Conference, discussing the issues, social context, and institutional responses of transboundary environmental governance in Southeast Asia. The theme of the conference, which coincided with ASEAN’s 40th year, was “ASEAN as a Community: Solidarity in a Globalizing World.” It aimed to serve as a venue for regional integration through the gathering of various stakeholders such as artists, academics, media practitioners, workers, and peasants from the Philippines and other countries to discuss possible solutions to many issues confronting Southeast Asia’s economy, culture, and security.

Dr. Marco and Dr. Javier were among the 14 faculty, co-academic personnel, and academic service faculty recognized by the De La Salle Brothers-Philippine District during the 2009 Juan Medrano Service Awards ceremony held on January 27 at the Chapel of the Pearl of Great Price. The award was instituted to recognize members of the Lasallian community who have dedicated 25 years of service to any Lasallian school in the District. It was established in memory of Juan Medrano, the first lay teacher in the Philippines who taught with the Brothers from 1915 until his retirement in 1963.

SDRC research associate and Behavioral Sciences faculty member Stella P. Go was invited to share her insights on the implications of the financial crisis for overseas Filipino workers during the forum on the Impact of the Global Financial Crisis held at the NEDA Building in Makati City on February 17, 2009. Participants of the forum included team leaders of the Poverty Economic Policy-Community Based Monitoring System (PEP-CBMS) Network Office of the DLSU Angelo King Institute for Economic and Business Studies (AKIEBS), and representatives of 13 countries who will take the lead in implementing the project in their respective countries: Benin, Burkina Faso, Ghana, Kenya, Nigeria, Tanzania, Zambia, Bangladesh, Cambodia, Indonesia, Lao PDR, Vietnam, and the Philippines.

Fellows’ Dissemination

SDRC Research Fellow Madelene Sta. Maria headed a conference symposium on “Values Socialized in the Development Environments of Filipino Youth” during the 45th Annual Convention of the Psychological Association of the Philippines held from August 14 to 16 at the Brokenshire College in Davao City. The symposium featured a departmental research initiative on the Filipino youth, the SDRC project “Paths to Social Integration and Participation for the Youth in the Philippines and Asia.” The conference, which had as its theme “Facing Emerging Issues and Building Better Futures: A Call to Psychologists,” featured over 50 oral research paper presentations showcasing the most recent research investigations in the subfields of psychology, including industrial/organizational psychology, applied social psychology, developmental and adolescent psychology, and clinical psychology.
The United Nations Children’s Fund is providing support to the DLSU Social Development Research Center for a new project on child and family welfare in the Philippines, which began in August 2008.

The “Assessment of the Child and Family Welfare System in the Philippines” project is unique in that it does not deal with the current, specific situations of children who may be vulnerable because they live on the streets, in orphanages, under circumstances of conflict, or have contracted sexually transmitted diseases. Rather, it looks into whether there are means to protect children from becoming vulnerable—whether there is a system to shield children who are victims of negligence, exploitation, or poverty. This is because in spite of the existence of programs that have been established precisely to address these issues, the number of children who suffer from danger or abuse continues to increase.

A recent review conducted by UNICEF pointed out the need for a strong family and child welfare system in the Philippines, “child and family welfare system” being defined as “a system that prevents and responds to abuse, violence and exploitation of children, and includes national policies, legal and regulatory frameworks, government structures, professional bodies and networks, and services for primary, secondary and tertiary prevention. ‘Child and family welfare system’ stresses the role of children, communities and families in preventing and responding to abuse, violence, and exploitation.”

SDRC has therefore conducted a research study with the aim of providing an in-depth assessment of the current Child and Family Welfare System (CFWS) within the social welfare system in the Philippines at the national, regional and local governance levels, and to make policy recommendations regarding the overall strategy and specific measures to be used in order to strengthen the system. The study assesses four dimensions of the CFWS, namely the institutional, organizational, human resource, and financial. Of these four dimensions, prevention of child abuse, violence against and exploitation of children, as well as CFWS response to actual incidents of abuse, violence, and exploitation are assessed in terms of effectiveness, efficiency, relevance, adequacy, sustainability, and appropriateness.

Members of the project team are SDRC research fellows College of Liberal Arts Dean. Exaltacion Lamberte (systems-based assessment framework) as Project Director and Principal Investigator; Psychology Department faculty member Ma. Angeles Lapeña (survey construction, outcomes assessment) as Deputy Project Director; and Economics Department faculty member Cristela Dakila (budget and expenditures, local and national level), Associate Vice Chancellor for Research and Learning and Behavioral Sciences faculty member Jesusa Marco (civil society, networking), and Psychology Department faculty member Caridad Tarroja (alternative family arrangement) as Co-Investigators.

Resource persons for the study are University Research Coordinating Office Director Madelene Sta. Maria (street children and abused children); Teresa de Guzman (IPs governance and CFW service provision); Frederick Mikhail Farolan (legal framework); Graduate School of Business faculty member Benito Teehankee (human resources, systems dynamics); and Political Science Department faculty member Allen Surla (local governance and CFW service provision).
Consumer Psychology of Philippine Entertainment Industry

The project seeks to understand consumer behavior and cognitions in relation to popular mass media. In particular, the focus will be viewers of noon-time shows and movie theater goers. The research program, which involves a series of mixed-method studies, generally aims to 1) determine consumer demographic profile and psychographics; 2) explore underlying personal, social, and contextual variables that relate to noon-time show viewing and movie-going behavior; and 3) generate and test structural models predicting noon-time show viewing and movie-going behavior.

The overall research design is structured such that qualitative components will generate data-driven theories or models and thick descriptions of target consumers. The quantitative components are intended to test specific hypotheses and models that arise from the qualitative aspects. The program has the following components: 1) a qualitative in-depth audience analysis, to analyze the target audiences’ patterns of thought and behavior, and social interaction; 2) audience cluster structure analysis, to generate cluster maps of the target audience in terms of various dimensions that combine data on personality, attitudes, needs, motivations, and demographics; 3) attitude and emotional attachment generation for shows and celebrities, to break down and surface micro patterns in the shows and the celebrities, and to assess the impact of the micro patterns on attitudes and emotional attachment of the audience; 4) profiling the Filipino Moviegoer, to assess his/her spending patterns, judgments and decision-making; and 5) movie trailer analysis, to analyze persuasion elements in Filipino movie trailers.

The project is being undertaken through the support of Roslino Villamil, a former head of Pulse Asia, and its director is Marshall Valencia of the Department of Psychology.

SDRC Welcomes a New Baby for 2009

Research and Information Assistant Ma. Catherine Dacillo Domingo gave birth to a baby girl, Arwen Kate, on April 6, 2009, at the University of Santo Tomas Hospital. She weighed in at a healthy 7.3 pounds. Congratulations Cathy and Anthony!
In Memoriam

The director and staff of the Social Development Research Center mourn the loss of Aurora S. Esquejo, Assistant for Administration and Budget, who passed away on February 28, 2009.

Yoyie, as she was known to colleagues, joined the University in 1979 as a researcher for the MBA-Materials Development Office. She transferred to the External Research Office (ERO) as a senior researcher the following year, after which she became office manager and eventually administrative assistant, addressing the staffing needs of project directors as well as assisting them in planning the budgets for their studies. She remained with the research office through its transition from ERO to the DLSU Research Center to the present Social Development Research Center of the College of Liberal Arts—a witness to the office’s history since its inception under then Vice President for Academics Bro. Andrew Gonzalez.

She is survived by her husband, Rey, and two children, Rayam and Angie.