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# Incidence of Dengue and the Characteristics of the People in a Community

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## ABSTRACT

Dengue is a worldwide problem endangering millions of lives every year. Recently, the Philippines has been ranked 3rd among countries with the most number of dengue cases. Dengue has remained uncontrolled and incremental and thus calls for vigilance and knowledge of preventive measures. This study determined the relationship between the demographic profiles of the respondents, their level of knowledge and practices, and dengue incidence in selected nine (9) communities grouped into high, medium, and low dengue incidence. Following a descriptive-correlation design and using a validated and pilot-tested researcher-made questionnaire, 30 randomly selected respondents participated in the study. Weighted mean, one-way ANOVA, post-hoc and force cluster methods were employed to analyze the data. Results showno significant relationship between the respondents demographic profile (age,

sex, education, socio-economic status) and level of knowledge on the rate of dengue. However, there was a significant relationship between the respondents practices and dengue incidence. Dengue prevention education should be a major concern of community health workers and community leaders.

***Keywords*** - Dengue, demographics, knowledge and practices of community people

## INTRODUCTION

According to World Health Organization, dengue is a mosquito-borne infection that causes a severe flu-like illness, and sometimes a potentially lethal complication called dengue hemorrhagic fever. It usually affects infants, young children and adults, most especially those who have low immunity. Generally, dengue fever manifests symptoms that range from a mild fever to incapacitating high fever, with severe headache, pain behind the eyes, muscle and joint pain, rashes and to a dangerously low platelet count often with fatal consequences (WHO, 2009).

Dengue hemorrhagic fever was first recorded in the Philippines in 1953 and was made a notifiable disease in 1958. Sporadic dengue outbreaks occurred in some areas of the country until the 1980's. Since then, dengue has maintained its endemicity in all regions of the country and control measures were instituted as necessary (Dominguez, 1997).

Recently, reports about dengue fever cases have been threateningly increasing. According to WHO, some 2.5 billion people, two-fifths of the world's population, are now at risk from dengue and estimates that there may be 50 million cases of dengue infection worldwide every year. As of September 25, 2010, Philippines ranked 3rd worldwide with 98,934 confirmed cases in this year's outbreak table of listed countries having the number of confirmed dengue incidence (Wikipedia, 2010).

Dengue cases in the Philippines rose by 75% in the first eight months of 2010, nearly double from the same period of the previous year and considered a serious concern. Health Secretary Enrique Ona believed that the country has reached the peak of dengue cases based on figures from previous years showing the number going down after August (Sisante, 2010).

Specific treatment for the disease is still lacking. Consequently, the best management for dengue fever is early detection to prevent complications that may lead to death. Government agencies concerned with the health of the people have established different programs to control and prevent the incidence of dengue. This includes preventive measures like proper hygiene, a healthy lifestyle and diet, good sanitation, maintenance of a safe and clean environment, and awareness about the

disease process. But not all people in different areas or communities with the programs imposed by the health sector. The most common reason for non-compliance is lack of facilities for proper dissemination of information.

Dr. Eric Tayag of the DOH's National Epidemiology Center advised the public to prevent dengue and treat mild cases at their own homes by keeping in mind the following guidelines: daily monitoring of patient's status; encouraging the intake of oral fluids like oresol, water, juices; noting any dengue warning signs like persistent vomiting and bleeding; giving paracetamol, not aspirin because aspirin induces bleeding; using mosquito nets; and seeking early consultation for any warning signs (Sisante, 2010).

Concerning this, enough knowledge or awareness has to be to integrated into the attitudes and practices for the prevention of dengue. Since there has been no known cure for this illness, each citizen is expected to take responsibility to equip oneself with enough knowledge about the disease and incorporate it with salutary practices and sound attitudes towards the prevention of disease.

The researchers sought to establish find the relationship between of dengue incidence the knowledge and practices as well as the demographic profile of the citizens.

## FRAMEWORK

This study is anchored on the Health Belief Model (HBM) of Irwin M. Rosenstock. The theory assumes that people will take preventive action for their health and engage in health-promoting behaviors if they believe that they are susceptible of contracting an illness, perceive the potential severity of an illness, are convinced that the recommended measures are effective in reducing the seriousness of impact, and are not hindered from perceived barriers.

The HBM deals with the relationship between the perceptions, cognitions and decisions of people with regards, to a certain illness. It provides a way to understanding and predicting how clients will behave in relation to their health and how they will comply with health care treatments (McEwen & Wills, 2007).

Practical interventions, based on HBM, consist mainly of the right communicator designing a message that is likely to persuade individuals to make healthy decisions. The message should produce accurate perceptions of the threat of the illness, and provide indications of the efficaciousness of preventive measures. This model can now be applied to health behavior situations where it has previously been less useful, namely in cases where long-term behavior change is necessary (Kerr, J., Privatdozen, R. W. &Moretti, M., 2005).

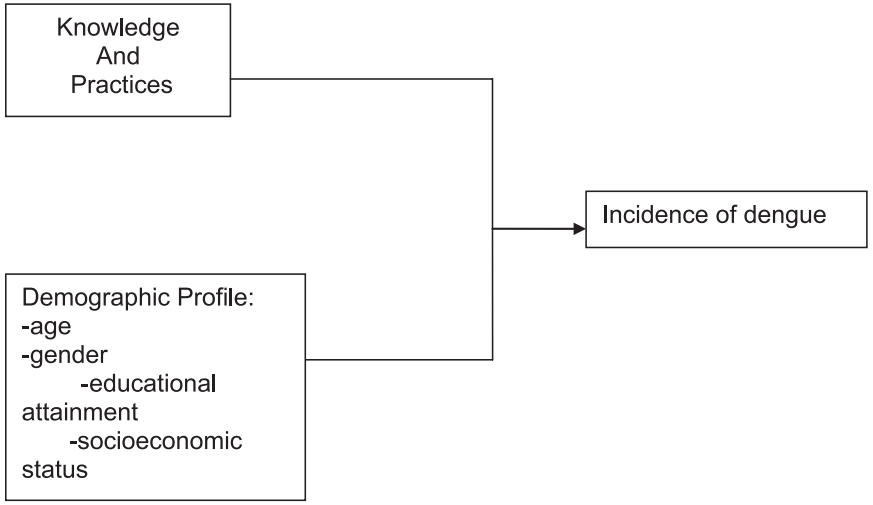


Figure 2. Schematic diagram of the study

The dependent variable of the study is the occurrence of dengue fever (respondents affected with dengue fever and the respondents that are not affected by dengue fever). The independent variables of the study are the respondents level of knowledge and practices and the profile that includes gender, age, socioeconomic status, and educational attainment.

Demographic, economic, behavioral, and social factors are often keys for effective communicable disease control and underpin successful public health programs. Despite promising indications in the literature, these factors have remained poorly understood in the case of dengue. Furthermore, recent field evidence has raised some questions regarding widely accepted characteristics of dengue that need review and confirmation.

The literacy level of an individual is directly related to the knowledge level on dengue fever (health concerns), which in turn affects health status. Thus, a more active approach should be adopted in order to reach a certain group of people and deliver easy-to-understand information (NG Siu Fung Jonathan, 2007).

In a study conducted in Karachi, Pakistan, people of primary level of education and illiterate persons were found to have similar levels of awareness of hygiene issues. Furthermore, decreasing prevalence of poor knowledge was seen as income increased. Another factor that seemed to determine knowledge in the sample of the study was a

family history of dengue. Insufficient knowledge was found to be more in the group where no person in the family had previously been exposed to dengue. Thus, it was assumed that drift of information occurs within a family, and that knowledge seeking behavior also improves in such families (Itrat, A., Khan, A., Javaid, S., Kamal, M., Khan, H., Javed, S., Kalia, S., Khan, A. H., Sethi, M. I., Jehan, I., 2008).

Another study in the same locale also revealed that knowledge of dengue was inadequate in the low socioeconomic class while better preventive practices against the vector were prevalent in the high socioeconomic group. (Syed, M., Saleem, T., Syeda, U. R., Habib, M., Zahid, R. Bashir, A., Rabbani, M., Khalid, M. Iqbal, A., Rao, E. Z., Shujja-ur-Rehman, &Saleem, S., 2010).

Income is as well related to health, both at the level of individuals and societies. Much of this relationship appears to be due to the association between income, education and occupation. The lower the income or status, the more likely it is that a person will engage in riskier forms of behavior such as improper drainage practices and the less likely it is that they will engage in health-promoting behaviors (Kerr, J., Privatdozen, R. W. &Moretti, M., 2005). In contrary, high incomes increase access to goods and services that are beneficial to health, such as health care, better food and housing, and preventive health measures.

Several studies have shown that a higher socio-economic status (SES) correlates with better knowledge scores. This suggests that means to disseminate knowledge regarding dengue among the general population has been more beneficial for those with a better income, and there has been a smooth transition of increasing knowledge with each ascending tier of income. These findings suggest that more effective programs for population awareness need to be implemented, which would target population in lower SES groups (Itrat et al., 2008).

With regard to age of an individual, hospital-based studies have similarly reported increasing infection rates among adults, mentioning that it is contrary to the popular belief that dengue is a pediatric disease. The increased incidence among young adults has important implications for control and prevention (WHO, 2012).

Dengue has been typically acknowledged as a childhood disease and is an important cause of pediatric hospitalization in Southeast Asia. There is, however, evidence of increasing incidence of dengue among older age groups. Three studies in Asia using surveillance data reported increasing age of infected patients. In Singapore, surveillance data showed a shift in peak dengue mortality from pediatric ages (1973–1977) to adults in 1982, since which year more than 50% of the deaths occurred in patients older than 15 years. From 1990–96, the highest age-specific morbidity rates were in the 15 to 34-year age groups. In Indonesia, surveillance data from 1975 to 1984 showed an increase in incidence rates among young adults in Jakarta as well as

in the provincial areas (Guha-Sapir & Schimmer, 2005).

Adults have accounted for proportions as high as 82% of all cases in the hospital-based surveillance study during the 2000 epidemic of dengue in Bangladesh; the highest proportion of cases occurred in the 18 to 33-year age group. All deaths in the Bangladesh outbreak in 2000 were in persons older than 5 years. In Puerto Rico, surveillance data analysis showed the highest incidence rate (11.8/1000) in the 10 to 19-year age group during an outbreak in 1994 and 1995.

Some studies found that while communities can score well in knowledge of the disease, they perform less in attitude and practice, indicating that behavior change is one area to target in social mobilization programs. According to a research conducted in Maldives, there is a lack of good practices towards a disease, because people do not absorb all the information they get and tend to forget most of the information. It may be a matter of motivation and perceived benefits. If people don't see the benefit of a given behavior, they do not practice it, regardless of understanding. It might be that the educational information is insufficient to address people's understanding of disease transmission and/or education methods used are flawed (Ahmed &Taneepanichskul, 2008).

Though indirectly implied, one thing is common among in the findings of the renewal studies, that is, many efforts and interventions need to be done in finding effective strategies for behavior change to prevent diseases, thereby achieving well -being (Smedley and Syme, 2001).

## OBJECTIVES OF THE STUDY

This study investigated the relationship between incidence of dengue in a selected communities in Cebu City and the characteristics of the residents.

### Hypotheses

H1: There is a significant relationship between incidence of dengue and the respondents level of knowledge.

H2: There is a significant relationship between the incidence of dengue and the respondents' practices.

H3: There is a significant relationship between the incidence of dengue and the respondents' demographic profile in terms of age, gender, educational attainment , and socioeconomic status.

## METHODOLOGY

### Research Design

A descriptive-correlational research design was utilized in this study. A correlational research design discusses interrelationship or association between two variables or more.

### Research Locale

Nine communities in Cebu City were chosen as the locale of this study. They were grouped according to dengue incidence. The three most dengue-infected communities were Guadalupe, Tisa, and Labangon. The three middle dengue-infected communities were Banilad, Calamba, and T. Padilla. The three least dengue-infected communities were Binaliw, Paril and Mabini.

### Research Respondents

The respondents of this study were the registered residents of the nine selected communities. The household heads were made to answer the questionnaire.

### Research Sampling Techniques

There were 30 respondents randomly selected from the nine communities. The respondents consisted of 15 individuals that diagnosed with dengue or a member of their family was diagnosed with dengue and 15 individuals who were not infected by dengue and had no diagnosed dengue in the household.

### Research Instruments

This study used as a researcher-made questionnaire that was validated and pilot tested for reliability with a cronbach's alpha value of 0.87. Part I determined the demographic profile of the respondents, Part II assessed their level of knowledge about dengue. Part III assessed their practices regarding dengue.

In assessing the practices of the respondents, a 4-point Likert scale was used. Dichotomous type of questions was used to assess level of knowledge.

**Research Data Gathering Procedures**

The researchers went to the health center of the nine communities and to the City Health Office to obtain the official list of respondents diagnosed with dengue. The respondents were given the questionnaire to accomplish. They were not obliged to write their name on the questionnaires. Informed consent was secured. The responses were coded accordingly to maintain confidentiality. A household head was made to answer the questionnaire. The questionnaires were collected right after they were accomplished. The data were tabulated and statistical treated for analyses.

**Research Statistical Analysis**

Forced Cluster Analyses was used to rank the results. Weighted mean was used to determine the respondents' level of knowledge and practices. Analysis of Variance (ANOVA) any post-hoc analysis were used to test the relationship between the independent and dependent variables.

## RESULTS AND DISCUSSION

The demographic profile of the respondents are summarized in Table 1.

Table 1. Respondents' demographic profile

| Independent Variables | Dengue Incidence | | | | | |
|---|---|---|---|---|---|---|
| | High | | Medium | | Low | |
| | F | % | F | % | F | % |
| **Age** | | | | | | |
| Adolescence (12-18) | 1 | 1 | 2 | 2 | 3 | 3 |
| Early Adulthood (18-35) | 62 | 69 | 67 | 74 | 68 | 76 |
| Middle Age (36-60) | 27 | 30 | 21 | 23 | 19 | 21 |
| Late Maturity (above 60) | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 90 | 100 | 90 | 100 | 90 | 100 |
| **Gender** | | | | | | |
| Male | 22 | 24 | 23 | 26 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Female | 68 | 76 | 67 | 74 | 90 | 100 |
| Total | 90 | 100 | 90 | 100 | 90 | 100 |
| **Annual Family Income (Php)** | | | | | | |
| Below 10,000 | 35 | 39 | 47 | 52 | 42 | 47 |
| 10,000-19,999 | 18 | 20 | 14 | 16 | 19 | 21 |
| 20,000-29,999 | 10 | 11 | 6 | 7 | 11 | 12 |
| 30,000-39,999 | 2 | 2 | 3 | 3 | 6 | 7 |
| 40,000-49,999 | 4 | 4 | 1 | 1 | 0 | 0 |
| 50,000-59,999 | 4 | 4 | 3 | 3 | 3 | 3 |
| 60,000-69,999 | 5 | 6 | 3 | 3 | 5 | 6 |
| Above 70,000 | 12 | 13 | 13 | 14 | 4 | 4 |
| Total | 90 | 100 | 90 | 100 | 90 | 100 |
| **Educational Attainment** | | | | | | |
| Elementary Level | 6 | 7 | 2 | 2 | 3 | 3 |
| Elementary Graduate | 12 | 13 | 7 | 8 | 6 | 7 |
| Highschool Level | 17 | 19 | 17 | 19 | 25 | 28 |
| Highschool Graduate | 20 | 22 | 25 | 28 | 31 | 34 |
| College Level | 24 | 27 | 20 | 22 | 18 | 20 |
| College Graduate | 11 | 12 | 19 | 21 | 7 | 8 |
| Total | 90 | 100 | 90 | 100 | 90 | 100 |

As shown in table 1, the respondents in areas with high dengue incidence were older than those in the medium and low dengue incidence areas because most of the respondents left at home during the survey were grandparents and most of the adults were out for work. The responders were mostly females most of the males were at work during the survey. The respondents in the high dengue incidence area had higher income than those in medium and low dengue incidence areas. Checking on their geography, the respondents with high income were in highly urbanized places. It is possible that the characteristics of the location may be the underlying reason for the level of dengue incidence. As observed, areas with the high dengue incidence had lots of stagnant canals, poor drainage, polluted creeks, and few trees. On the other hand, there was no pattern as to the educational attainment of the respondents. Most of them were jobless and just stayed home.

Table 2. Respondents' knowledge on dengue

| Category of Knowledge | Dengue Incidence | | | | | |
|---|---|---|---|---|---|---|
| | High | | Medium | | Low | |
| | F | % | F | % | F | % |
| Very High | 18 | 20 | 34 | 38 | 21 | 23 |
| High | 33 | 37 | 27 | 30 | 35 | 39 |
| Average | 11 | 12 | 12 | 13 | 12 | 13 |
| Low | 15 | 17 | 10 | 11 | 12 | 13 |
| Very Low | 13 | 14 | 7 | 8 | 10 | 11 |
| Total | 90 | 100 | 90 | 100 | 90 | 100 |

As shown in table 2, places with medium dengue incidence had very high knowledge on dengue while the respondents in high dengue incidence areas had comparable level of knowledge.

Table 3. Comparison of knowledge among three groups

| Group | Mean | Standard Deviation | Frequency | *p-value |
|---|---|---|---|---|
| High Incidence | 71.23 | 21.42 | 2.35 | 0.098 |
| Medium | 78.09 | 22.23 | | |
| Low | 73.46 | 21.28 | | |

*at 0.05 level of significance

Table 3 reveals a no significant difference in the level of knowledge on dengue among the three groups of respondents.

It is possible that the health workers in these areas provide education related to dengue. However, their being from medium dengue incidence areas suggests that their knowledge was minimally used or that the incidence of dengue may be attributed to other factors other than education statistically not significant p-value of 0.098.

Table 4. Respodents' dengue-related practices

| | High Incidence | | Medium Incidence | | Low Incidence | |
|---|---|---|---|---|---|---|
| | Mean Value | Description | Mean Value | Description | Mean Value | Description |
| Mean Score | 3.30 | VG | 2.98 | G | 3.43 | VG |

Description:
3.26-4.00 = Very Good (VG) 2.51-3.25 = Good (G)
1.76-2.50 = Average (A) 1.00-1.75 = Poor (P)

As shown in table 4, the respondents in low dengue incidence area had very good practices, they do not just suggesting that they apply their knowledge for dengue prevention. Although the respondents in low and high dengue incidence areas had very good practices, their location may have been a contributing factor to dengue incidence. A dirty environment can be a breeding ground for dengue mosquitoes.

Table 5. Comparison of practices among three groups

| Group | Mean | Standard Deviation | Frequency | p-value |
|---|---|---|---|---|
| High Incidence | 3.30 | 0.65 | 11.77 | 0.000 |
| Medium Incidence | 2.98 | 0.66 | | |
| Low Incidence | 3.43 | 0.59 | | |

*at 0.05 level of significance

As shown in table 5, the respondents in low dengue incidence areas had better practices comnpared with the other two areas. It is the actual behavior and not mere knowledge that would help prevent or reduce dengue incidence. The respondents from the nine communities may have similar level of knowledge, but what characterizes the low dengue incidence area is its higher level of good practices for dengue.

Table 6. Comparison of practices among three groups using pair-wise technique

| Pair | Mean Difference | P-value | 95% Confidence interval | |
|---|---|---|---|---|
| | | | Lower Bound | Upper Bound |
| Low-Medium | 0.446 | 0.000 | 0.223 | 0.668 |
| Medium-High | 0.313 | 0.003 | 0.091 | 0.536 |
| Low-High | 0.132 | 0.341 | 0.090 | 0.355 |

*at 0.05 level of significance

As shown in table 6, low dengue incidence areas had better practices compared with that of medium incidence areas. Those in medium dengue incidence areas hadlesser ways of preventing dengue. Good practices avert the occurrence of dengue in an area. In the case of high dengue incidence areas, their geographic characteristics play a major role in the incidence of dengue. Noticeably, stagnant canals, poor drainage, garbage-filled creeks, and few trees are amongst the reasons for high incidence of dengue.

Table 7. Cluster centroid of the 3 groups based on dengue incidence

| Profile Variable | High Incidence | Medium Incidence | Low Incidence | P-Value |
|---|---|---|---|---|
| Age | 31.8333 | 30.3556 | 29.7111 | 0.316 |
| Family Income | 3.1000 | 2.8111 | 2.4778 | 0.226 |
| Educational Attainment | 3.8661 | 4.2333 | 3.8556 | 0.093 |
| Knowledge | 71.2341 | 78.0860 | 73.4560 | 0.098 |
| Practices | 3.2956 | 2.9822 | 3.4278 | 0.000 |

As revealed in table 7, the respondents in areas with high incidence of dengue were older than those in areas with medium and low incidence of dengue. The respondents in the high dengue incidence areas had higher income compared with those in medium and low dengue incidence areas. But checking on their geography, those respondents with high income (mostly within the range of 20,000-30,000 per year) were in highly urbanized places. It is possible that the characteristics of the location are factors for the occurrence of the disease. However, the educational attainment of the respondents (mostly highschool graduates) did not have any pattern. The level of knowledge of the respondents in medium dengue incidence areas was higher than those in high and low dengue incidence areas. Based on the

findings, the respondents did not differ significantly in their level of knowledge. On the other hand, the respondents in low dengue incidence areas had better practices. It makes sense given that it is how people behaved in the community and not merely knowledge that helps prevent or decrease dengue incidence. The respondents from the nine (9) communities may have similar level of knowledge, but what characterizes areas with low dengue incidence is good practice for dengue prevention. The "gender" category was not included in the analysis because the incidence of dengue was not evenly distributed between the male and female population. In this cluster, only the locations of the dengue incidence, but not of the respondents, were compared.

## CONCLUSION

There is a significant relationship between practices and incidence of dengue. Results show that there was no significant relationship between respondents' demographic profile (age, gender, educational attainment and socio-economic status) and dengue incidence. Moreover, there was no significant relationship between respondents' evel of knowledge and dengue incidence.

## RECOMMENDATIONS

**Future Researchers.** Researchers may further assess whether knowledge and practices are related and if the demographic people of residents has bearing on such relationship if there is any. Researchers may also consider gender inrealtion to dengue incidence.

**Department of Health.** The Department of Health and other health care organizations may determine whether their information drives for awareness and prevention of dengue are eective. ey may also evaluate the practices of the community for dengue prevention. More eective and practical interventions may also be introduced to improve awareness and practices of the public, hence, equipping them for the control and prevention of dengue. e health centers should take responsibility in monitoring and advocating community sanitation. And lastly, focus may be accorded to the low socioeconomic areas in future health campaigns.

**Community.** The people must not rely only on the government. They should be vigilant and work together to reduce dengue incidence. Proper education starts at home . So, parents must teach their children the proper measures in preventing dengue.

## LITERATURE CITED

Kerr, J.
2005 *ABC of Behavior Change*. Philadelphia: Elsevier Ltd., pp. 58-59, 85-96, 127.

McEwen, M. and Wills, E.
2007 *Theoretical Basis for Nursing* (*2nd Edition).* Philadelphia: Lippincott Williams and Wilkins, pp. 318-319.

## INTERNET SOURCES

Ahmed, N. and Taneepanichskul, S.
2008 *Knowledge, Attitude and Practice of Dengue FeverPrevention Among the People in Male', Maldives.* Retrieved October 04, 2010, from (http://74.125.155.132/scholar?q=cache:iKw1RS5Ut6sJ:scholar.google.com/&hl=en&as_sdt=2000)

Dominguez, Ma. N. N.
1997 *Dengue Bulletin Volume 21: Current DF / DHF Prevention and Control Programme in the Philippines.* Retrieved October 05, 2010, from (http://www.searo.who.int/en/Section10/Section332/Section519_2385.htm)

Guha-Sapir, D.and Schimmer, B.
2005 Emerging Themes in Epidemiology 2005. *Dengue fever: new paradigms for a changing epidemiology.* Retrieved October 05, 2010, from(http://www.ete-online.com/content/2/1/1)

Itrat, A., Khan, A., Javaid, S., Kamal, M., Khan, H., Javed, S., Kalia, S., Khan, A. H., Sethi, M. I., Jehan, I.,
2008 (July 9,*). Knowledge, Awareness and Practices Regarding Dengue Fever among the Adult Population of Dengue Hit Cosmopolitan*. Retrieved October 05, 2010, from (http://www.plosone.org/article/info:doi/10.1371/journal.pone.0002620

Kerr, J., Privatdozen, R. W. &Moretti, M.
2005 The ABC of Behavior Change. A Guide to Successful Disease Prevention and Health Promotion. Retrieved 2010 from http://www.elsevier.ca/

ISBN/9780443074288/The-ABC-of-Behavior-Change

Mathers, C. and Schofield, D.
1998 *The health consequences of unemployment: the evidence*. Retrieved October 06, 2010, from (http://mja.com.au/public/issues/feb16/mathers/mathers.html)

Medicine Net, Inc.
2010 *Dengue Fever*. Retrieved October 10, 2010, from (http://www.medicinenet.com/dengue_fever/article.htm#2whatareas)

NG Siu Fung Jonathan
2007 (August).*An Analysis of Relationship Between Dissemination of Health Information and Demography in Hong Kong*. Retrieved October 05, 2010, from (http://docs.google.com/viewer?a=v&q=cache:hb4lDl_VlhIJ:hub.hku.hk/bitstream/10722/50706/1/FullText.html+AN+ANALYSIS+OF+RELATIONSHIP+ETWEEN+DISSEMINATION+OF+HEALTH+INFORMATION+AND+DEMOGRAPHY+IN+HONG+KONG)

Sisante, J.
2010 *Dengue cases nationwide nearly double from 2009*. Retrieved October 14, 2010, from (http://mabuhaycity.com/forums/health-wellness-fitness/12243-dengue-cases-rise-75-philippines-now-serious-concern.html)

Smedley, Brian D. and S. Leonard Syme
*2001* *Promoting Health: Intervention Strategies from Social and Behavioral Research*. American Journal of Health Promotion: January/February 2001, Vol. 15, No. 3, pp. 149-166. Retrieved 2012 from http://www.ajhpcontents.org/doi/abs/10.4278/0890-1171-15.3.149

Syed, M., Saleem, T., Syeda, U. R., Habib, M., Zahid, R. Bashir, A., Rabbani, M., Khalid, M. Iqbal, A., Rao, E. Z., Shujja-ur-Rehman, &Saleem, S.,
2010 Knowledge, attitudes and practices regarding dengue fever among adults of high and low socioeconomic groups. Retrieved October 04, 2010, from (http://www.ncbi.nlm.nih.gov/pubmed/20225792)

World Research Organization (WHO)
2009 *Dengue and dengue haemorrhagic fever.* Retrieved October 14, 2010, from (http://www.who.int/mediacentre/factsheets/fs117/en/)

World Research Organization (WHO)
2012 *Dengue and Severe Dengue*. Retrieved 2012 from http://www.who.int/mediacentre/factsheets/fs117/en/