

---

## **A Preliminary Opinion Survey of Taipei City Medical Personnel of the Communicable Disease Reporting System – Using the Reporting of Dengue Fever as a Model**

### **Introduction**

Along with the increase in world population, lifestyles have changed. Factors such as rapid and frequent international transportation, and the greenhouse effect have broadened contacts between people and between people and animals, resulting in more rapid and unrestricted transmission of communicable diseases. In order to effectively control communicable diseases, health authorities have, in addition to carrying out strict disease surveillance, asked medical care institutions to promptly report cases or suspected cases of communicable diseases upon identification in order to take immediate and adequate control measures to protect and maintain the health of the population. Thus, the awareness and cooperation of medical care personnel is of vital importance in the entire communicable disease reporting system.

To deal with the soft-turtle and the enterovirus incidents, the Department of Health has strengthened disease surveillance, and specified the responsibilities of organizations at various levels. The Regulations Governing the Control of Communicable Diseases were made Law on June 23, 1999, and communicable diseases were classified further into four categories. The first category which require immediate reporting and isolation includes cholera, plague, yellow fever, rabies and Ebola hemorrhagic fever. The second category is divided into two groups; included in group one are anthrax, typhoid fever and diphtheria which require reporting within 24 hours and isolation; the second group that requires, with the exception of open pulmonary tuberculosis, reporting within 24 hours and hospitalization. Though communicable diseases in the third category do not require mandatory hospital care, they are to be promptly reported. The fourth category includes other communicable diseases or emerging communicable diseases, whose reporting requirements and control measures will be decided by the competent national health authorities<sup>(1)</sup>.

Dengue fever belongs to group one of category three. It is an acute, vector-borne infectious disease. Unless controlled immediately, it may result in outbreaks and significant loss of health and life. It should, therefore, be reported within 24 hours upon identification.

### **Current Status**

Dengue fever virus is more prevalent in the area between 25°N and 25°S. In the past there were three island-wide outbreaks in Taiwan, in 1915, 1931, and 1942. Since the outbreak of dengue fever type II in Liuchiu Township of Pingtung County in 1981<sup>(2)</sup>, there have been imported cases or indigenous cases each year. In 1995, 162 indigenous cases of dengue fever were reported from Chungshu City of Taipei County. This was the first time since 1942 in Taiwan

that cases were reported from areas where there were only *Aedes albopictus* and no *Aedes aegypti*<sup>(3)</sup>. With the last reporting of a small-scale outbreak from Hsinyi District in 1996, no further outbreaks of indigenous cases have been reported in Taipei City in the last three years.

Virus-infected mosquitoes transmit dengue fever. Virus is found in the blood of an infected person from one day before until five days after the onset of symptoms. The virus multiplies in mosquitoes after biting an infected person, and in 10-14 days mosquitoes become carrier vectors. In turn, persons bitten by these mosquitoes will be infected resulting in an outbreak. Statistics of confirmed dengue fever cases in Taipei City show that a patient will on average visit two to three doctors within 6-12 days from the onset of symptoms till the confirmation of the diagnosis<sup>(4)</sup>. Chances of spreading the infection are great. The recognition of the infection and its reporting by physicians, therefore, play an important role in the control of dengue fever.

In the disease surveillance system of Taipei City, fewer cases are reported by primary care physicians (private practitioners). And yet, they are the front-line contacts of patients. The health of the population will be seriously threatened if physicians are not acquainted with and knowledgeable about communicable diseases.

### **Purposes of the Survey**

The purpose of the study is to encourage physicians to report more cases, therefore, it is necessary to ascertain their understanding of and attitude toward the reporting system, their comments on the process of reporting, and their recommendations for the improvement of the system.

### **Survey Method**

### 1. Subjects for Survey

Physicians in internal medicine, family medicine, pediatrics, and infectious diseases practicing at clinics, district hospitals, regional hospitals, and medical centers in Taipei City were selected for the survey. As time was limited, the survey was conducted for only five weeks between May 8 and June 3, 2000. Public health nurses of district health centers and hospital nosocomial infection control nurses were asked to select ten clinics in each district and ten physicians in each hospital at various levels for the questionnaire survey.

### 2. The Questionnaire

A mixed-type questionnaire designed specifically for the survey was used. The questionnaire included questions on the background of the individual, his/her knowledge of and attitude toward dengue fever reporting, and his/her practice of reporting.

To improve the validity of the questionnaire, the draft questionnaire was pre-tested with relevant staff members of the Center for Disease Control, the Department of Health, some private practitioners, physicians of regional hospitals and above, and staff members of the Taipei City Health Department and health centers.

### 3. Statistical Analysis

Excel was used in the statistical analysis. Percentages were calculated for each item.

## Results

### 1. Background Information

Of the 310 copies of questionnaire distributed, 250 were returned at a return rate of 81%. More copies were returned by medical centers at a rate of 96%; district hospitals at 90%; regional hospitals at 83%; clinics at 75%; and the least by other specialty hospitals at 30%. Of all valid copies, 32% (80) were returned by the sentinel reporting physicians designated by the Center for Disease Control of the Department of Health.

## 2. Knowledge of Reporting

93.8% (75) of the designated sentinel physicians and 83.5% of the non-sentinel physicians knew about regulations and fines regarding dengue fever reporting. 99.6% of physicians knew that dengue fever should be reported, only 86.8% knew the correct time period required for reporting. 37.2% of physicians had reported dengue fever cases; 58.6% in medical centers, and only 14.4% in clinics. Of the physicians who had reported dengue fever cases, 78.5% did not perceive any inconvenience in the reporting process; 18.3% considered the reporting inconvenient. 35.3% thought that the forms were complicated; 29.4% found the reporting process annoying. Of those who had never reported dengue fever cases, 68.8% did not see any dengue fever cases in their patients. To a question whether physicians should bear any social responsibility for dengue fever outbreak brought about by negligence of physicians in case reporting, 88.8% were affirmative. To another question whether environmental spraying around the areas of dengue fever cases and suspects was essential, 79.2% said two environmental sprayings were adequate; and 20% said two sprayings were unnecessary. Of them, 50% believed that the first spraying could be conducted within 24 hours, and the second spraying should be cancelled if the case was not confirmed to be dengue fever.

## 3. Willingness to Report

The question was originally designed for physicians to select items by order of priority. Most of them, however, simply selected items without indicating their priority orders. The top three items were, feedback regarding the statistical information (71.6%), simplifying the reporting process (68%), and offering incentives (65.6%). By comparing the comments on ways to improve reporting, willingness of physicians who had reported cases and who had no feedback regarding statistical information of the infection was considered the most important factor.

#### 4. Discussion

In 1985 Parasuraman, Zeithamal, and Berry developed a set of five determinants on the quality of service. They were graded by customers and arranged by order of priority as follows<sup>(5)</sup>:

1. reliability: whether the quality of service is constant and up to a certain level;
2. responsiveness: whether service personnel respond promptly and actively to requests and questions of customers with satisfaction;
3. assurance: whether the skills, manners and expertness of the service personnel convey to customers the feeling of trust and confidence;
4. empathy: whether concern for customers and special attention for individual customers is displayed;
5. tangibility: are the hardware, facilities, employees and contents of communication explicitly demonstrated?

Whether the quality of service is seen to be good or bad has to do with the difference between the customer's perceived level of service as

compared with the expected level of service. If the perceived level of service is lower than the expected level, customers are dissatisfied. On the other hand, if the perceived level of service is comparable to or even higher than the expected level, customers are satisfied with the service. Their chances of using the service again are greater.

Only 13 private practitioners (14.4%) had reported dengue fever cases. This finding corresponded to the low reporting rate of private physicians in the Taipei City communicable disease surveillance system. 68.8% of them did not report because they did not recognize dengue fever in their patients. To the open-ended questions, some physicians said “they either had never seen any dengue fever cases or are unable to confirm a suspected case”, “a training course on common seasonal communicable diseases “should be organized once every year at a time most convenient to private physicians”, “many doctors have no experience of dengue fever. Educational materials or training courses should help increase doctors’ knowledge and awareness”.

Infection control is one of the major factors in the assurance of medical care quality. One of the criteria of hospital accreditation and teaching hospital accreditation in 1994 requires that regional and higher rated hospitals should assign one physician and one trained nurse per 300 beds to monitor infection control. Infection control is extremely important<sup>(6)</sup>. Nosocomial infection does occur and quality of medical care will be affected if patients of infectious diseases are not duly reported, or if physicians are not familiar with infectious diseases. Lack of knowledge about dengue fever on the part of physicians is a concern in its control. Training programs related to dengue fever control should be a priority for health care workers in disease control.

A common belief is that increase in medical payment should improve the willingness of disease reporting. Findings of the survey, however, indicated

that feedback of disease statistics (71.6%) and simplification of the reporting process (68%) were more effective in improving reporting willingness, particularly among private practitioners. The flow of reporting in Taipei City<sup>(7)</sup> requires physicians to fax or telephone the disease information form and laboratory testing request to the City Health Department or health centers. The disease information form, as indicated by many, could perhaps be simplified. Answers to question 5, “have you ever come across any inconvenience in reporting dengue fever cases?”, should corroborate the above observation.

Item 2 of Article 5 of the Law on the Control of Communicable Diseases stipulates that “physicians shall according to the regulations, report, collect specimens, and refer patients with communicable diseases to prevent their spread; physicians, as part of their social responsibilities, shall also take appropriate public health measures”. Item 3 of Article 36 of the same Law further stipulates that “laboratory test findings of communicable diseases shall be confirmed by the central competent authority.” Thus, the laboratory testing of dengue fever cases and suspect cases should be confirmed by the central competent authority. The present practice that hospitals at any level should send their specimens to the Center for Disease Control for confirmation could delay diagnosis and may hamper the willingness of case reporting. To question 14, “Please give your comments on the current communicable disease reporting system”, some were of the opinion that “collection of specimens is unnecessary when the case has already been confirmed by medical centers”, “physicians are not informed of the laboratory testing findings, and therefore, are less willing to report cases”, “feedback to physicians annual disease information statistics including where cases were identified”, “inform immediately person in charge of the hospital of the confirmed diagnosis”. It



seemed that physicians were alienated by the laboratory testing procedures.

In the survey of reporting willingness, it was found that because of their practicing locations, primary care physicians were significantly in need of epidemiological information. They have less access to continuing education channels and administrative resources than physicians at the district and above hospitals. Rapid and correct diagnosis is most helpful to their practice. It thus seems that there is a gap in the perception of communicable disease reporting between clinical doctors and public health workers. Clinical doctors are more concerned about rapid diagnosis after case reporting for timely and correct treatment of patients to save their lives and restore health. Public health workers, on the other hand, are more concerned about ways to prevent the spread of infection and to maintain the health of the population. Though the goal of both is to maintain the health of the population, there are some differences in viewpoints related to the process. The Law of the Control of Communicable Diseases requires mandatory reporting of even suspected cases. Clinical doctors are of the opinion that disease control measures should be taken only when cases are confirmed. Public health workers, however, insist that for the effective control of communicable diseases, control measures should be taken immediately after any suspected cases are reported. This gap in perception sometimes irritates doctors, patients, and public health workers. Mutual respect of each other's profession is essential in maintaining good relationship between the parties concerned.

Article 45 of the Law on the Control of Communicable Diseases lists some incentives, "Individuals, medical care institutions, and other related institutions in the successful control of diseases in accordance with this Law, shall be rewarded. Such incentive measures shall be decided by the central

competent authority.”<sup>(8)</sup>. An award of NT\$ 4,000 is given to any one who reports the first indigenous case of dengue fever. These incentive measures, however, are not attractive enough to physicians. 65.6% of the physicians indicated the establishment of incentive measures as the third priority in improving willingness to report. As regards the open-end questions, although some physicians recommended higher cash awards, most physicians considered public citation of good performance more effective in the improvement of willingness to report. Though financial remuneration is important, doctors are civic-minded, and are willing to contribute. This finding corresponded to answers to question 6. Sentinel physicians were more familiar with regulations on communicable diseases; they were therefore, more willing to report.

Computerization of hospitals has helped reduce the costs of management, improve hospital management, and control the quality of service. Computers give immediate access to information and improve two-way communication<sup>(8)</sup>. Some physicians in the present survey suggested that “reporting should be directly connected to the hospital network; that is, there should be a line on the hospital network that connects directly to the communicable disease reporting system”, “simplify the reporting process and forms, connections to networks of major hospitals should be made available for the consolidation of information.”

The web site of the Center for Disease Control has a home page on communicable disease reporting. In the present survey, although 48% of the physicians knew of the home page, only 4.2% had ever used it. Of those who had used it, 60% thought it convenient. The attitude of physicians toward network reporting seemed as yet reserved. Some physicians asked for more information on network reporting and the web sites (should be made available

at the Center for Disease Control and health bureaus as well). It seems important to help physicians understand the functions and benefits of network reporting.

## **Recommendations**

### Short-term Measures

1. Conduct continuing education for physicians either with educational materials or training programs to improve their understanding of diseases, relevant regulations, and reporting process, particularly for a re-emerging disease such as dengue fever. The Physician's Law should be amended to include continuing education credits as one requirement for the renewal of physician's license.
2. Communicable disease reporting should be given more weight in the accreditation of hospitals. Currently, communicable disease reporting is made a relatively low priority item under infection control. A heavier weight should cause hospitals to attach more importance to it.
3. Specific incentive measures should be set up. Though provisions are made in the Law on the Control of Communicable Diseases, regulations concerning punishment are specific, whereas regulations concerning rewards are not so. They are not attractive enough to medical care personnel. Incentives including cash payment, and particularly public citations and other forms of awards should be considered.
4. Authorization for the laboratory testing of communicable diseases should be promoted. Laboratories should be contracted by the Center for Disease Control for such service. Currently, only a few communicable diseases,

not including dengue fever, are confirmed by authorized laboratories. This practice will hinder the detection of acute communicable diseases such as dengue fever. Dengue fever should be tested and confirmed by authorized laboratories.

5. Network reporting of communicable diseases should be promoted and expanded. Though web sites will soon be set up for the current communicable disease reporting system, only some medical centers and proprietary hospitals will be included in the network. Communicable disease reporting should be handled in such a way as the payment claims of the National Health Insurance.
6. Reporting forms should be simplified. Both the communicable disease reporting form and the laboratory testing request should be combined into one to reduce the burden of physicians and thus to improve their willingness of reporting.

#### Mid-term Measures

1. The payment claim network of the National Health Insurance and the communicable disease reporting system should be integrated to prevent any negligence in reporting on the part of physicians.
2. A national databank on communicable disease reporting should be set up to monitor the long-term trend of communicable diseases. This monitoring will issue warnings about the occurrence of communicable diseases.
3. Improve the two-way communication on networks. In the national health information network, hospitals will be given codes for access to laboratory testing findings of cases. Physicians may also report treatment on the

network. Public health workers will report epidemiological information for more effective control of communicable diseases.

## **Conclusion**

Reporting of communicable diseases is the front-line defense in disease control. If physicians will actively report communicable diseases upon detection, health authorities will be able to take timely and adequate disease control measures to minimize loss of life and property. The findings of the present survey were that physicians in general were civic-minded and willing to report communicable diseases in their busy clinical practice provided that the reporting process was simplified, and the laboratory testing reports and disease statistics were fed back to them promptly. Incentive measures that promote their participation and facilitate their willingness to report such as paying honor, and respect should be promoted.

Due to time constraints and other limitations in access to information, the present survey included only descriptive discussions of single variables. In future studies, more will be done to analyze any statistically significant differences in different groups. Many physicians knew of the network reporting, and yet only a few had used it. Many physicians suggested the referral of communicable disease cases. A referral system has been tried out in Taiwan without much success. What are the relations between these two factors? Further studies will be required to understand the reasons and help improve medical care services in general and communicable disease reporting in particular.

## **Acknowledgement**

It was difficult for the author to complete the report in five weeks.

One reason was because the author was not adequately trained in writing research reports. Another reason included the difficulty in the collection of information, the designing, distribution and collection of the questionnaire, the collection of background information, etc. The author was fortunate to have help from many sources, including Dr HY Wu, Director of the Taipei City Venereal Disease Control Center (formerly Division Chief, the First Division, Taipei City Health Department); Mr WK Huang, Division Chief, the First Division, Taipei City Health Department; Ms AC Lai, Section Chief of the same Division; Ms TC Lee, Division Chief, Center for Disease Control; Ms LJ Chien and Mr KP Wu of the same Division; communicable disease control workers of the 12 district health centers of Taipei City; infection control workers of hospitals at all levels in Taipei City; Ms LL Wu, Ms YF Chung and others. The author is most grateful to them.

**Prepared by:** HC Wei

Taipei City Health Department

## **References**

1. Hsu CC. Health and Medical Care Laws and Regulations. Kuei-Kuan Publishing Co., August 1999, 19-27
2. Web site, Vector and Entomology Division, Center for Disease Control, DOH.
3. Lin TH. Introduction to Dengue Fever. Paper distributed at the Communicable Disease Control Workshop, Taipei City Health Department, May 1999, 11-15.
4. Tu HJ, Wu HY, Liao KF, et al. Disease control as fire fighting – control

strategies toward zero indigenous dengue fever case. 1999 Plan for the Control of Dengue Fever, Department of Health, April 1999, 23-31.

5. Fan SJ. Sales Strategies. Sanmin Book Co., August 1998, 558-559.
6. Research, Development and Evaluation Commission, the Executive Yuan. Indexes for the Assessment of Medical Care Quality of Hospitals. February 1999.
7. Wei HC. Flow of the reporting of vector-borne communicable diseases. Paper distributed at the communicable Disease Control Workshop, Taipei City Health Department, April 2000, 49-56.
8. Department of Health. Law on the Control of Communicable Diseases. June 1999.