

Infectious diseases and biomedical waste disposal*

A seminar on infectious diseases and biomedical waste disposal was organized. Neera Kewalramani, Deputy Executive Health Officer, Municipal Corporation of Greater Mumbai (MCGB), and Daksha Shah (Public Health Department and Epidemiology Cell, MCGB) spoke at length about the infectious communicable diseases. They presented an overview on diseases such as malaria, dengue and leptospirosis, which are rampant during the rainy season not only in Mumbai, but across the country. Y. B. Sontakke (Maharashtra Pollution Control Board (MPCB)) presented a talk on biomedical waste (BMW) and its disposal.

Kewalramani stressed the importance of surveillance in the containment and control of diseases, which commonly afflict the population during monsoon. Amongst the several diseases that occur during monsoon, she drew attention in particular to dengue, malaria and leptospirosis. Both Kewalramani and Shah gave a detailed description of these three diseases.

Dengue is an acute febrile disorder caused by a virus belonging to the Arbovirus group. The disease is transmitted by the bite of an infected, day-biting mosquito *Aedes aegypti*. Dengue epidemics are explosive and begin during the rainy season when the breeding of this vector mosquito is prominent. The transmission occurs by 'man-mosquito-man' cycle. The mosquito can become infectious after 10 days of having infected blood meal and remains so for life. The infection can lead to classical dengue fever or dengue haemorrhagic fever without shock or dengue shock syndrome. According to Shah, the dengue peaks during September–October. However, the peak observed was between July and December in 2007.

Stagnant pools of water in potholes on roads, plastic covers and tyres in slum areas, water collected in air conditioners in high-rise buildings are all breeding

grounds for mosquitoes. High fever, headache, backache, joint pain and muscle pain and pain behind the eyes are symptoms of classical dengue. Bleeding from the gums, haemorrhage, haematuria – blood in urine are signs of haemorrhagic dengue fever. Dengue shock syndrome is a severe form of the disease. Both doctors stressed upon the importance of laboratory diagnosis – haemoglobin, platelet count, PCR test, positive tourniquet test and positive rapid test, and also on the prevention and control of mosquito breeding at home as well as areas around, in addition to individual mosquito-bite protection using nets, repellents and creams.

According to the Public Health Department, MCGB, malaria in Mumbai is endemic and man-made. The incidence rises during monsoon between June and September. The cause is a parasite *Plasmodium vivax* and *falciparum* being common. The culprit again is the female *Anopheles* mosquito, which transmits the disease. The *falciparum* variety is most dangerous as it causes cerebral malaria and can cause death. The symptoms include fever with or without chills, body ache, headache, pain in the muscle, vomiting and confusion, vertigo, giddiness, semi-consciousness or unconsciousness in the case of cerebral malaria.

The National Malaria Control Programme has been merged under National Vector Borne Disease Control Programme, which includes malaria, filarial, dengue, kala-azar and Japanese encephalitis. Kewalramani said that surveillance, which can be of two types, is important in tracing the number of cases inflicted with the disease. Active surveillance means that workers of the malaria department visit the area, construction or community sites when they get information about fever outbreak, positive malaria cases in the area, collect blood samples and give treatment according to the guidelines. In passive surveillance, blood smears are collected from fever cases reporting to the Out Patient's Department of dispensaries, hospitals and medical colleges, along with necessary treatment and the same are examined for malarial parasite. Chloroquine is the drug of choice for treatment of malaria in Mumbai, the dose

being 1500 mg of chloroquine and 45 mg of primaquine.

Kewalramani also gave a detailed overview on leptospirosis, a bacterial disease caused by spirochete, *Leptospira interrogans*, which has 23 serogroups affecting man and animals. Moisture and warmth (20–30°C) favour its survival. Outbreaks occur due to exposure to water contaminated with the urine of infected animals, such as rodents and dogs in urban areas. Infection occurs through skin contact, especially with mucosal surfaces, such as the eyes or nose or broken skin. Walking through contaminated flooded water can give rise to leptospirosis. There is no man-to-man spread of this infection.

According to the Public Health Department notification, all those who complain about abrupt onset of high-grade fever, severe splitting headache, muscle pain, body ache or reddening of the eye are suspected cases. Increased IgM titres in the blood using ELISA test help confirm the diagnosis of leptospirosis. Shah mentioned the possibility of false positives, which need to be looked into. Also, she stressed upon taking early steps to prevent outbreaks of the disease.

Taking precautions such as wearing protective shoes or gumboots, avoiding walking through flooded water, rodent control, etc. can help in disease prevention. Most importantly, anti-flooding measures or preventive engineering measures such as de-silting of nallahs, drains, etc., closing of valves at the time of high tide, if possible, or any other engineering methods to drain out flood waters, prompt repair of potholes and garbage removal can help control the infection from spreading.

Sontakke, in his talk on BMW disposal, defined BMW as any kind of waste generated from the medical environment, such as the one generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining to the production or testing of biological materials. According to the Environment Protection Act 1986, the Central Government has made The Biomedical Waste (Management and Handling) Rules amended in the year 2000, in order to

*A report on the seminar on Infectious Diseases and Biomedical Waste Disposal, organized by the Association of Medical Consultants in collaboration with Mumbai Nursing Home Owners Association held in June 2008 at the Indian Medical Association Hall, Mumbai.

safeguard the public and healthcare workers from the risks arising due to BMW.

The waste handling and collection rules have been circulated amongst the hospitals. BMW should be segregated into specific coloured containers/bags at the point of generation prior to its storage, transportation, treatment and disposal. The containers need to be labelled accordingly. Sontakke stressed that no untreated BMW should be kept/stored beyond a period of 48 h.

Soiled waste, items contaminated with blood and body fluids, including cotton dressing, soiled plaster casts, lines, beddings and other materials contaminated with blood require incineration/autoclave microwaving. Solid waste generated from

disposable items such as needles, syringes, scalpels, blades, glass, tubings catheters, intravenous sets, etc. require chemical disinfection autoclave/microwaving and mutilation/shredding to prevent unauthorized reuse.

Liquid waste generated from the laboratory and washing, cleaning housekeeping and disinfecting activities need to be disinfected chemically using 1% hypochlorite solution and discharged into drains. Biomedical research institutes come up with a lot of animal waste, which requires incineration/deep burial. Also cell culture, stocks of specimens of microorganisms and live or attenuated vaccines need autoclaving/microwaving.

According to Sontakke, there are 38 facilities in Maharashtra to dispose BMW

safely. To facilitate BMW disposal, the State Government has arranged for transporters, who collect the waste from generators such as hospitals, clinics, dispensaries, pathology laboratories, research institutions, etc. There are incinerators at Taloja, Maharashtra for waste disposal. For detailed information one can visit www.nihfw.org (a website created by the National Institute of Health and Family Welfare) or www.mpcb.mah.nic.in (MPCB).

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MEETING REPORT

Rice planthoppers strike back*

The rice planthoppers, particularly the brown planthopper (BPH), *Nilaparvata lugens* was once perceived as a threat to rice production in Asia during the mid 1970s. Also labelled as the pest of the green revolution, it had summoned the First International Conference during 1977. Modern high-yielding dwarf rice varieties like Taichung Native 1, IR8 and Jaya had been just then released for commercial cultivation in several Asian countries. Driven by high inputs like nitrogenous fertilizers and irrigation, these varieties offered had a potential to double the yield of the then prevailing long-duration, photosensitive, tall land races and improved selections. Application of high doses of inorganic nitrogenous fertilizers also became inevitable for higher yields. These miracle varieties showed susceptibility to major pests and diseases. Anxious to realize the full potential of these magic varieties, farmers were lured to use broad-spectrum, persistent insecti-

cides like BHC, methyl parathion, etc. Such a practice then led to extensive damage by BPH, termed as hopper burn. In this background, the first international conference was organized at the International Rice Research Institute (IRRI), Philippines. Activities triggered by this meeting, including breeding for BPH resistance and development of IPM packages emphasizing the reduction in unnecessary insecticide use helped keep BPH under control for the next 20 years.

However, during 2005 the planthoppers struck back in southern China in a big way. About 7.53 mha of rice was damaged accounting for 2.77 mt of rice production. During 2006, Vietnam suffered a production loss of 0.4 mt of rice. In a panic response, the Vietnam Government imposed a ban on rice exports, sending shock waves across Southeast Asian countries like Indonesia, Malaysia and the Philippines. This also added to spiralling rise in food price across the globe. This time it is not BPH, but also the two other related species of planthoppers, viz. white backed planthopper (WBPH) *Sogatella furcifera* and the smaller brown planthopper (SBPH), *Laodeltax striatella* that are causing problems. The situation is further compounded with as-

sociated transmission of deadly viral diseases like rice ragged stunt, rice grassy stunt and yellowing syndrome of rice. These viruses are transmitted by BPH and SBPH.

With this backdrop, the Second International Conference on Rice Planthoppers was convened by IRRI. The three-day conference brought together 73 participants from 14 countries, who have been involved in research, extension, administration, and production and marketing of seeds and pesticides. The conference critically analysed the causes and consequences of failure of 'ecological services' that led to the present crises, reviewed the progress of recent research and identified lacunae. It also debated the action plan at various levels to contain the menace of planthoppers in the immediate future.

In his welcome address, delivered in absentia through a video recording, Robert Zeigler (Director General, IRRI) cautioned that since we had let down our guards on food security during the last 15 years, the world is now facing a crisis in the food front. Peter Kenmore (FAO, Rome) in his keynote address touched upon the science and politics of rice planthopper management in Asia. Being

*A report on the Second International Conference on Rice Planthoppers held at IRRI, Philippines during 23–25 June 2008 and sponsored by FAO, Government of Japan, Thailand and a few Asian countries along with the private sector.