

## Building laboratory-based surveillance for foodborne diseases in the Western Pacific region

Few countries in the western Pacific perform laboratory-based surveillance, even though it is the foundation of foodborne disease outbreak detection and response. The WHO Western Pacific Regional Office (WPRO) requested that the US Centers for Disease Control, on behalf of WHO Global Salm-Surv, evaluate: 1) the need and capacity for hosting WHO Global Salm-Surv training in the Western Pacific region, particularly the Pacific Islands; 2) the current foodborne disease surveillance systems in Fiji Islands and the Philippines; and 3) each country's capacity for performing *Salmonella* isolation, identification, and sub-typing.

Here is a summary of the evaluation report.

### Needs assessment

In the past six years, substantial progress has been made toward improving communicable diseases surveillance in the Pacific Islands. Established in 1996, the PPHSN is a regional organisation consisting of 22 ministries and departments of health and allied health-related agencies (including WHO). The Secretariat of the Pacific Community serves as the "focal point" for activities involving the PPHSN. The network has three core activities. "PacNet" is an un-moderated electronic discussion group for public health and medical personnel in all 22 countries. Over 400 members contribute to approximately 12 messages sent per month, with periods of increased activity during times of local or regional outbreaks of infectious diseases. "EpiNet" was created to improve epidemic response in Pacific Island nations. As of 2001, each Pacific Island member nation has identified a multi-disciplinary team of persons who would be responsible for investigating communicable disease outbreaks in their country. Finally, "LabNet" consists of a network of primary and referral clinical laboratories for Pacific Island nations with agreements to perform reference testing for specific communicable diseases. The Institut Pasteur de Nouvelle-Calédonie provides technical leadership for LabNet activities.

A recent survey by LabNet demonstrated that Pacific Island nations are poorly equipped to conduct laboratory-based surveillance for food-borne diseases. Of 16 countries polled, only 7 (44%) responded that they have clinical laboratories in their country that can isolate and identify *Salmonella* Typhi. Some of the challenges to improving this situation include: 1) limited resources for laboratory supplies in some countries; 2) limited training of microbiologists; 3) limited motivation and political support for further training because of perception that laboratory capacity is not critical to nation's needs; 4) limited use of laboratory by clinicians; 5) limited funds to transport specimens; and 6) decreased willingness of commercial airlines and shipping companies to transport patient specimens or isolates. Institut Pasteur de Nouvelle-Calédonie currently performs *Salmonella* isolation, identification, serotyping and susceptibility testing (using broth micro-dilution) on human faeces and food.

The WHO Global Salm-Surv model emphasises capacity building through training of microbiologists and epidemiologists. This model has been successful in Asia (Thailand sub-regional centre), South America (Argentina sub-regional centre), Eastern Mediterranean, and Eastern Europe, where substantial scientific progress has been made. As a result of these courses, manuscripts have been written, scientific presentations delivered, collaborative public health and microbiology research projects begun, and additional grant support for ongoing activities obtained. Focused public health interventions to improve food-borne disease control are likely to come as a result of these activities. This approach is unlikely to succeed in Pacific Island nations at this time for the following reasons: 1) there is limited appreciation from nations about the importance of surveillance in improving food safety; 2) cooperative agreements on improving public health surveillance recognise cholera and typhoid fever as high priority diseases, but do not recognise other food-borne pathogens; 3) the population, specimen collection practices, and laboratory infrastructure of Pacific Islands make primary isolation of pathogens a challenge, let alone sub-typing and

## Inform'ACTION n° 14

MAY 2003

susceptibility testing. An alternative approach would be to establish reference testing sites, but shipping specimens is costly, slow or, under some situations, not possible.

Because laboratory-based surveillance is essential to all infectious disease surveillance, the PPHSN has begun developing a plan to balance in-country capacity with reference testing services. The PPHSN is also working to solve the problem of shipping specimens and isolates on commercial airline carriers. WHO Global Salm-Surv's approach, therefore, could be to address the more critical problem: limited appreciation of food-borne diseases and the value of food-borne disease surveillance. One way to address this problem would be to fund a targeted surveillance system enhancement and an analytical epidemiology study in one Pacific Island nation, with collaboration from the PPHSN and its laboratory network. If this project were to demonstrate the importance of food-borne disease surveillance in food safety policy, political interest in devoting resources to food-borne diseases might increase. Participation of the PPHSN might help validate the existence of its LabNet programme and highlight the transferability of laboratory-based food-borne disease surveillance to surveillance of other high-priority infectious diseases. Fiji Islands is a good place to start such a WHO Global Salm-Surv initiative in the Pacific Islands because of the country's population, size, location, health care system, laboratory capacity, epidemiologic capacity, and likely burden of disease.

If WHO Global Salm-Surv is able to build political support for food-borne disease surveillance, the current training model could be applied in the future to the Pacific Islands. An appropriate training facility would be the Fiji School of Medicine, particularly if the staff receive training as part of a focused public health research project as discussed above. The staff is motivated and interested and has hosted similar training courses before. The school has an appropriate laboratory with 20 workstations and the requisite equipment for a training course. Perhaps most important, the school is recognised politically as the primary health care training site for 12 different Pacific Island nations.

### Recommendations

- WHO Global Salm-Surv may wish to consider collaborating with the Fiji School of Medicine, Fiji Ministry of Health, and Pacific Public Health Surveillance Network to develop a targeted epidemiologic study about risk factors for infection from the predominant strains of *Salmonella* in Fiji.
  - For example, a prospective case-control study could be performed on all patients infected with *Salmonella* Weltevreden or subsp. 1 Ser 3,10:r:-. Case finding could include patients at Colonial War Memorial, as well as any interested regional hospitals. Hypotheses for this study would be developed from reviewing existing surveillance.
  - Microbiology for this study could be performed by the Colonial War Memorial Hospital, with training in laboratory methods and quality assurance from the Institut Pasteur de Nouvelle-Calédonie, using WHO Global Salm-Surv methods, materials and equipment. This would help solidify and strengthen Institut Pasteur's role as the technical lead for the Pacific Public Health Surveillance Program's LabNet initiative.
  - WHO Global Salm-Surv could provide training in WHONET.
  - Funds for this project could be used from money that may be allocated for WHO Global Salm-Surv Western Pacific activities in financial year 2002–2003.
  - Data from this project should be disseminated widely within Fiji and Pacific Public Health Surveillance Network member nations using existing Pacific Public Health Surveillance Network media (electronic discussion group, newsletters, journal) to build political support for food-borne disease surveillance.
  - Institutional review boards at the Fiji School of Medicine and Ministry of Health should review and approve any research involving human subjects. Review by CDC's Institutional Review Board will also be necessary whenever CDC epidemiologists collaborate on such projects.
- Future activities for WHO Global Salm-Surv in the Western Pacific might include training of Pacific Island microbiologists in food-borne disease laboratory methods and training of epidemiologists in food-borne disease outbreak investigations and surveillance.

## Inform'ACTION n° 14

MAY 2003

- Possible enhancements to existing training materials could include microbiologic methods of isolating seafood-associated pathogens, such as non-cholera vibrios, and surveillance methods for specific marine intoxications such as ciguatera, scombroid, and paralytic shellfish poisoning.

### Result

Health officials in Fiji are currently developing a pilot project to demonstrate the value of laboratory-based *Salmonella* surveillance in detecting outbreaks, improving food safety, and documenting the burden of disease. This project is being led by the Fiji Ministry of Health, Fiji School of Medicine, the University of the South Pacific, and the WHO South Pacific Office. Through WHO Global Salm-Surv and the WHO Western Pacific Regional Office, technical assistance will be provided by the Centers for Disease Control and Prevention (CDC, Atlanta, USA) and the Institut Pasteur de Nouvelle-Calédonie. The goal is to have the project start in the fall (autumn) 2003 and to share results with PPHSN.

### Dr Jay K. Varma

Foodborne and Diarrheal Diseases Branch (FDDB)  
Division of Bacterial and Mycotic Diseases (DBMD)  
National Center for Infectious Diseases (NCID)  
Centers for Disease Control and Prevention (CDC)  
USA