



## International Food Safety Authorities Network (INFOSAN)

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INFOSAN Information Note No. 6/2005 - WHO Global Salm-Surv

### WHO Global Salm-Surv A surveillance network for foodborne diseases

This note contains information on 'WHO Global Salm-Surv', a network for building capacity for laboratory-based foodborne disease surveillance and outbreak detection and response.

#### SUMMARY NOTES

- Foodborne diseases, and more specifically diarrhoeal diseases, are an important cause of morbidity and mortality worldwide.
- Surveillance of foodborne diseases provides information for action. It detects outbreaks of an infectious disease and monitors trends. The use of laboratory data in surveillance enables the identification of pathogens and the potential sources of infection.
- Integrated surveillance including human data as well as animal- and food-monitoring data allows risk-managers to develop preventive measures along the entire food-chain based on an evaluation of disease burden and an attribution of disease risk to specific foods.
- In 2000 WHO initiated the WHO Global Salm-Surv network to build laboratory and epidemiological capacity for integrated laboratory-based foodborne disease surveillance. The network now has almost 1000 members (including national institutions, as well as individual experts) from 149 countries.

#### Background

Foodborne diseases, and more specifically diarrhoeal diseases, represent a significant health problem with important economic consequences. Salmonellosis and several other foodborne illnesses result in diarrhoea, bloody diarrhoea, vomiting, and abdominal cramping. One of the most harmful types of foodborne bacteria, Shiga toxin-producing *Escherichia coli*, can result in haemolytic uraemic syndrome, a condition that can lead to kidney failure. It is estimated that each year two million people die from diarrhoeal diseases, mostly attributed to contaminated food and drinking water. Studies from the United States of America (USA) show that each year in the USA foodborne diseases result in 76 million illnesses, 325 000 hospitalizations, and 5000 deaths. It is estimated that foodborne diseases in the USA caused by *Campylobacter*, *Salmonella*, *E. coli* O157, and *Listeria monocytogenes* cost almost US\$ 7 billion each year. The globalization of the food trade now allows food produced in one country to be sold and



consumed half way around the world. This means that a contaminated food product can cause disease outbreaks in many countries at the same time.

Establishment of foodborne disease surveillance provides the means for collecting, analysing and monitoring trends of foodborne pathogens and the antimicrobial resistance profiles of these bacteria. Surveillance also facilitates the definition and monitoring of effective control and intervention strategies for foodborne diseases. This makes surveillance an essential component of any food safety system. It is also important for surveillance systems to meet the obligations under the International Health Regulations (2005)<sup>1</sup> and INFOSAN<sup>2</sup>.

Currently, only a few countries in the world have fully adequate surveillance programmes. All other countries, including all the developing countries, are in the process of establishing and improving their national system. As a consequence, the real health impact and extent of foodborne diseases, particularly in developing countries remains unknown. In 1997 a WHO survey of National Reference Laboratories showed a general lack of basic infrastructure for laboratory-based surveillance for foodborne diseases in up to one-third of WHO Member States.

### **WHO Global Salm-Surv: introduction**

WHO initiated WHO Global Salm-Surv (GSS) in 2000. In order to reduce foodborne diseases worldwide, the goals of GSS are to strengthen laboratory-based foodborne disease surveillance and to improve outbreak detection and response. GSS is an international resource for training and expertise in foodborne disease. Initially, GSS focused on the surveillance of Salmonella, but it has now expanded to diseases caused by other foodborne pathogens such as *E. coli* and *Campylobacter*. GSS also provides training related to resistance against antimicrobials in these important human pathogens as transmitted through food. GSS is a collaborative effort through which activities are undertaken in collaboration with key partner national institutions and WHO regional and country offices.

WHO is working on GSS with the following partners:

- Centers for Disease Control and Prevention, United States of America
- National Food Institute, Denmark
- Reseau International Des Instituts Pasteur, France
- Public Health Agency of Canada
- Food and Drug Administration Center for Veterinary Medicine, United States of America
- Animal Sciences Group Lelystad, Netherlands
- Enter-net, European Union
- OzFoodNet, Australia

In addition, GSS has two affiliated networks:

- Training Programmes in Epidemiology Interventions and Public Health Network (TEPHINET)
- PulseNet International

GSS works through five project components that promote capacity building, collaboration and communication. Through these components collaboration and communication between epidemiologists and microbiologists from human, veterinary and food-related disciplines, is fostered.

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<sup>1</sup> For more information see INFOSAN information note No. 4 - 10 May, The identification, assessment and management of food safety events under the International Health Regulations (2005) at:

[http://www.who.int/foodsafety/fs\\_management/infosan\\_archives/en](http://www.who.int/foodsafety/fs_management/infosan_archives/en)

<sup>2</sup> For more information see the INFOSAN users guide at:

[http://www.who.int/foodsafety/fs\\_management/infosan/en](http://www.who.int/foodsafety/fs_management/infosan/en)

The components are explained in further detail in the following paragraph. They include: 1/ annual training courses in all regions, 2/ a free External Quality Assurance (EQAS) programme for participating laboratories, 3/ focused regional and national projects, 4/ a list-serv and website ([www.who.int/salmsurv](http://www.who.int/salmsurv)), and 5/ a database of *Salmonella* serotyping results from participating countries, which allows a comparison of strains between countries and regions. GSS now has almost 1000 members (including laboratories, epidemiological units and individual experts) from 149 countries.

## Components of WHO Global Salm-Surv

### 1. International Training Courses

Training courses are being conducted at training sites around the world, some of which are recognized as a Regional Centres of Excellence. Courses are being offered in Arabic, Chinese, English, French, Russian and Spanish. The Level-I course focuses on microbiological training for *Salmonella* isolation, identification, serotyping and antimicrobial resistance. The Level-II course reviews Level I theory and techniques, with additional course work focusing on *Campylobacter* isolation and resistance testing. The Level-III course brings together epidemiologists and microbiologists. Epidemiologists focus on laboratory-based surveillance and outbreak detection and response issues, while microbiologists review laboratory techniques. Practical case study exercises are carried out by epidemiologists and microbiologists from each country, working together as a team. Country plans of action are created to implement skills after the course and to build on intra-country relationships developed. The Level-IV course focuses on molecular subtyping methods, and brings together epidemiologists, microbiologists and managers, allowing for a more sophisticated foodborne disease country plan of action to be developed.



Source: Centers for Disease Control & Prevention, Atlanta, USA

### 2. External Quality Assurance System

WHO Global Salm-Surv promotes capacity building through its annual External Quality Assurance System (EQAS), which encourages laboratories to achieve the highest quality isolations, identifications, serotyping and antimicrobial susceptibility test results. Through the National Food Institute in Denmark, GSS distributes blinded strains to participants for serotyping and susceptibility testing. GSS also provides antisera to national reference laboratories. Laboratories with sub-optimal results are encouraged to seek assistance to improve their skills. The EQAS is the world's largest external quality assurance programme with the participation of between 100 – 150 laboratories per year from 60 to 80 countries.

### 3. Focused Regional and National Projects

In addition to the international training courses, one mechanism for encouraging collaboration between the countries and different scientists is through focused regional and national projects, which are created to promote the continued development and application of skills or concepts introduced or learned at the training courses. Focused regional projects focus on regional foodborne pathogens, serotypes, or public health practices of interest. The *Salmonella* Weltevreden Project, focusing on predominantly Southeast Asian and Western Pacific isolates of *S. Weltevreden*, is a successful example of a focused regional project. The results demonstrated that *S. Weltevreden* is associated with chicken, water and seafood, and has low levels of antibiotic resistance in the study regions.

Importantly, this study showed that countries can successfully work together to learn more about foodborne diseases.

#### *4. Electronic Discussion Group*

The goal of fostering communication among an international network of individuals working in foodborne diseases is achieved through the Electronic Discussion Group (EDG), linking members through a listserv. Messages on the EDG range from programmatic issues, to solicitations for information on outbreaks or rare serotypes, to training materials and recent publications on foodborne disease. Messages are provided in English, Spanish, French and Arabic.

#### *5. WHO Global Salm-Surv Country Databank*

A second method for information sharing in GSS occurs through the Country Databank. This web-based databank contains the top fifteen *Salmonella* Serotypes submitted by members from laboratories in different countries. Data may be from human, animal, food, feed or environmental sources. The Country Databank can be accessed on the web and used by individuals or countries as a resource. For example, individuals can research specific serotypes or can explore the databank to learn more about prevalent serotypes in specific regions. Member contact information is also accessible from this database and members can contact each other regarding projects or outbreak investigations.

For a report on the achievements of GSS during the last five year period 2000 - 2005 please see: <http://www.who.int/salmsurv/GSSProgressReport2005.pdf>.

### **WHO GSS Future directions**

The vision of GSS for 2006 to 2010 was charted at the WHO Global Salm-Surv Strategic Meeting in Winnipeg, Canada in September 2005. In the next five year period GSS will focus on measuring and describing the impact of activities worldwide. GSS will focus on country or regional specific techniques developed to gauge the programme's impact on response-time to foodborne disease outbreaks, the benefit of the training courses, and the overall reduction of foodborne diseases.

To strengthen national capacities of foodborne disease detection and response systems, GSS will strengthen existing training cycles, while expanding to new geographical areas. To promote interventions that reduce foodborne diseases, GSS will assist Regional Centres of Excellence in identifying appropriate evidence-based interventions, develop plans for countries to use for control of foodborne diseases, and assist countries in translating public health surveillance data into practical information for use by policymakers and other stakeholders. The full report on the five-year strategic plan for GSS for 2006-2010 can be found at:

[http://www.who.int/salmsurv/general/documents/GSS\\_STRATEGICPLAN2006\\_10.pdf](http://www.who.int/salmsurv/general/documents/GSS_STRATEGICPLAN2006_10.pdf).

### **Participation and support**

WHO would like to acknowledge the support from the mentioned partner institutions. WHO also would like to encourage other Member States with an interest in WHO Global Salm-Surv to contribute. For further details please contact the Director of the WHO Department of Food safety, Zoonoses and Foodborne Diseases, Dr Jørgen Schlundt - Tel: +41 22 791 3445 - E-mail [schlundtj@who.int](mailto:schlundtj@who.int)

Institutions and individuals are also invited to join WHO Global Salm-Surv. We look forward to your participation. You can receive a membership form from: Dr Danilo Lo Fo Wong - Tel: +41 22 791 3882 - E-mail: [lofowongd@who.int](mailto:lofowongd@who.int) or download the form from the website: [www.who.int/salmsurv](http://www.who.int/salmsurv)

## Reference

Patrick ME, Hendriksen RS, Lertworapreecha M, Aarestrup FM, Chalermchaikit T, Wegener HC, Lo Fo Wong DMA and the WHO Global Salm-Surv partners in the South-East Asian Region (SEAR) and Western Pacific Region (WPR), 2004. Epidemiology of Salmonella Weltevreden in South-East Asia and the Western Pacific: A WHO Global Salm-Surv Regional Research Project. Third International Conference on Emerging Infectious Diseases. Atlanta, United States of America, March 2004.

*INFOSAN serves as a vehicle for food safety authorities and other relevant agencies to exchange food safety information and to improve collaboration among food safety authorities at both the national and international level.*

*INFOSAN Emergency, embedded in INFOSAN, links official national contact points to address outbreaks and emergencies of international importance and allows for the rapid exchange of information. INFOSAN Emergency is intended to complement and support the existing WHO Global Outbreak Alert and Response Network (GOARN).*

*INFOSAN is operated/managed by WHO, Geneva. It currently includes 163 Member States.*

*More information is available at: [www.who.int/foodsafety](http://www.who.int/foodsafety)*