



**World Health
Organization**



International Food Safety Authorities Network (INFOSAN)

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INFOSAN Information Note No. 7/2007 - Outbreak Manual

Foodborne Disease Outbreaks – Guidelines for Investigation and Control

SUMMARY NOTES

- Acute gastroenteritis is very common with diarrhoeal diseases accounting for an estimated 1.8 million childhood deaths worldwide every year, predominantly in developing countries. Food represents an important vehicle in the transmission of these diseases.
- Thorough investigation of foodborne disease outbreaks is important in order to control ongoing outbreaks, detect and remove implicated foods and prevent future events. Too often, however, outbreaks of foodborne diseases go unrecognized, unreported or are not properly investigated.
- WHO has prepared user-friendly guidelines which serve as a general introduction to the identification, as well as practical aid for the investigation and control of foodborne disease outbreaks in a variety of settings. The Guidelines include background information and practical tools, such as sample questionnaires and investigation report forms.
- The Guidelines highlight the importance of inter-sectoral approaches to outbreak investigations and control, the need for preparedness and solid procedures at national and sub-national levels, and the importance of links to regional foodborne disease networks and international networks including INFOSAN.

Why should foodborne disease outbreaks be investigated?

Acute diarrhoeal illness is very common worldwide and estimated to account for 1.8 million childhood deaths annually, predominantly in developing countries¹. The burden of diarrhoeal illness is substantial in developed countries as well². Estimates of the burden of foodborne diseases are complicated by a number of factors; different definitions of acute diarrhoeal illness are used in various studies, most diarrhoeal illness is not reported to public health authorities, and few illnesses can be definitively linked to food.

There are many reasons for foodborne disease to remain a global public health challenge. As some diseases are controlled, others emerge as new threats. The proportions of the population who are elderly, immunosuppressed or otherwise disproportionately susceptible to severe outcomes from foodborne diseases are growing in many countries. Globalization of the food supply has led to the rapid and widespread international distribution of foods. Travellers, refugees and immigrants may be exposed to unfamiliar foodborne hazards in new environments. Changes in microorganisms lead to the constant evolution of new pathogens, development of antibiotic resistance, and changes in virulence of known pathogens. In many countries, as people increasingly consume food prepared outside the home, growing numbers are potentially exposed to the risks of poor hygiene in commercial foodservice settings.

¹ World Health Organization (2005). The World Health Report 2005 - Making every mother and child count. Geneva, Switzerland, 2005, <http://www.who.int/whr/2005/en/index.html>.

² Scallan E et al. (2005). Prevalence of diarrhoea in the community in Australia, Canada, Ireland, and the United States. *International Journal of Epidemiology*, 34:454–460.

Foodborne disease outbreaks are investigated to prevent both ongoing transmissions of disease and similar outbreaks in the future. Specific objectives include:

- control of ongoing outbreaks;
- detection and removal of implicated foods;
- identification of specific risk factors related to the host, the agent and the environment;
- identification of factors that contributed to the contamination, growth, survival and dissemination of the suspected agent;
- prevention of future outbreaks and strengthening of food safety policies and programmes;
- acquisition of epidemiological data for risk assessment of foodborne pathogens;
- stimulation of research that will help in the prevention of similar outbreaks.

Too often, outbreaks of foodborne disease go unrecognized, unreported or un-investigated and may only be visible after major health or economic damage has occurred. This is compounded by the fact that the many relevant actors involved in foodborne disease outbreaks, including officials in the Ministry of Agriculture, food regulators, laboratories, public health practitioners, food scientists, and consumers, among others, do not communicate well with each other. All actors need to be optimally prepared for the investigation of outbreaks and use standard procedures. For this reason, WHO has developed the **Guidelines for the Investigation and Control of Foodborne Diseases** which are intended to serve as general introduction as well as practical aid to the identification, investigation and control of foodborne disease outbreaks in a variety of settings.

How should foodborne disease outbreaks be investigated?

The investigation and control of foodborne disease outbreaks are multi-disciplinary tasks requiring skills in the areas of clinical medicine, epidemiology, laboratory medicine, food microbiology and chemistry, food safety and food control, and risk communication and management. Responsibilities for the investigation and management of outbreaks will vary between countries and according to a number of factors including the nature and size of the outbreak, its importance with regard to the health of the public, and its economic impact. Where contamination of food is suspected or confirmed to be deliberate, the police or national defence forces would normally have the lead in the overall management of the event.

Successful investigation and control of foodborne disease outbreaks depend on working fast and responsibly, using well-established and validated procedures and protocols. Countries need to be prepared for such situations and professionals well briefed in the necessary procedures before outbreaks occur. All individuals involved in the investigation must clearly understand the course of action, and no time should be lost in discussing policy matters that should have been resolved in advance.

Typical steps in the investigation of a foodborne disease outbreak include:

- establishing the existence of an outbreak;
- verifying the diagnosis;
- defining and counting cases;
- determining the population at risk;
- describing the epidemiology (including number and location of cases, age distribution etc);
- developing hypotheses (including source and type of agent, mechanism of contamination, etc);
- undertaking additional epidemiological, environmental and laboratory studies, as necessary;
- implementing control and prevention measures;
- communicating findings.

The responsible authorities – in consultation with all agencies that may be involved in the investigations – should develop outbreak investigation and control plans to address:

- arrangements for consulting and informing authorities at local, regional, national and international levels;
- the exact roles and responsibilities of organizations and individuals involved;

- the resources/facilities available to investigate outbreaks;
- the composition and duties of an outbreak control team, and when it should be convened;
- the official and non-official lines of communication with consumers affected, and overall groups of population possibly exposed to same risk

Who should be involved in foodborne disease outbreak investigations?

A broad range of stakeholders should be part of the investigation and control of disease outbreaks. The most relevant authorities and professional groups include local health authorities, food, water, agricultural and veterinary authorities, and educational organizations, food producers, food sellers (retail level), street vendors, etc) representing the entire food safety chain from 'farm to table', including consumers. The objectives of keeping these groups fully engaged are to ensure accurate case-finding and to facilitate the implementation of control measures. Other professional groups that have no direct part in the investigation may still be affected by the outbreak (e.g. local hospitals and general practitioners) and good communication with them should also be maintained. Colleagues in other administrative areas or from other districts/countries may also benefit from information about the outbreak and may be able to provide additional insight and knowledge of similar occurrences.

One important aspect of the investigation and control of outbreaks is the link with regional and/or global foodborne disease networks. Such links enable countries to rapidly communicate the occurrence of outbreak events, exchange data on foodborne pathogens, share knowledge and capacity in investigative methodologies, and coordinate responses at regional level where required. Examples of such regional foodborne disease networks include the European Union's EnterNet, the Australian OzFoodNet, PulseNet as well as the recently established Asian FoodNet. At the international level, countries should be aware of the obligations of the International Health Regulations (2005) which came into force in June 2007. The purpose and scope of the IHR (2005) are to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade. Within the very wide scope of IHR (2005), certain food safety events, including both food contamination and foodborne disease events with international implications, require action under the legal provisions included in the IHR (2005). INFOSAN Emergency facilitates the identification, assessment and management of food safety events under the IHR (2005)³.

How do the WHO Guidelines for the Investigation and Control of Foodborne Diseases help?

Many outbreaks of foodborne disease are poorly investigated, if at all, because these skills are unavailable or because a field investigator is expected to master them all single-handedly without having been trained. The WHO Guidelines have been written for public health practitioners, food and health inspectors, district and national medical officers, laboratory personnel and others who may undertake or participate in the investigation and control of foodborne disease outbreaks.

While the manual focuses on practical aspects of outbreak investigation and control, it also provides generic guidance that can be adapted to individual countries and local requirements. At the field level it will be valuable in initial epidemiological, environmental and laboratory investigations, in implementation of appropriate control measures, and in alerting investigators to the need to seek assistance for more complex situations. At national and regional levels, the guidelines will assist decision-makers in identifying and coordinating resources and in creating an environment appropriate for the successful management of foodborne disease outbreaks.

This manual is intended as guide but does not claim to be exhaustive. Numerous other resources are available for additional, more detailed, information on surveillance, epidemiology, statistical analyses and the medical aspects of foodborne diseases. It is important to remember that no general guidelines will fit a specific situation perfectly, and the local environment will always make it necessary to modify investigation techniques to account for the unique characteristics of every

³ For more information on the IHR(2005) see the May 2007 INFOSAN Information Note entitled: The identification, assessment and management of food safety events under the International Health Regulations (2005)

outbreak. It is also important to note that addressing the risk of foodborne disease goes beyond the public health worker. Ultimately it requires the implementation of a well functioning and integrated food control system. This necessitates collaboration among all the components of a food control system, including food law and regulations, food control management, inspection services, epidemiological and food monitoring (laboratory services) and education of and communication with the consumer.

The guidelines can be downloaded from the WHO website (http://www.who.int/foodsafety/publications/foodborne_disease/fdbmanual/en) and will shortly be available in printed format and on CD ROM. For reprints or CD ROMs of the manual (which in future will also be available in French and Spanish), please contact foodsafety@who.int.

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 164 Member States.

More information is available at: www.who.int/foodsafety