

specific infections such as campylobacteriosis, salmonellosis, or *E. coli* O157:H7 infection. Laboratory surveillance involves the recording of results of laboratory investigation of specimens (usually faecal samples) obtained from patients. The laboratory can

test for a range of pathogens.

Outbreak detection takes several forms. Health workers should keep alert to the possibility of a shared exposure among patients with the same condition, or they may routinely report selected conditions either voluntarily or as required by law.

KEY POINTS

- Prevention is better than cure.
- Education in food safety is an important preventive measure.
- Educational programmes must be focused and relevant to the target audience.
- Specific target groups for food safety education should be identified and educational interventions aimed at them.
- Mothers and pregnant women are important target groups for prevention of infant diarrhoea.
- In addition to education of food handlers in basic principles of food hygiene, an HACCP-based approach can be applied to the preparation of food in homes, in food service establishments or for street food vending operations in order to select behaviours which are of particular importance to food safety.
- Surveillance of foodborne diseases is an important tool for assessing the food safety situation and identifying factors leading to foodborne diseases.

themselves but also communicate the need for food hygiene to their parents and other family members. The earlier that education in food safety starts, the better it is. Even children in kindergartens and nurseries can be trained in some basic rules of food hygiene. Teaching children about food safety has the doubly beneficial effect of helping to protect a vulnerable group and of educating the next generation.

In many places, existing school education on food safety is limited to teaching about hand-washing after defecation, protection from flies and rodents, latrine use and safe storage of water. Although this advice is important, it has not always been enough to prevent foodborne illness, which more often results from insufficient cooking, incorrect storage of food, re-use of leftovers, lack of hand-washing prior to food preparation, and other factors that favour contamination, survival and multiplication of pathogens, or production of toxins in food.

Teachers may themselves have no education in the subject, and may often lack teaching materials. Therefore, if teaching about food safety is to be improved, teachers should also receive formal training in food safety. Where food safety is not on the school curriculum, this presents an opportunity for health workers to visit schools to educate children about the importance of food hygiene.

Street food vendors and food service establishments

A substantial amount of food handling and processing occurs in street food vending operations and food service establishments. In many situations it is not possible to control these operations completely through official inspection. Control must be exercised by the food handlers themselves. The role of the

health worker in helping this to happen is to provide both the food handlers and the consumers with information and education about food safety.

Surveillance

Health workers should actively participate in the surveillance of foodborne diseases. Epidemiological data are needed so that public health authorities can be aware of the kind of diseases that are current in the population, can identify which population subgroups are most at risk, can plan appropriate food safety programmes, and can target educational interventions in an appropriate way. Surveillance of diseases involves five methods:

- registration of deaths and hospital discharge diagnoses;
- disease notification;
- sentinel surveillance;
- laboratory surveillance;
- outbreak investigation.

In most countries, physicians complete a death certificate when a person in their care dies. In many hospitals, and in all hospitals in some countries, hospital records include data on the diagnosis of all patients who are discharged.

Notification of diseases is often legally required from physicians or other health workers, though this notification may apply only to certain conditions. This information is usually analysed centrally in order to identify trends in health and illness and also to detect outbreaks of disease.

In sentinel surveillance, selected health workers or facilities monitor selected health events. For foodborne diseases, relevant health events might include syndromes such as diarrhoea, dehydration and haemolytic uraemic syndrome, or

made aware that the health consequences of foodborne infections may be more serious for them, and that they may be more susceptible than other groups to infections such as salmonellosis, enterohaemorrhagic *E. coli* infection and listeriosis. Health workers in contact with the elderly can encourage them to avoid high-risk foods such as meals made from raw or undercooked animal products (eggs, meat, milk) or raw seafood.

The sick

Great care should be taken when preparing food for hospital patients — including the newborn if they are not breast-fed. Food handlers in hospital kitchens should be trained in safe food handling. Nurses and dieticians should also receive education in food safety. The highest standards of hygiene will be required for foods produced for the sick and elderly.

It should be remembered that the standard of cleanliness and hygienic practice in health centres sets an example for visitors. A poor standard of hygiene in these places will have a negative effect while good hygienic practices will encourage visitors to emulate them.

The undernourished

Undernourished persons are especially susceptible to foodborne diseases and should therefore also be seen as an important target group for educational interventions.

The community

The whole community should participate in health education in food safety. In their dealings with members of high-risk target groups and with the community members in general, health workers should ensure that all understand the *Ten Golden Rules for Safe Food Preparation* recommended by WHO.

Refugees

When disaster strikes, the safety of the food supply may be affected, leading to a greater risk of foodborne disease. At the same time, people may flee their homes and the situation of refugees and displaced persons requires special care and attention. Conditions in refugee camps are prone to outbreaks of foodborne disease. Environmental contamination and improper food handling increase the risk of epidemics such as cholera. While education of the public in food safety is important at all times, in disasters and emergencies it is an absolute necessity. When there is a risk of epidemics, families should be reminded of the rules of safe food handling.

Mass feeding in refugee camps has many advantages. It ensures, for instance that food is available to everyone. However, there are also disadvantages in that it increases the risk of large scale outbreaks of foodborne illness. In refugee centres, food handlers who are responsible for preparing the food, and their supervisors, need training in safe food handling and in the HACCP concept. Health workers can give them clear instructions about their responsibilities and may even put up posters with the rules for safe food handling. Health workers should make sure that those responsible for the refugee centre understand the important need for adequate clean water and sanitation, and for proper disposal of unused food and other waste.

Schoolchildren

Schoolchildren are both a target group for education on food safety and a channel for this education as well. Educating school children is a very effective strategy for preventing foodborne diseases as the children not only learn about food safety

how to protect their breast milk from chemical or other hazards (e.g. by minimizing contact with pesticides, by avoiding consumption of foods containing unsafe levels of contaminants).

Mothers of older infants and young children

While public health authorities have recognized the importance of breast-feeding in preventing foodborne diseases, almost no attention has been paid to safe food handling during the preparation of complementary foods. The education of mothers and care-givers in food safety principles is vital if there is to be a substantial improvement in prevention of diarrhoeal diseases in infants and children. In this area, health workers clearly have the leading role. Most health centres already advise mothers on breast-feeding, infant feeding and nutrition, as well as other aspects of the care of infants and children. It would be important that these centres extend their information and education to include information on safe food handling practices. WHO has issued a leaflet entitled *Basic principles for preparation of safe food for infants and young children* that health workers can use for advising mothers in food safety.

Professional food handlers

Professional food handlers should ideally receive training and education in two aspects of food safety:

- a) *principles of good hygienic practice;*
- b) *application of the HACCP concept to food preparation.*

Where food handlers are receiving formal training and education in food preparation, the above two aspects of food safety should be included in their curricula. Training in principles of good hygienic practice equip food handlers with the rudiments of food safety whereas training in HACCP helps them to learn

to adopt a critical thought process and eventually learn to:

- identify potential hazards and control measures that are relevant, effective and specific to the operation in question and to the work situation;
- prioritize control measures, ensure that the critical ones are applied correctly and that they meet the necessary conditions; and
- to take appropriate action when conditions are not met.

When food handlers lack professional training and qualifications, it may be difficult to train them in HACCP. In such cases, it is nevertheless important to impress on them the value of this technique. Health authorities or health workers could assist in conducting HACCP studies by identifying hazards, appropriate control measures, critical control points, critical limits and corrective measures and train food handlers in the outcome of the studies.

High-risk groups and people preparing food for them

Travellers

Travellers will require advice on safe and unsafe foods in a particular area. If a region has a reputation for unsafe food, income from tourism could be affected. Travellers often consult physicians or clinics for vaccination and other prophylactic or therapeutic treatment. Advice on prevailing foodborne diseases and on food and drink likely to be contaminated in certain countries could be provided to travellers at vaccination centres. WHO has issued a guide on safe food for travellers that is intended to help meet this need (see bibliography).

The elderly

The elderly constitute an increasing proportion of the population. They must be

care-giver who brings a child for treatment can be given information about how to avoid foodborne hazards by correct food preparation. A group of cases of diarrhoeal disease would be an opportunity to give educational messages to the whole community. In this way the health worker plays not only a reactive (curative) role but also a proactive (preventive) one. The situation varies from country to country and it is not possible to prescribe one approach to prevention that will work equally well everywhere. However, some suggestions are given here that may be adapted to different situations.

Food safety education programmes should aim to improve the knowledge and practice of an entire population (including policy-makers, food producers, food processors, professional food handlers and consumers), as all have a role to play in food safety. However, certain groups, either because of their direct role in food preparation and/or increased vulnerability to foodborne diseases need to receive greater emphasis in the programme. These groups are:

- *domestic food handlers* who prepare food for the family, particularly expectant mothers and mothers with small children who are especially vulnerable;
- *professional food handlers* such as street food vendors, catering personnel and those working in the food processing industry (in feeding large numbers of people their impact on overall food safety is considerable);
- *high-risk groups and people preparing food for them*, particularly small children, travellers, pregnant women, the immunocompromised and the elderly.

Domestic food handlers

Domestic food handlers are persons who prepare food for consumption by their families. Experience has shown that a large proportion of foodborne disease outbreaks occur in the home as a result of mishandling of food. Education of this target group will help domestic food handlers to protect themselves and their family members. Particular attention should be given to WHO's *Ten Golden Rules for Safe Food Preparation* (Appendix 2).

Expectant mothers

There are a number of foodborne infections, notably listeriosis and toxoplasmosis, which may adversely affect the foetus. Chemical contaminants such as lead or methyl mercury, depending on their level of intake, may also have negative effect on the health of the foetus. Pregnant women are often motivated to do all they can for the health of their baby. Health workers — particularly those in maternal and child health centres and primary health care centres — have the responsibility of informing women on the type of food/practices which may present greater risks. Education of expectant mothers in food safety should include information on breast-feeding. A WHO brochure providing advice on food safety issues of importance to pregnant women is also under preparation.

Lactating women

Breast milk is the ideal source of nourishment and the safest food for infants during the first 4–6 months of life. It protects them against foodborne diarrhoea through its anti-infective properties and by minimizing exposure to foodborne pathogens. Major efforts are being made at national and international levels to promote breast-feeding, and a great deal of educational material is available for advising mothers on this subject. Health workers can also advise lactating women

Chapter 7

The role of health workers in food safety

The first six chapters describe the basics of foodborne illness: what it is, the factors that lead to it, the problems associated with specific foods and food processing, and how these factors might be controlled. We now consider what the health worker can do to alleviate the problem of foodborne illness, particularly with regard to children.

The health worker has essentially three roles: curative, preventive and surveillance.

The curative role

In many cases the immediate problem faced by the health worker is how to deal with a sick patient. The foodborne origin of an illness may not be immediately apparent for, although many foodborne illnesses have diarrhoea as a principal symptom, others can have a variety of presentations. It is not the intention of this book to provide a manual on the treatment of foodborne illness. Much of this should already be a key part of a health worker's training and there are a number of other publications that deal specifically with this aspect (see bibliography).

Reliance on treatment, however successful, has its limitations. Treatment of an infected individual does not remove the cause of illness from the environment or eliminate behaviours that lead to foodborne illness. It does not, therefore, prevent other people from becoming ill by the same route. Nor does infection necessarily confer protection and reduce the risk of a patient succumbing to another episode soon after recovery. So while treatment remains an essential task for the health worker, recognition of its limitations has led to greater emphasis being placed on preventive measures to reduce the overall incidence of illness.

The preventive role: controlling foodborne hazards

The health worker can intervene to reduce the incidence of foodborne illness through food safety education programmes. Cases of diarrhoeal disease, for instance, should prompt the health worker to consider whether food is being prepared correctly. The mother or other