



UNITED KINGDOM (UNK): England and Wales

Population: 53 million

Area: 244 046 km²



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1. General information

1.1 Sources of data

There are three main national surveillance systems for gastrointestinal infection in England and Wales operated by the Public Health Laboratory Service Communicable Disease Surveillance Centre (PHLS CDSC). These are:

- The statutory notifications of food poisoning
- The national surveillance scheme for laboratory confirmed infections
- The national surveillance scheme for general outbreaks of infectious intestinal disease (IID)

In addition there is close liaison with the PHLS reference laboratories (Laboratory of Enteric Pathogens, Food Safety Microbiology Laboratory and the Enteric Virus Laboratory), all of which have national and international recognition for their reference facilities, and with external bodies such as the Veterinary Laboratories Agency, the Food Standards Agency, the Ministry of Agriculture, Fisheries and Food and the Department of Health.

The main characteristics of each of data source are outlined below.

1.2 Statutory notification of food poisoning

All doctors in clinical practice have a statutory duty to notify the proper officer of the local authority of all clinically diagnosed cases of diseases specified under the Public Health (Infectious Diseases) Regulations 1988. Food poisoning is one of the infections which is notifiable. In 1992 the Department of Health's Advisory Committee on the Microbiological Safety of Food (ACMSF) defined food poisoning as "any disease of an infectious or toxic nature caused by or thought to be caused by the consumption of food or water." This is a very sensitive definition of food poisoning which includes non-infective causes. Notification of food poisoning does not require that a laboratory diagnosis be obtained. Therefore, it is usually impossible to determine the number of cases of notified food poisoning attributable to specific organisms.

Notification data are collated nationally by CDSC on behalf of the Office for National Statistics (ONS). The collated data are published weekly in the Communicable Disease Report (CDR Weekly) which can be found at <http://www.phls.co.uk/publications/cdr.htm>.

For further reference on national and international data on foodborne diseases please visit the web page <http://www.who.it/docs/fdsaf/fddata.htm>.

1.3 National surveillance scheme for laboratory confirmed infections

Clinical microbiology laboratories in England and Wales voluntarily report data on microbiologically confirmed cases of infectious disease to the Public Health Laboratory Service Communicable Disease Surveillance Centre (PHLS CDSC). The data reported include:

- organism
- source laboratory (laboratory at which the specimen is initially examined)
- reference laboratory
- specimen date
- case identifier
- date of birth
- gender

The following events must occur cases to be included in the national surveillance database for laboratory confirmed infections:

1. an infected individual must consult a clinician (general practitioner or hospital doctor)
2. the doctor must arrange for a specimen to be taken and referred to a clinical microbiology laboratory
3. the laboratory must isolate or identify a pathogen
4. the laboratory must submit a report to the national surveillance centre

The national surveillance scheme for laboratory confirmed infections does not necessarily provide a direct measure of the numbers of cases of infection in the population caused by those pathogens under surveillance. A number of factors influence the degree of the disparity between the number of recorded laboratory reports for any given pathogen and the true number of cases of infection in the population. These include:

- severity of disease
- duration of symptoms

- selectivity of screening protocols employed by diagnostic laboratories
- sensitivity of available diagnostic techniques

The severity of the disease and the duration of symptoms associated with infection dictates both the proportion of cases that consult clinicians and the proportion of presenting cases from whom specimens are collected.

Laboratory screening protocols determine the investigations that are conducted on any given specimen so ascertainment of cases by laboratory report surveillance for any given pathogen is influenced by the laboratory screening protocols in operation.

There are variations in the sensitivity of the routine diagnostic techniques employed for different species and subtypes of pathogen. The sensitivity determines the proportion of cases that are identified by laboratory investigation. A range of microbiological techniques are which vary greatly in sensitivity and specificity. These include: light microscopy; isolation; immunoassays; novel techniques based on molecular biology.

Therefore it can be seen that the disparity between laboratory report surveillance data and infection in the community is lessened for pathogens that cause severe disease and for which laboratories screen widely using sensitive methods.

Despite these caveats, voluntary reporting of laboratory-confirmed cases is the most reliable means of determining trends in the major foodborne pathogens.

1.4 National surveillance schemes for general outbreaks of infectious intestinal disease (IID)

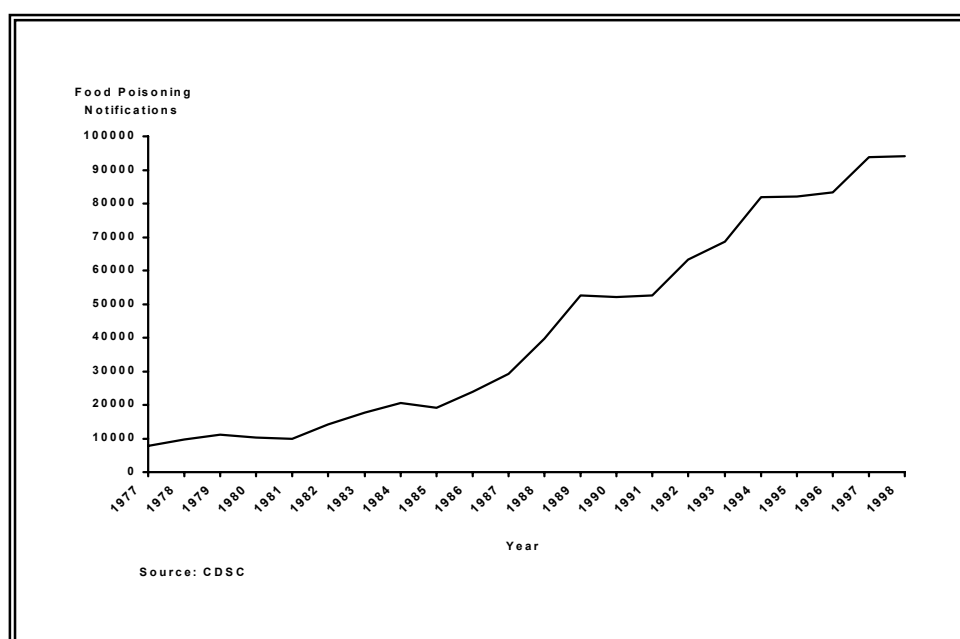
Since January 1992 enhanced surveillance of outbreaks of infectious intestinal disease has been conducted in England and Wales. General outbreaks are defined as outbreaks which affect people from more than one household. CDSC receives preliminary reports of general outbreaks of infectious intestinal disease (IID) from laboratories including the national reference laboratories, Consultants in Communicable Disease Control (CCDCs) in health authorities and local authority Environmental Health Officers (EHOs). Standardised questionnaires are then sent to the appropriate health authority in order to collect a minimum dataset on each outbreak. The investigating CCDC is asked to complete the questionnaire when the outbreak investigation is complete. The completed questionnaires are returned to the national surveillance centre and the data entered onto a database (Figure 1).

2. Statutory notifications

2.1 Formally notified and otherwise ascertained cases of foodborne diseases

Notifications of food poisoning in England and Wales have risen steadily since the early 1980s. By 1998 more than 90 000 cases had been reported nationally. It is worth noting that following dissemination of the definition of food poisoning devised by the ACMSF a sharp increase in notifications occurred which is due to the inclusion of *campylobacter* infection in the food poisoning notifications.

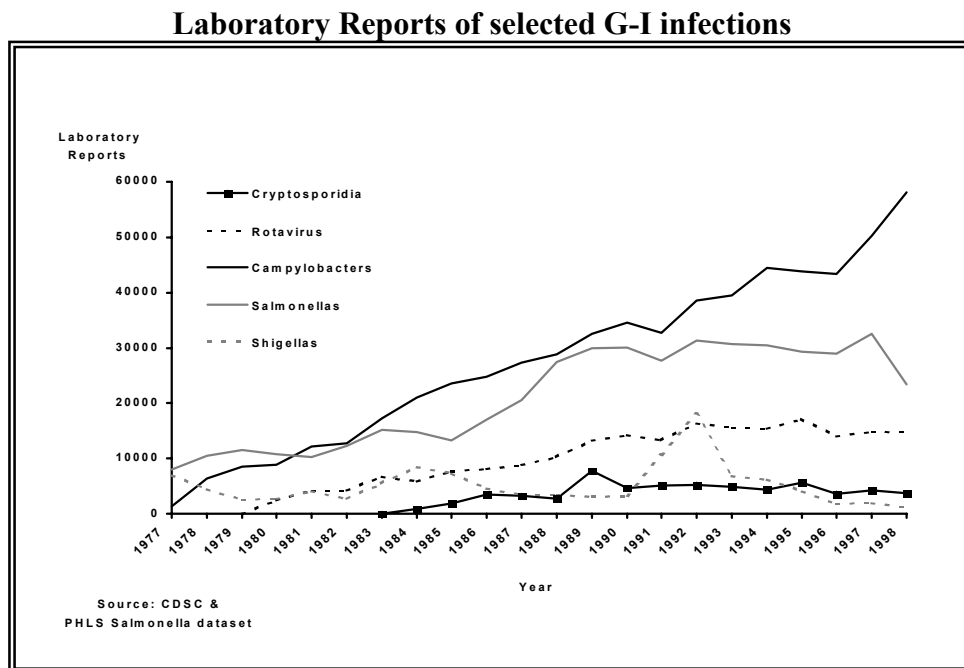
Figure GB-EW 2



2.2 National surveillance scheme for laboratory confirmed infections

The most noteworthy changes in reporting of laboratory confirmed infections in England and Wales were the continued rise in campylobacter infection and a sharp fall in reporting of salmonellosis (Figure 3).

Figure GB-EW 3



Campylobacter continues to be the most commonly identified bacterial cause of gastroenteritis in England and Wales. In 1997 the incidence exceeded 50 000 cases for the first time. It is rarely recognised as causing foodborne outbreaks.

Salmonellas are the second most commonly identified bacterial cause of gastroenteritis. The incidence of salmonellosis in England and Wales rose rapidly during the 1980s, a rise attributable to the emergence of *S. enteritidis* phage type 4. Poultry and eggs became contaminated with this strain. In 1998 the PHLIS Laboratory of Enteric Pathogens reported just over 23 000 laboratory reports of salmonellosis to CDSC which was the lowest total for over a decade. It represented a 27% decrease on the previous year and laboratory confirmed cases of infection with virtually all major serotypes fell. It is too early to say whether or not this dramatic fall in incidence of salmonellosis in England and Wales is the start of a downward trend.

3. Epidemiologically investigated outbreaks

3.1 National surveillance schemes for general outbreaks of infectious intestinal disease (IID) England and Wales

Between 1993 and 1998 a total of 3 712 general outbreaks of IID were reported to CDSC of which 1 093 were foodborne (Table GB-EW 1).

WHO Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe
7th Report

Country Reports: *UNITED KINGDOM: England and Wales 1993 – 1998*

Table GB-EW 1

Outbreaks by year
England & Wales, 1993-1998

Year	Mode of transmission						Total
	Foodborne	Equal/unknown*	Person to person	Water	Other	Unknown	
93	225	18	189	8	3	11	454
94	191	47	226	8	4	12	488
95 [†]	180	51	538	3	6	59	837
96 [†]	159	36	470	4	1	63	733
97	218	27	256	7	7	76	591
98	120	20	375	9	3	82	609
Total	1093	199	2054	39	24	303	3712

Source: GSURV database, PHLS CDSC

* Equal or unknown proportion of foodborne & person to person

[†], In 1995 & 1996 enhanced surveillance of outbreaks of SRSV infection was undertaken, hence the number of salmonella outbreaks as a proportion of all outbreaks was lower than expected.

3.2 Causative agents

Causative agents: The predominant causative organism in foodborne outbreaks of IID was *Salmonella* sp. with *S. enteritidis* phage type 4 the most common (Table GB-EW 2).

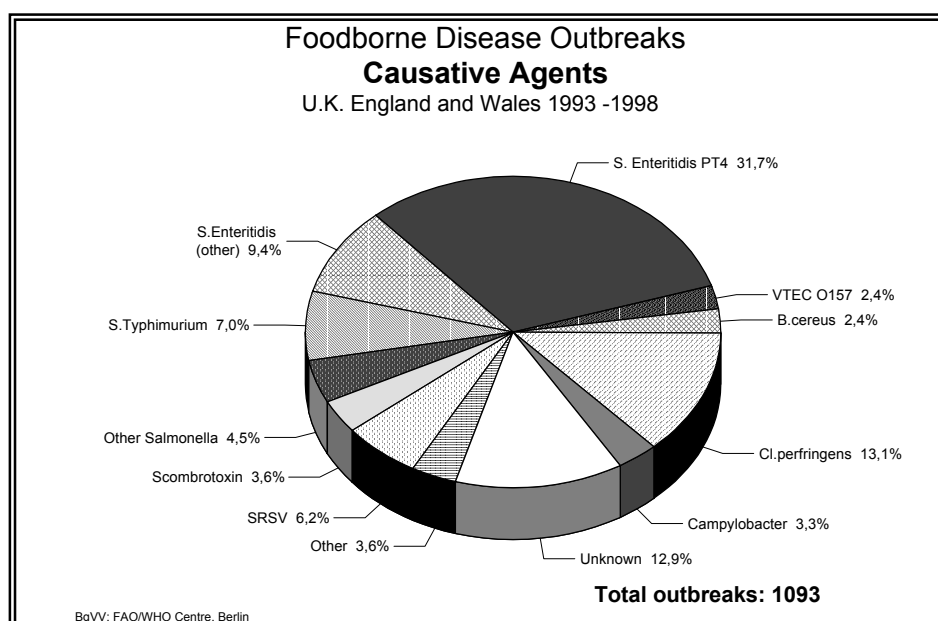
Table GB-EW 2

Foodborne outbreaks – causative agents
England & Wales 1993-1998

Organism	Year						Total (%)
	93	94	95	96	97	98	
<i>S. enteritidis</i> PT4	98	52	55	47	61	34	347 (32)
<i>Cl. perfringens</i>	32	21	18	18	34	20	143 (13)
<i>S. enteritidis</i>	14	11	9	18	36	15	103 (9)
<i>S. typhimurium</i>	15	18	14	10	16	3	76 (7)
SRSV	13	17	15	7	8	8	68 (6)
Scombrototoxin	2	8	9	6	10	4	39 (4)
<i>Campylobacter</i>	3	5	4	6	7	11	36 (3)
Other <i>Salmonella</i>	3	5	8	8	6	5	35 (3)
<i>B. cereus</i>	2	6	8	4	6	0	26 (2)
VTEC O157	6	0	5	7	4	4	26 (2)
<i>S. virchow</i>	2	5	4	1	2	0	14 (1)
<i>Staph. Aureus</i>	1	2	3	5	2	0	13 (1)
<i>B. subtilis</i>	0	1	2	2	3	0	8 (1)
Astrovirus	0	1	0	1	0	1	3 (0.3)
<i>Sh. flexneri</i>	0	0	0	1	0	1	2 (0.2)
Cryptosporidium	0	0	1	0	0	0	1 (0.1)
Rotavirus	0	1	0	0	0	0	1 (0.1)
<i>Sh. sonnei</i>	0	1	0	0	0	0	1 (0.1)
Other	1	6	1	1	1	0	10 (1)
Unknown	33	31	24	17	22	14	141 (13)
Total	225	191	180	159	218	120	1093 (100)

Source: GSURV database, PHLS CDSC

Figure GB-EW 4



3.3 Incriminated food

Food vehicles: A specific food vehicle was identified for the majority of foodborne outbreaks (Table GB-EW 3).

Table GB-EW 3

Identification of food vehicles England and Wales, 1993-1998

Year	Vehicle identified?				Total
	Yes		No		
93	132	(59)	93	(41)	225
94	128	(67)	63	(33)	191
95	138	(77)	42	(23)	180
96	134	(84)	25	(16)	159
97	164	(75)	54	(25)	218
98	91	(76)	29	(24)	120
Total	787	306			1093

Source: GSURV database, PHLS CDSC

Levels of evidence: The evidence adduced for implicating food vehicles in outbreaks is presented in table GB-EW 4.

Table GB-EW 4

Evidence implicating food vehicles
 England and Wales, 1993-1998*

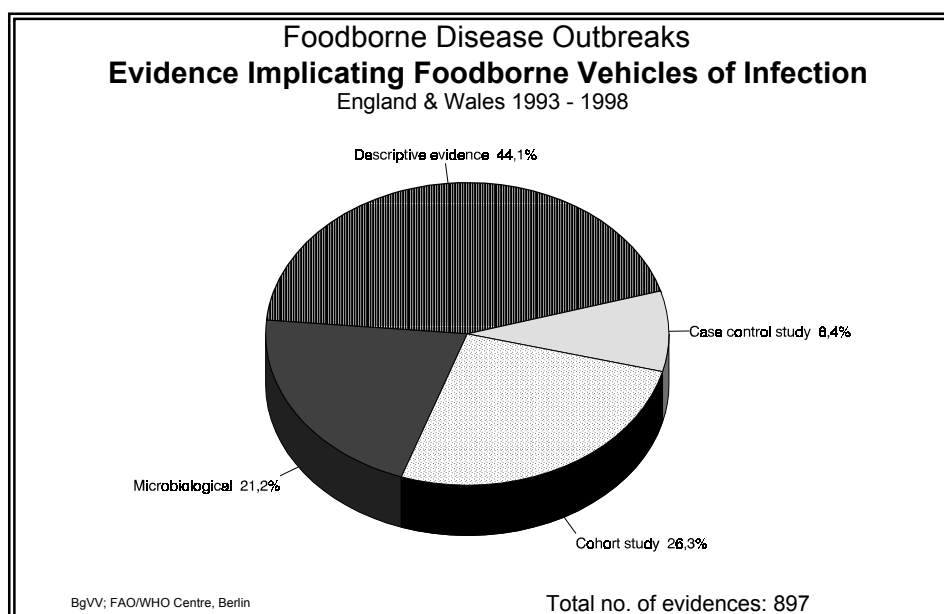
Evidence	Number of instances[†]	%
Microbiological	190	21.2
Cohort study	236	26.3
Case control study	75	8.4
Descriptive evidence	396	44.1
Total	897	100.0

Source: GSURV database, PHLS CDSC

*, For 346 foodborne outbreaks no evidence was reported.

[†], More than one type of evidence can be reported in each outbreak.

Figure GB-EW 5



Incriminated foods: Poultry was the most commonly implicated foodstuff during this surveillance period (Table GB-EW 5).

Table GB EW 5

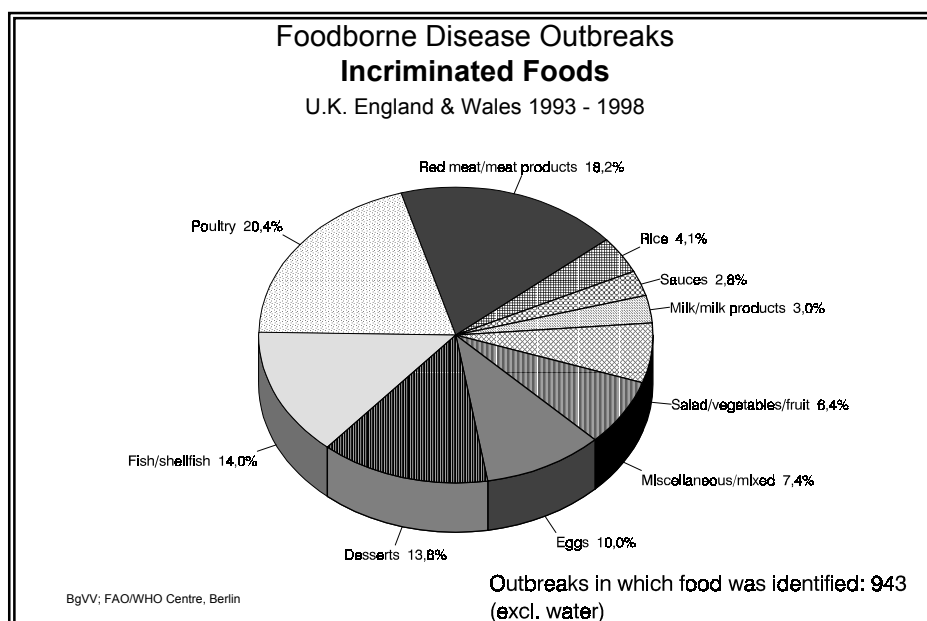
Foodborne vehicles of infection
England and Wales 1993 - 1998*

Category	Year						Total	
	93	94	95	96	97	98	No.	%
Poultry	35	24	30	41	42	20	192	20.3
Red meat/meat products	41	30	32	23	29	17	172	18.2
Fish/shellfish	15	24	26	23	32	12	132	14.0
Desserts	24	21	21	22	29	13	130	13.8
Eggs	19	12	15	16	18	14	94	10.0
Miscellaneous	10	7	22	6	11	14	70	7.4
Salad/vegetables/fruit	7	18	6	17	4	8	60	6.4
Rice	0	7	9	11	10	2	39	4.1
Milk/milk products	4	5	6	4	7	2	28	3.0
Sauces	2	2	5	2	10	5	26	2.8
Water	1	0	0	0	0	0	1	0.1
Total	158	150	172	165	192	107	944	100.0

Source: GSURV database, PHLS CDSC

*, More than one vehicle can be reported for any given outbreak. The outbreaks above represent those where at least one of the foods reported fell into the appropriate category.

Figure UK-EW 6



WHO Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe
7th Report

Country Reports: *UNITED KINGDOM: England and Wales 1993 – 1998*

3.4 Place where food was consumed

Outbreak setting: Food prepared on commercial catering premises were the most frequently identified settings (Table GB-EW 6).

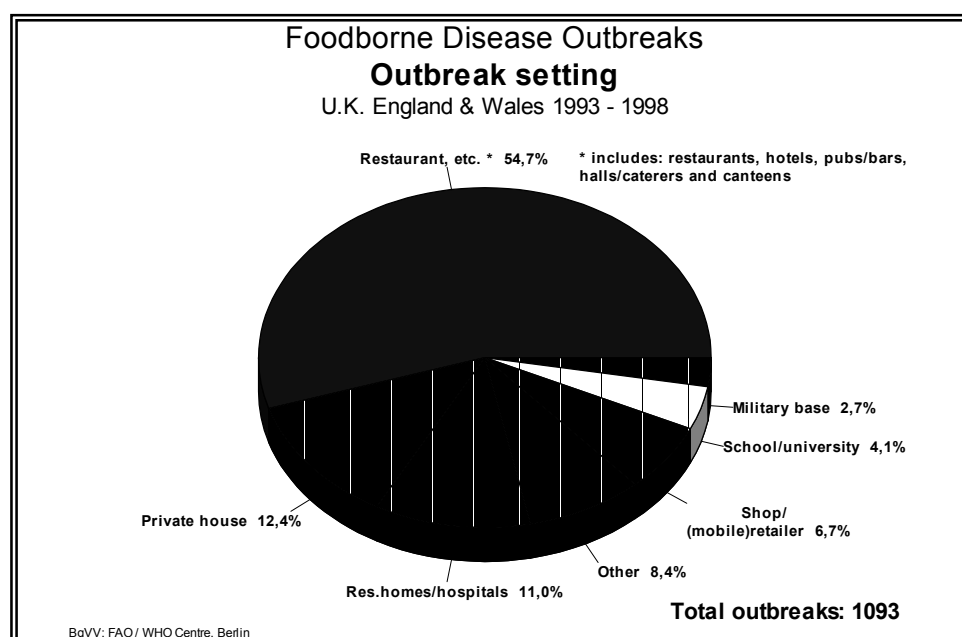
Table GB-EW 6

Outbreak setting
 England and Wales, 1993-1998

Place	Year						Total
	93	94	95	96	97	98	
Restaurant	43	47	42	39	59	30	260 (24)
Hotel	30	22	28	25	29	19	153 (14)
Private	33	25	19	26	25	8	136 (12)
Residential homes	24	17	17	9	23	12	102 (9)
Other	16	19	9	7	13	9	73 (7)
Pub/bar	9	11	14	9	15	11	69 (6)
Shop/retailer	10	11	13	7	12	13	66 (6)
Hall/caterers	5	2	18	16	11	7	59 (5)
Canteen	14	10	5	9	10	2	50 (5)
School	9	11	7	3	5	2	37 (3)
Armed services	12	4	2	3	5	3	29 (3)
Hospital	8	3	0	1	4	2	18 (2)
Community	3	3	3	2	2	1	14 (1)
University/college	6	0	1	0	1	0	8 (1)
Holiday camp	2	1	2	0	1	1	7 (1)
Mobile	1	3	0	0	3	0	7 (1)
Farm	0	2	0	3	0	0	5 (0.5)
Total	225	191	180	159	218	120	1093 (100)

Source: GSURV database, PHLS CDSC

Figure GB-EW 7



3.5 Contributing factors

Food handling faults: Inadequate cooking, inappropriate storage of food and cross contamination were the most frequently reported food handling faults. Although infected food handlers were identified during the course of investigations it is not clear whether they are causes or victims of foodborne outbreaks. The possible exception to this is foodborne outbreaks of viral gastroenteritis where there are often reports that a food handler preparing the implicated food had symptoms e.g. vomiting into a sink where salad vegetables were being, or about to be, prepared.

Table GB-EW 7

Faults contributing to foodborne outbreaks
England and Wales 1993-1998*

Contributory fault	Number of instances [†]	%
Infected food handler	119	10.2
Inadequate heat treatment	333	28.7
Cross contamination	286	24.6
Inappropriate storage	324	27.9
Other faults	100	8.6
Total	1162	100.0

Source: GSURV database, PHLS CDSC

*, For 367 foodborne outbreaks no contributory fault was reported.

†, More than one fault can be reported in each outbreak.

Figure GB-EW 8

