



SWITZERLAND (SWI)

Population: 7.13 million (1994)

Area: 41 290 km²



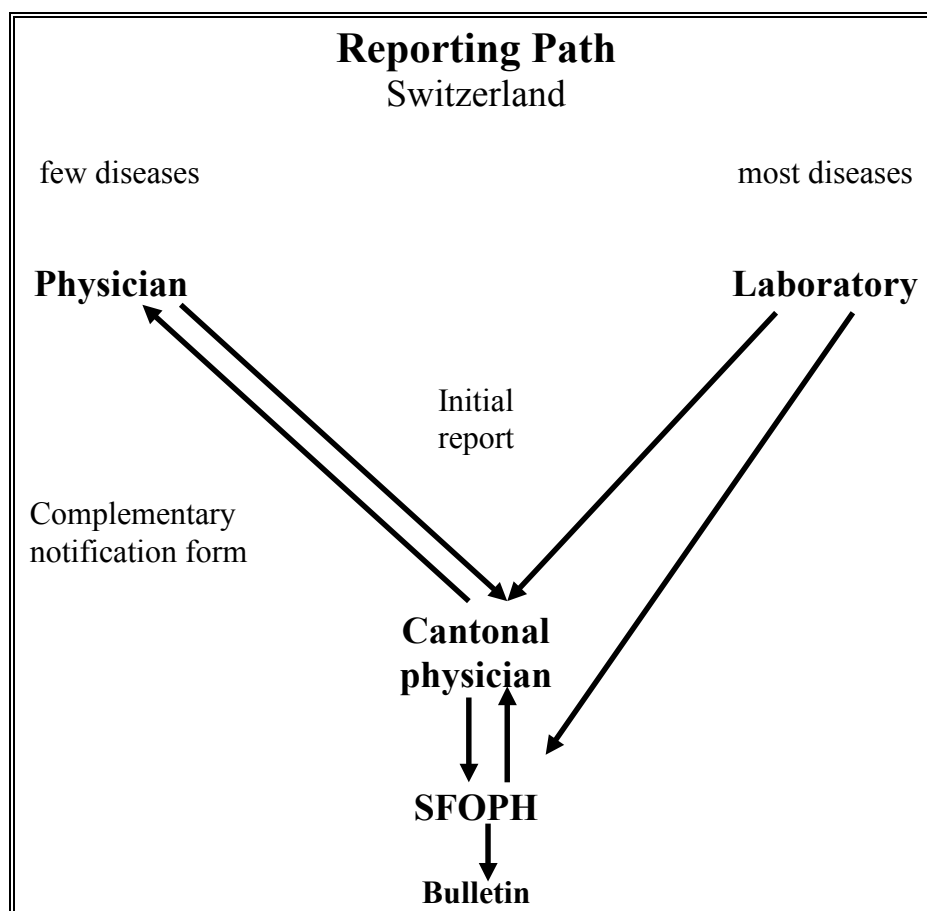
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1. General information

The Swiss Federal Office of Public Health (SFOPH) collects information on foodborne infections and intoxications from different sources:

- The Swiss Reporting System legally requires the federally registered laboratories to report identifications of all agents listed in the Regulation on Disease Notification of 1999 to the SFOPH. Owing to this system, single cases of foodborne disease only come to the knowledge of the federal health authorities if they are caused by one of the agents listed under 2. The laboratory reports contain information on age, sex, and residence of the patient, date of diagnosis, the result of typing of the agent and the material from which the isolation was made.
- Information on sources of infections and places where infections occurred are available for outbreaks which are epidemiologically investigated by cantonal (regional) health authorities and reported to the SFOPH.
- Determinants for the acquisition of sporadic cases of *Campylobacter* Enteritis and salmonellosis were identified by means of case-control studies. These were performed by the SFOPH and the National Reference Laboratory for Foodborne Diseases.

Figure CH 1



2. Statutory notification

Diagnosis of the following, mainly foodborne infectious agents, are subject to mandatory reporting: *Salmonella* causing gastroenteritis, *Salmonella typhi*, *Salmonella paratyphi*, *Campylobacter* spp., *Shigella* spp., *Listeria monocytogenes*, *Clostridium botulinum* and hepatitis A virus. The mandatory reporting of *Yersinia* spp. has been abolished by the Regulation on Disease Notification of 1999.

Salmonellosis and campylobacteriosis are the leading foodborne diseases in Switzerland. Following a *Salmonella* Enteritidis epidemic, which began in the mid-1980s, and peaked in 1992, the annual number of salmonellosis laboratory reports have declined constantly. This has primarily been due to a reduction in *S. Enteritidis* infections. In 1998, there were 68% fewer isolations of this serovar reported to the SFOPH than in 1992. The number of other serovars and not serotyped isolates fell by 50% in the same period. This trend contrasted with a 33% increase in cases of *Campylobacter* enteritis. In 1995, their number exceeded the figure for *Salmonella* isolations for the first time (Tables CH 1, CH 2).

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Country Reports: *SWITZERLAND 1993 – 1998*

Table CH 1

Notified cases and incidence rates of enteric diseases
SWITZERLAND 1992 – 1998

Agent	Year					
	1993	1994	1995	1996	1997	1998
<i>Salmonella</i>	6142	5068	4520	3908	3627	3004
Incidence rate	87.9	72.0	70.8	55.0	51.0	42.1
Shigellosis	516	547	533	437	624	499
Incidence rate	7.4	7.8	7.5	6.2	8.8	7.0
<i>Campylobacter</i>	5058	4931	5044	5656	5955	5455
Incidence rate	72.4	70.1	71.2	79.6	83.7	76.5
Hepatitis A	664	614	510	258	278	361
Incidence rate	9.6	8.8	7.3	3.7	3.9	5.0
<i>Yersinia spp.</i>	115	124	83	89	68	51
Incidence rate	1.6	1.8	1.2	1.3	1.0	0.7
<i>Cl. botulinum</i>	-	12	-	-	-	-

Table CH 2

Distribution of Salmonella serotypes among human cases
SWITZERLAND 1992 - 1998

Serotype	Year						Total	
	1993	1994	1995	1996	1997	1998	No.	%
<i>S. Enteritidis</i>	3670	2720	2776	2434	2147	1715	15462	71.7
<i>S. Typhimurium</i>	429	681	518	536	455	353	2972	13.8
<i>S. Virchow</i>	83	109	67	42	37	30	368	1.7
Other serotypes	717	477	441	336	406	397	2774	12.9
Total	4899	3987	3802	3348	3045	2495	21576	100.0

Table CH 3

Multidrug-resistant *S. Typhimurium* strains isolated from humans
SWITZERLAND 1993 – 1998

Year	<i>S. Typhimurium</i> Total No. isolates*	DT 104 (%)	(% of R-Type ACSSuT)‡
1993	435	NA†	22 ^s
1994	647	NA	22 ^s
1995	504	NA	22 ^s
1996	500	NA	NA
1997	492	NA	31
1998	364	NA	33

* Isolates which were investigated at the National Reference Laboratory for Foodborne Diseases, University of Bern

† not available; *S. Typhimurium* is not phage typed in Switzerland

‡ % of all *S. Typhimurium* isolates belonging to R-type ACSSuT

^s determined on a random subset of strains for the three years together

Figure CH 2

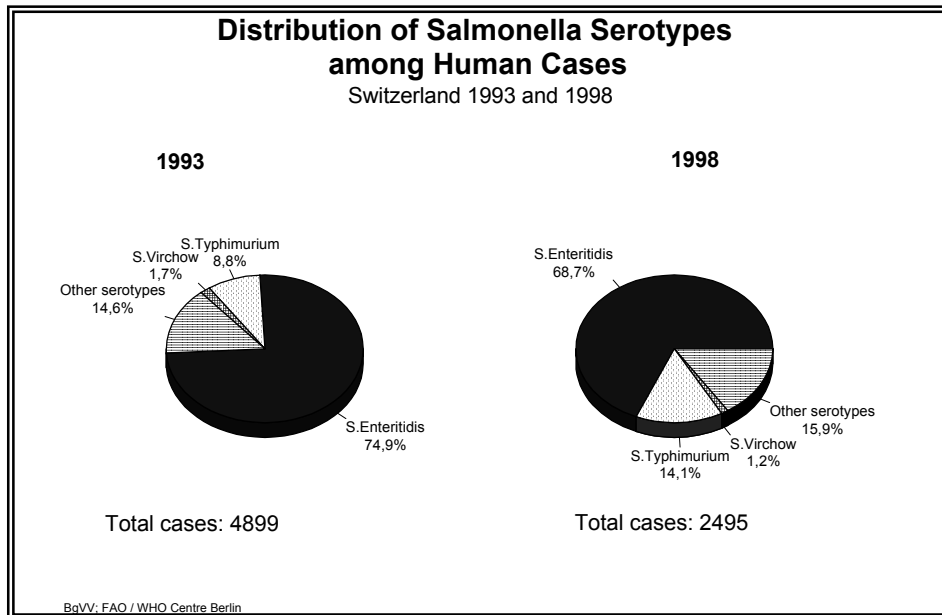


Figure CH 3

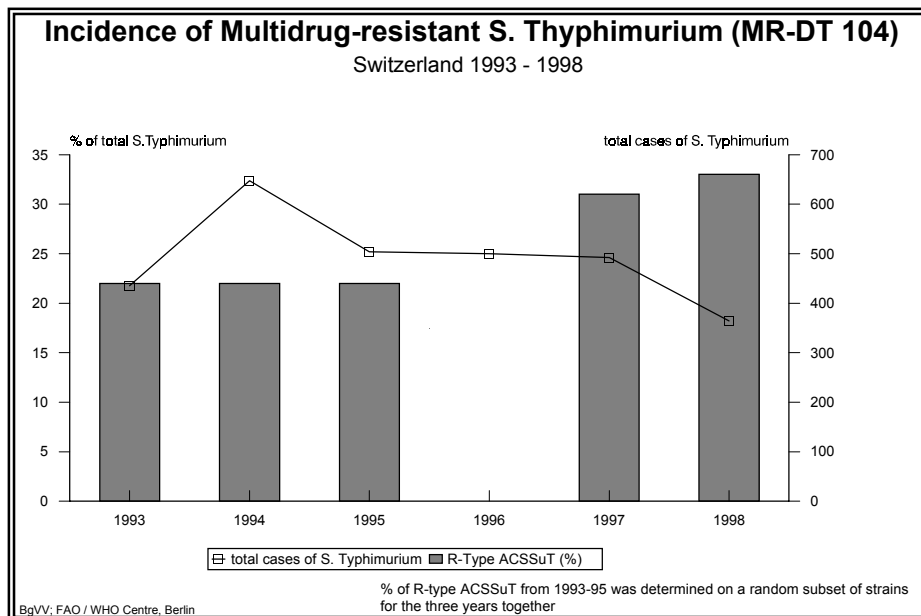
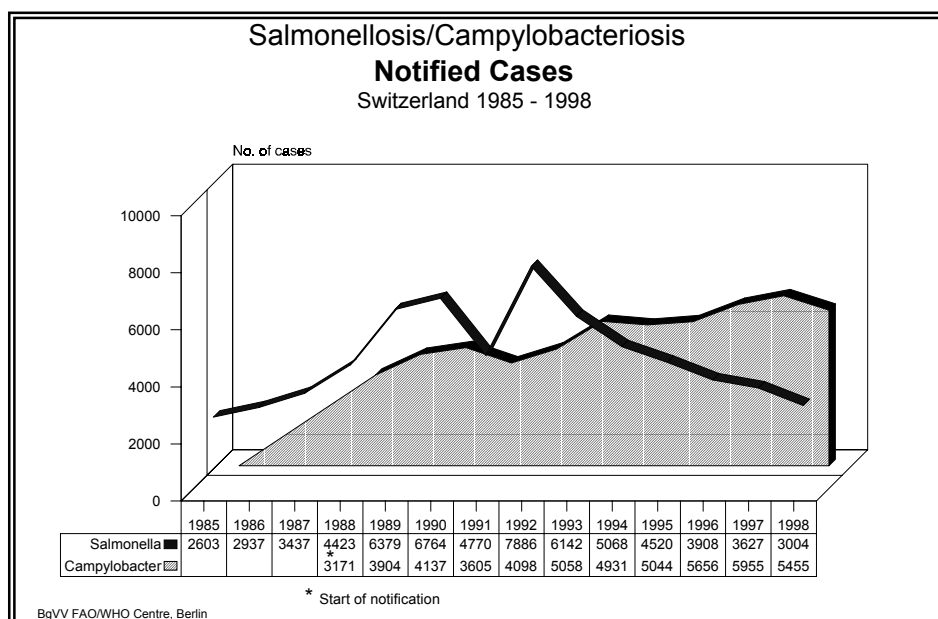


Figure CH 4



3. Epidemiologically investigated incidents

In the years 1993 to 1998, a total of 156 outbreaks of gastroenteric diseases, each involving the whole range of a few to about 400 persons, was investigated by the cantonal health authorities, occasionally with federal support. The results from these investigations collected by the SFOPH are an important source for recommendations to the public and to the catering industry, aiming at lowering the incidence of foodborne diseases.

3.1 Causative agents

The causative agent could be identified in 105 (67%) outbreaks; 72 (69%) of these were due to enteric salmonellae of which 58 (81%) were serotyped as *Salmonella* Enteritidis (Table CH 3). Concomitant with the observed decline in laboratory reports, the number of *S. Enteritidis* outbreaks has decreased markedly, from 28 in 1992 to 5 in 1997 (6 in 1998). Other bacterial agents involved in outbreaks were *Campylobacter jejuni*, *Shigella sonnei*, *Escherichia coli*, *Staphylococcus aureus*, *Clostridium perfringens* and *Clostridium botulinum*. Viral agents were identified in only five outbreaks (small round structured viruses SRSV, adeno- and rotaviruses). There were, however, 21 further outbreaks, where the search for a bacterial agent was negative and the clinical symptoms (sudden onset of vomiting and diarrhea, low or no fever, short duration of illness) pointed to a viral rather than a bacterial disease.

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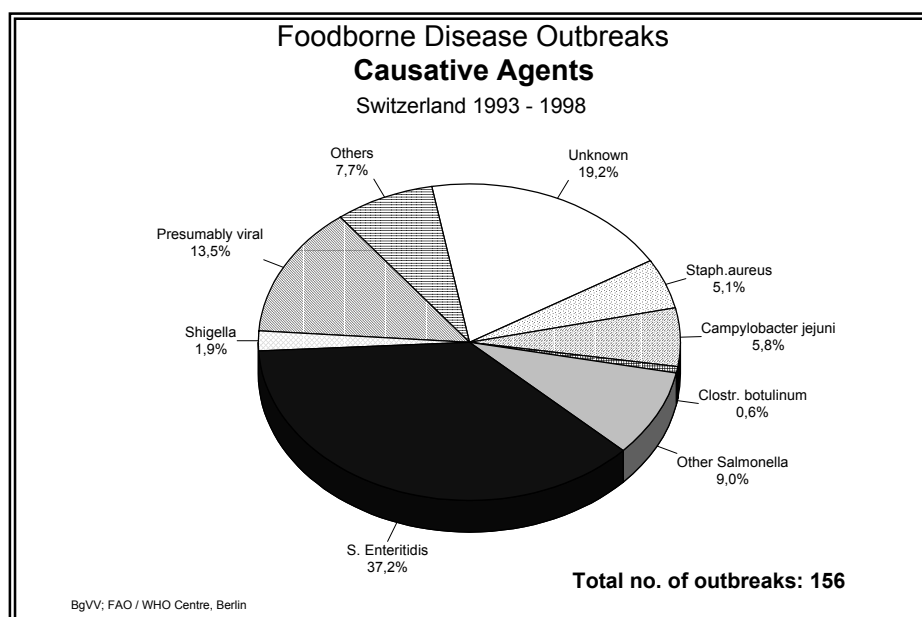
Country Reports: *SWITZERLAND 1993 – 1998*

Table CH 4

Foodborne disease outbreaks by causative agents
SWITZERLAND 1993 – 1998

Causative Agent	Year						Total	
	1993	1994	1995	1996	1997	1998	1993-1998	
	No. of outbreaks						No.	%
<i>S. Enteritidis</i>	23	11	7	6	5	6	58	37.2
<i>S. Typhimurium</i>	-	1	-	1	-	-	2	1.3
<i>S. Braenderup</i>	1	-	-	-	-	-	1	0.6
<i>S. Dublin</i>	-	-	1	-	-	-	1	0.6
<i>S. Thompson</i>	-	-	1	-	-	-	1	0.6
<i>S. Tosamanga</i>	-	-	1	-	-	-	1	0.6
<i>S. Rissen</i>	-	1	-	-	-	-	1	0.6
<i>S. Livingstone</i>	-	-	-	-	1	-	1	0.6
<i>S. Group C</i>	-	1	-	-	-	-	1	0.6
<i>S. Group D</i>	3	1	-	-	-	-	4	2.6
<i>Salmonella</i> spp.	-	-	-	-	1	-	1	0.6
<i>S. typhi</i>	-	1	-	-	-	-	1	0.6
<i>Campylobacter jejuni</i>	1		3	2	2	1	9	5.8
<i>Shigella sonnei</i>	1	2	-	-	-	-	3	1.9
<i>Staph. Aureus</i>	1	1	-	2	3	1	8	5.1
<i>Clostr. perfringens</i>	1	1	1	-	-	-	3	1.9
<i>Bacillus cereus</i>	1	-	-	1	-	-	2	1.3
<i>Clostr. botulinum</i>	-	1	-	-	-	-	1	0.6
<i>E. coli</i>	-	-	-	1	-	-	1	0.6
SRSV	-	-	-	-	1	3	4	2.6
Adeno- and rotaviruses	-	-	1	-	-	-	1	0.6
Presumably viral	4	5	4	5	-	3	21	13.5
Unknown	12	6	4	3	5	-	30	19.2
Total	48	32	23	21	18	14	156	100.0

Figure CH 5



3.2 Incriminated foods

In about half of the outbreaks, epidemiological and microbiological investigations allowed to identify the food item most likely associated with the incident (Table CH 4). Among these, all but three of the *S. Enteritidis* outbreaks were related with the consumption of food items which contain raw or lightly cooked eggs: Dessert dishes, other dishes with eggs (e.g. pasta sauce, raw meat dish), mayonnaise, pastry (filling or glaze containing eggs). Likewise, a case-control study conducted over a one-year period identified raw and undercooked eggs as determinants for the acquisition of sporadic *S. Enteritidis* infection in Switzerland.

In one *S. Enteritidis* outbreak which affected more than 400 persons, precooked and reheated Asian dishes, served at a public gathering with many food stalls, were implicated. 280 persons in the Western part of the country fell ill after consuming a canned meat product contaminated with *S. Braenderup*.

Campylobacter caused much fewer outbreaks than *Salmonella*, although the numbers of laboratory reports for these two types of agents were similar. In none of the 9 outbreaks could *Campylobacter* be isolated from an incriminated food item or water sample. Three of these incidents were associated with drinking water and raw milk was incriminated in one.

Foods precooked (couscous, rice) or stored over a long time (dried ham) were the vehicles of toxins in outbreaks of *Bacillus cereus*, *Clostridium perfringens* and *Clostridium botulinum*. Staphylococcal toxins in meat dishes (kept at room temperature after cooking), cheese and a potato salad caused further outbreaks. The potato salad was apparently contaminated by a food handler with a purulent finger. There was also evidence for bacterial contamination of food by an infected food handler in two outbreaks caused by *Salmonella typhi* and *Shigella sonnei*, respectively.

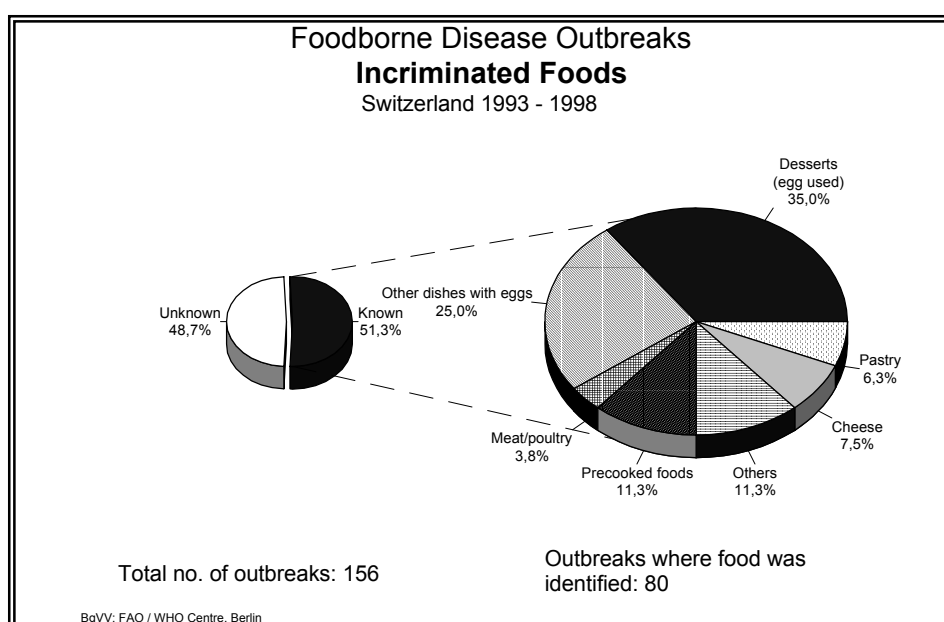
In the cases in which a viral agent was isolated, or a presumed viral agent was implicated, there was evidence for transmission of the agent by food, but also from person to person.

Table CH 5

**Foodborne disease outbreaks by incriminated foods
SWITZERLAND 1993 - 1998**

Food	Year						Total	
	1993	1994	1995	1996	1997	1998	1993-1998	
	No. of outbreaks						No.	%
Desserts made with raw eggs	12	4	1	4	3	4	28	17.9
Other dishes with eggs	5	2	4	1	2	2	16	10.3
Mayonnaise	-	2	-	-	1	-	3	1.9
Pastry	2	1	-	1	1	-	5	3.2
Cold meat dish	-	-	1	-	-	-	1	0.6
Canned meat prod.	1	-	-	-	-	-	1	0.6
Precooked foods	4	2	1	-	1	1	9	5.8
Chicken	-	1	-	1	-	-	2	1.3
Cheese	-	1	1	1	3	-	6	3.8
Drinking water	-	-	3	-	-	1	4	2.6
Food probably contaminated by infected food handler	1	1	-	2	-	-	4	2.6
Probably person-to-person transmission	-	-	-	-	-	1	1	0.6
Unknown	23	18	12	11	7	5	76	48.7
Total	48	32	23	21	18	14	156	100.0

Figure CH 6



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3.3 Places where contaminated food was eaten

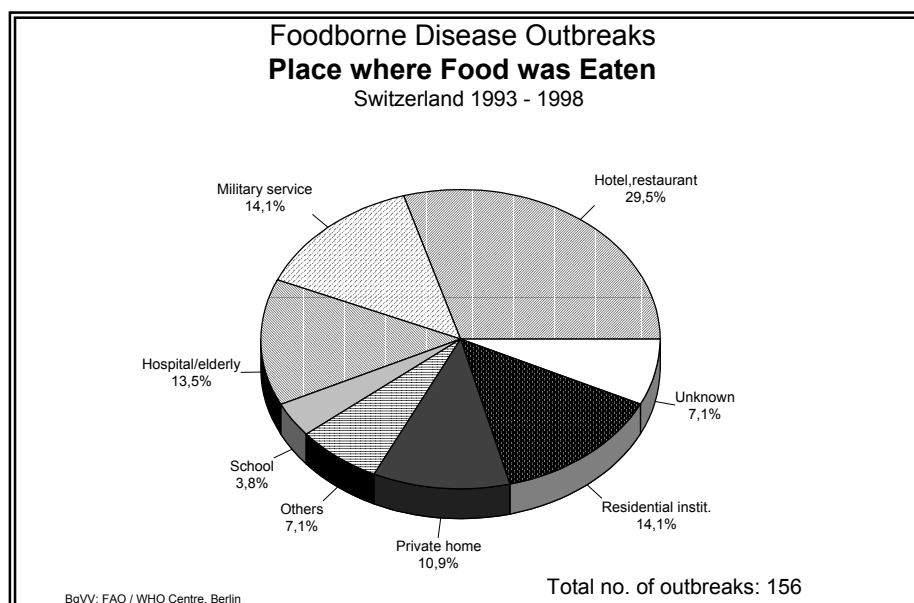
Most of the known outbreaks occurred in places of collective catering such as hotels, restaurants or canteens, military quarters, hospitals, nursing homes, psychiatric clinics, residence for elderly or homeless persons, holiday homes for children, schools, youth camps, public festivals, and in one case in a monastery. Eleven outbreaks affected consumers in different households after they had eaten contaminated products (e.g. eggs from the same farm, pastry product from the same bakery, canned meat product). An outbreak with *Salmonella* Dublin affected consumers of a cheese in France and in Switzerland and could be traced to the same producer (Table CH 6).

Table CH 6

Foodborne disease outbreaks by place where food was eaten
SWITZERLAND 1993 – 1998

Place	Year						Total	
	1993	1994	1995	1996	1997	1998	1993-1998	
	no. of outbreaks						No.	%
Hotel,restaurant, canteen	12	9	9	6	5	5	46	29.5
Hospital,nursery	8	5	2	3	2	1	21	13.5
Residential institution	7	7	3	3	2	-	22	14.1
Military service	9	4	3	3	3	-	22	14.1
School	1	2	-	2	-	1	6	3.8
Public festival with food stalls	1	-	1	-	-	1	3	1.9
Monastery	1	-	-	-	-	-	1	0.6
Private home	4	2	3	2	-	6	17	10.9
Youth camp	-	1	1	1	2	-	5	3.2
Public swimming pool	-	-	-	-	2	-	2	1.3
Unknown	5	2	1	1	2	-	11	7.1
Total	48	32	23	21	18	14	156	100.0

Figure CH 7



4. Comments

Previous reports have already described raw or lightly cooked eggs as being the most common vehicles in outbreaks involving *S. Enteritidis*. This continued during the time period covered by the present report, but the number of outbreaks caused by *S. Enteritidis* dropped considerably from 1993 to 1997. Concomitantly, the number of laboratory reports for this agent decreased as well. Specific recommendations for improvements in food and kitchen hygiene issued by the SFOPH and their subsequent dissemination by the mass media may have exerted a certain preventive impact. Increased awareness of the risk has led to greater care in the handling of eggs, especially in the catering industry (for example, the use of pasteurized eggs for raw egg dessert dishes). Measures taken in the food industry at different levels of the egg production chain and an intensified activity of food control authorities might also have contributed to the improvement of the situation concerning salmonellosis.

The increase in *Campylobacter* isolations is not completely understood. It is conceivable that improved laboratory diagnostics may have influenced the recognition of cases. Also, the epidemiology of *Campylobacter* is very different to that of *S. Enteritidis*. This is indicated by its lower tendency to cause outbreaks, the higher proportion of infections imported while travelling abroad and the apparent differences in transmission. Poultry stocks are without doubt the main reservoir of *Campylobacter*, but the chain of infection is not completely understood. For this reason, legal measures for the control of *Campylobacter* have not yet been established.

5. Source of information

Schorr D, Schmid H, Rieder HL, Baumgartner A, Vorkauf H, Burnens A. Risk factors for *Campylobacter enteritidis* in Switzerland. Zbl. Hyg. 1994; 196: 327-37.

Schmid H, Burnens AP, Baumgartner A, Oberreich J. Risk factors for sporadic salmonellosis in Switzerland. Eur. J. Clin. Microbiol. Infect. Dis. 1996; 15: 725-32.

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Baumgartner A, Schmid H. Kranke und gesunde Ausscheider infektiöser oder toxigener Erreger im Umgang mit Lebensmitteln. (Handling in foodstuffs by sick and healthy persons shedding pathogenic or toxigenic microorganisms). Mitt. Gebiete Lebensm. Hyg. 1998; 89: 581-604.

Schmid H, Baumgartner A. *Salmonella enterica* serovar *enteritidis* in Switzerland: Recognition, development, and control of the epidemic. In: Saeed AM. *Salmonella enterica* serovar *enteritidis* in humans and animals. Iowa State University Press, Ames, 1999, p. 81-89.

6. Additional information

The Swiss Federal Office of Public Health publishes a weekly report on infectious diseases that can be found at: <http://www.admin.ch/bag/infreporting/index.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>.