



TYPHOID AND PARATYPHOID FEVER 1999-2001

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Clinical manifestation & transmission

Typhoid fever and paratyphoid fever are septic febrile illnesses caused by *Salmonella typhi* and *S. paratyphi* serotypes A, B or C. Paratyphoid fever caused by *S. paratyphi C* is rare, while *S. typhi* and *S. paratyphi A* and B are frequent causes of infection. The route of infection for all *Salmonella* types is faecal-oral. While the zoonotic *Salmonella* types, such as *S. enteritidis* and *S. typhimurium*, are usually characterised by diarrhoea as the prevalent symptom, fever is the cardinal symptom in typhoid and paratyphoid fevers. The bacterium can often be isolated from both blood and faeces in the acute phase of the illness, but only from faeces in convalescents. Humans are the only known reservoir for *S. typhi* and *S. paratyphi A-C*. Thus, the diseases spread from person to person via foodstuffs that have been polluted with human faeces or via water. Hence, typhoid and paratyphoid fevers usually occur in countries with low standards of hygiene.

Notified cases

In 1999-2001, a total of 59 cases of typhoid fever and 71 cases of paratyphoid fever were notified, [Table 1](#).

Table 1. Notified cases of typhoid and paratyphoid fever, 1999-2001

Year	Typhoid fever	Paratyph. fever
1999	20	45
2000	22	9
2001	17	17
Total	59	71

The unusually high number of cases of paratyphoid fever in 1999 was due to an outbreak among Danes on holiday in Alanya, Turkey. Thirty-four cases had been notified, EPI-NEWS 34/99. Apart from this, the number of notified cases was comparable to that as in previous years. Both typhoid and paratyphoid fevers occurred most commonly among schoolchildren and younger adults, as in previous years, [Table 2](#).

Table 2. No. of notified cases of typhoid and paratyphoid fever by age (years), 1999-2001

Age	Typhoid fever	Paratyph. fever
< 2	3	0
2-6	7	4
7-14	14	6
15-19	10	7
20-29	8	29
30-39	10	11
40-49	4	5
50 +	3	9
Total	59	71

Typhoid and paratyphoid fevers are often serious illness. In fact, 93% and 70% of notified patients respectively, were hospitalised.

Mode of transmission - typhoid fever

A total of 34% of the typhoid fever patients were infected in Pakistan, while 41% were infected elsewhere in Asia, [Table 3](#).

Table 3. Notified cases of typhoid and paratyphoid fever, by presumed country/area of infection, 1999-2001

Country/area	Typhoid fever	Paratyph. fever
Pakistan	20	12
The rest of Asia	24	6
Africa	4	2
Central America	1	0
Turkey	1	36
Denmark	5	14
The rest of Europe	1	1
Not stated		
(several countries)	3	0
Total	59	71

A total of 11 out of the 24 children <15 years of age were Pakistani immigrants who visited their home country. One child <2 years of age was infected in Pakistan, another in Denmark, and for a third child, country of infection was not stated, [Table 2](#). Eight Danes were infected during foreign travel, four in Africa, three in Asia and one in Central America, [Table 4](#).

Table 4. Notified cases of typhoid and paratyphoid fever, by mode of transmission and ethnic origin, 1999-2001

Mode of transmission	Typhoid fever	Paratyph. fever
Immigrants visiting home country or on tourist trip	47	14
Danes infected on foreign travel	8	43
Immigrants inf. in DK	3	0
Danes infected in DK	1	14
Total	59	71

Six of the eight patients had stayed abroad for over three weeks. In one case, the duration abroad was not stated. Information on vaccination status was available for 10/59 (17%) of typhoid patients; nine had stayed abroad for over three weeks, seven were immigrants visiting their home country without prior vaccination, and three were Danes, of whom two were vaccinated. One 11-year old Danish child was unvaccinated while being stationed abroad for six months.

Mode of transmission - paratyphoid fever

A total of 17% of the paratyphoid patients were infected in Pakistan, while 8% were infected elsewhere in Asia, [Table 3](#). Four out of ten children <15 years of age were Pakistani immigrants visiting their home country. A total of 34 Danes were infected whilst on holiday in Turkey and formed part of the mentioned outbreak. Of the remaining nine Danish patients, one was infected in Turkey, one in Russia, six in Asia and one in Africa. A total of 14 Danes were thought to have been infected with *S. paratyphi* in Denmark, [table 4](#). In the period 1995-1998, this statistic was six patients, EPI-NEWS 42-43/99. Ten of the patients were notified in 2001, one in 2000 and three in 1999. Moreover, there was no temporal correlation or known common source of infection.

Laboratory-confirmed cases

[Table 5](#), shows number of verified cases of *S. typhi* and *S. paratyphi A, B* or *C* diagnosed on culture of test material or culture submitted to the SSI.

Table 5. Laboratory-diagnosed cases of typhoid and paratyphoid fever, 1999-2001. Notified cases in ()

Year	Typhoid fever	Paratyph. fever
1999	22 (20)	70 (45)
2000	21 (22)	10 (9)
2001	16 (17)	17 (17)
Total	59 (59)	97 (71)

Apart from cases relating to the aforementioned paratyphoid outbreak in Turkey in 1999, practically all laboratory-confirmed cases were notified. A reminder procedure was introduced in January 2000; 23% and 42% of the notifications, respectively, were not received until after a reminder had been forwarded to the treating doctor.

Comments

The majority of notified cases of typhoid and paratyphoid are imported. Vaccination against typhoid is particularly relevant for long journeys and family visits in endemic areas. Vaccination can be performed from the age of two with a parenteral vaccine containing capsule polysaccharide from *S. typhi*, or from the age of five with an oral vaccine containing live attenuated *S. typhi* in enteric-coated capsules, EPI-NEWS 22a+22b/02. None of the vaccines protects against paratyphoid fever. (G. H. Kock-Hansen, S. Samuelsson, Dept. of Epidemiology, P. Gerner-Smidt, Dept. of G-I Infections)

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Patients with selected individually notifiable diseases

Notifications received during 2nd quarter of 2002 compared with 2nd quarter of 2001

County	AIDS		Hepatitis A		Meningococcal disease		Tuberculosis	
	2002	2001	2002	2001	2002	2001	2002	2001
Copenhagen Municip.	3	4	2	4	1	2	33	42
Frederiksberg Municip.	2	1	-	1	1	-	4	4
Copenhagen	-	1	1	2	1	3	15	23
Frederiksborg	-	1	3	2	1	6	2	4
Roskilde	-	-	-	-	2	1	3	1
West Zealand	1	-	-	-	-	4	3	1
Storstrøm	1	-	1	1	3	-	4	5
Bornholm	-	-	-	-	-	-	-	-
Funen	2	1	-	-	3	4	8	10
South Jutland	-	-	-	-	2	2	3	2
Ribe	-	-	-	-	1	-	2	2
Vejle	-	-	2	-	3	2	5	7
Ringkøbing	1	-	-	-	-	3	2	6
Aarhus	2	2	2	1	2	8	14	29
Viborg	-	-	1	-	1	5	2	4
North Jutland	4	1	-	-	2	8	12	4
Other	1	-	-	-	1	1	2	-
Total	17	11	12	11	24	49	114	144

Patients with other individually notifiable diseases

Notification received during 2nd quarter of 2002 and 2001, respectively, whole country

	2002	2001
Bacterial meningitis	55	52
Hepatitis B - acute *	13	8
Hepatitis B - chronic *	34	46
Hepatitis C - acute *	3	-
Hepatitis C - chronic *	122	74
Legionellosis	19	19
Measles	2	2
Mumps	1	1
Paratyphoid fever	1	8
Pertussis < 2 years	80	24
Psittacosis	2	1
Shigellosis	27	33
Typhoid fever	1	5

* In this table patients notified with e.g. chronic hepatitis B+C are included under both hepatitis B and C

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