had recovered and did not grow *V. cholerae*. All patients recovered after four days. No secondary cases were detected. The attack rate for the tour group was 6/8 (75%).

The tour group had travelled around west Turkey on a 14 day package tour. Group members, three men and three women, were aged between 58 and 68 years. They used a private bus, and at the end of their trip, they took an internal flight from Ankara to Istanbul.

During the journey they stayed at different hotels and visited Istanbul, Bursa, Efeze, Affrodisias, Pamukkale, Kusadasi, Antalya, Cappadocia, Ilhara and Ankara. They ate in several small restaurants and also ate food bought at markets and shops. During the internal flight, a salad was served.

Control measures

All tour group members were informed of the risks, and advised to contact their general practitioner and provide a stool sample. General practitioners were advised about treatment and follow-up. Patients were advised to limit their contacts and to apply hygienic measures to prevent further transmission. Patients were not automatically admitted to hospital nor systematically treated with antibiotics. The World Health Organization (WHO), the Turkish health authorities and the European Early Warning and Response System (EWRS) were informed immediately after detection of the cases.

Discussion

Cholera is an acute bacterial enteric disease caused by an infection with *V. cholerae*, serogroup O1 or O139. *V. cholerae* includes two biotypes - the classical type and El Tor type. Each biotype has 3 serotypes (Inaba, Ogawa, and rarely Hikojima). Cholera may be present in an asymptomatic state, as a mild disease or as the typical syndrome characterised by a sudden onset and profuse, painless, watery diarrhoea. The incubation period varies from a few hours to five days and patients are infectious while they have diarrhoea and up to 7 days after [1,2].

Databases of cholera cases reported to the WHO last recorded cholera cases in Turkey in 1977, and no data was supplied from 1978-1992. To date, there have been no other recent cases of cholera reported from Turkey [3].

Only the two patients confirmed to have cholera were treated with antibiotics. The other patients received symptomatic treatment and recovered quickly. The patients had only a few contacts, and were not working on or participating in activities which could have facilitated secondary transmission.

The attack rate was rather high (75%). A seventh patient developed minimal diarrhoea five days after return from Turkey but was not considered as a probable case. The high attack rate probably represents a high infective dose and there could potentially be other cases in Turkish residents or in visiting tourists. There are unofficial reports of cholera outbreaks in countries in the region surrounding Turkey, such as Iran, Tajikistan and Afghanistan. [4,5,6]

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Salmonella Typhimurium DT104 outbreak linked to imported minced beef, Norway, October – November 2005

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Outbreak alert

On 3 November 2005, four cases of multidrug-resistant *Salmonella* Typhimurium DT 104 infections were notified to the Infectious Disease Epidemiology Department by the Reference Laboratory of the Norwegian Institute of Public Health. The four isolates had identical multi-locus VNTR analysis (MLVA)-profiles (2-7-11-7-3) and antimicrobial resistance pattern (Amp-Chlor-Tet-Sulph-Strep-Nal). The same MLVA profile and resistance pattern was also detected in a routine sample of mixed meat that consisted of both Norwegian meat and meat imported from Poland. Further testing of unmixed samples showed salmonella growth only in the imported meat. This isolate was subsequently confirmed to have the same MLVA profile as found in the cases. Since sporadic infections by multidrug-resistant *S.* Typhimurium are very rare in Norway [1], detection of these cases prompted an immediate investigation.

Outbreak investigation

Three of the four patients were interviewed on 4 November to determine the time of symptom onset, illness duration and exposure history during the week before illness onset. These patients became ill between 2 September and 2 October and did not report any recent travel outside Norway before onset of symptoms. All three patients reported eating minced beef before becoming ill, and all of them tasted raw meat during food preparation. The beef product was bought frozen at national supermarket chain A during September. This information was immediately communicated to the Norwegian Food Safety Authority, which started tracing of the suspected beef. On 8 November, another patient was confirmed to have a salmonella infection with an MLVA pattern identical to one found in the index patients. This patient became ill on 7 October and also consumed the suspected meat.

An urgent enquiry was sent through the Enter-net network on 4 November and an alert was posted on the European Early Warning and Response System on 5 November. In response, Denmark reported two cases of *S.* Typhimurium DT104 with identical MLVA-profile and resistance pattern, one in a patient who had travelled to Poland. Some other countries have also reported cases of *S.* Typhimurium DT104 with the same resistance pattern. However, this is a relatively common type and further investigation and typing are needed in order to assess a possible link to the outbreak in Norway.

Product tracing and recall

The investigation indicated that the implicated beef was imported from Poland in June 2005. The consignment was accompanied by documentation that the batch had been controlled for salmonella and tested negative. The consignment was divided in three parts by the importer. The first part was sent to supplier 1, who took a routine sample of the meat. This sample tested positive for salmonella and had an MLVA profile indistinguishable to that of the cases. This meat was not released to the market. The second part of the original consignment was delivered to supplier 2 that produced minced beef and subsequently distributed it in frozen 400 gram packages in September and October via supermarket chain A. The remaining part of the initial shipment was stored by the importer; testing of this meat recovered *S.* Typhimurium DT104 with the same MLVA profile. Another sample was obtained from leftover frozen minced beef that was stored in a freezer of one of the cases: testing of this sample is pending. Based on epidemiological and microbiological data, the imported meat used for preparation of minced beef was suspected to be the source of this outbreak and the product was recalled from the market on 5 November. In addition, an announcement through mass media was made on the same day to warn the public not to consume this meat.

Discussion

The outbreak investigation implicated imported raw beef as the source of the outbreak. The beef was processed into minced meat in Norway, and subsequently distributed for sale via a national supermarket chain. The outbreak probably occurred over several weeks and since only a limited number of people were affected, it is possible that cooking the meat may have inactivated the bacteria, thereby preventing more cases. The product was recalled from the market according to zero tolerance policy for salmonella based on the National Food Law. Each year, approximately 1500–2000 cases of salmonellosis are reported in Norway, of which approximately 75-80% acquired infection abroad [3]. The National Salmonella Control Programme documented that cattle, swine, and poultry in Norway as well as domestically produced food products of animal origin are virtually free from salmonella [2]. Therefore, similarly to Finland and Sweden, Norway has negotiated the agreement requiring documentation of salmonella testing of meat and egg imports from EU countries [3]. The meat implicated in this outbreak was also accompanied by such documentation.

The application of MLVA typing method has been critical in both detecting this outbreak and determining the source. The MLVA method has been used as a routine typing tool for *S.* Typhimurium isolates received by Reference Laboratory of the Norwegian Institute of Public Health since 2004 [4]. This laboratory routinely receives all salmonella isolates from human, animal, food and feed samples for further typing. In comparison with PFGE gels, the MLVA fingerprinting method is fast and easy-to-use providing high-resolution discrimination between *S.* Typhimurium DT104 isolates, which are often genetically similar. Since *S.* Typhimurium DT104 is commonly isolated, it may be difficult to detect differences in strains with the use of another typing technique. Therefore, the MLVA method may be a valuable tool in determining the source of the outbreak. Moreover, the easy strain identification makes it possible to rapidly share results between countries in case of outbreaks. The detection of this outbreak through application of molecular methods highlights the importance of genetic characterisation of human and food isolates in order to identify possible clusters. The presence of an established system for tracing of food products facilitated a rapid recall of the implicated meat.

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Malaria cases and deaths in UK travellers returning from The Gambia

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Six cases of falciparum malaria have occurred in United Kingdom (UK) travellers who have recently returned from The Gambia [1]. Two patients are known to have died, and a further two are seriously ill. The patients, aged between 31 and 61 years, all returned to the UK and became ill in the second half of November 2005. Five had been on holidays lasting between one and two weeks, all in resorts within 20km of the Atlantic coast, with some patients having been on fishing or bird-watching excursions. The sixth patient had visited The Gambia several times on business and had travelled a little further inland than the other patients. All of the patients had taken either no or inadequate chemoprophylaxis.

The Gambia is a popular 'winter sun' destination for UK travellers, who account for nearly half of all tourist visits to the country [2] (around 30 000 UK tourists visited The Gambia in 2004 [3]). Malaria is highly endemic in The Gambia, with year-round transmission and over 100 000 cases reported annually in local residents [4].

Plasmodium falciparum is the most common type of malaria in The Gambia, and accounts for over 90% of cases in travellers returning to the UK from The Gambia. Falciparum malaria is the most severe form of the disease, and can rapidly progress to serious illness and death. Nearly 4% of falciparum malaria cases in travellers returning from The Gambia (2000-2004) were fatal.

Over the past six years, the annual number of cases in travellers returning to the UK from The Gambia has decreased, but the case fatality rate has increased (Table). Most cases of *P. falciparum* malaria were in travellers who did not take chemoprophylaxis.

FIGURE

Total numbers of *Plasmodium falciparum* malaria cases in travellers returning to the UK from The Gambia, reported to the UK Malaria Reference Laboratory, compared with reported cases acquired in all countries worldwide, 2000-2005 [5]

Year		Cases returning from The Gambia			
	Cases from all countries	Number of cases (% of all cases)	Number of Deaths	Case fatality rate	Percentage known to have taken prophylaxis*
2000	1576	121 (7.7)	4	3.3%	38.0%
2001	1576	74 (4.7)	1	1.4%	25.7%
2002	1469	46 (3.1)	2	4.3%	32.6%
2003	1339	48 (3.6)	3	6.3%	6.3%
2004	1221	31 (2.5)	2	6.5%	19.4%
2005**	855	8 (0.9)	1	12.5 %	30.0%

* The denominator is all falciparum case reports from The Gambia, including those where propylaxis status was unknown

** To end of August 2005. Please note that the main holiday season to The Gambia from the UK is during the UK winter months

Travellers to the Gambia and other malarious countries should seek medical advice on appropriate measures before travelling. The risk of malaria can be reduced by taking appropriate chemoprophylaxis, and by bite avoidance through suitable clothing, insect repellents and bed nets [6].

There is significant chloroquine resistance in The Gambia, so chloroquine (which can be obtained without prescription in the UK) is not recommended as chemoprophylaxis [7]. According to UK guidelines, travellers should instead use atovaquone/proguanil (Malarone), or doxycycline or mefloquine (Lariam). These regimes are only available on prescription, and doxycycline or mefloquine should be started at least one week before travelling. Full details are available in the 2003 UK guidelines [8], and the UK National Travel Health Network and Centre (http://www.nathnac.org) can provide up-to-date advice to clinicians on travellers with complex medical needs or travel itineraries.

Organising preventive measures, medical advice and prescriptions may be difficult when holidays are booked at short notice, and a cluster of cases were reported in the UK in December 2003 associated with trips to The Gambia that had been booked shortly before departure [9]. 'Late booking' holidays are increasingly available through internet-based travel companies.