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FOODBORNE OUTBREAKS IN NORTHERN PORTUGAL, 2002

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In October 2001, foodborne outbreaks (FBO) were included in the Portuguese alert and response surveillance system. Accordingly, the northern regional health authority (Delegado Regional de Saúde do Norte - DRSN) began a surveillance programme of foodborne outbreaks. This report is a brief description of data generated from this programme in 2002. For each foodborne outbreak the local health authority (Delegado de Saúde Concelhio - DSC) produced a written report. Fifty-nine percent of the 27 FBOs studied by DSCs during 2002 were reported within 72 hours after the date of onset. Five hundred and seventy seven people became ill, 9.6% of the patients were admitted to hospital, and no deaths were reported. The aetiological agent was identified from patients in 63% of FBOs, and in food items in 18.5% of the situations. Salmonella enterica was responsible for 73.7% of the outbreaks in which the agent was laboratory confirmed. Meals implicated in the outbreak were mainly prepared in restaurants and private homes (75.0% of FBO). Inadequate processing, preparing or handling of foods were the contributing factors more often reported by the DSC. We believe that epidemiological surveillance and control of FBO must be reinforced in Portugal as part of a wider strategy to promote food safety.

Introduction

For many years, Portuguese local health authorities (Delegado de Saúde Concelhio - DSC) have been responsible for foodborne outbreak investigations, as part of their legal duties in the field of surveillance and control of communicable diseases in the community (1). However, written reports were not mandatory and had no standard format. Foodborne outbreaks (FBO) were not reportable events although some individual cases were due to causative agents that were part of the list of statutory reportable diseases (Doenças de declaração obligatória - DDO) (e.g. botulism, brucellosis, salmonellosis). In October 2001, FBOs were included in the Sistema de Alerta e Resposta Apropriada (SARA). DSCs were given the responsibility to report FBOs to regional health authorities and a standard report form was proposed (2). Having adapted this for Portugal, the northern regional health authority (Delegado Regional de Saúde do Norte - DRSN) created a formal surveillance programme of FBOs.
This report briefly describes data generated from this programme, in the first year of its existence, in the northern health region (Região de Saúde do Norte) (3.23 million inhabitants) in Portugal.

Material and methods

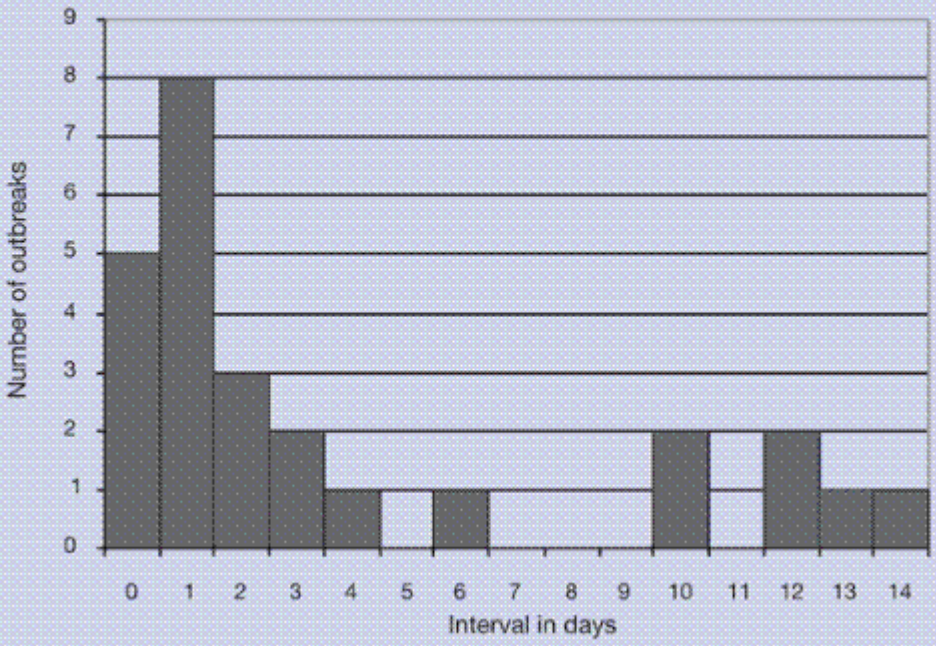
Initial information on individual cases and/or clustering of cases was provided to the DSC and/or the DRSN by different sources (hospitals, DDO, etc). A preliminary assessment was then made in order to confirm that a FBO had occurred. As part of the above mentioned programme, when a DSC (at the municipal level) knew of a FBO, they reported it to the DRSN. That report was first made by phone and letter in a specific written format. Some FBOs were detected initially by the DRSN, who then contacted the DSC. The DRSN

provided technical advice and guidance in the discussions with a DSC investigating an outbreak. Ultimately, the DSC was the coordinator of each outbreak investigation, except when outbreaks involved several municipalities, in which case coordination was by the DRSN. For each outbreak, a final written report was produced. After analysis of each report, feedback was provided to the DSC in the region concerned.
These reports are the source of the data described here. Information was recorded, processed and analysed, using Epi Info 6.04 (3).
We describe here data concerning operational issues of the programme and some epidemiological aspects of foodborne outbreaks in northern Portugal in 2002.

Results

Twenty seven FBOs were studied by DSCs and/or the DRSN, during 2002. Initial information concerning cases of a suspected FBO was provided by different entities: hospitals (16/27), senior staff members of institutions where the FBO had occurred (4/27), DDO (4/27) and other sources (3/27). The proportion of index cases reported within 72 hours, one week and two weeks after the date of onset were respectively 59% (16/27), 74% (20/27) and 100% (27/27) of the outbreaks (Figure 1).

Figure - Delay between the occurrence of the index case and the reporting to Health Authorities. Foodborne outbreaks, Northern Portugal, 2002



In one of the reports, no data was given concerning the number of persons affected. In 26 FBOs, 577 people became ill, resulting in an estimated incidence rate of 17.9 per 100 000, in northern Portugal. The size of the outbreaks varied from a minimum of one case (botulism) to a maximum of 154 cases (mean number of persons per outbreak: 22.2). Forty seven per cent of patients were between 15 and 59 years old, 30% were less than 15 years and 23% were more than 59 years old. Nine point six per cent of the patients were admitted to hospital. No deaths were reported.
Whenever available, suspected food items were analysed in the laboratory, in order to identify the agent and the vehicle of infection. Thirty five food item samples, from 44.4% (12/27) of the outbreaks, were sent to be analysed. Laboratory investigations which aimed to isolate aetiological agents were performed among patients in 81.5% FBOs (22/27) (Table 1). As a result, the aetiological agent was identified from patients in 63.0% (17/27) and from food items from 18.5% (5/27) of FBOs. In three FBOs there laboratory evidence was obtained from both patients and food items (Table 1).

Table 1
Laboratory data. Putative aetiological agents isolated in patients and suspected food items by foodborne outbreak. Northern Portugal – 2002

		Isolation in patients			Total
		Yes	No	Not done	
Isolation in food items	Yes	3	1	1	5
	No	4	1	2	7
	Not done	10	3	2	15
Total		17	5	5	27

Combining laboratory evidence from patients and food items (Table 1 and 2) it was possible to isolate a putative agent in 70.4% of outbreaks (19/27), while aetiology was unknown in 22.2% (6/27). Based on clinical and epidemiological data it was possible to presume a causative agent in 7.4% (2/27) of the FBOs

studied (Table 2). In the FBOs in which laboratory results were negative both in patients and food items, it was suspected, based on epidemiological and clinical data, that the aetiological agent was Norovirus (Tables 1 and 2). In one of the two FBO for which no laboratory analyses were performed at all (Table 1), the aetiological agent (diarrhoeic shellfish poisoning toxin) and the vehicle (shellfish) were presumed based on clinical and epidemiological data (Table 2).

Table 2
Confirmed and presumed aetiology of foodborne outbreaks. Northern Portugal, 2002

Aetiological evidence	Agent	No. outbreaks	No. cases
Confirmed			
	Clostridium botulinum toxin	3	4
	Staphilococcus aureus enterotoxin	1	7
	*Salmonella enterica**	14	286
	Diarrhoeic shellfish poisoning	1	58
Total confirmed		**19**	**355**
Presumed/suspected			
	Norovirus	1	154
	Diarrhoeic shellfish poisoning	1	4
Total presumed/suspected		**2**	**158**
Unknown		6	64
TOTAL		**27**	**577**

* In one of the outbreaks, the number of patients was unknown. In another one, other aetiological agents than *Salmonella* were isolated in food items (enterotoxin producing *E. coli* and enteroaggregative *E. coli*).

For those in which the aetiology was confirmed, Salmonella enterica was responsible for 73.7% (14/19) of the outbreaks and for 80.6% (286/355) of the cases (Table 2). Serovar Enteritidis was identified in 4 of the 14 outbreaks, and phage types 1 (PT1) and 4 (PT4) were found in two of those four outbreaks.

Based on epidemiological evidence (results from the analysis of questionnaires), raw eggs and foods containing raw egg were identified as the vehicle in 8 of the 27 outbreaks, followed by meat and meat products (3/27), fish products (2/27), smoked raw ham (2/27), shellfish (2/27) and drinking water (1/27).
In 24 FBOs it was possible to know the place where the meals had been prepared. In most cases (41.7%, 10/24) meals were prepared in restaurants, followed by private homes (33.3%: 8/24) and canteens (25.0%: 6/24).
Thirty one contributing factors were reported by DSCs, in 13 of the 27 FBOs. Inadequate processing, preparing or handling of food were factors more often (7/31) reported, followed by contamination of drinking water (5/31), use of contaminated raw material (5/31), preparation of food items too far in advance (4/31), contamination by personnel (3/31) and inadequate cooking (3/31).
In 18 of the 27 reports (Table 3) we had information about the control measures implemented by DSCs in order to prevent further FBOs. Besides health services, other state departments, with responsibilities in the areas of environment and economy were contacted by DSCs to be involved in the control measures, in sixteen FBOs.

Table 3
Control measures implemented by the local health authorities by foodborne outbreak. Northern Portugal – 2002

Control measures	No. of outbreaks
Source	
Food recall	7
Modifying preparation process	1
Correcting food premises structure	6
Closing food premises	2
Total	**16**
Prevention measures	
Public advice	3
Exclusion of infected food handlers	3
Training/education of food handlers	4
Total	**10**
Unknown	**9**

Discussion

2002 was the first year of the surveillance programme of foodborne outbreaks in northern Portugal. Because of this, the number of FBOs studied was small and data was missing for some variables and observations and thus conclusions drawn from this study must be cautiously interpreted because of potential biases.
In this review, declaration of FBOs to health authorities were made sooner than in a published study in France (4), in which 48% and 68% of FBOs were reported to Health Authorities within three and seven days after onset

respectively. We question if timeliness was influenced by the fact that 2002 was the first year of the programme. Our main source of declaration were hospital doctors (59%), a higher value than reported in France (28%) (4). Reasons for this difference are not apparent.

The estimated incidence rate of foodborne disease in northern Portugal (17.9/100000) was between the extremes of European values observed in 1998 (the Russian Federation (3/100 000) and Yugoslavia (219/100 000)) (5). It is believed that only 10% of FBOs in industrialised countries (6) are reported, but no data are available to estimate the level of underreporting in our study.
The average number of persons per outbreak in this study (22.2) was higher than that estimated from data reported by the World Health Organization between 1993 and 1998 (11.7) (5). The high value found in this study was influenced by the size of one of the outbreaks (n=154) and possibly by under-reporting of smaller size outbreaks.
The proportion of patients hospitalised as a consequence of a foodborne disease in this report (9.6%) is similar to the value reported in France in 2001 (10%) (4). But, unlike the French study, no deaths were reported among cases of foodborne disease in our case series. These differences must be interpreted with caution, because this study included a smaller number of cases and other data must be available to make a proper comparison of severity among countries.

The aetiological agent was unknown in 22.2% of the FBOs studied, which is between the values of 17% and 29.3% found in other studies (Table 4). Comparison with FBOs in France, in 2001 (4), the agent was confirmed in a higher proportion of outbreaks, and presumed in a lower proportion of FBOs (Table 4). As in other studies (4,5) Salmonella enterica was the most common isolated agent (7), and raw eggs and raw egg-containing foods were found to be important vehicles of agents of FBOs.

Table 4
Identification of the causative agents in foodborne outbreaks. Comparison between studies, Northern Portugal - 2002.

Percentage of outbreaks with	North of Portugal 2002 (present study)	France 2001 (4)	European Region, WHO, 1993-1998 (5)
Confirmed agent	70.4	49	
Suspected agent	7.4	34	70.7
Unknown agent	22.2	17	29.3

Foodborne outbreaks originating from meals prepared at home (33.3%) were less common than in similar studies in European countries (4,5).
Based on this first year of experience we believe that epidemiological surveillance and control of foodborne disease outbreaks must be pursued and reinforced in Portugal. The type of program described here is one of the important activities of a wider strategy to promote food safety (8).

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