**ACM/847**

**ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD**

**UPDATE ON LISTERIOSIS IN THE UNITED KINGDOM**

The attached paper provides an update on the continued high level of reporting of human listeriosis in the United Kingdom. Dr Jim McLauchlin of the Health Protection Agency will present the paper and accompanying slides. The HPA's last update to the Committee was in December 2006.

Members' views are sought on the increase in reported cases of listeriosis and methods of control.

**Secretariat**
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**ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD**

# UPDATE ON LISTERIOSIS IN THE UNITED KINGDOM, JUNE 2007

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## Key Issues and summary

1. The ACMSF has previously requested updates on the increase in human listeriosis in the UK. This report further described the continued high level of reporting of human listeriosis in England and Wales in patients ≥60 years of age with bacteraemia (invasion of the blood stream). The increased reporting did not occur in patients with invasion of the central nervous system or in pregnant women. A similar increase was reported in Scotland in 2005 and the incidence in Northern Ireland, whilst lower, is increasing. Increases have occurred in other EU Member States, particularly in Germany where the increase occurred in similar age groups to that reported in the UK. Members of the ACMSF are invited to provide views on the increase in reported cases of listeriosis and methods of control.

## Background

2. *Listeria monocytogenes* and the disease listeriosis were first described in laboratory animals in 1924. The disease is now recognised as amongst the most important human foodborne illnesses. The disease, although rare, is severe, primarily affecting the unborn, the newly delivered, the immunocompromised and the elderly. The disease normally presents as abortion, septicaemia or central nervous system (CNS) infections, with high mortality rates reported in all patient groups.

3. At its meeting in September 2005 and December 2006, members were informed of a change in the epidemiology of *L. monocytogenes* infection in England & Wales. This change was characterised by increased in the numbers of reported cases from 2001, which occurred predominantly in patients aged ≥60 years of age and who presented with bacteraemia (the presence of bacteria in the blood) without CNS infection. This increase, occurred in most regions in England and Wales, in both genders, and could not be explained by outbreaks recognised during this time.

4. In Scotland in 2005, the incidence was significantly higher than in 2004 and from the period 1993 to 1999. Furthermore, the clinical presentation in Scotland in 2005 was similar to that observed in England and Wales, with the disease occurring predominantly in older patients with bacteraemia in the absence of CNS infection. No significant increase was observed in Northern Ireland up to 2005. Additional data were presented which

suggested that the altered epidemiological/clinical picture in England & Wales was not artefactual. This report provides a further update to the ACMSF of human listeriosis in the UK, together with a comparison to other countries within the EU.

**Update on activities of the HPA (and others) on surveillance and epidemiological investigations for human listeriosis**

5. The numbers of cases of listeriosis reported in England and Wales declined to 187 cases in 2006, as compared to 189 cases in 2005, 213 in 2004, 237 in 2003 and 136 in 2002. However this still represents an approximate doubling in the incidence in patients ≥60 years of age as compared to that in the 1990 (Figs 1 and 2). This upsurge continues to be in ≥60 years of age patients with bacteraemia. Similar increases have not been detected in patients ≥60 years with *Salmonella* or *Campylobacter* bacteraemia suggesting further that this increase is not artefactual and not due to increases in blood cultures taken or improvements in blood culture technology. Clusters and sporadic cases were detected possibly associated with food vehicles (Table 1) but these did not explain the increase in incidence.

6. Subtyping of *L. monocytogenes* isolates from the upsurge since 2000, both within specific time periods or regions, do not suggest common source outbreaks as have been previously reported. For the first part of 2007 (weeks 1 to 19) the numbers of cases reported is greater than that since active surveillance began in 1990.

7. Incidence in Scotland dropped by 26% in 2006 compared with 2005 (17 and 23 cases respectively). The incidence in Northern Ireland, whilst lower than in other UK countries, has increased in each of the past four years ($\chi^2$ for trend 3.66; P=0.055). Overall, there has been an increase in human listeriosis cases reported within the EU between 2001-5 (Anon 2005). Sixty seven percent of all cases within the EU are reported from Germany, France and the UK, and increases have been recognised in all three countries. The increase in Germany, similarly to that for the UK, occurred predominantly in patients aged ≥60 years (Koch and Stark, 2006).

8. The Health Protection Agency (HPA) continues to collect isolates of *L. monocytogenes* from clinical cases of listeriosis in England and Wales and carries out a range of discriminatory tests to identify clusters of possibly related cases. Isolates from food are also subjected to these tests. Isolates from approximately 80% of cases are referred to the HPA. A clinical questionnaire is sent to microbiologists in England and Wales and completed information is obtained for approximately 70% of cases. Additionally, food exposure data is sought using a standardised questionnaire for cases in England. Due to the difficulties in following up patients (largely due to the disease severity) this was only possible for 16% of cases between 2005 to 2007 although this proportion has increased over this time period. Analysis of questionnaires where food

exposure data was obtained identified only one single group of 10 cases infected by indistinguishable isolates: the majority of cases are infected by a unique type or are related to isolates from only one other case. Preliminary analysis of the data has not revealed any association between a specific food type and the single group.

9. Further analysis has been performed on the regional distribution of listeriosis cases in England and Wales during 2003 to 2006. Increases were detected within specific regions in each of the years. Four examples were detected of the co-incidental occurrence of increases of 'sporadic' cases (due to multiple strains of *L. monocytogenes*) with either clusters or single foodborne cases. The epidemiological significance of this observation is not understood.

10. In 2007 a *L. monocytogenes* contamination incident was detected in sandwiches from a manufacturer in SE England which resulted in a voluntary product withdrawal. A similar contamination problem had occurred in the same factory in 2005. In early 2006 the manufacturer supplied 10,000 sandwiches/day to the SE of England with hospitals receiving 40% of product. A single case was detected in London infected with an indistinguishable *L. monocytogenes* strain, and with a history of sandwich consumption at one of the hospitals supplied by this manufacturer. However, isolates from five cases were indistinguishable from one of the two 'factory types' and these were significantly associated with South Thames during 2005-07. Following the absence of detection of *L. monocytogenes* in product on 4 consecutive days, production was resumed in April 2007. Further monitoring of the product and factory sites is ongoing. This incident together with previous incidents (Table 1), highlights problems with the serving of this type of food to vulnerable groups in hospitals as *L. monocytogenes* may legally be present in ready-to-eat foods up to 100 cfu/g**.**

11. The recognition of the increase in listeriosis has been communicated through HPA updates/briefing notes, local, national and international meetings as well as written reports and publications (Gillespie et al., 2006, Anon 2005, 2007a and b) as well as presentations to the ACMSF. In addition, the HPA and the Local Authorities Co-ordinators of Regulatory Services (LACORS) Co-ordinated Food Liaison Group food programme focuses on foods of concern associated with: food production; the food service sector; and retail foods. These studies produce national data on the microbiological quality of ready-to-eat food and also develop ways of targeting specific food hygiene problems and investigating ways of monitoring and improvement. Indeed, the UK probably has as much or more data on the contamination of food by *L. monocytogenes* than most other countries. These include recent studies undergoing complete analysis (e.g. the shopping basket survey, sampling completed in May 2007) or reports prepared for consultation (sandwiches from hospitals and residential/care homes, consultation June 2007), as well as those published in peer reviewed journals (Little et al., 2007, 2004; Sagoo et al., 2007, 2003, 2001; Lewis et al., 2006; Elson et al., 2004, Gillespie et al.

2001). This data not only supports follow up from cases of listeriosis, provides base line data from food regulation, and provides information for consideration to formulate advice to vulnerable groups on risks from specific food types.

12. The HPA responded to the Food Standards Agency's (FSA) research requirement B14R0001 'Further our understanding of the epidemiology of foodborne listeriosis in the UK and the reason(s) for the recent rise in reported cases.' This call requested a 'well balanced and innovative proposal' on 'how molecular tools could be applied to maximise the value of epidemiological studies' and 'how an epidemiological approach could be harnessed to provide information on food handling and storage practices in vulnerable groups'. Funding was sought for a multi-centred epidemiological and microbiological approach comprising a case-control study examining food consumption, handling and storage practices, the development of rapid typing methods and growth characteristic studies. The FSA invited the HPA to resubmit a revised proposal to "concentrate solely on . . . the identification of risk factors" and a revised proposal, reflecting this request was submitted. Responses to refereeing of this proposal have been provided by the HPA and a meeting will take place with the FSA on 31st May to discuss this proposal.

**Conclusions**

13. Data up to the first 5 months of 2007 show a continued increase in the numbers of human listeriosis cases reported in the UK to that recognised in the 1990s. The change in cases presentation after 2000 occurred predominantly in patients ≥60 years of age who presented with bacteraemia. Similar change has occurred elsewhere in the EU. Examples were detected of co-incidental occurrence of increases of 'sporadic' cases within a defined region together with either clusters or single foodborne cases. The epidemiological significance of this association is not understood. In 2007 a contamination incident was detected in sandwiches from a manufacturer in SE England which supplies 40% of its products to hospitals. There followed a voluntary product withdrawal. A single case was detected in London infected with an indistinguishable strain, and had a credible history of sandwich consumption. Isolates from five cases were indistinguishable from one of the two 'factory types' and significantly associated with South Thames during 2005-07. This, together with previous incidents (Table 1) highlights problems with the serving of this type of food in hospitals.

14. Members of the ACMSF are invited to provide views on the increase in reported cases and methods of control particularly with respect to:

- Surveillance and epidemiology in providing:
  - a better understanding of 'sporadic' infection
  - risk factors and behaviours which lead to infection
  - a co-ordinated approach across the UK

- Elimination and/or reduction of *L.monocytogenes* in the food chain and advice on actions when contamination occurs in food or the factory environment

- Food regulation particularly for foods to vulnerable groups

- Dietary Advice targeted to most common vulnerable groups and assessed for effectiveness

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**Table 1. Probable and possible foodborne listeriosis cases and clusters in England and Wales 1999-2007**

| Year | Region | Cases | Vehicle |
|---|---|---|---|
| 1999 | NE England | 4 | Hospital sandwiches |
| 2003 | NE England | 17 | Butter |
| 2003 | NE England | 18 | None identified |
| 2003 | S Wales | 2 | Hospital sandwiches |
| 2003 | SW England | 5 | Hospital sandwiches |
| 2004 | E Mids | 6 | None identified |
| 2004 | SE England | 2 | Hospital sandwiches |
| 2005 | NW England | 1 | Sliced meat |
| 2006 | London | 1 | Sliced meat |
| 2007 | London | 1 | Hospital sandwiches |

**Fig 1 Numbers of reported listeriosis cases in England and Wales 1990-2006**

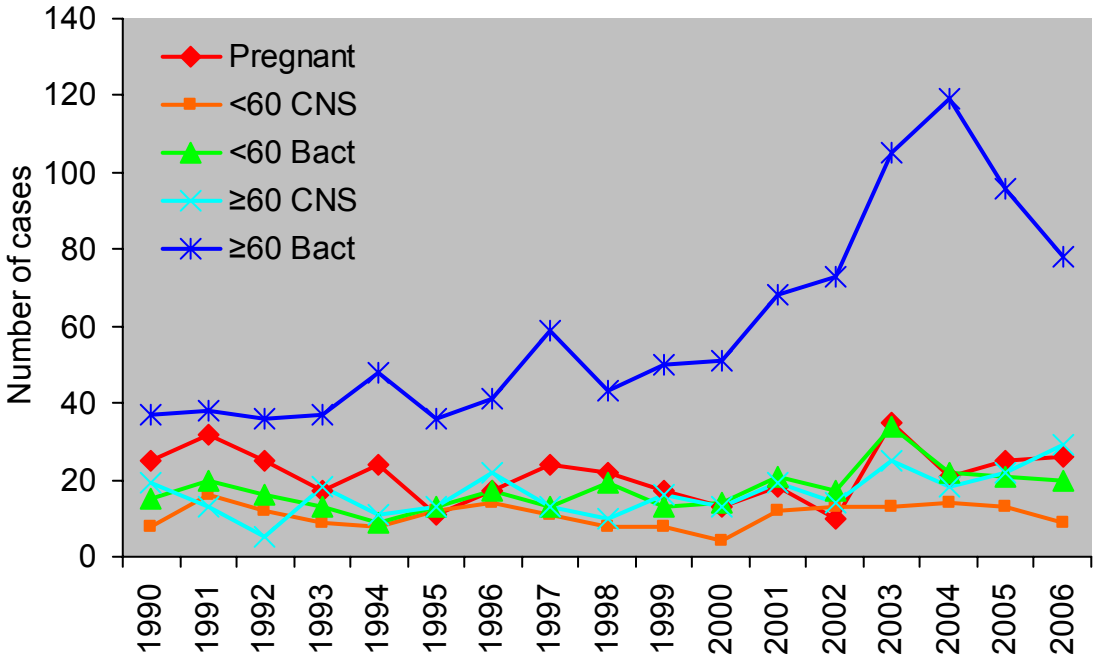

**Fig 2. Age specific rates of listeriosis in England and Wales 1990-2006**