

Update on human listeriosis in the United Kingdom, 1993-2006.



Jim McLauchlin

Health Protection Agency

June 2007

Contents



- **Background**
- **Surveillance**
 - in England and Wales
 - Scotland and Northern Ireland
 - Europe
- **HPA (and others) activities**
 - surveillance strategy
 - ‘sporadic’ increases in incidence
 - food surveillance
- **Information from the USA**
- **Members invited to provide views on**



Listeriosis



- Most often affects the unborn, newly delivered, immunocompromised and elderly
- Primarily presents as abortion, septicaemia or CNS infections
- High case fatality rate
- Predominately foodborne



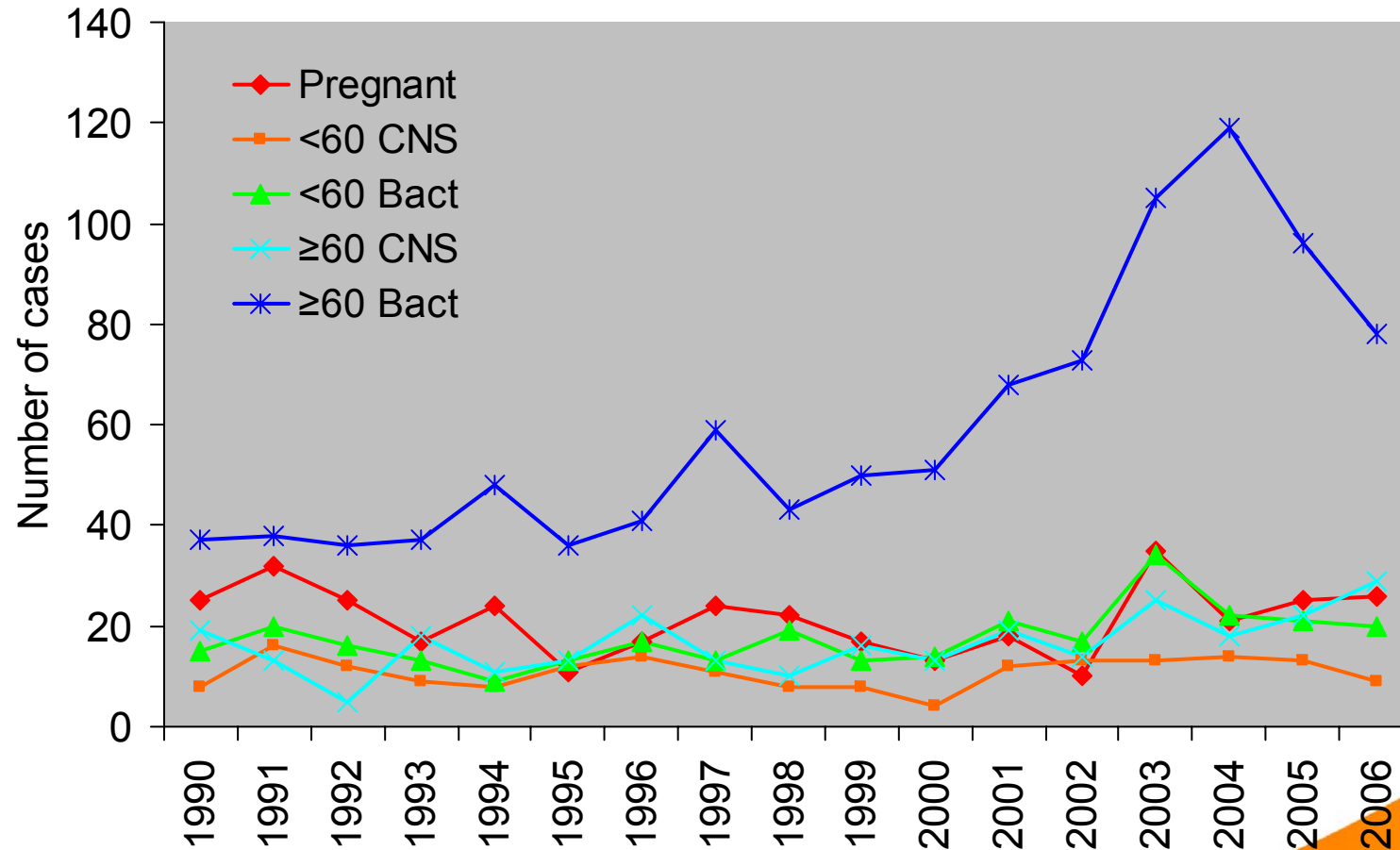
Background



- Increase in England & Wales 2000-2005
 - sporadic cases >59 years
 - bacteraemia in the absence of CNS involvement
- Independent of:
 - Gender
 - Season
 - *L. monocytogenes* subtype
 - Region
 - Underlying condition
- Increase in Scotland 2000-2004
 - further (significant) increase in 2005
 - similar to trend to England and Wales
- No increase in Northern Ireland 2000-2004



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



Multiple subtypes of *L.monocytogenes* were associated with the increase in patients aged ≥ 60



L.monocytogenes types associated with bacteraemia in patients ≥ 60

2005

124 cases

25 isolates not typed

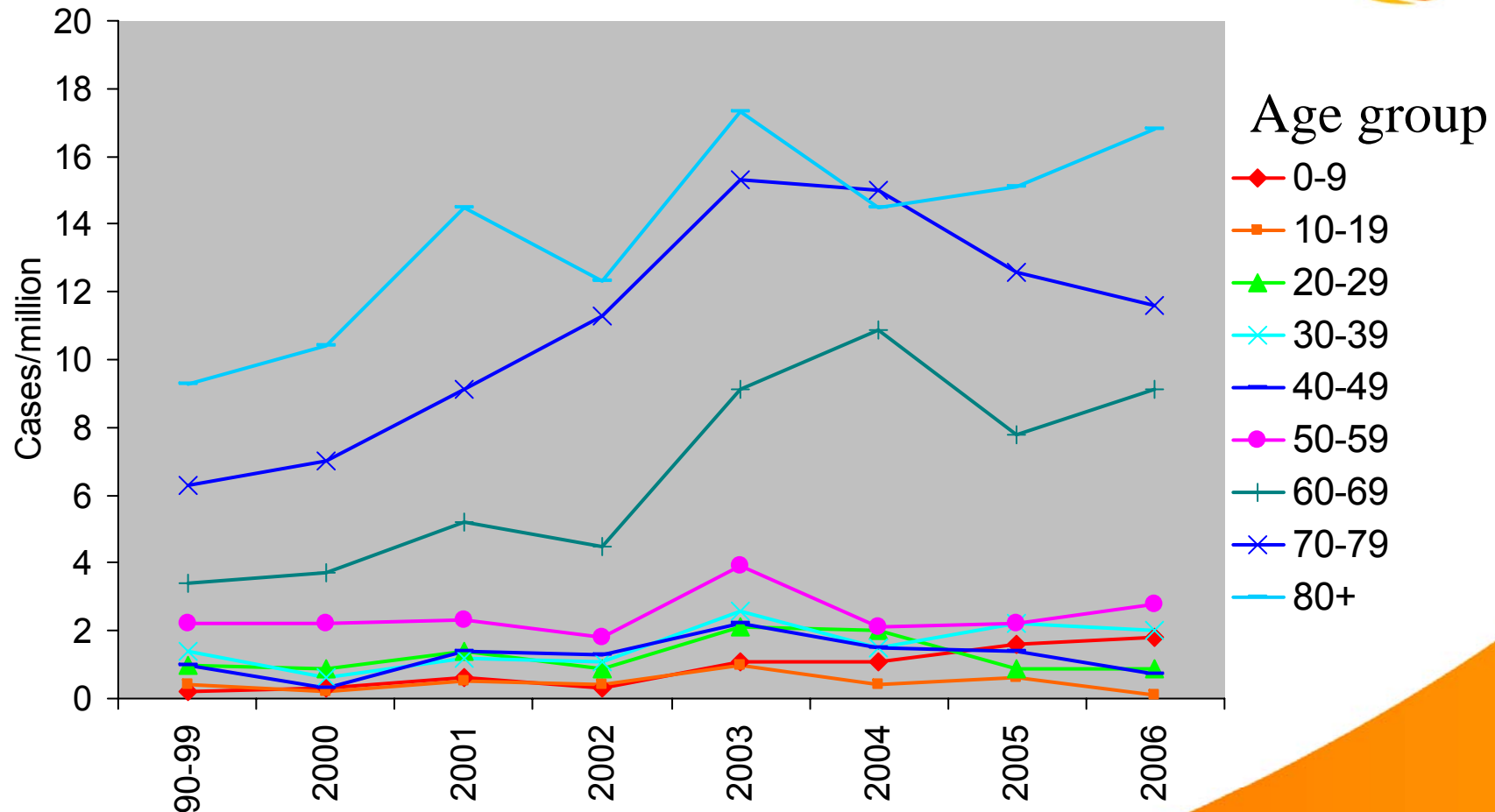
1 'cluster' of 13 cases

2 'clusters' of 9 cases

3 'cluster' of 7, 6, or 5 cases

28 'clusters of 4 or less cases (18 unique types)

Age specific rates of listeriosis in England and Wales 1990-2006



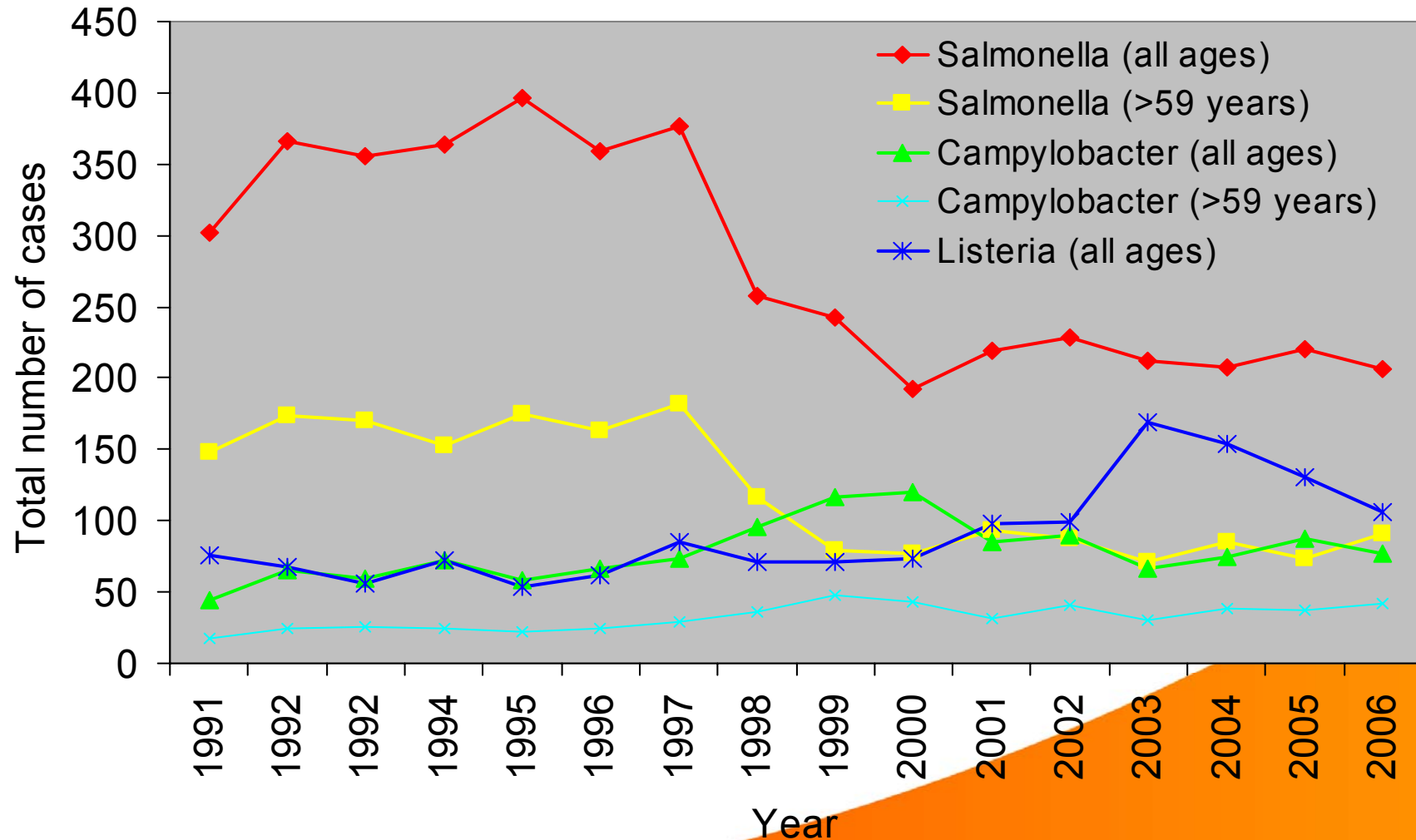
Listeriosis in patients aged ≥ 60 is now twice as common as reported in the 1990s



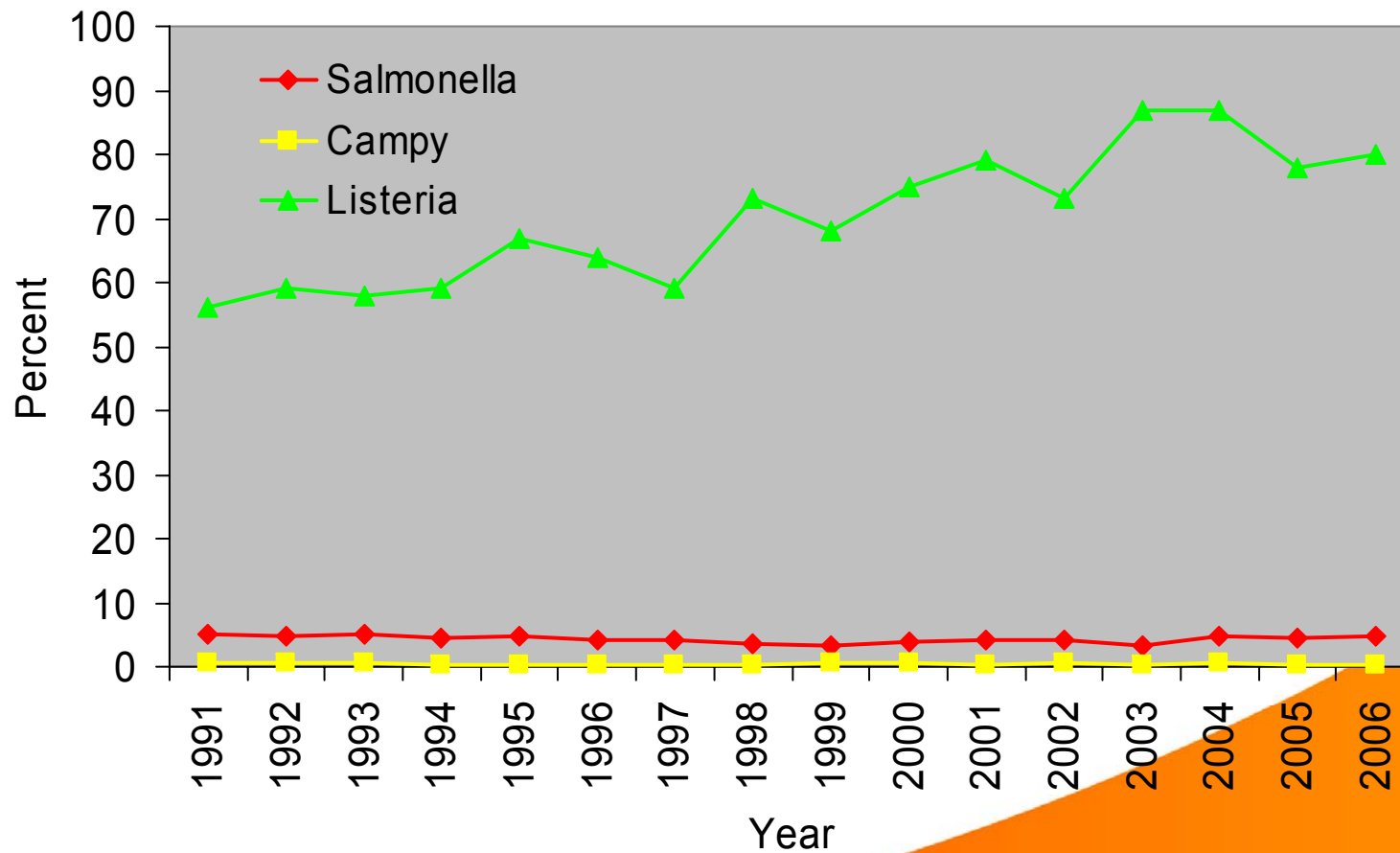
Is the increase an artefact?



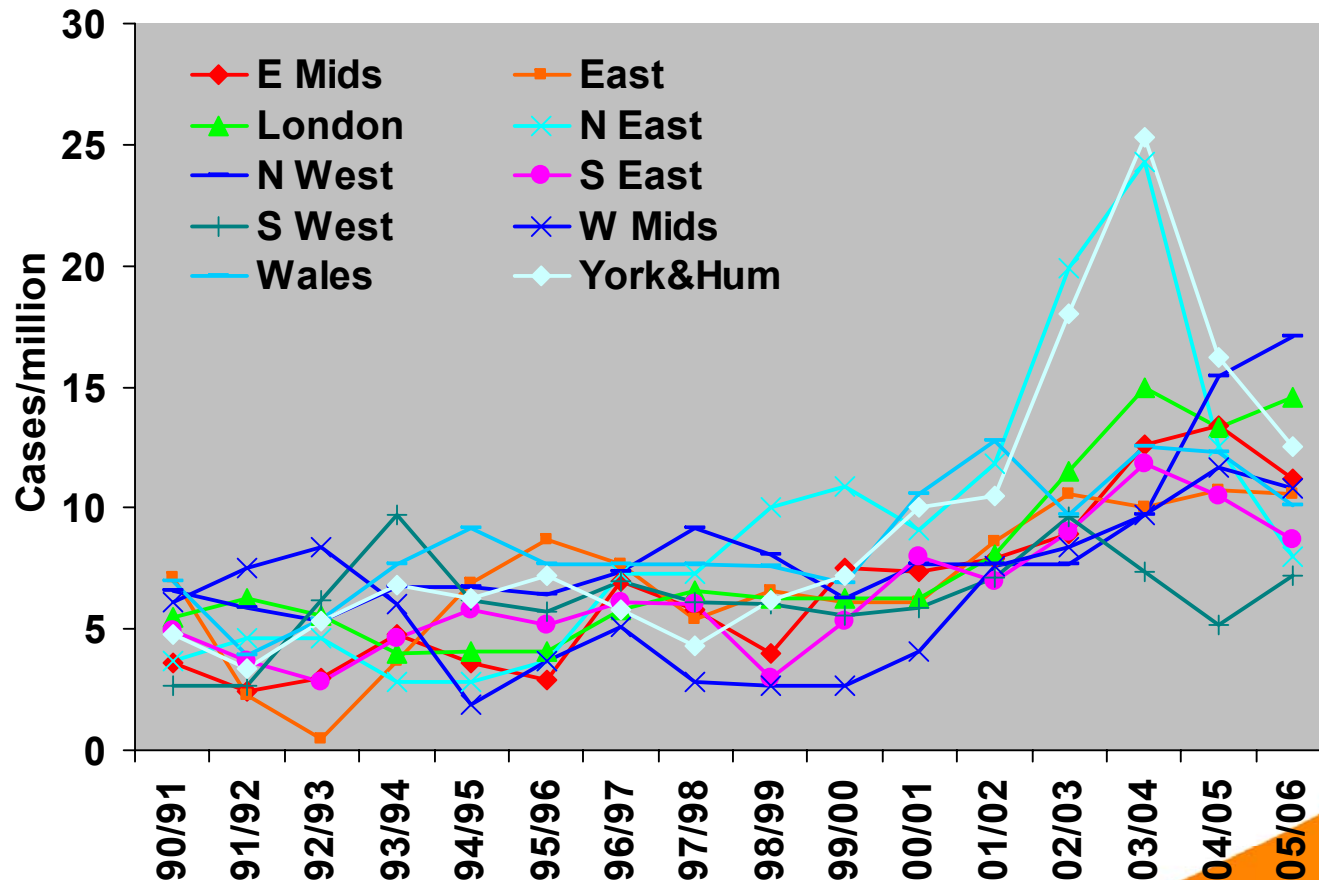
Salmonella, Campylobacter and L.monocytogenes bacteraemia reported in England and Wales, 1991-2006



Percent *Salmonella*, *Campylobacter* and *L. monocytogenes* bacteraemias in patients aged ≥ 60 , England & Wales



Regional rates of listeriosis in cases aged ≥ 60 in England and Wales: 1990-2006 (two year means)



Upward trend in most regions

Unlikely to be due to a single common source outbreak

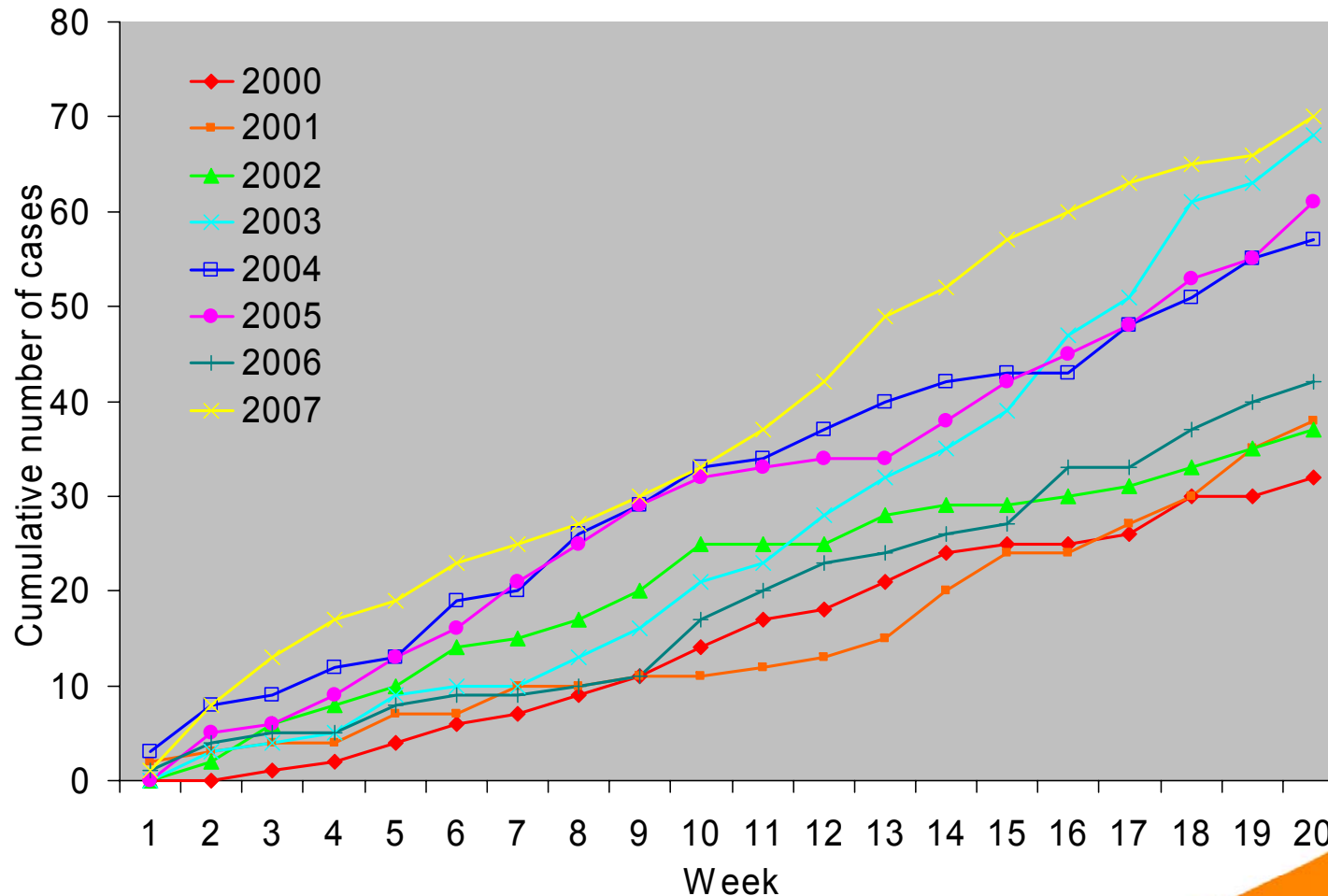
Probable and possible foodborne listeriosis cases and clusters in England and Wales 1999-2007



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

Clusters or sporadic cases not responsible for the upsurge

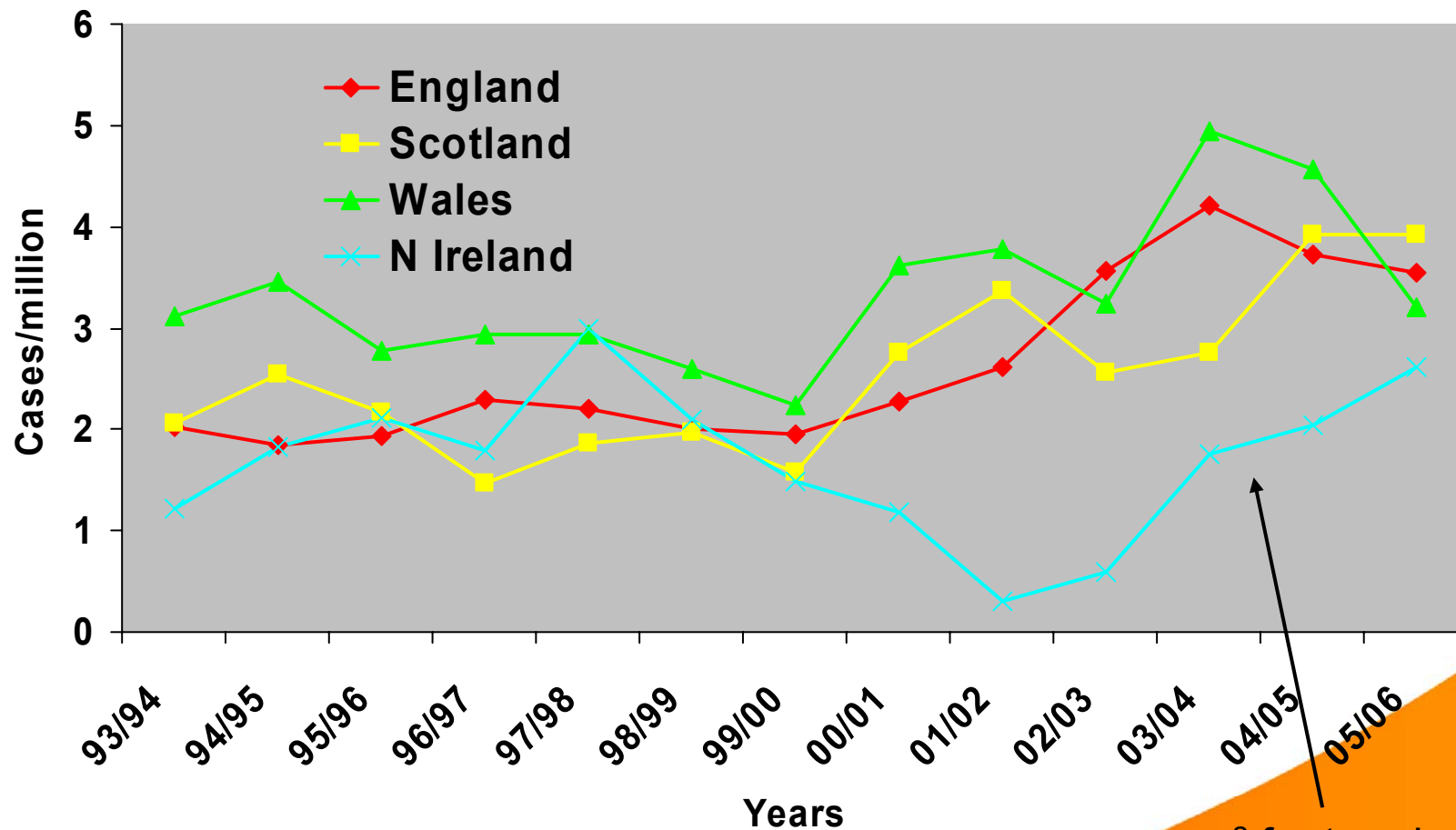
All reported cases of listeriosis 2000-2007 in England and Wales weeks 1-19



The increase for the first part of 2007 is similar or greater than that for the previous three years

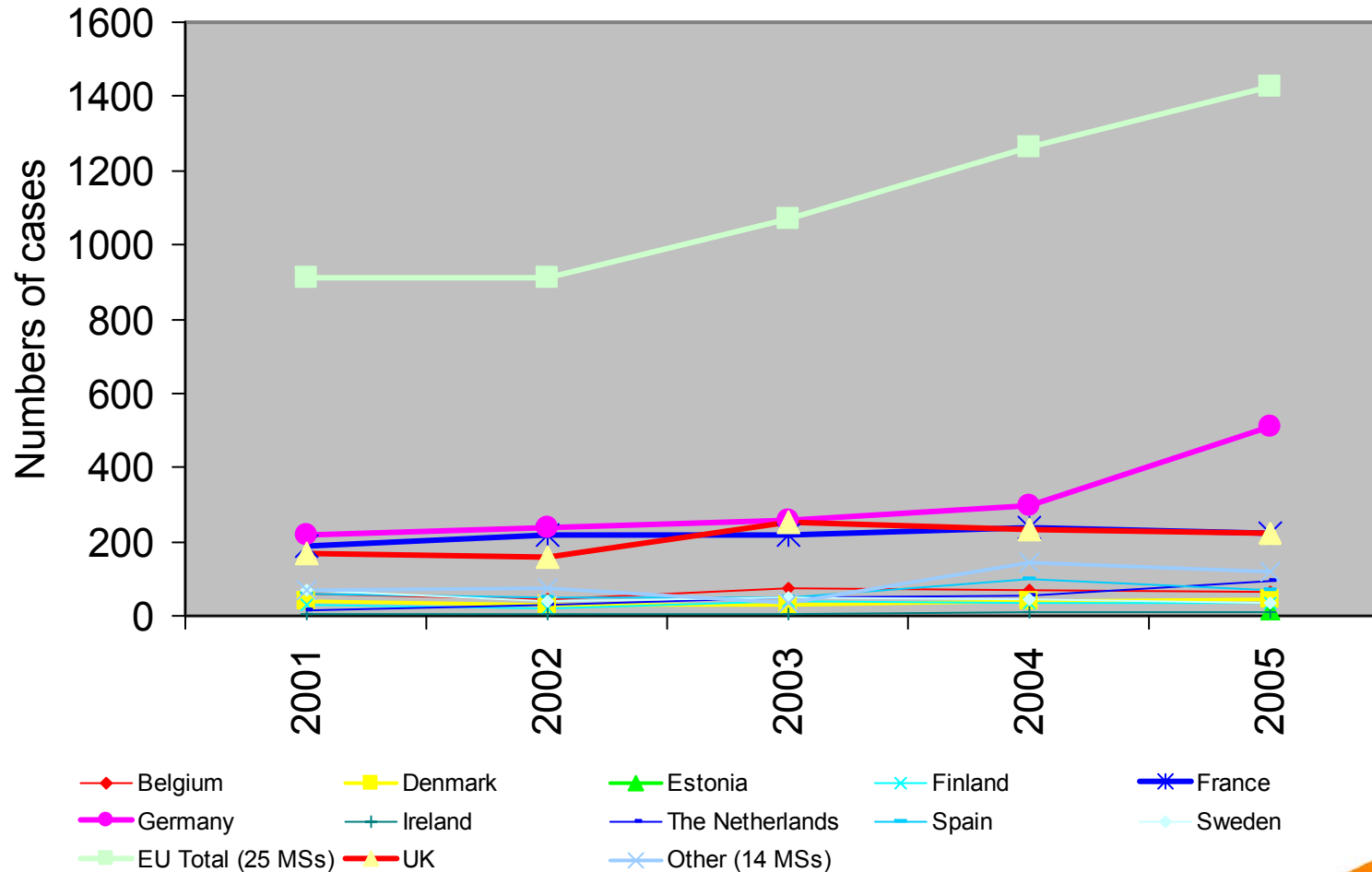
Typing or regional distributions do not suggest common source clusters

Listeriosis in countries within the UK



χ^2 for trend
3.66; P=0.055

Reported listeriosis cases in EU Member States

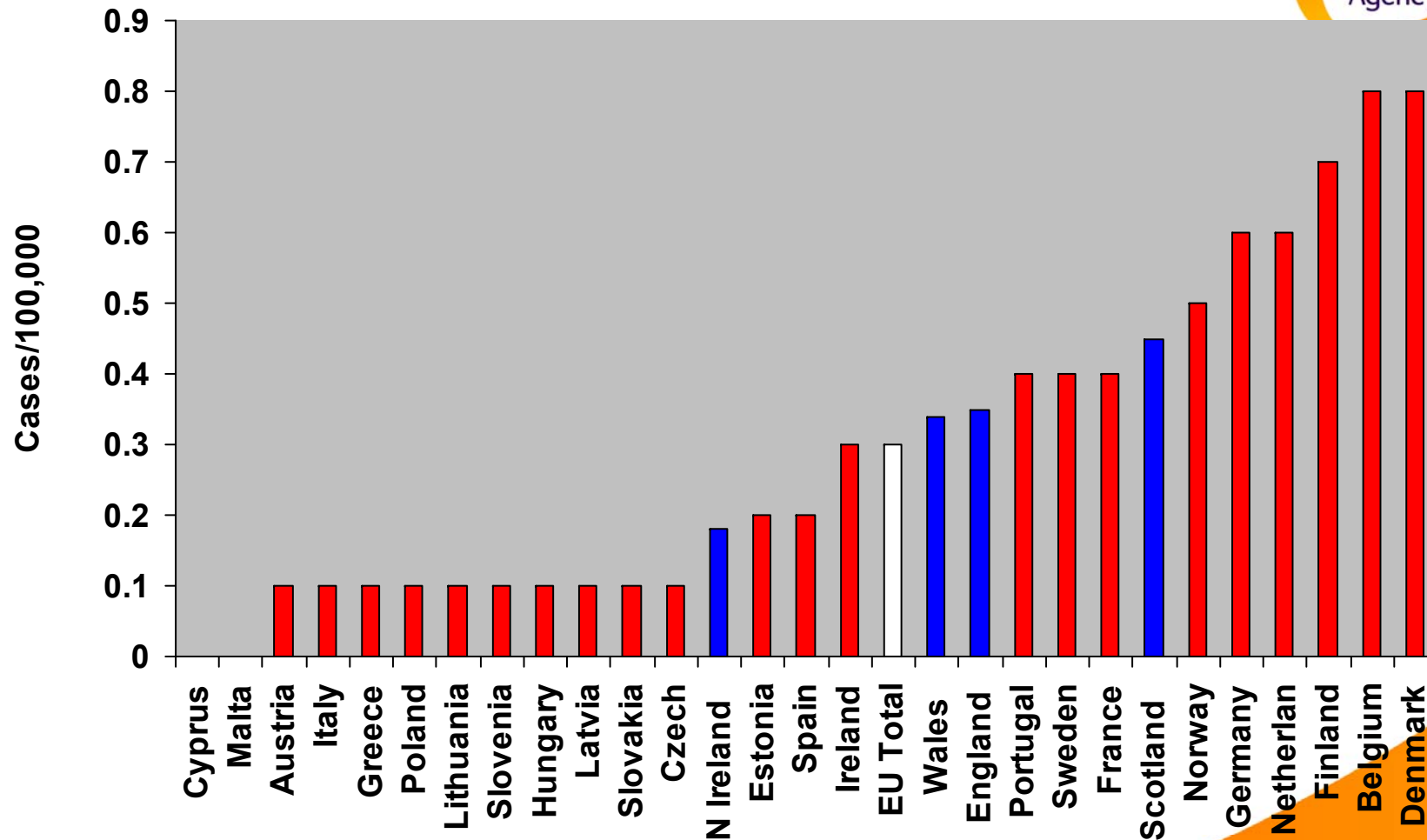


Increase in reports within the EU

67% of all listeriosis in the EU occurs in Germany, France and the UK

Data from: The Community Summary Report on Trends and Sources of Zoonoses, Zoonotic Agents, Antimicrobial Resistance and Foodborne outbreaks in the European Union in 2005, The EFSA Journal 2006;94.

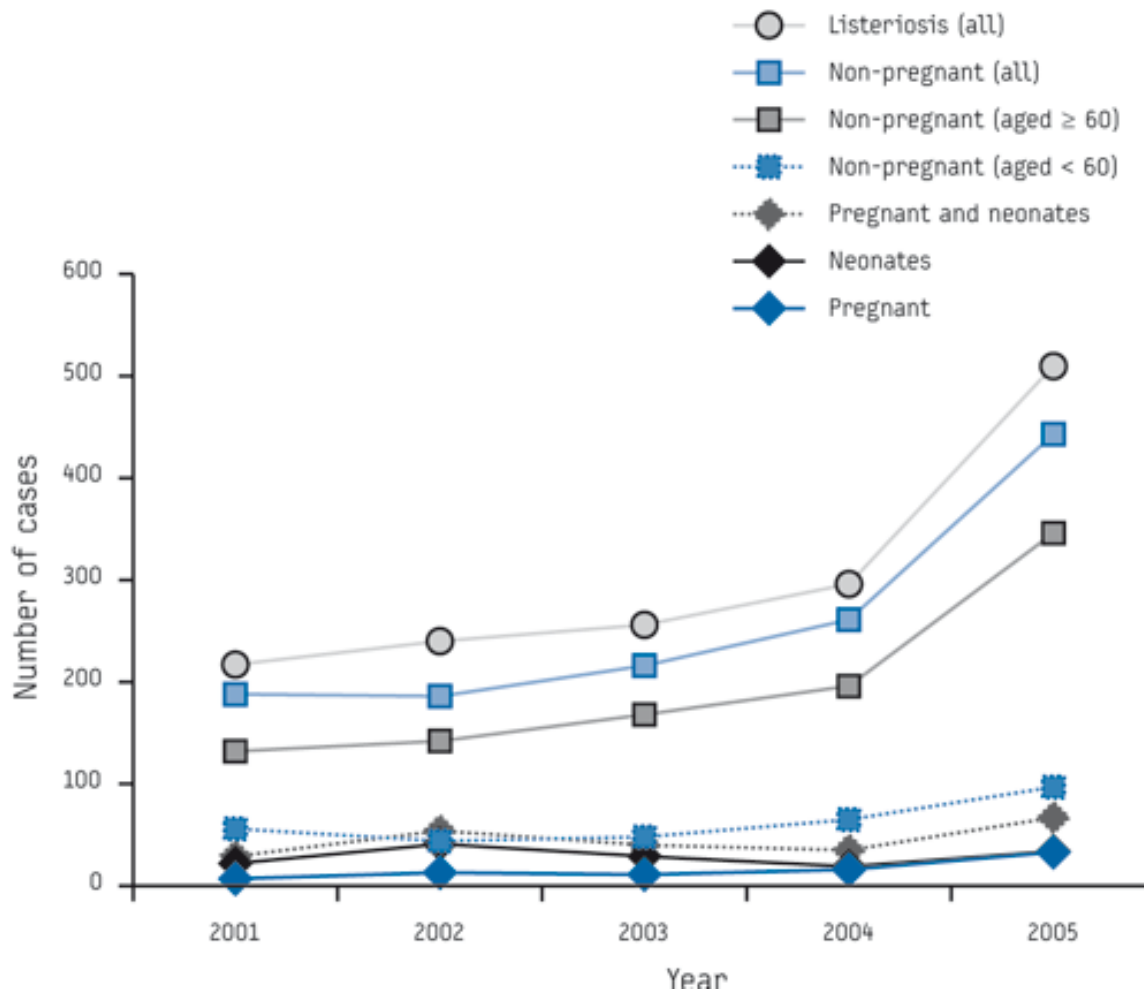
Human listeriosis in Europe (2005)



Data from: The Community Summary Report on Trends and Sources of Zoonoses, Zoonotic Agents, Antimicrobial Resistance and Foodborne outbreaks in the European Union in 2005, The EFSA Journal 2006;94.

EFIG data for UK countries

Listeriosis in Germany



Listeriosis became a notifiable disease in 2001

Increase mainly in the ≥60 years old

Increase not explained by change in surveillance or raised diagnostic awareness

Koch and Stark. Significant increase of listeriosis in Germany – epidemiological patterns 2001-2005. Eurosurveillance 2006;11:85-8.



HPA (and others) activities



Investigation of individual cases



***L.monocytogenes* isolates collected from ~80% of cases**

All isolates subtyped by a range of discriminatory tests

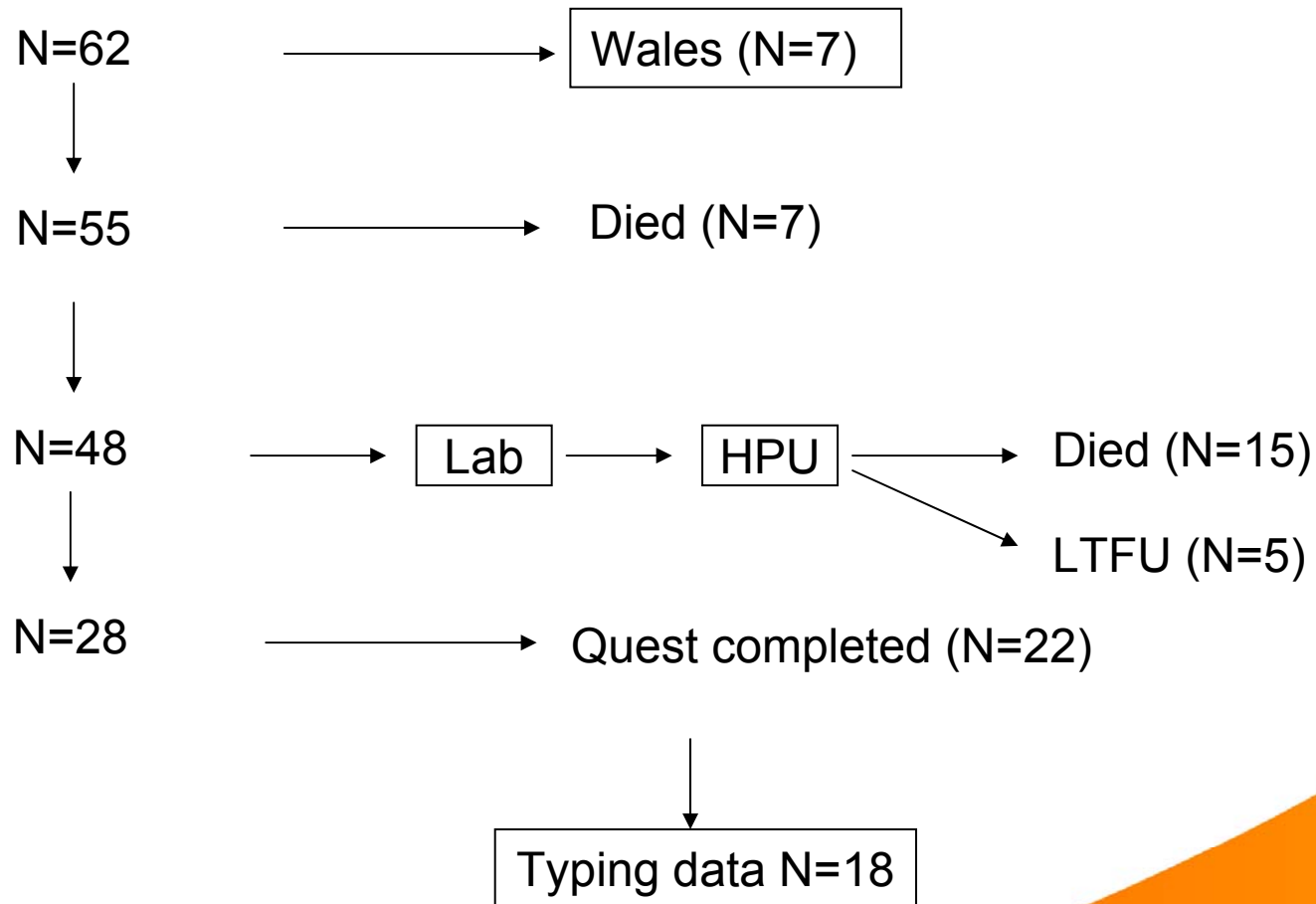
Isolates from food collected and subtyped

Local microbiologist contacted for all cases reported in England and Wales clinical questionnaire (~70% return)

HPU contacted for all living cases administration of a clinical and food preference questionnaire for England

Data bases for all results in England and Wales

2007, ability to follow up patients for completion of the food preference questionnaire



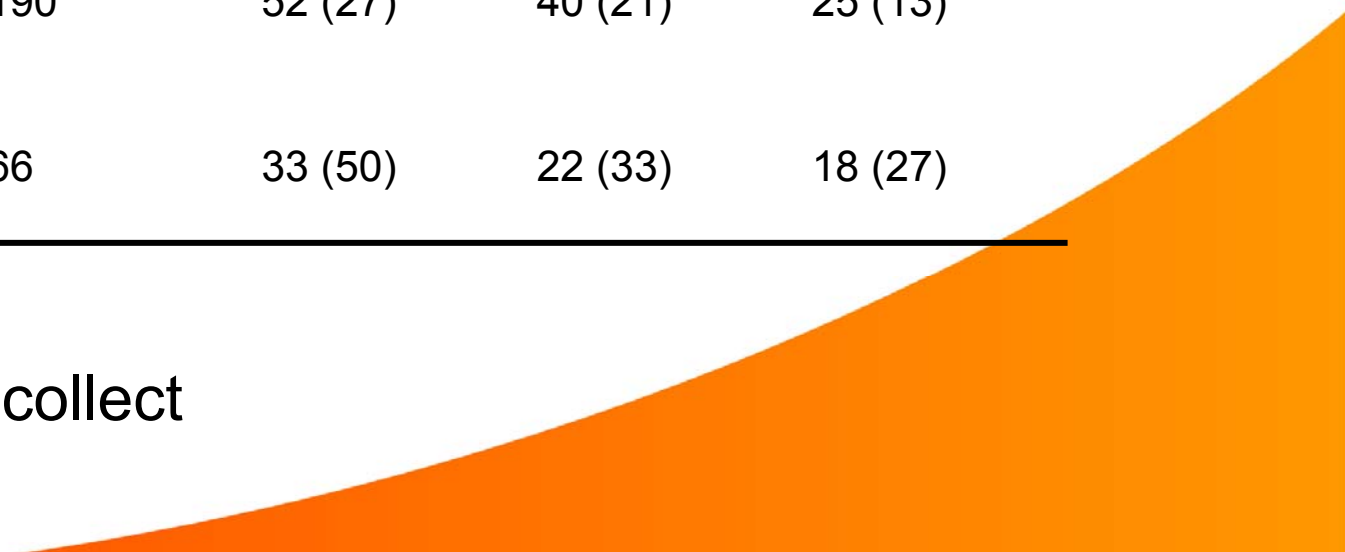
Data available for 26% of all cases

Trawling questionnaires received per year

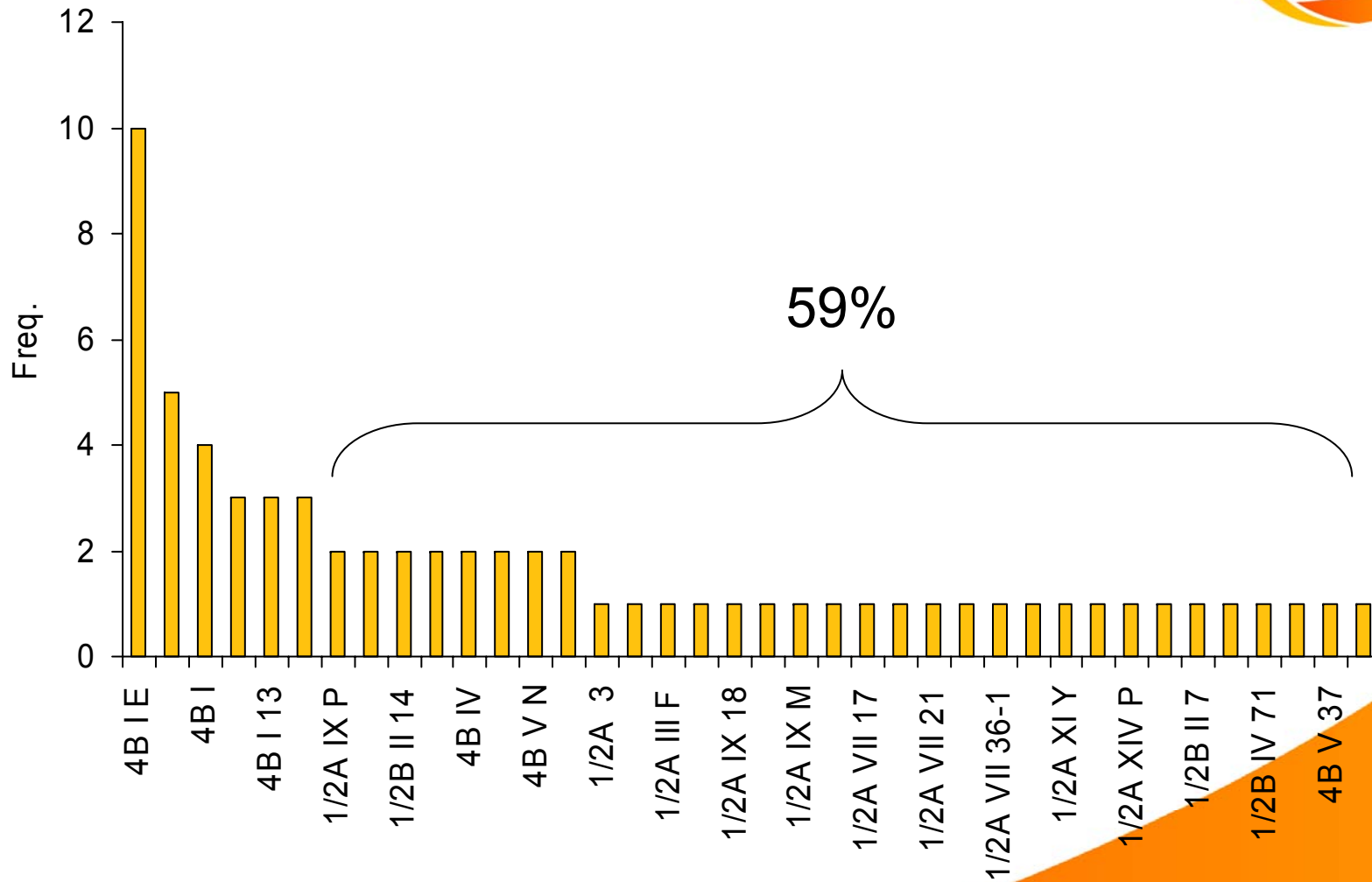


Year	Cases	Rec'd	Alive	Typing
2005	189	34 (18)	28 (15)	27 (14)
2006	190	52 (27)	40 (21)	25 (13)
2007	66	33 (50)	22 (33)	18 (27)

Data difficult to collect



Subtypes of *L.monocytogenes* from patients where food preference questionnaire was completed



Majority of cases not related to 'clusters' of 3 or more

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

Regional reporting of listeriosis cases



Region	Numbers of cases reported			
	2003	2004	2005	2006
E Mids	9	19	13	14
East	16	13	21	17
London	39	14	29	39
N East	22	15	8	9
N West	26	21	44	28
S East	27	17	22	24
S West	24	36	11	12
W Mids	20	29	17	15
Wales	12	39	10	8
York & Hum	51	15	14	20

Regional rates of listeriosis cases



Region	Cases per million			
	2003	2004	2005	2006
E Mids	2.1	4.4	3.0	3.2
East	2.9	2.7	3.8	3.1
London	4.0	4.8	3.9	5.2
N East	8.6	6.0	3.1	3.5
N West	3.8	3.4	6.4	4.1
S East	3.3	3.6	2.7	2.9
S West	4.8	2.0	2.7	2.4
W Mids	3.7	3.7	2.2	2.8
Wales	4.1	5.8	3.2	2.7
York & Hum	10.1	5.8	2.7	4.0

populations, 2.1 to 8.1 million per region

Yorkshire and Humberside and the North East: 2003-4



**17 cases in 2003 due to a single *L.monocytogenes* type
association with butter**

18 cases due to a second *L.monocytogenes* type

No foods identified with cases

Significant increase in sporadic cases

>9 other *L.monocytogenes* types

Yorkshire and Humberside and the North East, 2003-4



Region	Cases per million			
	2003	2004	2005	2006
N East	8.6	6.0	3.1	3.5
York & Hum	10.1	5.8	2.7	4.0

Interventions/actions:

Local and national investigations

Withdrawal of butter

Improvement in butter factory hygiene

North West England



2005, isolates from 40 of 43 cases in the North West typed

- 25 different types
- Single case possibly linked to sliced meat consumption
 - Complex distribution of sliced meats from related manufacturers/suppliers
 - >120 isolates from single manufacturing environment and food
 - contaminated due to multiple types
- 18 patients (4 types) indistinguishable from food isolates



North West England



Region	Cases per million			
	2003	2004	2005	2006
N West	3.8	3.4	6.4	4.1

Interventions/actions:

Local and national investigations

Improvement in sliced meat factory hygiene
and supply chain



London 2006



39 cases (average 28 cases 2000-2005)

22 types

One case, possible association with sliced meat

67 *L.monocytogenes* from sliced meat factory sites and food

4 different types

Persistence in slicing machinery



London, 2006



Region	Cases per million			
	2003	2004	2005	2006
London	4.0	4.8	3.9	5.2

Interventions/actions:

Local and national investigations

Improvement in sliced meat factory hygiene

Three examples of the co-incidental occurrence of increases of 'sporadic' cases with clusters or single foodborne cases

Understanding of these local increases will provide information on the overall upsurge

London 2007



Sandwich manufacturer in SE England

2005: *L.monocytogenes* contamination problem from sandwiches and factory sites

March 2007: heavy contamination ($>10^2/g$) detected

Company supplies 10,000 sandwiches/day to the SE of England: hospitals receive 40% of products

Product withdrawn

Two strains of *L.monocytogenes* present in factory including a drain

1 case detected in London with indistinguishable strain, credible history of sandwich consumption

April, contamination at factory not detected on 4 consecutive days, production resumed

Isolates from cases indistinguishable from 'factory type' significantly associated with South Thames '05-'07

Sandwiches in the NHS



The current (contracted) annual value of sandwich sales into the NHS is £13m approx

16 million sandwiches at an average price of £0.80

This does not account for the sandwiches that are bought from non-contracted suppliers or made in house.

Data from NHS Supply Chain



Actions, additional communication



Local, National and International meetings

Internal HPA updates/briefing notes

Anon. Changing epidemiology of listeriosis in England & Wales. *Commun Dis Rep* 2005; 38;
<http://www.hpa.org.uk/cdr/archives/2005/cdr3805.pdf>

Gillespie I, et al. Changing pattern of human listeriosis in England and Wales, 2001-2005. *Emerg Infect Dis* 2006;12:1361-6.

Listeria contamination of sandwiches – an update. *Health Protection Report* 2007;1 (13)

Listeria contamination of sandwiches. *Health Protection Report* 2007; 1(12)

Actions, additional communication, Food surveillance



LACORS/HPA Co-ordinated Food Liaison Group Studies

Sandwiches from hospitals and residential/care homes
(consultation June 2007)

Shopping basket survey focussed on over 60s
(sampling completed May 2007)

Peer reviewed articles (2000-7) on contamination of:

- Retail Pre-Packaged Mixed Vegetable Salads
- Vacuum-packed and modified-atmosphere-packed cooked meats (end of shelf life)
- Butter
- Pre-cut fruit, sprouted seeds, and unpasteurised fruit and vegetable juices
- Ready-to-eat cold sliced meats and pate
- Ready-to-eat salad vegetables:
- Organic vegetables

LACORS/HPA surveys



Food types	Total	L.mono	$\geq 10^2$
Butter	3229	13	0
Sandwiches from hospitals and residential/care homes	3249	88	0
Vacuum-packed and modified-atmosphere-packed cooked meats at end of shelf life	2,981	190	27

Common risk factors for contamination:

**stored or displayed at 8°C or more or not monitored
when a hazard analysis system was not in place**

Lewis et al., J Food Protect 2006;69:1518-26
Sagoo et al., J Food Protect 2007;70:943-51.
HPA/LACORS 2007

Listeriosis in the USA



Listeriosis in USA, 2,518 cases (2000-2004)

71% of cases aged >44, 40% aged ≥70.

Ewald et al., ISOPOL XVI abstract 0-01

Case control study (2000-2003)

249 cases

5% associated with outbreaks

sporadic cases risks were identified with:

eating melon at a commercial establishment

eating hummus at a commercial establishment

Varma et al., Clin Infect Dis 2007;44:521-8.

Listeriosis in the USA



Comment to the case control study

“Because the high risk population.... is going to increase....priority must be given to the reduction of contamination level and inhibition of growth of *L.monocytogenes* in high risk foods.

Another priority is to not only advise individuals at high risk for illness to avoid high-risk foods but also to inform them how to reduce the risks by thorough cooking, avoidance of cross contamination, and short term refrigerated storage of cooked perishable foods.”

Goulet. Clin Infect Dis 2007;44:529-30.

Members invited to provide views on:



Methods for control of listeriosis:

Surveillance and epidemiology

- better understanding of 'sporadic' infection
- risk factors and behaviours which lead to infection
- co-ordinated approach to the UK

Elimination and/or reduction of *L.monocytogenes* in the food chain

- action when contamination occurs in food or the factory environment

Food regulation

- foods to vulnerable groups

Dietary Advice

- targeted to most common vulnerable groups and assessed for effectiveness



Acknowledgements



Health Protection Scotland

CDSC Northern Ireland

HPA Colleagues

especially to

Iain Gillespie, Kathie Grant, Christine Little

