



UNIVERSITY OF
LIVERPOOL



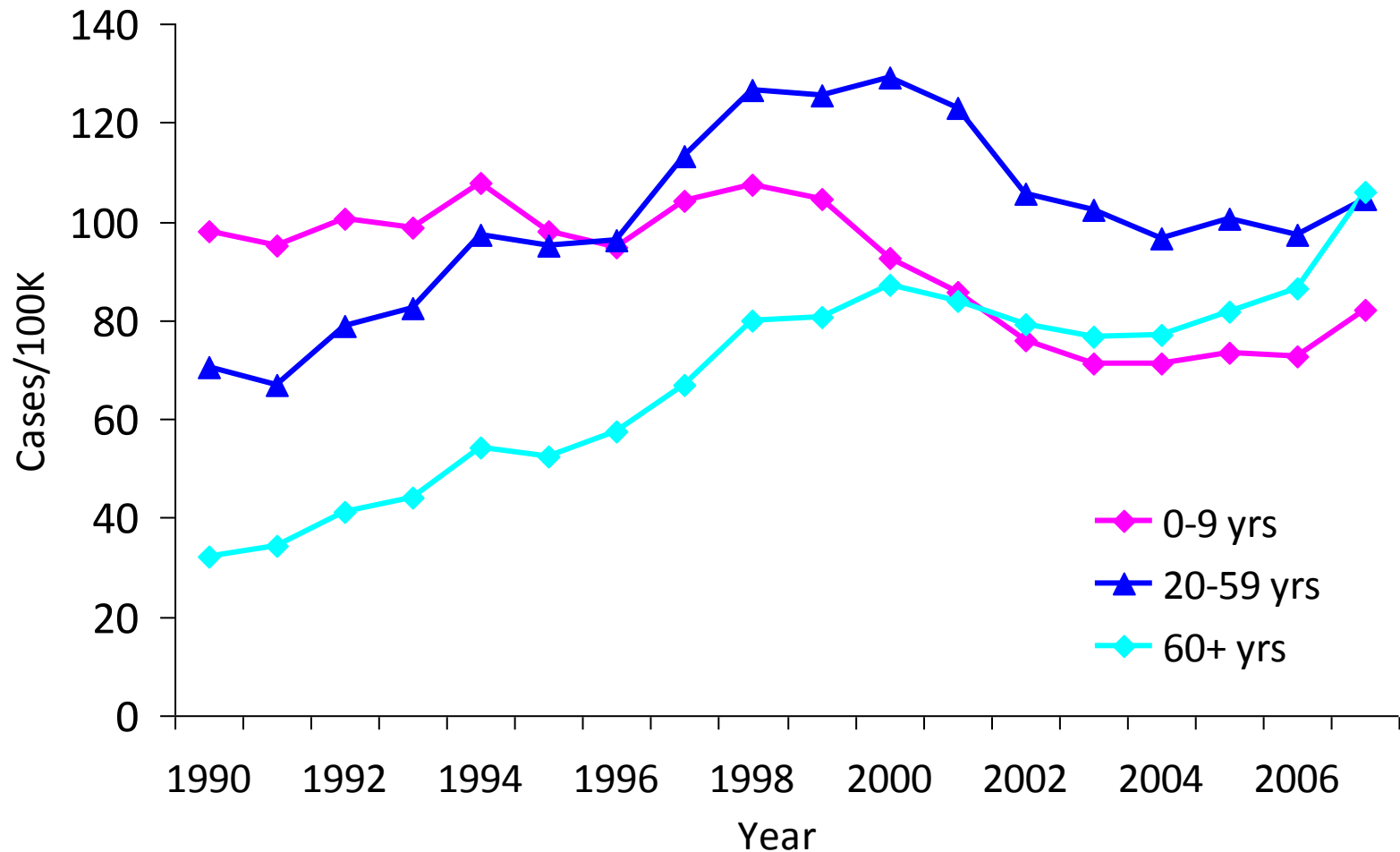
Gastrointestinal Zoonoses in the UK: the changing demography of foodborne disease

Sarah J O' Brien

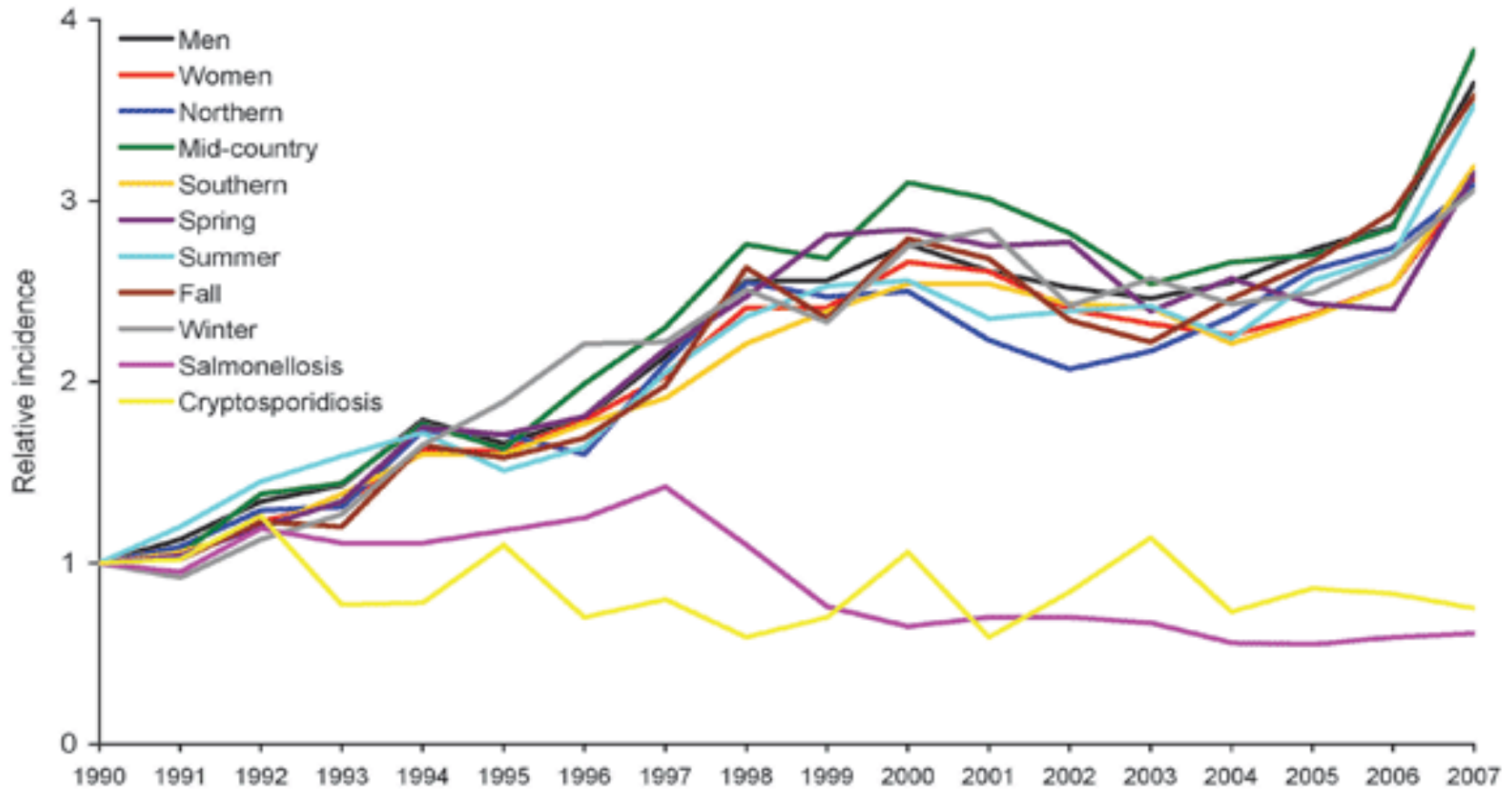
Institute of Infection and Global Health
and

National Centre for Zoonosis Research

Campylobacter incidence by age group, E&W, 1990-2007



Campylobacteriosis, Salmonellosis and Cryptosporidiosis in > 60s



Changes in age profile of campylobacteriosis, E&W

- Independent of
 - Gender
 - Season
 - Geography
 - Not observed for other common GI pathogens
 - Less likely to be a surveillance artefact
- a sub-set analysis of a recent national case-control study of *Campylobacter* infection in England

National case-control study

	>= 60 years	%	<60 years	%	Total
Cases	518	32.5	1074	67.5	1592
Controls	1184	29.7	2799	70.3	3983
Total	1702	30.5	3873	69.5	5575

Mean age = 70.2 years (median = 68.9 years)

Risk factors – final model

Exposure domain	Variable	Category	OR	p	95% CI	
					Lower	Upper
HEALTH DETAILS	Diarrhoeal illness in previous 12 months	Yes	2.53	0.001	1.45	4.48
	Proton pump inhibitor use in previous 28 days		3.02	0.000	2.07	4.40
FOOD	Salads eaten per week	<i>None</i>				
		Once	0.71	0.179	0.42	1.17
		Twice	0.57	0.028	0.35	0.94
		3 times	0.48	0.010	0.27	0.84
		4 times	0.61	0.143	0.32	1.18
		5+ times	0.43	0.003	0.25	0.75
		Pulses eaten per week	<i>None</i>			
	Once	0.62	0.016	0.42	0.91	
	Twice	0.49	0.001	0.32	0.74	
	3 times	0.68	0.119	0.42	1.10	
	4 times	0.45	0.018	0.23	0.87	
	5+ times	0.49	0.040	0.25	0.97	

Risk factors – food safety practices

Exposure	OR [95% CI]	P value
<i>Food safety practices:</i>		
Chopping board used in the home to hold/cut/process raw chicken	1.4 [1.1-1.9]	0.02
Knife or other utensil used in the home for cutting raw chicken	1.6 [1.2-2.3]	<0.001
After handling raw chicken:		
- wash their hands with soap and water	1	
- rinse their hands with water	1.0 [0.7-1.4]	0.96
- wipe their hands with a cloth/apron	1.7 [0.9-3.2]	0.11
- continue cooking as normal	3.3 [1.5-7.0]	<0.001

Risk factors – food safety practices

Exposure	OR [95% CI]	P value
----------	-------------	---------

Food safety practices:

After using a cutting board for raw chicken:

- use a separate chopping board	1	
- wash the chopping board with detergent	1.7 [1.1-2.6]	0.01
- rinse the chopping board with water	2.4 [1.3-4.4]	<0.001
- wipe the chopping board with a cloth	2.9 [1.5-5.6]	<0.001
- continue using the chopping board	2.8 [0.7-11.4]	0.15

After using a knife for cutting raw chicken:

- use a separate knife	1	
- wash the knife with detergent	1.4 [0.9-2.0]	0.13
- rinse the knife with water	2.1 [1.2-3.7]	0.01
- wash the knife with detergent	1.7 [0.8-3.7]	0.19
- continue using the knife as normal	3.6 [1.0-13.1]	0.05

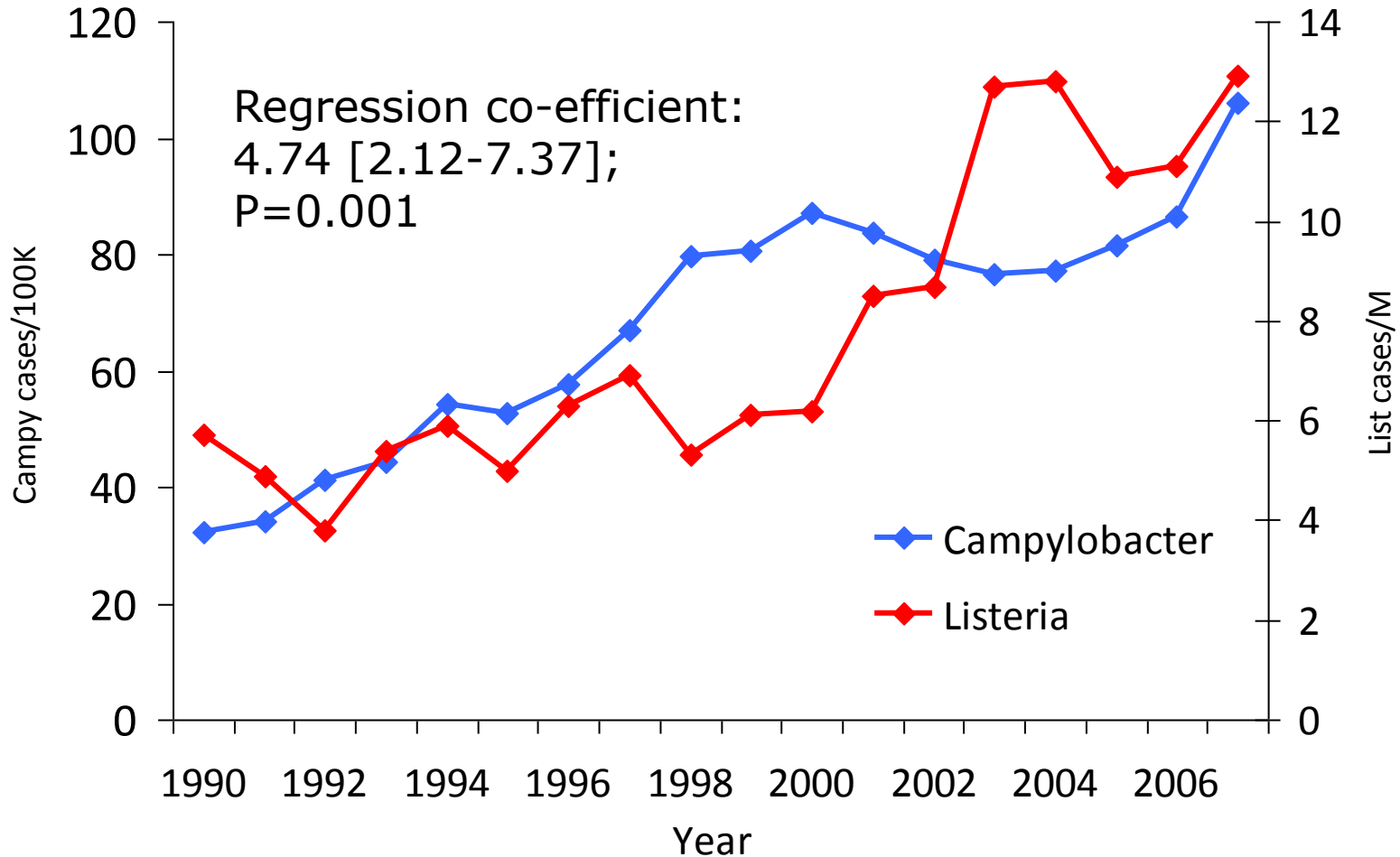
Caveats

- Subset analysis
 - Hypothesis – generating!
 - Insufficient statistical power for hypothesis testing
 - Minimum detectable OR for chicken consumption = 1.39
 - » Power in original study = 87%
 - » Power in subset analysis = 26%

Conclusions

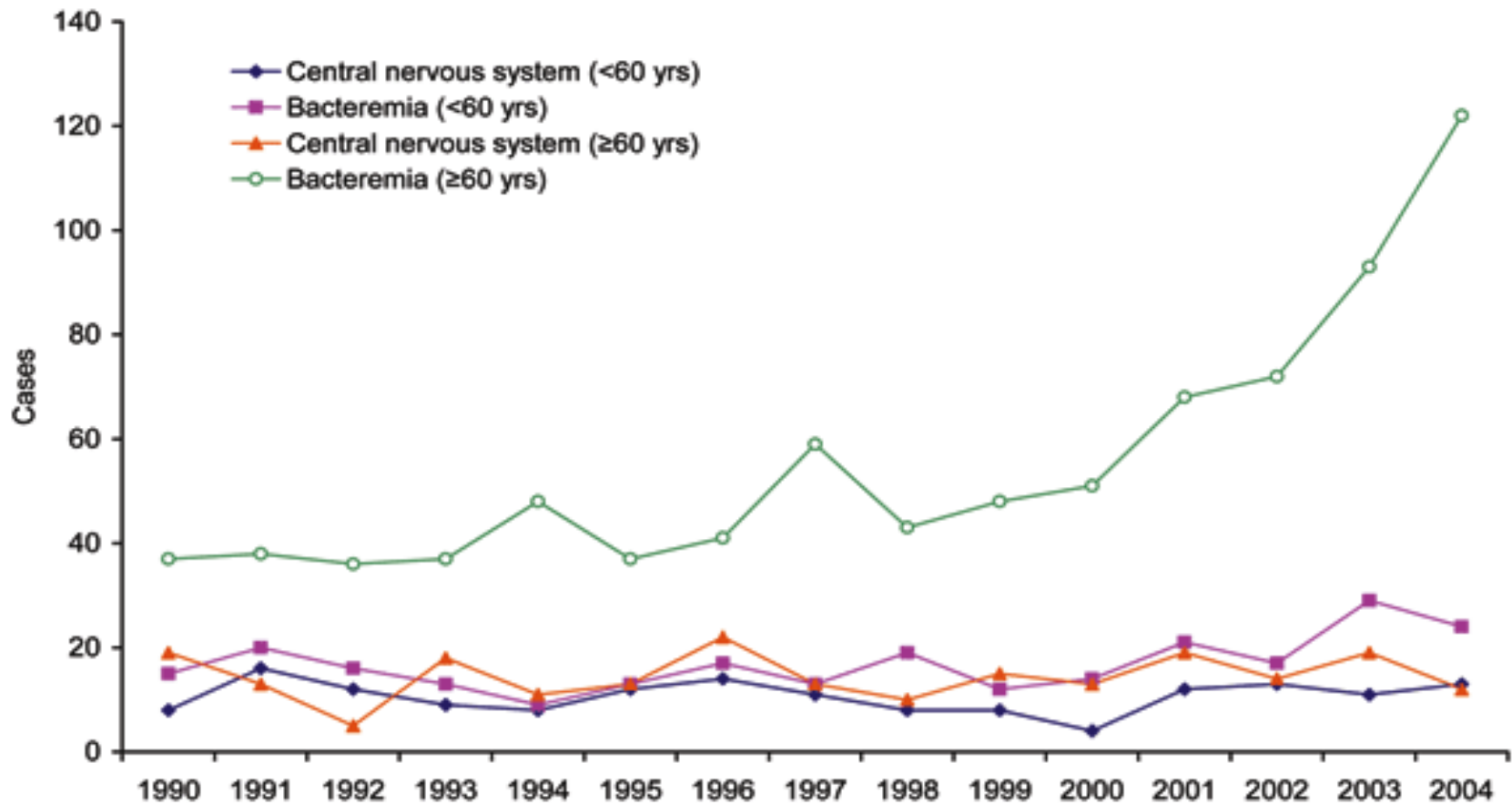
- Risk of campylobacteriosis for older residents of England related to:-
 - general wellbeing
 - food safety practices within the home
- Both amenable to intervention

Listeriosis in >60 year olds, E&W



Source: Health Protection Agency

Changing clinical presentation



Hypothesis 1

- The rise in cases of listeriosis in compromised people over 60 years of age is an artefact associated with improved case recognition
- BUT no recent changes in
 - Case definition
 - Methods of detection
 - Surveillance methods
 - Bacteraemia rates for other GI pathogens

Hypothesis 2

- The population predominantly affected by the recent increase has become more susceptible to infection with *L. monocytogenes*

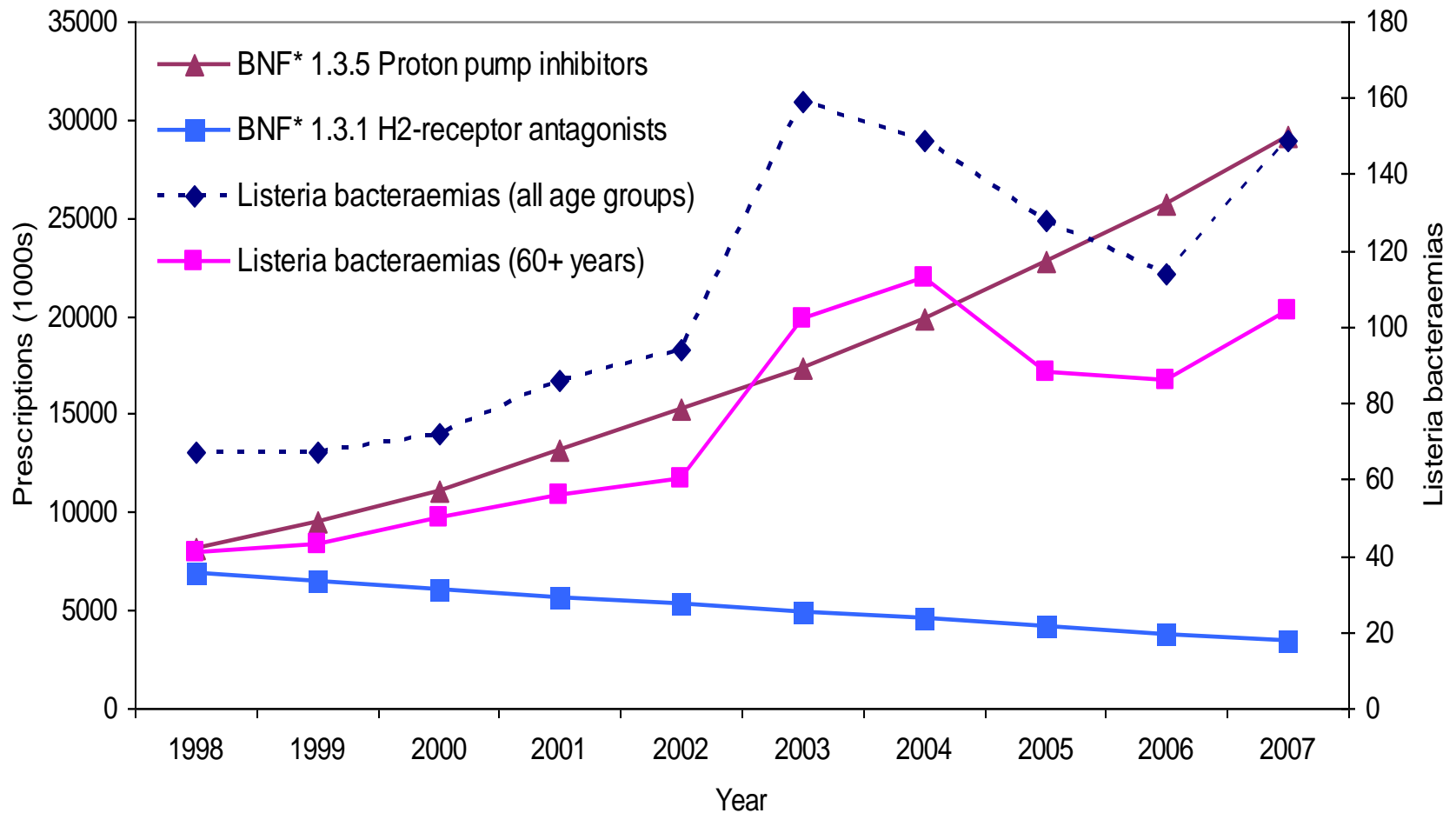
Selected co-morbidities in the > 60s

ICD 10 Chapter Heading	Sub-group	Relative Risk [95% CI]
Infectious and parasitic diseases (A00-B99)		2.5 [1.1-5.9]
Neoplasms (C00-D48)		2.9 [2.3-3.6]
	Breast (C50)	2.6 [1.4-5.2]
	Thyroid and other endocrine glands etc. (C73-C80, C97)	3.2 [1.6-6.4]
	Lymphoid, haematopoietic & related tissues (C81-C96)	2.8 [2.0-3.9]
Endocrine, nutritional and metabolic diseases (E00-E90)		6.3 [3.5-11.2]
	Diabetes Mellitus (E10-E14)	4.9 [2.7-8.8]
Mental and behavioural disorders (F00-F99)		1.7 [1.0-2.8]
	Due to psychoactive substances	4.7 [2.7-8.1]

Bacteraemia cases versus CNS cases - final model

Underlying condition	Red. Acid secretion	Odds Ratio (95% CI)
None	-	1
Non-malig underlying condition	No	1.6 (0.9-2.8)
	Yes	2.9 (1.5-5.9)
Known non-digestive malig	No	3.2 (1.5-6.7)
	Yes	2.6 (1.1-6.0)
Malig of the digestive organs	All	17.5 (4.0-76.7)

Listeria monocytogenes bacteraemias and acid-suppressing medication in England



* BNF = British National Formulary

Gillespie et al. *J. Clin Micro.* 2009

Hypothesis 3

- The pathogen *L. monocytogenes* has become more virulent and “new” strains are better able to cause bacteraemia
- No evidence to support this
 - In vitro
 - In vivo

Hypothesis 4

Levels of exposure have increased

Comparison with Market Research Panel Members

- Cases > 60 years more likely than their Panel Member counterparts to eat
 - Cooked meats (beef/ham/pork)
 - Cooked fish (especially smoked salmon)
 - Shellfish (prawns)
 - Dairy products (milk & certain cheeses)
 - Mixed salads

Levels of *Listeria* in RTE Foods

- May 2006 to April 2007
 - 6,984 samples
- Prevalence of *L. monocytogenes*
 - Sandwiches = 7% (0.4% > 100CFU/g)
 - Sliced meats
 - 3.7% within shelf life (0.7% > 100 CFU/g)
 - 4.2% end of shelf life (1.0% > 100 CFU/g)

Conclusions

- Increase in listeriosis most likely a combination of
 - Increased host susceptibility
 - Increased exposure to *L. Monocytogenes*

National Food Safety Week, 2009



FOOD STANDARDS AGENCY

If you're over 60 these could save your life in the kitchen

KILLER FACT:
Listeria food poisoning can kill.
Avoid the risk of life-threatening listeria – take a good look at the label and don't use food that's past its 'use by' date.
Call 0845 606 0667 for a free leaflet.

GERM WATCH

A closer look at the label could save your life eatwell.gov.uk



FOOD STANDARDS AGENCY

If you're over 60, a closer look in the kitchen could save your life

Look closely at your food labels to avoid life-threatening listeria

Listeriosis: Association with neighbourhood deprivation

- Listeriosis incidence highest in the most deprived areas
- Cases more likely to purchase from convenience stores and small businesses

Acknowledgements

Craig Higgins, Laura Rodrigues, Clarence Tam, Brendan Wren,
London School of Hygiene and Tropical Medicine

Keith Neal, University of Nottingham

Bob Adak, Eric Bolton, Jenny Frost, Iain Gillespie, Piers Mook, Bob
Owen, Judith Richardson, Health Protection Agency

Members of the ACMSF Ad Hoc Group on Vulnerable Groups

Hannah Jackson, University of Manchester



FOOD
STANDARDS
AGENCY

