ACM/935

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

DISCUSSION PAPER

CHANGING AGE STRUCTURE OF HUMAN CAMPYLOBACTERIOSIS IN ENGLAND AND WALES

At the March 2008 meeting of the Epidemiology of Foodborne Infection Group (EFIG), the Health Protection Agency (HPA) briefed the Group on the changing age structure of human campylobacteriosis in England and Wales. EFIG considered the issues raised and referred them to the ACMSF for further consideration.

Attached is the HPA's paper on the changing age structure of human campylobacteriosis in England and Wales.

Members are invited to comment on the issues raised in this paper.

Secretariat
March 2009

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

Changing age structure of human campylobacteriosis in England and Wales

Iain A Gillespie[1], Sarah J O'Brien[2] and Eric J Bolton[3]

[1]Health Protection Agency Centre for Infections; [2]University of Manchester; [3]Regional Health Protection Agency Laboratory Manchester.

Issue

1. To brief the Committee on changes in the age-specific rates of human *Campylobacter* infection in England.

Background

2. *Campylobacter* is the most commonly reported bacterial cause of gastrointestinal infection in the United Kingdom (UK). A provisional total of 55,484 laboratory-confirmed cases were reported in the UK in 2008, and this figure underestimates community disease by a factor of about eight. Whilst self-limiting and rarely fatal, *Campylobacter* infection is unpleasant and approximately 10% of cases require hospital treatment for their infection. Sequelae which can follow infection, such as Inflammatory Bowel Disease, Reactive Arthritis and Guillain-Barré Syndrome, contribute further to disease burden.

3. Following a greater appreciation of the role of campylobacters in gastrointestinal disease in the late 1970s, disease incidence increased rapidly throughout the 1980s (from 8,956 cases in 1980 to 33,234 cases 1989; 271% increase (figure 1)). This increase was largely artefactual, reflecting increased scientific interest in, and testing for, campylobacters, and improvements in isolation media and methods. A further increase (from 34,478 cases in 1990 to 56,465 cases in 1999; 64% increase) throughout the 1990s however, could not be explained fully by further methodological improvements or increased surveillance activity in that decade. Similarly, the reasons for a rapid decline in incidence from 2000 to 2004 (from 58,236 to 44,544 cases; 24% decrease) and a subsequent increase from 2005 to 2007 (from 46,724 to 51,975 cases; 11% increase) were unknown.

The Study

4. To investigate these changes in incidence in more detail, data on cases of *Campylobacter* infection reported in England and Wales between 1990 and 2007 were compared with denominator data for England and Wales for the same time period. Data on non-typhoidal salmonellas and cryptosporidiosis cases were extracted and examined for comparative purposes. Age-specific incidence rates were calculated for all three disease groups for different time periods, with geographical and gender differences investigated for campylobacteriosis only. Relative risks (RR) with 95% Confidence Intervals (in squared parentheses) were calculated where appropriate.

Findings

5. The age-specific incidence of *Campylobacter* infection in England and Wales for the period 1990 to 2007 is shown in figure 2. Between 1990 and 1999 incidence increased in all age groups, but the increase was proportionate to increasing age: 0-9 years RR 1.07 [1.03-1.10]; 10-19 years RR 1.47 [1.41-1.55]; 20-59 years RR 1.78 [1.75-1.81]; ≥60 years RR 2.51 [2.41-2.61]. Hence the incidence in people aged ≥60 years relative to younger age groups increased from 0.45 [0.44-0.47] to 0.72 [0.70-0.73].

6. Between 2000 and 2004 incidence decreased in all age groups, but the decrease in people aged ≥60 years (RR 0.88 [0.86-0.91]) was slower compared to younger people (RR 0.75 [0.74-0.76]), hence the relative incidence in people aged ≥60 years relative to younger age groups increased further from 0.78 [0.77-0.80] to 0.91 [0.89-0.94].

7. Although based on a shorter time series, the incidence in 0-9 year olds (RR 1.12 [1.08-1.17]), 20-59 year olds (RR 1.04 [1.03-1.06]) and ≥60 year olds (RR 1.33 [1.29-1.36]) increased from 2005 to 2007, with the incidence in people aged ≥60 years relative to younger age groups increasing further (0.93 [0.91-0.95] to 1.17 [1.15-1.19]).

8. In simplest terms, the incidence of campylobacteriosis in people aged ≥60 years has increased more than threefold over the period 1990 to 2007 (RR 3.38 [3.25-3.51]). This pattern, which can be observed in both genders, in each season and in all geographical areas, was not observed for non-typhoidal salmonellosis or cryptosporidiosis (table 1).

Conclusion

9. We report a dramatic change in the underlying age structure of human campylobacteriosis in England and Wales, with the emergence of older people as the group at greatest risk on infection. The absence of a similar change in the age distribution of laboratory-reported salmonellosis or cryptosporidiosis from the same population suggests that this is unlikely to be a surveillance artefact.

10. As life expectancy increases in the United Kingdom, the number of people living with chronic conditions is likely to increase, suggesting that the incidence of campylobacteriosis in older people will increase further in future. There is therefore a need to identify risk factors for *Campylobacter* infection specific to older UK residents.

ACMSF Action

11. The Committee is asked to consider and comment on the issues raised in this paper.

Figure 1. The annual incidence of human *Campylobacter* infection. All isolations. England & Wales, 1977-2007 (HPA, unpublished data).

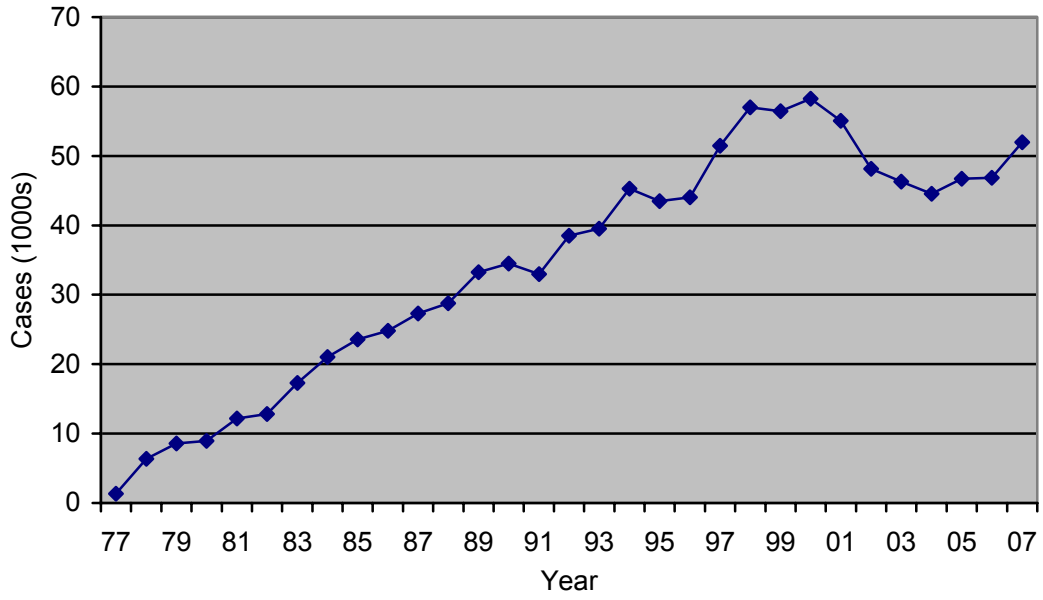

Figure 2. The incidence by age group of laboratory-reported campylobacteriosis. England and Wales, 1990-2007.

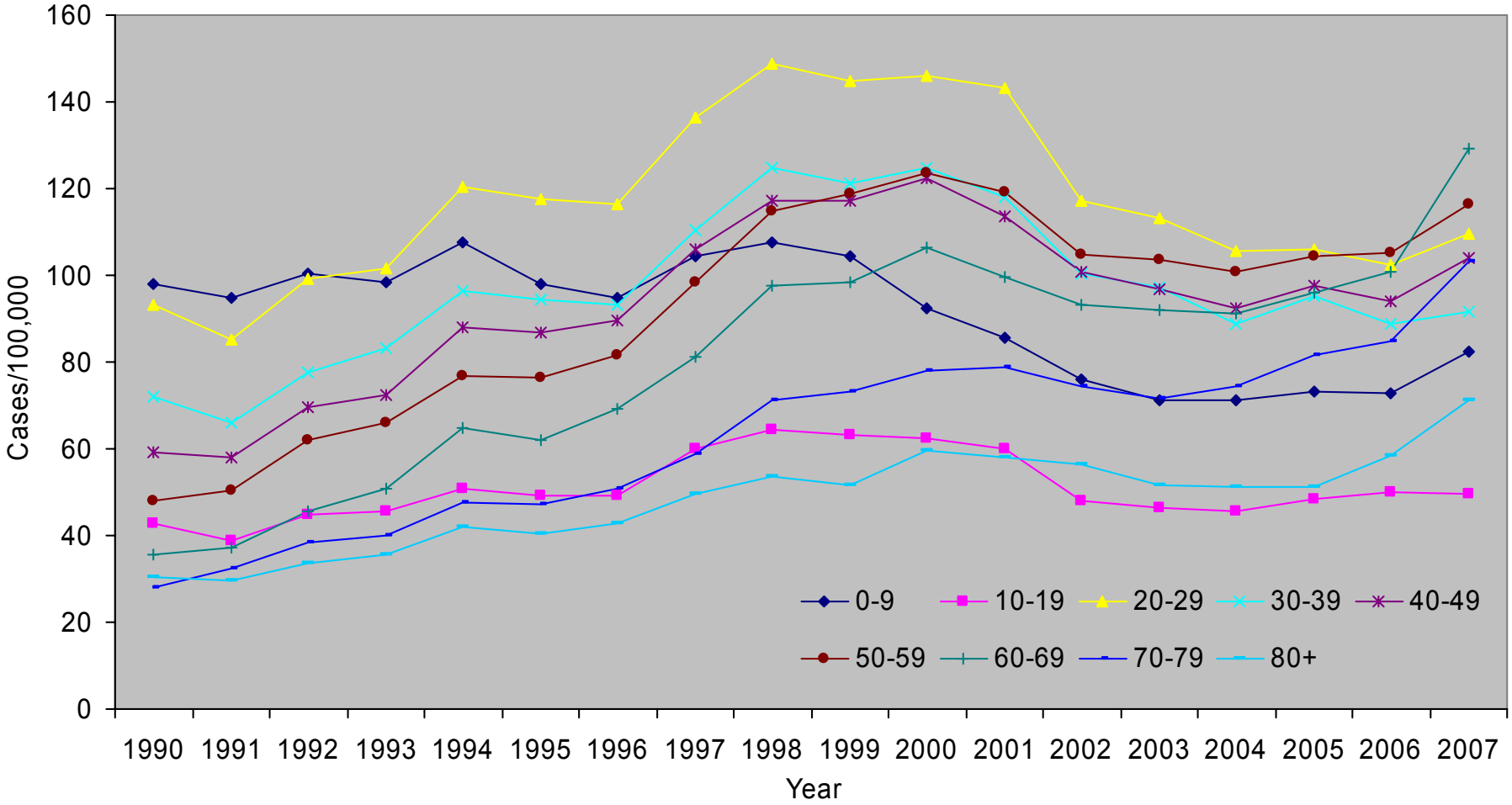

Table 1. Relative incidence in each year compared to 1990. Patients aged ≥60 years infected with selected gastrointestinal pathogens. England and Wales, 1991 to 2007.

Year	Incidence relative to 1990 incidence [95% Confidence Interval]										
	Campylobacter spp.									Sal†	Crypto‡
	Gender		Area*			Season					
	Male	Female	'Top'	'Middle'	'Bottom'	Spring	Summer	Autumn	Winter		
1991	1.1 [1.1-1.2]	1.0 [1.0-1.1]	1.1 [1.0-1.2]	1.1 [1.0-1.1]	1.1 [1.0-1.1]	1.0 [0.9-1.1]	1.2 [1.1-1.3]	1.0 [0.9-1.1]	0.9 [0.8-1.0]	0.9 [0.9-1]	1.0 [0.8-1.3]
1992	1.3 [1.3-1.4]	1.2 [1.2-1.3]	1.3 [1.2-1.4]	1.4 [1.3-1.5]	1.2 [1.1-1.3]	1.2 [1.1-1.3]	1.4 [1.3-1.6]	1.2 [1.1-1.3]	1.1 [1.0-1.3]	1.2 [1.1-1.2]	1.3 [1-1.5]
1993	1.4 [1.3-1.5]	1.3 [1.3-1.4]	1.3 [1.2-1.4]	1.4 [1.3-1.6]	1.4 [1.3-1.5]	1.3 [1.2-1.5]	1.6 [1.5-1.7]	1.2 [1.1-1.3]	1.3 [1.1-1.4]	1.1 [1.1-1.2]	0.8 [0.6-1.0]
1994	1.8 [1.7-1.9]	1.6 [1.5-1.7]	1.7 [1.6-1.9]	1.8 [1.6-1.9]	1.6 [1.5-1.7]	1.7 [1.6-1.9]	1.7 [1.6-1.8]	1.6 [1.5-1.8]	1.7 [1.5-1.8]	1.1 [1.1-1.2]	0.8 [0.6-1.0]
1995	1.7 [1.6-1.8]	1.6 [1.5-1.7]	1.7 [1.6-1.9]	1.6 [1.5-1.8]	1.6 [1.5-1.7]	1.7 [1.6-1.9]	1.5 [1.4-1.6]	1.6 [1.5-1.7]	1.9 [1.7-2.1]	1.2 [1.1-1.2]	1.1 [0.9-1.4]
1996	1.8 [1.7-1.9]	1.8 [1.7-1.9]	1.6 [1.5-1.7]	2.0 [1.8-2.1]	1.8 [1.7-1.9]	1.8 [1.7-2.0]	1.6 [1.5-1.8]	1.7 [1.6-1.8]	2.2 [2.0-2.4]	1.3 [1.2-1.3]	0.7 [0.6-0.9]
1997	2.1 [2.0-2.3]	2.0 [1.9-2.1]	2.1 [1.9-2.3]	2.3 [2.1-2.5]	1.9 [1.8-2.0]	2.2 [2-2.4]	2.1 [1.9-2.2]	2.0 [1.8-2.1]	2.2 [2.0-2.4]	1.4 [1.4-1.5]	0.8 [0.6-1]
1998	2.6 [2.4-2.7]	2.4 [2.3-2.5]	2.6 [2.4-2.8]	2.8 [2.6-3.0]	2.2 [2.1-2.4]	2.5 [2.3-2.7]	2.4 [2.2-2.5]	2.6 [2.4-2.8]	2.5 [2.3-2.8]	1.1 [1-1.2]	0.6 [0.5-0.8]
1999	2.6 [2.4-2.7]	2.4 [2.3-2.5]	2.5 [2.3-2.7]	2.7 [2.5-2.9]	2.4 [2.2-2.5]	2.8 [2.6-3.1]	2.5 [2.4-2.7]	2.3 [2.2-2.5]	2.3 [2.1-2.6]	0.8 [0.7-0.8]	0.7 [0.6-0.9]
2000	2.8 [2.6-2.9]	2.7 [2.5-2.8]	2.5 [2.3-2.7]	3.1 [2.9-3.3]	2.5 [2.4-2.7]	2.8 [2.6-3.1]	2.6 [2.4-2.7]	2.8 [2.6-3.0]	2.8 [2.5-3.0]	0.6 [0.6-0.7]	1.1 [0.9-1.3]
2001	2.6 [2.5-2.8]	2.6 [2.5-2.8]	2.2 [2.1-2.4]	3.0 [2.8-3.2]	2.5 [2.4-2.7]	2.8 [2.5-3.0]	2.3 [2.2-2.5]	2.7 [2.5-2.9]	2.8 [2.6-3.1]	0.7 [0.7-0.7]	0.6 [0.5-0.8]
2002	2.5 [2.4-2.7]	2.4 [2.3-2.5]	2.1 [1.9-2.2]	2.8 [2.6-3.0]	2.4 [2.3-2.6]	2.8 [2.6-3.0]	2.4 [2.2-2.6]	2.3 [2.2-2.5]	2.4 [2.2-2.7]	0.7 [0.7-0.7]	0.8 [0.7-1.0]
2003	2.5	2.3	2.2	2.5	2.4	2.4	2.4	2.2	2.6	0.7	1.1

Year	Incidence relative to 1990 incidence [95% Confidence Interval]										
	Campylobacter spp.									Sal†	Crypto‡
	Gender		Area*			Season					
	Male	Female	'Top'	'Middle'	'Bottom'	Spring	Summer	Autumn	Winter		
	[2.3-2.6]	[2.2-2.5]	[2.0-2.3]	[2.4-2.7]	[2.3-2.6]	[2.2-2.6]	[2.3-2.6]	[2.1-2.4]	[2.3-2.8]	[0.6-0.7]	[0.9-1.4]
2004	2.6	2.3	2.4	2.7	2.2	2.6	2.2	2.5	2.4	0.6	0.7
	[2.4-2.7]	[2.1-2.4]	[2.2-2.5]	[2.5-2.8]	[2.1-2.4]	[2.4-2.8]	[2.1-2.4]	[2.3-2.7]	[2.2-2.7]	[0.5-0.6]	[0.6-0.9]
2005	2.7	2.4	2.6	2.7	2.4	2.4	2.6	2.7	2.5	0.6	0.9
	[2.6-2.9]	[2.2-2.5]	[2.4-2.8]	[2.5-2.9]	[2.2-2.5]	[2.2-2.6]	[2.4-2.7]	[2.5-2.9]	[2.3-2.7]	[0.5-0.6]	[0.7-1.1]
2006	2.9	2.5	2.7	2.8	2.5	2.4	2.7	2.9	2.7	0.6	0.8
	[2.7-3.0]	[2.4-2.7]	[2.5-3.0]	[2.7-3.0]	[2.4-2.7]	[2.2-2.6]	[2.5-2.9]	[2.7-3.2]	[2.5-2.9]	[0.6-0.6]	[0.7-1.0]
2007	3.6	3.1	3.1	3.8	3.2	3.1	3.5	3.6	3.1	0.6	0.7
	[3.4-3.9]	[3.0-3.3]	[2.9-3.3]	[3.6-4.1]	[3.0-3.4]	[2.9-3.4]	[3.3-3.8]	[3.3-3.9]	[2.8-3.4]	[0.6-0.7]	[0.6-0.9]

*, Top = North West, North East, Yorkshire and the Humber regions; Middle = Wales, West Midlands, East Midlands and East of England regions; Bottom = London, South East and South West regions; †, non-typhoidal salmonellas; ‡, Cryptosporidiosis.