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NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES

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DANMAP 2008: ANTIMICROBIAL CONSUMPTION AND RESISTANCE

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The annual DANMAP report (Danish Integrated Antimicrobial Resistance Monitoring and Research Programme) summarises Danish consumption of antimicrobial agents used for animals and humans and follows the development of resistance in bacteria collected from animals, food and humans. The 2008 DANMAP report is available at www.danmap.org. Some of the main observations from the human area are described below.

Antimicrobial consumption

From 2007 to 2008, the consumption of antibiotics for human treatment decreased to 35.5 million DDD (Defined Daily Doses) or 17.7 DDD per 1,000 inhabitants/day (DID), corresponding to a decrease of 0.3% and 1.1%, respectively. This is the first year since 1999 that a decrease has been observed in the total consumption of antibiotics. In primary health care, the total antibiotics consumption increased by 1.6% to 15.9% DID in 2008. The decrease in total consumption was caused by a decrease in three groups of antibiotics (betalacmatase sensitive penicillins, macrolides and sulfonamides). However, in the majority of the remaining antibiotic groups, consumption increased (tetracyclines, penicillin combinations, including betalactamase inhibitors and fluoroquinolones). Betalacmatase-sensitive penicillins remained the primary group of antibiotics with 33% of total consumption, followed by extended-spectrum penicillins (20%) and macrolides (15%). In 2008, a total of 308 in every 1,000 Danes received a minimum of one antibiotic prescription; the previous year, the corresponding number was 320 in every 1,000 persons. In Danish hospitals the total consumption continued its increasing trend from previous years. From 2007 to 2008, consumption increased by 7%, from 669.4 to 749.2 DDD/1,000 bed-days. Stated as DDD/1,000 discharged patients, consumption increased by 6%. The consumption of several broad-spectrum antibiotics increased considerably: cephalosporins (10%), carbapenems (28%) and fluoroquinolones (17%). Cephalosporins comprised 20% of the overall hospital consumption. Extended-spectrum penicillins (19%), betalacmatase-sensitive penicillins (13%) and fluoroquinolones (13%) were also important contributors to the increase.

Resistance

The occurrence of resistance to 3rd generation cephalosporins increased from 4.4% in 2006 to 10.8% in 2008 in Klebsiella pneumoniae from blood, which corresponds to the level of some Southern European countries. Until 2006, the occurrence of resistance in K. Pneumoniae was low and at par with the other Nordic countries. In E. coli isolates from blood, the occurrence of antibiotic resistance for all tested antibiotics was the same as in 2007.

This year's DANMAP report was the first to include data on resistance against 3rd generation cephalosporins (ceftazidim, ceftriaxon, cefpodoxim and cefotaxim) and carbapenems. Four percent of E. coli isolates were 3rd generation cephalosporin-resistant and less than 1% were carbapenem-resistant.

Among E. Coli isolates from urine in primary healthcare as well as hospitals, the occurrence of resistance against ciprofloxacin, nalidixan acid and mecillinam increased with respect to 2007.

Clostridium difficile 027 (CD027) is resistant to recent fluoroquinolones and is an increasingly important problem in Danish hospitals.

In 2008 the occurrence of penicillin and erythromycin resistance remained low among Streptococcus pneumoniae, and group A, B, C and G streptococci.

The occurrence of ampicillin resistance was high (87%) in Enterococcus faecium isolates from blood. However, less than 1% of E. faecium and Enterococcus faecalis isolates were vancomycin-resistant.

The number of E. Faecium isolates from blood reported from 11 of the clinical microbiology departments increased from 137 in 2002 to 369 in 2008.

In 2008, the number of methicillin-resistant Staphylococcus aureus (MRSA) bacteraemias was 17 (1.3% of all staphylococcus bacteraemias), in line with previous years. Resistance against the remaining tested antibiotics did not change significantly. The number of new MRSA cases increased to 854 in 2008 (from 706 and 659 cases in 2006 and 2007, respectively). The increase was, among others, caused by three outbreaks at neonatal departments, EPI-NEWS 48/08, and intensified screening of the participants at a swine producer's conference, EPI-NEWS 34/09.

Resistance in zoonotic bacteria

As in previous years, the resistance occurrence of several tested antibiotics, including ciprofloxacin, was higher in S. Typhimurium, S. Enteritidis and Campylobacter jejuni isolates from patients with travel-related infections than in isolates from infections acquired in Denmark.

Commentary

Denmark currently sees the consequence of the increasing consumption of broad-spectrum antibiotics, particularly in hospitals. The increase in the occurrence of resistant K. pneumoniae isolates from blood has occurred concurrently with an increase in the consumption of broad-spectrum antibiotics (fluoroquinolones (ciprofloxacin) and 2nd and 3rd generation cephalosporins). Previous treatment with fluoroquinolones, cephalosporins or carbapenems has been reported as a risk factor for E. faecium infections, which have also increased in recent years. The increased occurrence of CD027 also seems to be associated with the increase in the consumption of fluoroquinolones. After two years with a reduction in the number of new MRSA cases, the increase this year causes concern. Particularly the increase in the swine-related clone CC398 is followed closely. Increased risk of infection with resistant salmonella and campylobacter bacteria in connection with travels abroad probably reflects an increased veterinary antibiotic consumption abroad rather than in Denmark. Ciprofloxacin-resistant bacteria may be associated with an increased risk of treatment failure, and it is therefore essential to consider any travel activity before initiating treatment. Denmark's previous position characterised by a low antibiotics consumption and a low occurrence of resistance has changed. Antibiotic consumption should receive considerable attention, particularly at hospitals. Furthermore, continuous monitoring via typing and epidemiological studies of resistant E. coli and Klebsiella bacteria is needed to understand how spreading occurs, and which measures may be implemented to avoid spreading.

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Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2009 figures are preliminary)

Table 1	Week 46 2009	Cum. 2009 [1]	Cum. 2008 [1]
AIDS	1	36	35
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	1
Creutzfeldt-Jakob	0	7	5
Diphtheria	0	0	0
Food-borne diseases	3	483	785
of these, infected abroad	0	86	131
Gonorrhoea	14	495	334
Haemorrhagic fever	0	0	0
Hepatitis A	0	30	45
of these, infected abroad	0	23	26
Hepatitis B (acute)	0	22	22
Hepatitis B (chronic)	0	147	156
Hepatitis C (acute)	0	15	6
Hepatitis C (chronic)	2	253	258
HIV	1	223	218
Legionella pneumonia	1	123	111
of these, infected abroad	0	29	42
Leprosy	0	0	0
Leptospirosis	0	0	5
Measles	0	9	10
Meningococcal disease	0	61	54
of these, group B	0	36	25
of these, group C	0	20	17
of these, unspec. + other	0	5	12
Mumps	1	14	24
Neuroborreliosis	2	47	54
Ornithosis	0	12	3
Pertussis (children < 2 years)	1	101	89
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	5	4
Listeria monocytogenes	0	5	1
Streptococcus pneumoniae	0	65	75
Other aethiology	0	9	18
Unknown aethiology	0	16	20
Under registration	1	20	-
Rabies	0	0	0
Rubella (congenital)	0	0	3
Rubella (during pregnancy)	0	0	0
Shigellosis	2	92	74
of these, infected abroad	2	75	60
Syphilis	9	252	121
Tetanus	0	0	2
Tuberculosis	3	317	331
Typhoid/paratyphoid fever	0	24	32
of these, infected abroad	0	21	26
Typhus exanthematicus	0	0	0
VTEC/HUS	3	141	135
of these, infected abroad	3	34	48

[1] *Cumulative number 2009 and in corresponding period 2008*

Selected laboratory diagnosed infections

Number of specimens, isolates, and/or notifications received in SSI laboratories

Table 2	Week 46 2009	Cum. 2009 [2]	Cum. 2008 [2]
Bordetella pertussis (all ages)	1	184	173
Gonococci	10	395	327
of these, females	3	105	67
of these, males	7	290	260
Listeria monocytogenes	4	81	44
Mycoplasma pneumoniae			
Resp. specimens [3]	4	75	74
Serum specimens [4]	5	112	75
Streptococci [5]			
Group A streptococci	3	128	122
Group B streptococci	6	117	113
Group C streptococci	0	32	20
Group G streptococci	8	156	114
S. pneumoniae	21	916	803
Table 3	**Week 44 2009**	**Cum. 2009 [2]**	**Cum. 2008 [2]**
MRSA	11	642	630
Pathogenic int. bacteria [6]			
Campylobacter	74	2994	3037
S. Enteritidis	11	572	582
S. Typhimurium	5	724	1796
Other zoon. salmonella	14	644	906
Yersinia enterocolitica	7	207	287
Verocytotoxin-producing E. coli	4	148	139
Enteropathogenic E. coli	11	200	180
Enterotoxigenic E. coli	8	284	361

[2] *Cumulative number 2009 and in corresponding period 2008*

[3] *Resp. specimens with positive PCR*

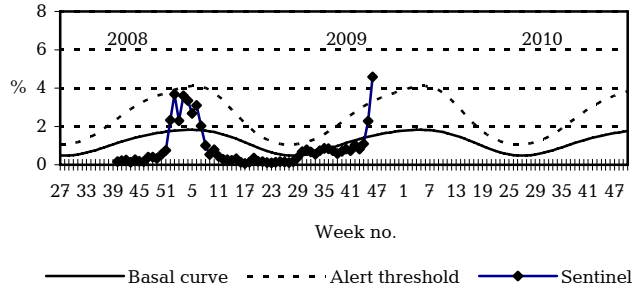
[4] *Serum specimens with pos. complement fixation test*

[5] *Isolated in blood or spinal fluid*

[6] *See also www.germ.dk*

Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2008/2009/2010



Sentinel:	Influenza consultations (as percentage of total consultations)
Basal curve:	Expected frequency of consultations under non-epidemic conditions
Alert threshold:	Possible incipient epidemic

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