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DANMAP 2000

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DANMAP (Danish Integrated Anti-microbial Resistance Monitoring and Research Programme), EPI-NEWS 8/97 and 3/99, has existed since 1995, and the fifth report has been published. The report describes the consumption of antimicrobials and development in resistance among bacteria collected from food animals, foodstuffs and humans in Denmark. Selected results from the most recent report are presented below.

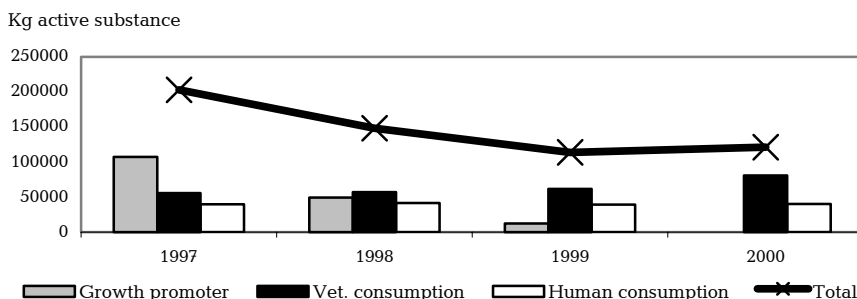
Consumption of antimicrobials

In recent years, the Danish Veterinary Institute, in collaboration with the Danish Medicines Agency, has implemented continuous registration of the consumption of antimicrobials at prescription level (VETSTAT). By far the greatest amount of the total volume of antimicrobials is still used in animals, Fig.1. Since 1997, the consumption of growth promoters for food animals has fallen to zero in 2000. At the same time, the consumption of antimicrobials for treatment of animals has increased in recent years.

In 1997, approx. 40,000 kg of antimicrobials were used in humans, which represented about 20% of total consumption. In 2000, consumption for humans made up 33% of total consumption. 90% was used in the primary health care sector, where the total consumption of antimicrobials did not, however, increase significantly. In the year 2000, consumption in the primary sector was 12.3 defined daily doses (DDD) per 1,000 population per day, which, seen in an international perspective, is low. There are, however, significant geographic differences, which may give rise to a difference in resistance, Fig. 2 (see overleaf). This difference in consumption is not due to differences in morbidity.

Within the individual classes of antimicrobials, the greatest change was found in fluoroquinolones, where consumption fell by 25%. The greatest fraction of this decrease coincides in time with the amendment to the subsidy regulations in March 2000. Consumption in hospitals relative to number of bed-days increased, as in the previous three years. Part of this increase can be explained on the basis of a decrease in the average duration of stay in hospital during that

Fig. 1. Overall consumption (kg active substance) of antimicrobials in Denmark, 1997-2000



period. From 1999 to 2000, consumption increased from 428 to 457 DDD per 1,000 bed-days.

Antimicrobial resistance

The incidence per 100,000 of registered cases of salmonellosis fell from 62 in 1999 to 43 in 2000. Resistance among Salmonella was not particularly widespread. Resistance was generally higher if the infection was acquired abroad; for example, quinolone resistance among imported S. enteritidis isolates was 18%, compared with 5% among domestic cases.

However, an increase in quinolone resistance has also been seen among domestic isolates, from <1% in 1997 to 5% in 2000. The source of this increase could be imported poultry. Generally, there is a good correlation between level of resistance among Salmonella from production animals and from humans who have acquired the infection in Denmark.

In Campylobacter jejuni isolated from humans, quinolone resistance has increased steadily since 1997, being 24% among domestic isolates in 2000. This is worrying as regards the consequences for patient treatment.

Among clinical Streptococcus pneumoniae isolates there was an increasing occurrence of resistance to macrolides and penicillin. The increase in erythromycin-resistance continued in 2000, while there was a slight decrease in resistance to penicillin.

The incidence of methicillin-resistant Staphylococcus aureus (MRSA) is also increasing, from 34 cases in 1994 to 97 cases in 2000. About 20% of clinical isolates come from general practice, the rest from hospitals. The most recent increase in the incidence of MRSA is not due to an increase in the number of imported cases.

For other bacteria, the incidence of resistance has been fairly stable for the last five years.

Comments

From the beginning, DANMAP has made several important contributions to the understanding of the development and spread of antimicrobial resistance. The effect of interventions among human pathogens is generally reflected in the frequency of resistance after a short time (months), and there are significant differences in both consumption and resistance between counties.

The complete DANMAP 2000 report can be read on: www.vetinst.dk. (T. L. Sørensen, D. L. Monnet, N. Friemodt-Møller, Dept. of Microbiol. R&D)

MEASLES OUTBREAK - CONTINUED

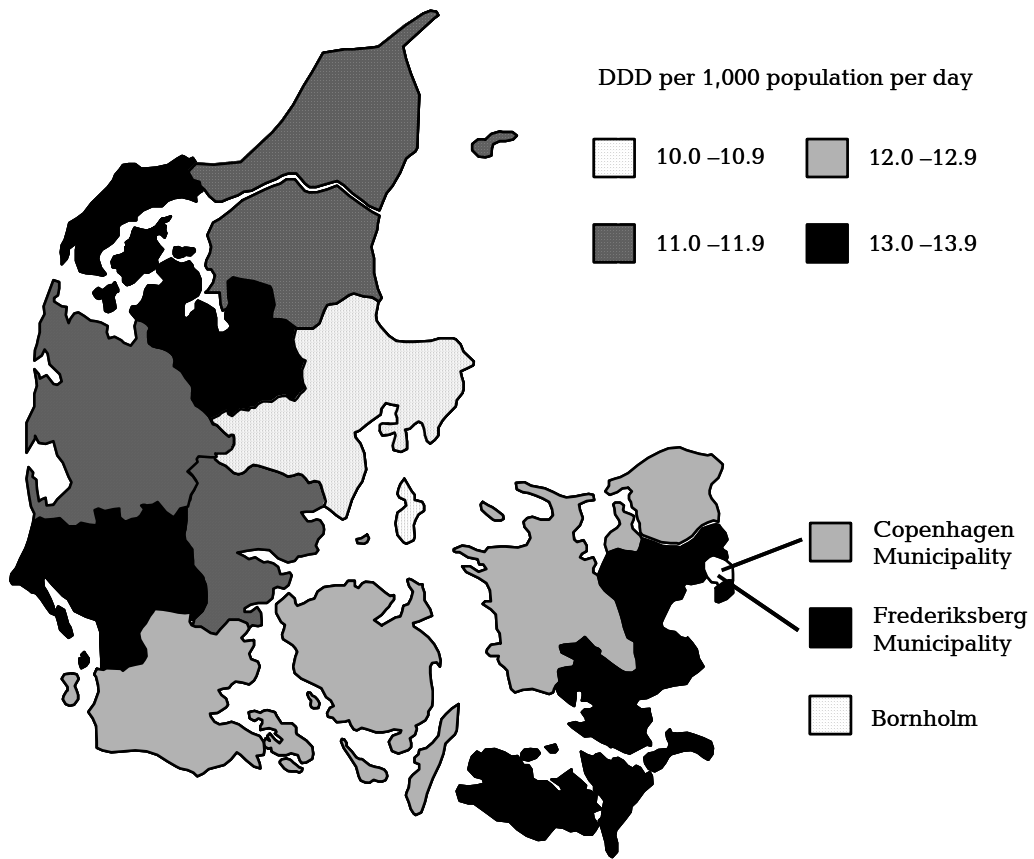
A total of 19 patients has been notified in connection with the measles outbreak in North Jutland County, EPI-NEWS 5/02. Ten patients are < 2 years old, one is 2-5 years and eight are 6-10 years

The last seven patients notified all have an association with patients in North Jutland County. Three are resident in Copenhagen. Fifteen of the patients were unvaccinated, of which 10 were < 2 years old. The vaccination status of two patients is unknown, and two have previously received MMR 1 vaccination.

In the case of 15 patients, the diagnosis has been laboratory-confirmed. The other four have all had contact with a laboratory-confirmed case. Further cases cannot be excluded, and physicians are encouraged to be particularly attentive towards patients with possible symptoms of measles. (S. Glismann, Dept. of Epidemiology)

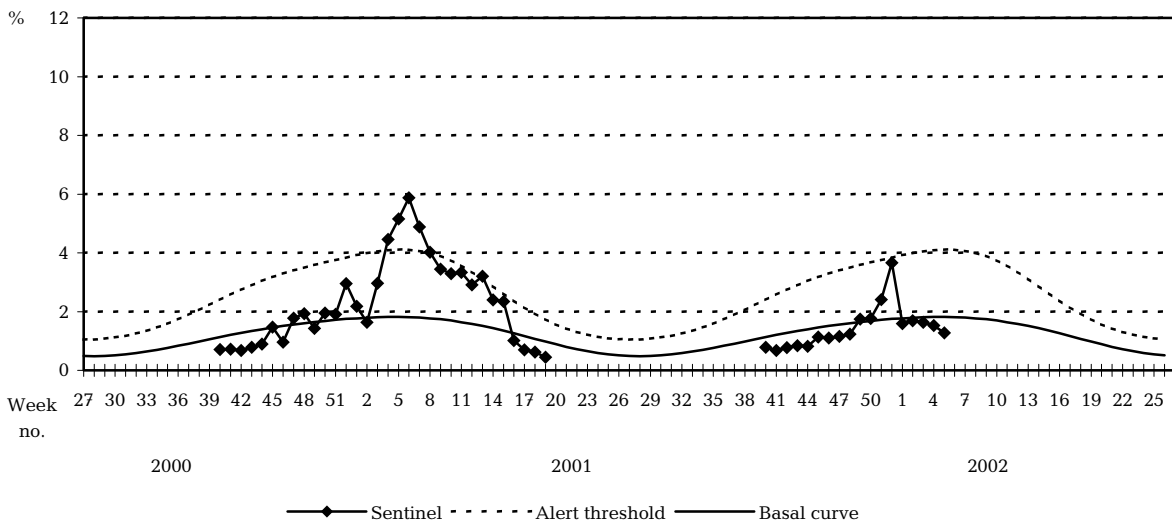
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**Fig. 2. Consumption of antibacterials as defined daily doses (DDD) per 1,000 population per day for systemic use (ATC code J01) in the primary sector, by county, 2000**



**Sentinel surveillance of influenza activity**

Weekly percentage of consultations, 2000/2001/2002



**Sentinel:** Influenza consultations as % of total consultations  
**Basal curve:** Expected frequency of influenza consultations under non-epidemic conditions  
**Alert threshold:** Possible incipient epidemic