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Consumption of antibacterial agents and antibacterial resistance. Decreased use of antibacterial agents in Iceland in 2009

Editorial Board:  
Haraldur Briem,  
Chief Epidemiologist

Gudrun Sigmundsdottir  
Thorolfur Gudnason

Editor:  
Jonina M. Gudnadottir

**DIRECTORATE OF HEALTH  
CHIEF EPIDEMIOLOGIST  
FOR ICELAND**

Austurströnd 5  
170 Seltjarnarnes  
Tel: +354 510 1900  
Fax: +354 510 1920

E-mail: [mottaka@landlaeknir.is](mailto:mottaka@landlaeknir.is)  
Website: [www.landlaeknir.is](http://www.landlaeknir.is)

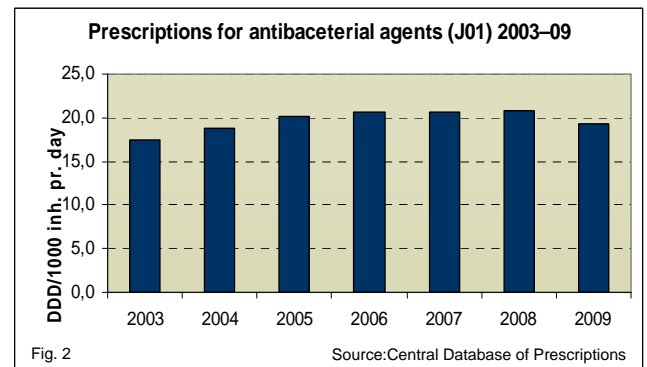
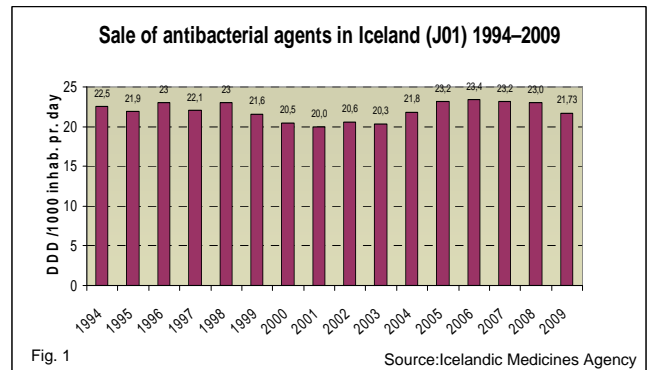
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**CONSUMPTION OF ANTIBACTERIAL AGENTS AND ANTIBACTERIAL RESISTANCE. DECREASED USE OF ANTIBACTERIAL AGENTS IN ICELAND IN 2009**

Antibacterial resistance is an increasing problem world-wide. It threatens patient safety and can be a threat to public health of international concern. One explanation of the spread of antibacterial resistance is the extensive use of antibacterial agents. Although the consumption of antibacterial agents is associated with the spread of resistance not all factors relating to this problem are fully understood. It is important to monitor the consumption of antibacterial agents in order to better understand the relationship between consumption and resistance. Antibacterial agents are important for the treatment of serious infections. Therefore, they should be used responsibly and appropriately. No one doubts their importance when they are needed.

**Monitoring the consumption of antibacterial agents and antibacterial resistance**

One of the legal obligations of the Chief Epidemiologist is to monitor the consumption of antibacterial agents in Iceland. The antibacterial resistance of defined bacteria and health-care-associated infections are reportable. Infection control is important within the health care system and infections are monitored. The consumption of antibacterial agents within and outside health-care institutions is being monitored in order to follow the development of antimicrobial resistance.



The Department of Microbiology at Landspítali University Hospital monitors the development of antibacterial resistance while the consumption of antibacterial agents is monitored on one hand through the total sale of antibacterial agents (Fig. 1) and on the other hand by data obtained from a central database of prescriptions (Fig. 2). By international comparison, the consumption of antibacterial agents is rather high in Iceland, especially compared with the other Nordic Countries. The consumption can mainly be explained by a high consumption of tetracycline (doxycycline) (Fig 3, page 2).

Antibacterial consumption (J01) in 27 European countries 2006

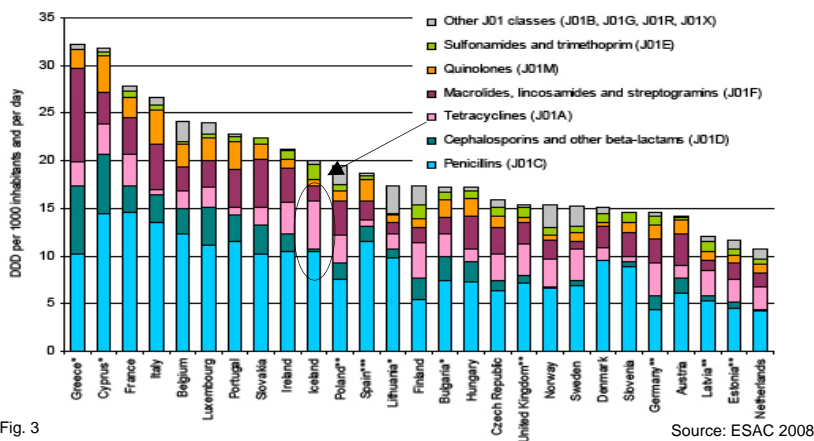


Fig. 3

Source: ESAC 2008

**What is being done to contain the spread of antibacterial resistance?**

Information on the consumption of antibacterial agents can be of use for physicians prescribing these drugs. Vaccination against many bacterial and viral infections can lead to a reduction in the incidence of infections and thus a reduced consumption of antibacterial agents. A special Committee on Antimicrobial Consumption and Resistance has investigated last year's consumption and resistance and come to the following conclusions:

1. **Azithromycin** is consumed in relatively high quantities in the age group 0–4 years in Iceland. The most common cause for the use of antibacterial agents in this age group is otitis media. Since the half life of azithromycin is extensive in the body it is likely to increase the spread of antibacterial resistance, especially of pneumococci,

*Tetracycline is used in great quantities in the age group 15–19 years, more than in any other neighbouring countries.*

the most common cause of otitis media. Azithromycin is not a suitable drug for the treatment of otitis media.

2. **Tetracycline** (in Iceland **doxycycline**) is used in great quantities in the age group 15–19 years, more than in any other neighbouring countries. Tetracycline is used in this age group mainly for treating acne. Resistance to tetracycline is increasing in Iceland. Therefore, it is of importance to reduce the consumption of tetracycline.
3. The use of **quinolones** (especially **ciprofloxacin**) has increased in Iceland in recent years. At the same time, the resistance of *E. coli*, the main cause of urinary tract infections, has increased steadily. It is important to maintain the effectiveness of quinolones by reducing their use and replacing them with drugs with a narrower antibacterial spectrum.

**Advice of the Committee on Antimicrobial Consumption and Resistance.**

1. Physicians should be informed of the main conclusions of the Committee by means of meetings and discussion. Solutions should be found to reduce the consumption of antibacterial agents, in particular some specified agents, when appropriate.
2. The results of the collaboration on prudent use of antibacterial agents should

Cont. p. 3

Antibacterial prescriptions in Iceland (J01) 2007–2009 by age

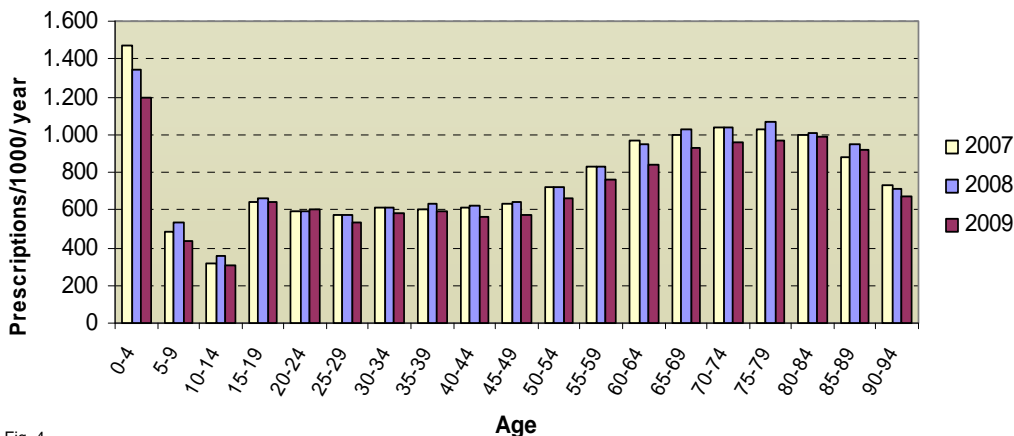


Fig. 4

Age

*The sale and prescriptions of antibacterial agents went down in Iceland in 2009.*

*The Committee recommends that the health authorities initiate vaccination against pneumococcal disease as part of the childhood vaccination programme.*

be checked by monitoring databases on antimicrobial consumption and resistance.

- The Committee recommends that the health authorities initiate vaccination against pneumococcal disease. The gain is threefold: Reduced burden of disease due to pneumococcal infections and otitis media, less consumption of antibacterial agents and reduced antibacterial resistance among pneumococci

### Decreased consumption of antibacterial agents

As shown seen in figs. 1 and 2, the sale and prescriptions of antibacterial agents went down in 2009. The total reduction in the sale of antibacterial agents was 5,6%, which is a reduction of more than 1,6% of drugs in general. Considering the number of prescriptions for antibacterial agents according to age, there has been a steady reduction in the number of prescriptions in the age group 0–4 years for the last three years (Fig. 4, p. 2).

- Although the use of azithromycine is not extensive by international comparison the number of prescriptions is quite high in Iceland (Fig. 5). The number of individuals being prescribed the drug has been reduced by 23% in 2009 as compared with the year before and the reduction is most pronounced in the age group 0–4 years and among the elderly.
- Tetracycline (doxycycline) is mostly prescribed to the age group 15–19 years (Fig. 6). There was a general reduction in prescriptions for doxycycline of 6% in 2009 as compared with the year before. Nevertheless, there was an increase in the age group 15–19-year s at the same time.
- The use of quinolones is not extensive in Iceland by international comparison although some increase has been taking place in recent years. However, there was a 6% reduction in the use of quinolones in 2009 as compared with the year before (Fig. 7).

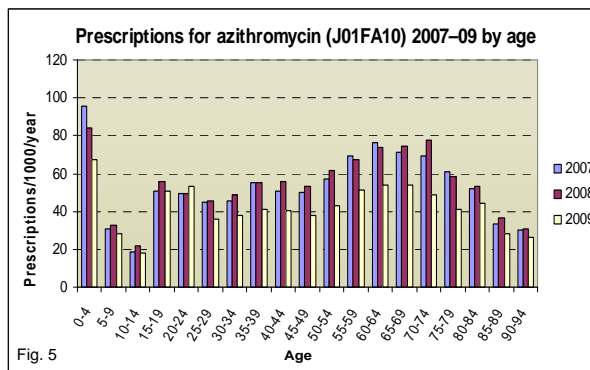


Fig. 5

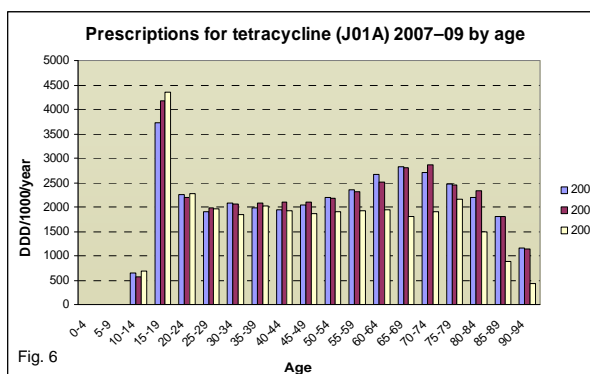


Fig. 6

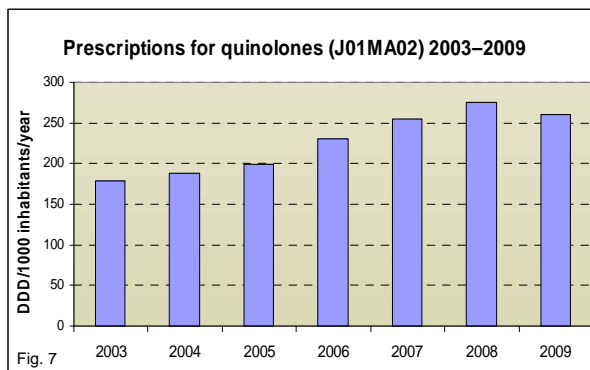


Fig. 7

Figures 5, 6 and 7. Source: Central Database of Prescriptions

### Conclusion

The reduced consumption of antibacterial agents is not fully explained. It has to be kept in mind that these drugs are not reimbursed by the national health-care insurance, which may result in a reduced consumption of the drugs when the economy is troubled. Also, an increased awareness of the importance of prudent use of antibacterial agents among physicians and the general public may play a part.

*Haraldur Briem*