



# ONE HEALTH STRATEGY AGAINST ANTIBIOTIC RESISTANCE

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Ministry of Environment  
and Food of Denmark



MINISTRY  
OF HEALTH

## One Health Strategy against antibiotic resistance

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### **Antibiotics must be used with care**

Resistance to antibiotics is a growing global problem, threatening the health of human beings and animals alike. The government has therefore highlighted this issue, with a new national strategy to combat antibiotic resistance.

If we are to halt the development of antibiotic resistance, it is essential to reduce the consumption of antibiotics. The consumption of these medicines facilitates the development of resistant bacteria, and keeps them alive. Antibiotics can only be obtained by prescription in Denmark, and only by a specific physician or veterinarian, for the treatment of people and animals.

For decades, Denmark has been a pioneer in the prevention of antibiotic resistance. The development of antibiotic resistance is closely related to the consumption of antibiotics among human beings and animals. Although Denmark has had a moderate use of antibiotics compared with other countries, we have also seen an increase in the development of resistant bacteria.

Antibiotic resistance should be managed from a “One Health” perspective, across the human, veterinary and environmental sectors, with the need for a more holistic view of human and animal health, in addition to consideration for the environment. Continuing efforts at a national and international level are also crucial.

This strategy will provide a framework for strong and coordinated efforts across sectors to combat antibiotic resistance. Targeted measures should be implemented to stop the increase of resistance, so that antibiotics can continue to be used to treat patients in hospitals and other facilities.

The current strategy may be viewed as a continuation of a wide range of other initiatives, including the 2010 National Antibiotics and Resistance Action Plan, the European Council’s conclusions regarding antimicrobial resistance, adopted during the Danish EU Presidency in 2012, as well as the Nordic Declaration on Antimicrobial Resistance, adopted by the Danish Presidency of the Nordic Council of Ministers in 2015.

This strategy should be viewed in light of the UN Political Declaration of September 2016, of the High-level Meeting, whereby the UN supported the Global Action Plan on Antimicrobial Resistance, launched in 2015. The Global Action Plan was developed by the World Health Organization, WHO, in collaboration with food, agriculture and animal health organisations such as the FAO and the OIE. In June 2016, the European Union adopted new Council conclusions regarding a strengthened One Health cooperation in the EU. The Global Action Plan and the European Council conclusions have determined that all member states shall prepare national action plans on antibiotic resistance and consumption by mid-2017. In the European Council conclusions, it is stated that all EU member states must set up specific national goals to manage antibiotic resistance and consumption in both humans and animals. In Denmark, there is already a set of targets for the use of antibiotics in animals, and by mid-2017, new, national, measurable goals will be determined for the use of antibiotics for human beings.

The strategy contains five goals, which combined form a framework for future measures against antibiotic resistance in Denmark, including the national action plans and establishment of measurable national goals for antibiotic resistance and consumption among humans.

By establishing these goals, we are placing emphasis on ensuring a more prudent use of antibiotics to reduce the incidence of resistance, strengthening measures for prevention of infections, facilitating alternatives to antibiotics, enhancing knowledge in order to improve targeted measures, providing information and advice on resistance and transmission, and ensuring international cooperation to minimise the development of antibiotic resistance. These five goals will also determine the direction of the national action plans, which will follow up on the overall goals of the strategy. To achieve these goals, we must to the extent possible apply a holistic approach to future efforts that includes socioeconomic considerations, including health economics.

To ensure progress in this area in following up this strategy, we will review the situation in 2 years to evaluate the combined efforts.



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***5 goals for the reduction of antibiotic use and the prevention of resistance among humans and animals.***

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## A prudent use of antibiotics to reduce the incidence of resistance

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***The Danish consumption of antibiotics in both humans and animals must be kept at a low and responsible level. The primary focus should be on the reduction in the use of broad-spectrum antibiotics and critically important antibiotics, to maintain the low level of antibiotic resistance in Denmark.***

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The development of antibiotic resistance is closely related to the type and amount of antibiotics used. Resistance can arise from the very first treatment with antibiotics, which is why antibiotics should only be used by humans and in animals when necessary. Preventive treatment for animals is not permitted in Denmark. Resistant bacteria can be transmitted and spread from person to person or from animal to animal. Some bacteria can also be transmitted between animals and humans. Resistant bacteria can be transmitted from the environment to both humans and animals, and vice versa.

In Denmark, there has been a restrictive use of antibiotics for humans, and 90 per cent of all antibiotics used by humans are prescribed in primary healthcare services. A 2015 summary of average antibiotic consumption by humans (in both primary and secondary healthcare sectors), indicates that Denmark had the 8th lowest consumption among 25 European countries. In mid-2017, the Minister for Health will launch a new national action plan, including specific, measurable national goals aimed at reducing antibiotic consumption among humans in Denmark, so that Denmark can perform even better in comparison with other European countries. These goals are prepared with input from the Danish National Antibiotic Council.

In Denmark, the use of antibiotics in livestock production is low, viewed in a European context. Denmark had the 10th lowest consumption among 29 European countries in 2014. A multi-annual programme has reduced the use of antibiotics for livestock and adjusted the consumption pattern to promote more prudent use from a One Health perspective. The use of critically important antibiotics in livestock production has been very low in Denmark in comparison with other EU countries.





## Greater efforts to prevent infections and to facilitate antibiotic alternatives

***Antibiotic consumption shall be reduced by preventing infections among humans and animals. Improved hygiene and increased use of vaccines will assist in reducing the need for antibiotics.***

Improved animal health can help to reduce the consumption of antibiotics. This can be carried out through better management of the livestock, better hygiene, better diagnostics, and the preventive use of vaccines to avoid diseases. In humans, increased focus on hygiene, as well as alternatives to antibiotics can assist in reducing the development of resistance. Alternatives to antibiotics should be facilitated.

Bacteria have many transmission routes. Bacterial pathogens can be transmitted by physical contact, through the air, from person to person, or by touching infected surfaces. If these bacteria are resistant, treatment options could prove inadequate, with a lengthier and more expensive course of treatment.

Patients in hospitals and nursing homes with weakened immune systems would be particularly vulnerable if infected with resistant bacteria. Individuals who are otherwise healthy may in rare cases develop serious infections, i.e. during surgery. Antibiotic resistance can have significant socioeconomic consequences since treatment of resistant bacteria requires more specific and expensive antibiotics. Special procedures must often be followed in such cases, such as the isolation of patients who have been infected with resistant bacteria upon hospitalisation.

The spread of infection in the healthcare system and in agriculture can be restricted by the widespread use of good hand hygiene, protective equipment (such as gloves and protective gowns), cleaning and disinfectants. Vaccines can also help prevent infections, thereby reducing the consumption of antibiotics. Examples include the pneumococcal vaccine to prevent pneumonia, which is a part of the Danish child vaccination programme, as well as vaccines to prevent mastitis in cows, caused by *E. coli* and *staphylococcus aureus* bacteria.





## Enhanced knowledge to improve targeted measures

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***Measures in the field of antibiotics and resistance must be based on solid scientific knowledge, which is continuously enhanced through systematic surveillance and research.***

***National and international surveillance must be applied and expanded in pace with new knowledge of antibiotic resistance and consumption.***

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Surveillance of antibiotic resistance and consumption has been a high priority in Denmark for many years, and has since 1995 been systematised through the establishment of the DANMAP programme (Danish Integrated Antimicrobial Resistance Monitoring and Research Programme). In addition to compiling data on the consumption of antibiotics among both humans and animals, the programme collects human resistance data from clinical microbiology hospital departments, as well as resistance data from the monitoring of animals and meat.

The monitoring of data provides a foundation for the identification of new resistant strains, and offers the opportunity for targeted measures in this area, through a concrete database on the development of antibiotic resistance and consumption. This foundation helps to prepare national policies and guidelines and data are also used in outlining new measures and providing guidelines from authorities.

On an international level, Denmark participates in the surveillance network for human and veterinary antimicrobial resistance and consumption. With respect to humans and antibiotics, the EU agency ECDC has since 2005 been responsible for collecting surveillance data on antibiotic resistance and consumption in humans in all EU countries. Data on veterinary consumption is collected through the European Medicines Agency (EMA) and is published annually. Since 2014, EU has harmonised the surveillance of animals and meat in all member states. The continued development and enhancement of surveillance cooperation in the EU and globally is essential for both humans and animals. Denmark has urged the EU Commission to introduce mandatory surveillance of antibiotic consumption in animals throughout the EU. Denmark will continue its work on this issue, among others within the framework of the new EU action plan on AMR that was published in June 2017. Denmark also participates in the newly established EU One Health Network, where Denmark has the opportunity to influence efforts in the prevention of antibiotic resistance.

This objective also emphasises research and new knowledge, providing an essential foundation for efforts to prevent antibiotic resistance. There is an ongoing need to gain access to knowledge about antibiotic resistance as a basis for current and future measures. More research is needed to understand how to reduce the consumption of antibiotics, including research on alternatives to antibiotics, in order to prevent antibiotic resistance.



## IV

### Information and guidance on resistance and transmission

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***Dissemination of knowledge regarding a more prudent use of antibiotics and linkage to resistance is essential. The communication of information on antibiotic resistance is a significant factor in combatting the development of resistance, and must ensure an appropriate and constructive dialogue with physicians and veterinarians when patients or animals are in need of treatment.***

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It is essential to reduce the consumption of antibiotics in order to minimise the development of antibiotic resistance. This is because the consumption of antibiotics facilitates the development of resistant bacteria, and keeps resistant bacteria alive. Antibiotics can only be obtained by prescription in Denmark, and can be prescribed only by a physician or a veterinarian for treatment of people and animals.

The public plays a decisive role in the consumption of antibiotics. Members of the public can help to maintain a low consumption of antibiotics by not demanding prescriptions for antibiotics for minor illnesses. National antibiotic awareness campaigns directed at the public are launched each year on European Antibiotic Awareness Day, 18 November, and during the World Health Organization's World Antibiotic Awareness Week, which is held the same week as the Antibiotic Awareness Day.

In Denmark, national efforts against antibiotic resistance in both the human and veterinary sector are brought together in the National Antibiotic Council. The Antibiotic Council was established in 2010, with the intent to ensure combined and coordinated efforts for the purpose of reducing antibiotic resistance and consumption in humans and animals. The Antibiotic Council discusses relevant issues in this field and implements measures.







## A strong international cooperation to minimise the development of antibiotic resistance

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***Denmark will continue its active efforts to promote cooperation with other countries in combating antibiotic resistance on a global level. Denmark is actively working to share Danish experiences with other countries, while also supporting and implementing international strategies and action plans.***

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Antibiotic resistance is a global health problem, which requires international cooperation on substantial, long-term efforts. Many countries are battling even larger resistance problems than those faced by Denmark, and many of the resistant bacteria in Denmark were brought in by humans, animals and food products crossing the border. It is therefore crucial that Denmark continues to have a close and ongoing cooperation with other countries in the fight against antibiotic resistance, and that Denmark contributes by sharing knowledge and experiences in this field.

Denmark took the initiative to adopt the Nordic Declaration on Antimicrobial Resistance, during the Danish Presidency of the Nordic Council of Ministers in 2015. A new Nordic One Health Strategy Group was established, as a result of the Declaration, for the purpose of exchanging knowledge between the Nordic countries, and ensuring that Nordic countries are better equipped to influence and promote initiatives under the direction of EU and the UN. Denmark also participates actively at the EU level with respect to negotiations on new regulations for veterinary antibiotics, and also actively supports the new EU action plan on AMR.

Denmark is also participating in the EU Commission's newly established One Health Network, where Denmark has the opportunity to have an impact on the EU Commission's planned activities in the area of antibiotics. On an international level, Denmark participates in activities through international organisations such as FAO, OIE, WHO and CODEX, including drafting the guidelines for antibiotic resistance and consumption.



