DET ETISKE RÅD

Public Policy Brief

The Danish Council on Ethics' Statement on Ethical Antibiotic Stewardship in a One Health Perspective

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To read the full statement of the Danish Council on Ethics please visit **www.etiskraad.dk**

Why is antimicrobial resistance (AMR) an important socieal problem?

Antimicrobial resistance (AMR) occurs when bacteria or other micro-organisms are no longer responding to the antimicrobial treatment that would have been used to prevent or treat the infectious disease.

- **The discovery of antibiotics was a landmark event in medical history:** Since their discovery in 1925, several hundred million human lives have been saved. However, the growing resistance to antibiotics threatens the medical revolution.
- **Globally, AMR poses a far greater challenge, than it does in Denmark:** In Italy, OECD estimates that one-third of infections are currently caused by resistant bacteria today. AMR is dangerously high in Greece, India and Türkiye. By 2035, OECD expects 40% of all infections in these countries to be caused by resistant bacteria.
- **The consequences are global.** Every year, AMR is causing more than one million deaths and additionally associated with more than 4.5 million deaths worldwide. Experts estimate that, by 2050, resistant bacteria could cause more than 10 million deaths annually.
- **AMR in Denmark:** In 2023 10 percent of all infections in Denmark were caused by resistant bacteria and AMR-associated mortality in Denmark is comparatively low. Today, most resistant infections are treatable in the Danish healthcare system. Yet, there are indications that particularly problematic resistant bacteria – notably carbapenemase-producing organisms (CPO's) – are on the rise. In 2024 497 CPO carriers were detected in Denmark. →

> **Any use of antibiotics carries the risk that bacteria and other microorganisms may develop resistance. In other words, the more antibiotics are used in treatment of humans and animals, the greater is the likelihood that the pathogenic bacteria become resistant**

- **Consequences for the Danish healthcare system and its patients:** More widespread occurrence of AMR, globally and in Denmark, will make standard procedures – such as surgery, chemotherapy and dialysis – more risky for patients and more costly for the Danish healthcare system.

Contributing factors in the development of AMR

Any use of antibiotics carries the risk that bacteria and other microorganisms may develop resistance. In other words, the more antibiotics are used in treatment of humans and animals, the greater is the likelihood that the pathogenic bacteria become resistant. The combined societal consumption of antibiotics, nationally and globally, plays a crucial role in determining the extent to which bacteria develops resistance:

- **In Denmark**, 137 tonnes of antibiotics are used each year, accounting for 0.1% of global consumption.
- **87 tonnes** are used to treat animals (primarily within the pig sector), while 50 tonnes are used to treat people in the healthcare system.
- **In the last ten years** human antibiotic consumption has declined. However, it has increased slightly following the Covid-19 pandemic.
- **Since 2009** the consumption in the veterinarian and agricultural sectors has declined. Still, a slight increase has been observed between 2022-2024.
- **Over the years**, Denmark has launched several political national action plans to reduce antibiotic consumption. Generally, the politically defined reduction targets set by these national action plans have not been met. Still, some progress has been made towards the accomplishment of such reduction targets.

AMR as an ethical issue - A Tragedy of The Commons

In an ethical perspective the problem of antimicrobial resistance can be understood as a so-called *tragedy of the commons*. The tragedy of the commons is a particular kind of ethical problem in which a group of individuals overuse or deplete a shared limited resource all the while that the very same group have a shared interest in preserving that in a longer term.

Antibiotics constitutes an exemplar of such a shared scarce resource. Unless access to this resource is somehow regulated, every single individual would tend to overuse the resource to an extent, where the combined overuse gradually depletes the resource. Antibiotics as disease treatment would then become less effective. To preserve the effectiveness of antibiotics, then, restrictions in some or all of the individuals access to the resource would need to be imposed.

However, this leads to the difficult ethical question: which groups should be prioritised in this ethical zero-sum game, where no individual or group of individuals can benefit without others being treated worse off. Effective antibiotics constitute a large but not indefinitely large natural resource. The way society manage and distribute can be more or less ethical. It can treat otherwise fatal disease among humans and animals. However, the scope is limited and will eventually expire.

To complicate things even further antibiotics constitutes a *globally* shared scarce resource. The resource is not "only" shared by local people at a national level. It is also shared with future generations, shared with other species than humans and shared across national borders. **In other words, AMR raises profound ethical questions about inter-generational, inter-regional and inter-species distributive justice**.

Ethical antibiotic stewardship involves addressing, administering and balancing these difficult ethical questions: how should we as a society allocate and distribute the shared scarce resource of antibiotics? Should future generations be prioritised above the currently living? Should the health and welfare of humans precede that of animals? And should national health care systems prioritize their "own" national patients before and above patients in other nations?

Statement and policy recommendations of the Danish Council on Ethics regarding AMR

In the statement 'Ethical Antibiotic Stewardship in a One Health Perspective' the Danish Council on Ethics elucidates and address the ethical dilemmas, that confronts a so-called ethical antibiotic steward (or civil servant) working within a One Health Framework. In the statement the council sets forth three policy recommendations:

1. **The Danish Council on Ethics** highlights that antibiotic resistance pose a considerable global healthcare risk in the long term, and thus recommend further efforts to mitigate antibiotic resistance in Denmark and globally. In addition, the Danish Council on Ethics express concern that the consumption of antibiotics in Denmark has increased within recent years, and that the political efforts to reduce consumption appears to have grinded to a halt.

2. **The Danish Council on Ethics** recommends significant reductions of antibiotic consumption within agriculture, animal husbandry and the veterinary healthcare sector, and in particular recommends changes to those conventional practices within animal husbandry, that in itself increase the demand for antibiotics.

3. **The Danish Council on Ethics** recommends that the humane healthcare sector reduces its antibiotic consumption further in a responsible manner.

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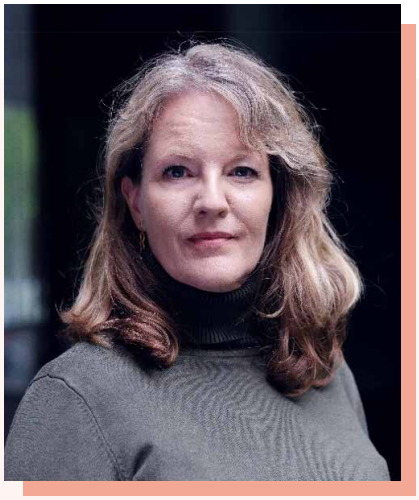
What is The Danish Council on Ethics?

The purpose of the council is to advise the Parliament, government, ministers and public authorities on ethical issues and challenges, as well as to promote public debate on contemporary ethical matters. The council advices on bio- and genetic technologies that affect human life, nature, the environment, and food. It also addresses ethical issues within the healthcare system.

The council consists of 17 lay members who are personally appointed to serve for up to 6 years. Members are appointed by the Danish Parliament. All Members of the Council are appointed from various strands of civil society. The council thus variously comprises healthcare professionals, sociologists, psychologists, theologians, biologists, philosophers and many other professions and occupations. The Council is politically independent and has no legislative, executive, or judicial functions.

Christine NELLEMANN

Chairman of the Danish Council on Ethics



Christine Nellemann is provost at the Technical University of Denmark (DTU). Prior to this role, she served as dean of sustainability and as Director of the DTU National Food Institute. She holds an MSc in human Biology, a PhD in medicine and an Executive MBA in Management of Technology and Innovation. Christine Nellemann serves in several boards, including as chair of the Danish Council on Ethics and as member of The Danish Council for Research and Innovation Policy. She contributed as an expert in an EU high-level advisory group, supporting the EU commission on science-policy interfaces in the green transition of food systems.