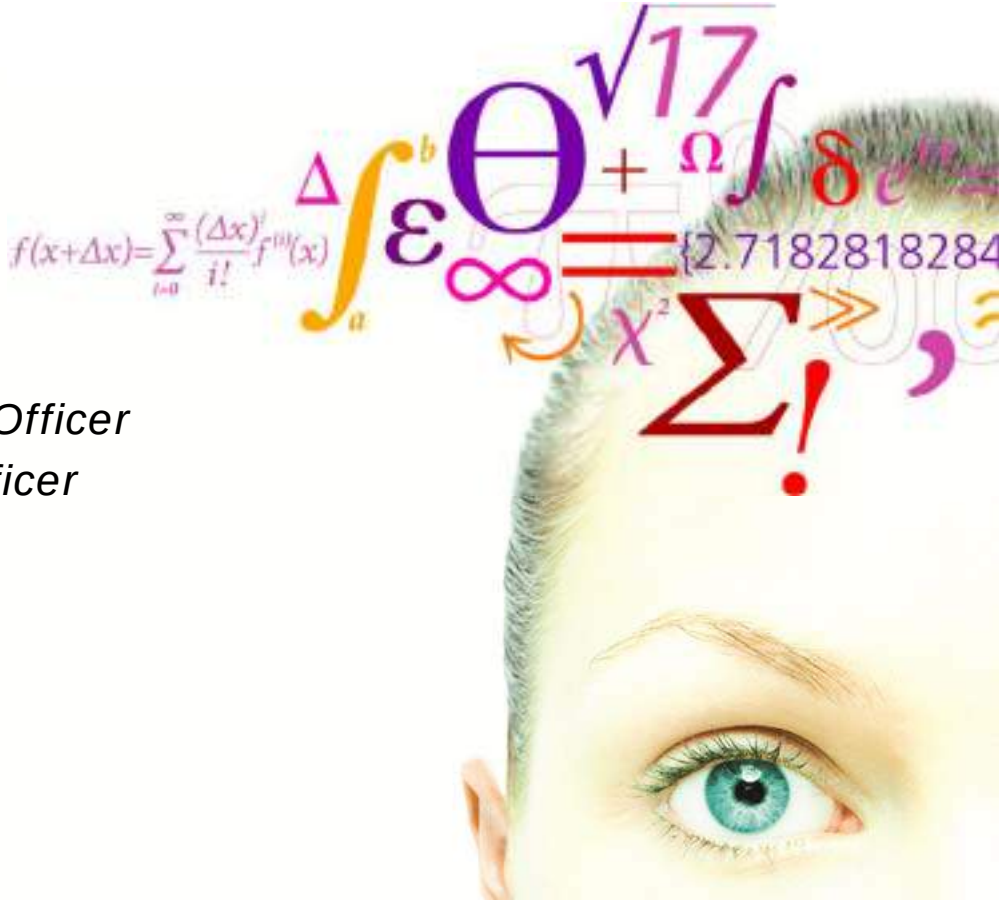
Methods and challenges in data and information sharing in the Danish Integrated Surveillance for Antimicrobials and Antimicrobial Resistance system (DANMAP)



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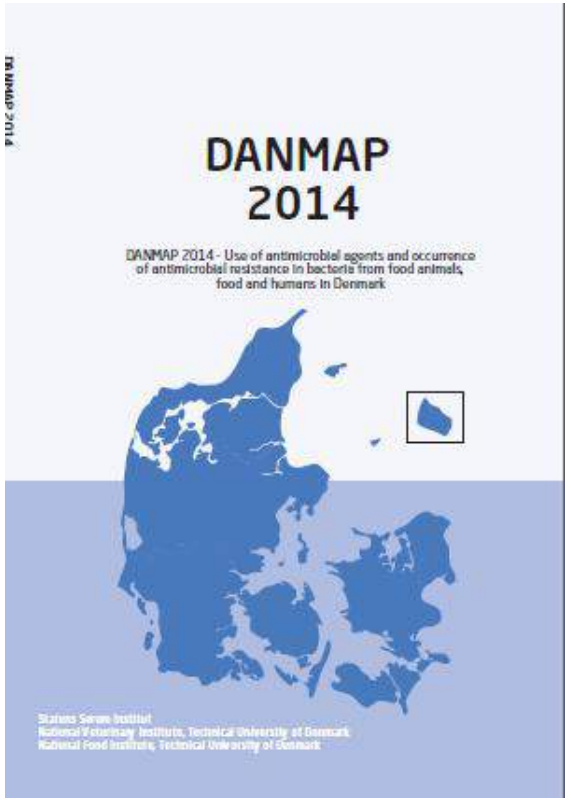
Tine Hald, Professor
National Food Institute, DTU

Outline

- Introduction to DANMAP
- Data used in DANMAP
- How data are used, examples
- Dissemination information
- Challenges
- EU/Global perspective
- Concluding remarks



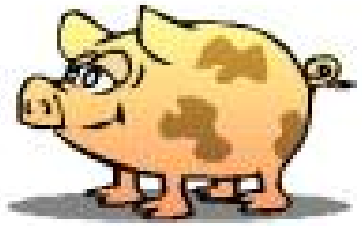
Danish Integrated Antimicrobial Monitoring and Research Programme

- **Since 1995**
- **Collaborative project:**
  - Danish Veterinary Institut
  - Danish Food & Veterinary Adm.
  - Danish Medicines Agency
  - Statens Serum Institut
- **Yearly report since 1997**

http://www.danmap.org

Aim of the DANMAP programme

To Investigate associations between use of antimicrobial agents in animals and humans and occurrence of resistance among bacteria from animals, food, and humans



The perfect world.....









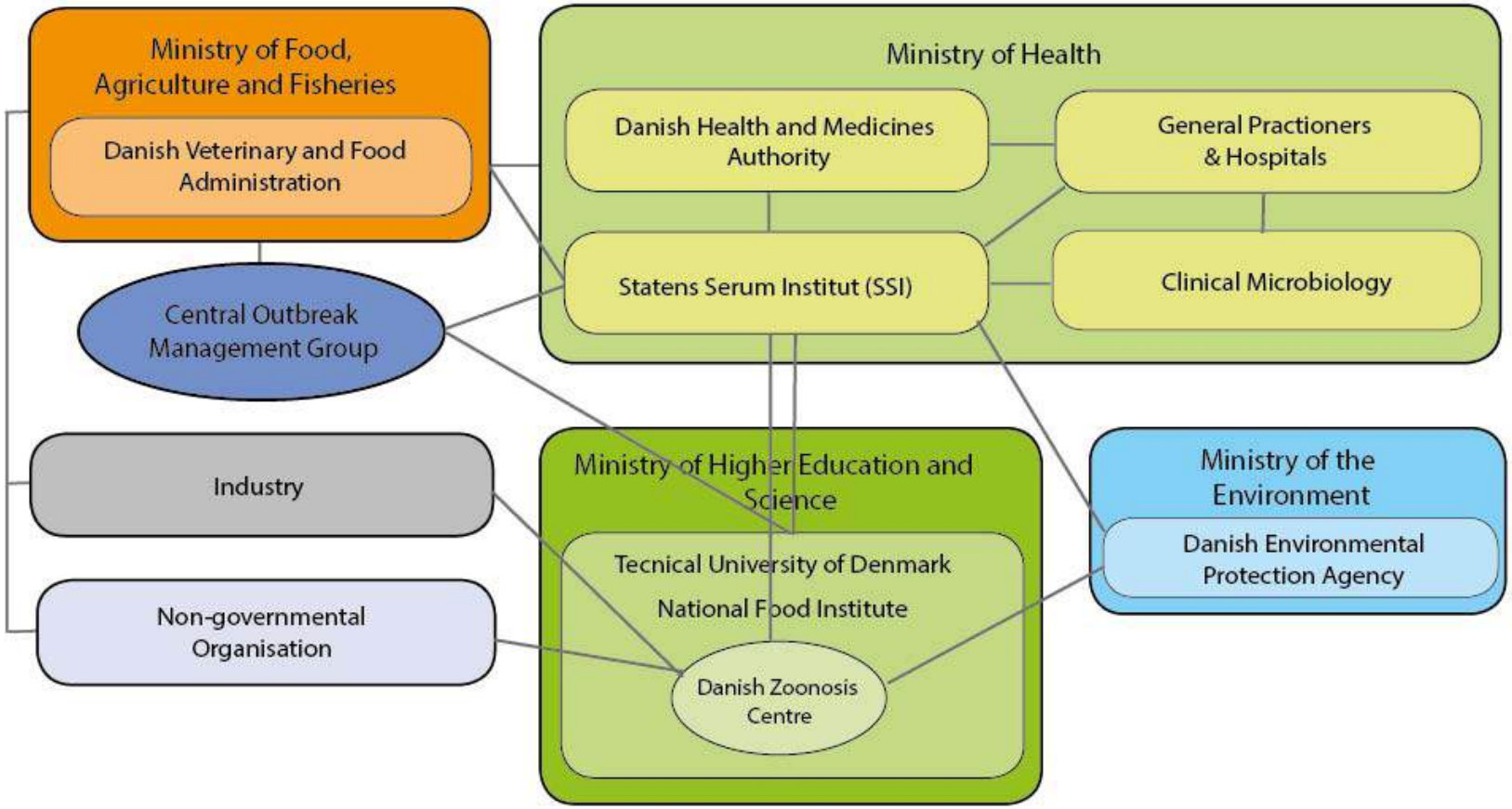







Several Ministries involved……

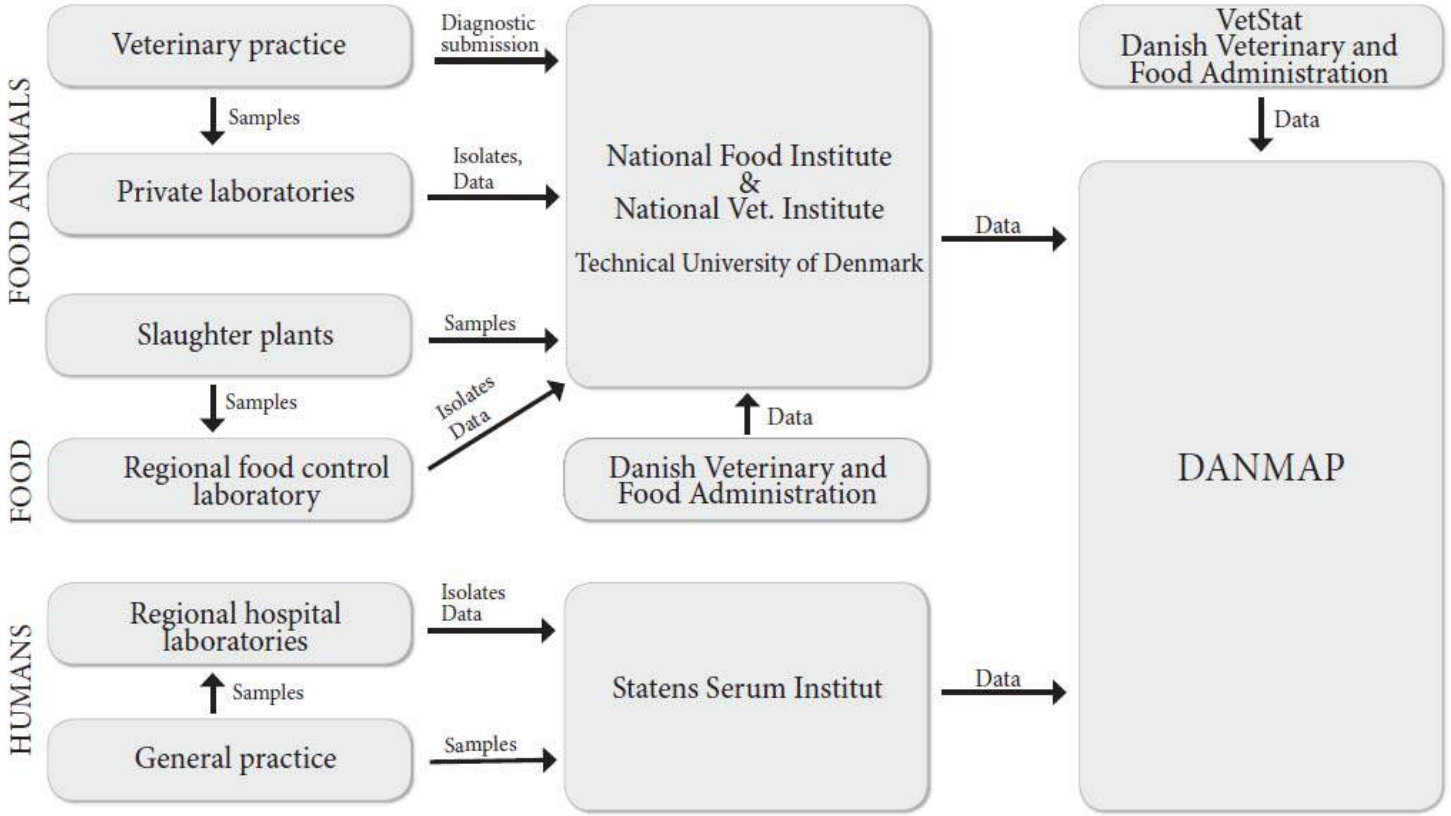
Monitoring Network for reporting infectious pathogens in humans, animals, foddstuffs and feedstuffs in Denmark



Source: Annual report in Zoonosis in Denmark, 2014

Multiple sources of data.....

Organisation of DANMAP



Sources of AMR data – veterinary side

- Samples are collected by
  - DFVA personnel or
  - Food business operators according to DFVA sampling plans or as part of national surveillance

- Samples are examined by
  - the DFVA laboratory in Ringsted – AMR surveillance projects
  - Industry laboratories – National Salmonella surveillance
  - DTU Food laboratory –Salmonella serotyping and MIC of industry isolates and WGS of ESC
  - DTU Vet Laboratory – Clinical samples

- Data collected at DTU Food and DTU Vet
  - DANMAP, Danish Antimicrobial Resistance monitoring and Research Programme
  - EFSA Data Collection Framework

Sources of AMR data – human side

- Samples are collected by
  - GP
  - Hospital

- Samples are examined by
  - Departments of Clinical Microbiology (DCM)
  - SSI

- Data collected at the Unit for Antibiotic Resistance and Staphylococci from the Departments of Clinical Microbiology

Sources of consumption data

- **Veterinary side**
  - Pharmacies, Veterinarians, feedmills
  - Data collated in Vetstat, DVFA
  - Analysed for DANMAP at DTU Food

- **Human side**
  - Pharmacies, incl. hospital pharmacies
  - Data collated in Register of Medicinal Product Statistics
  - Analysed for DANMAP at SSI

Antimicrobial consumption – humans

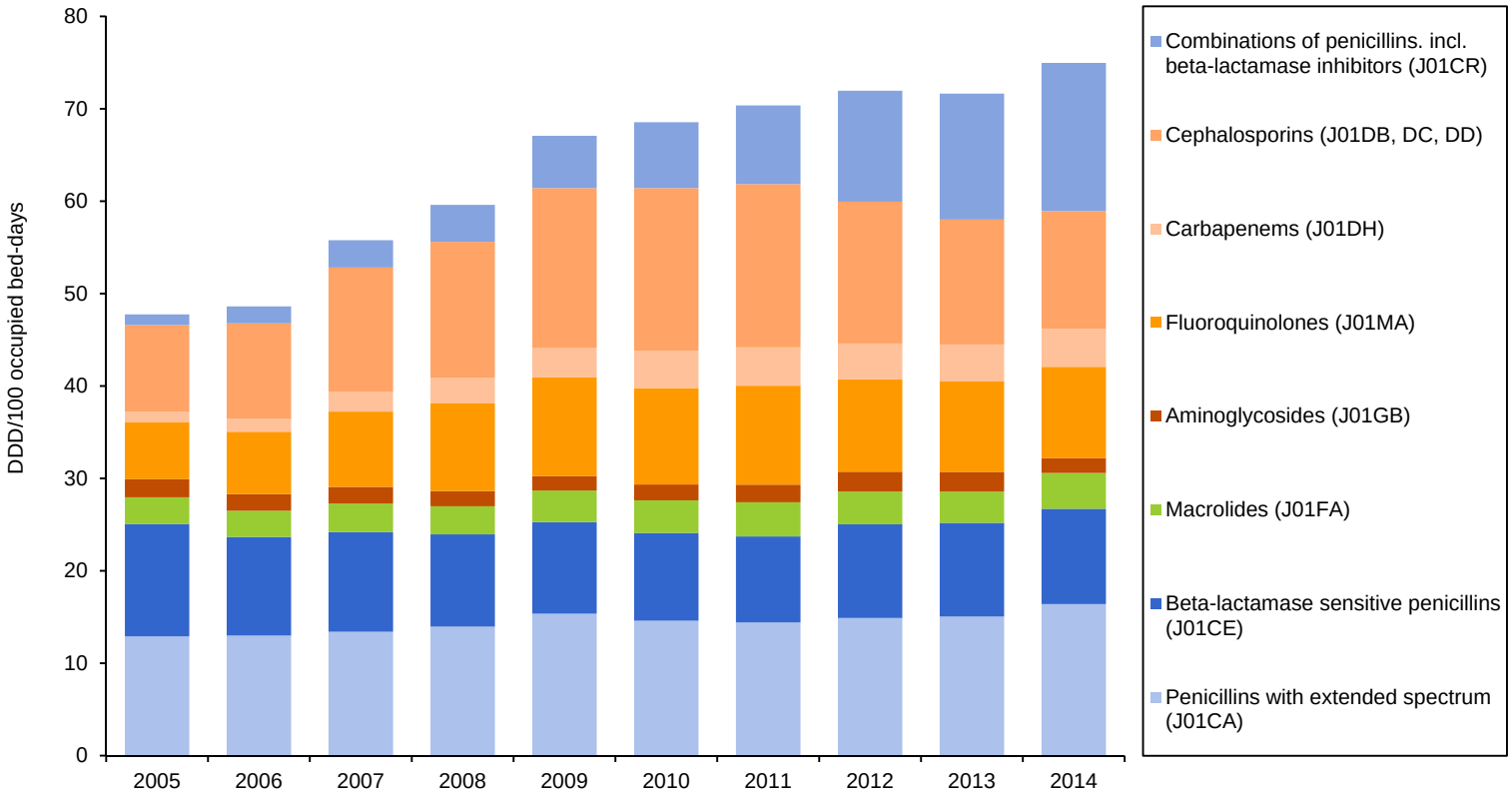


Figure 5.9. Total somatic hospital consumption (DBD) by leading groups of antimicrobial agents (J01), Denmark

Total antimicrobial consumtion for humans

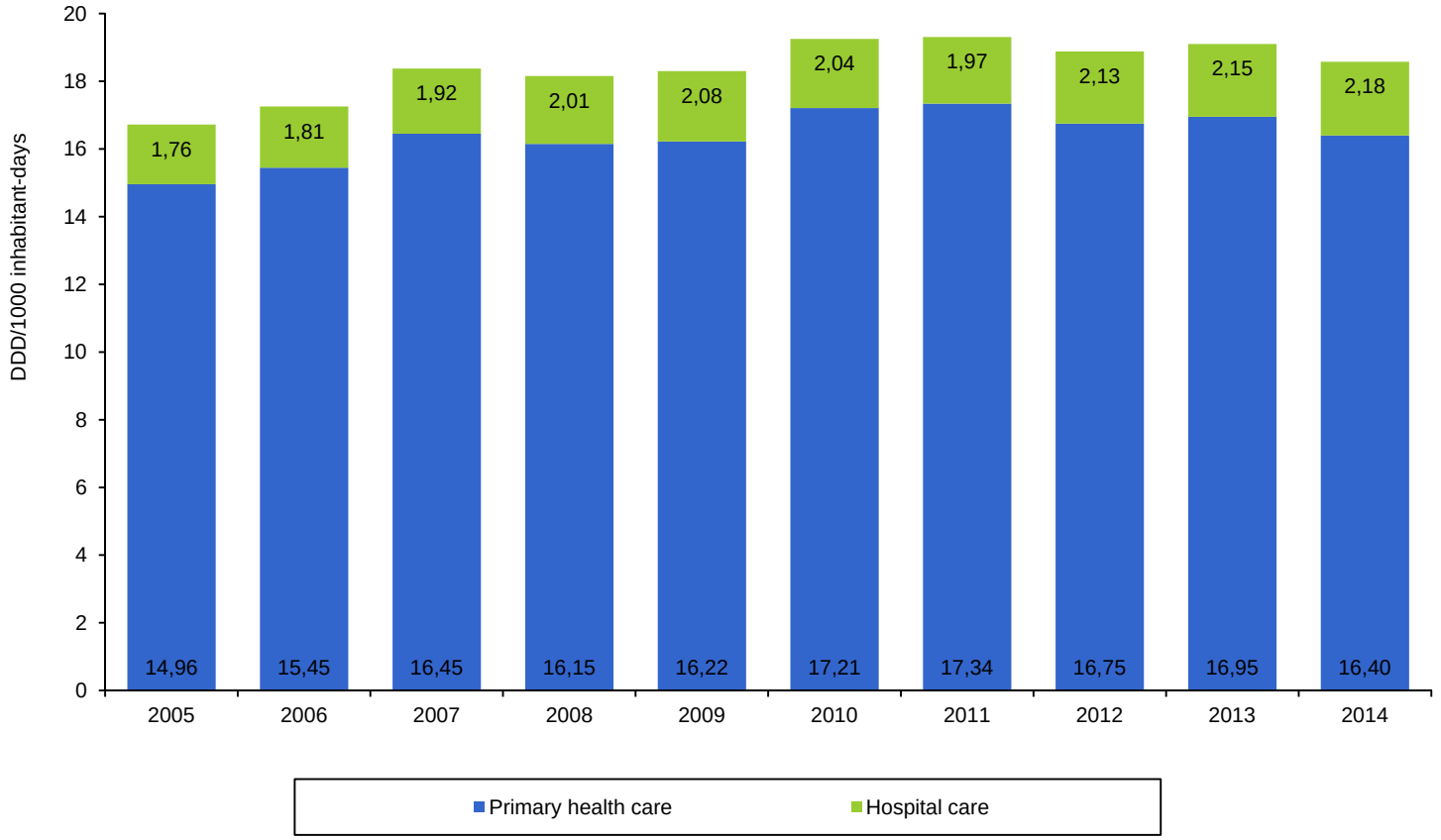


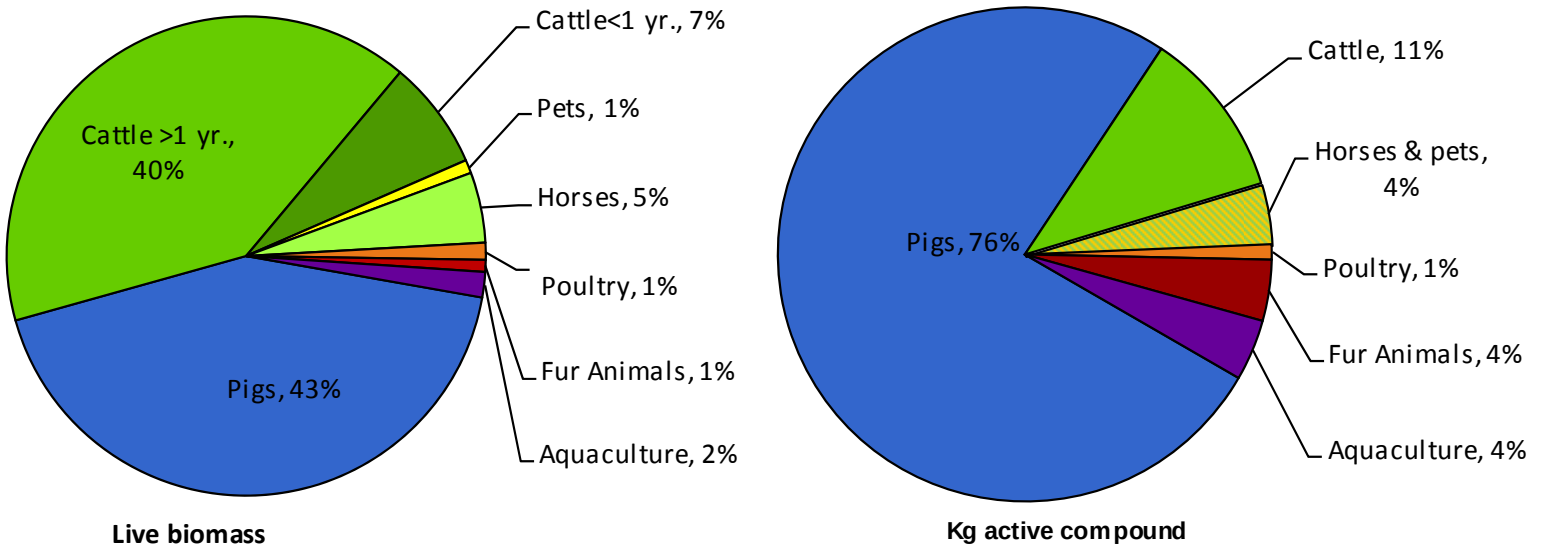
Figure 5.1. Total consumption of antimicrobial agents (J01) in humans by sector, Denmark

Source. DANMAP 2014

Antimicrobial consumption – animals, DK, 2014

Total veterinary consumption in tonnes (114) in 2014; 2% reduction compared to 2013

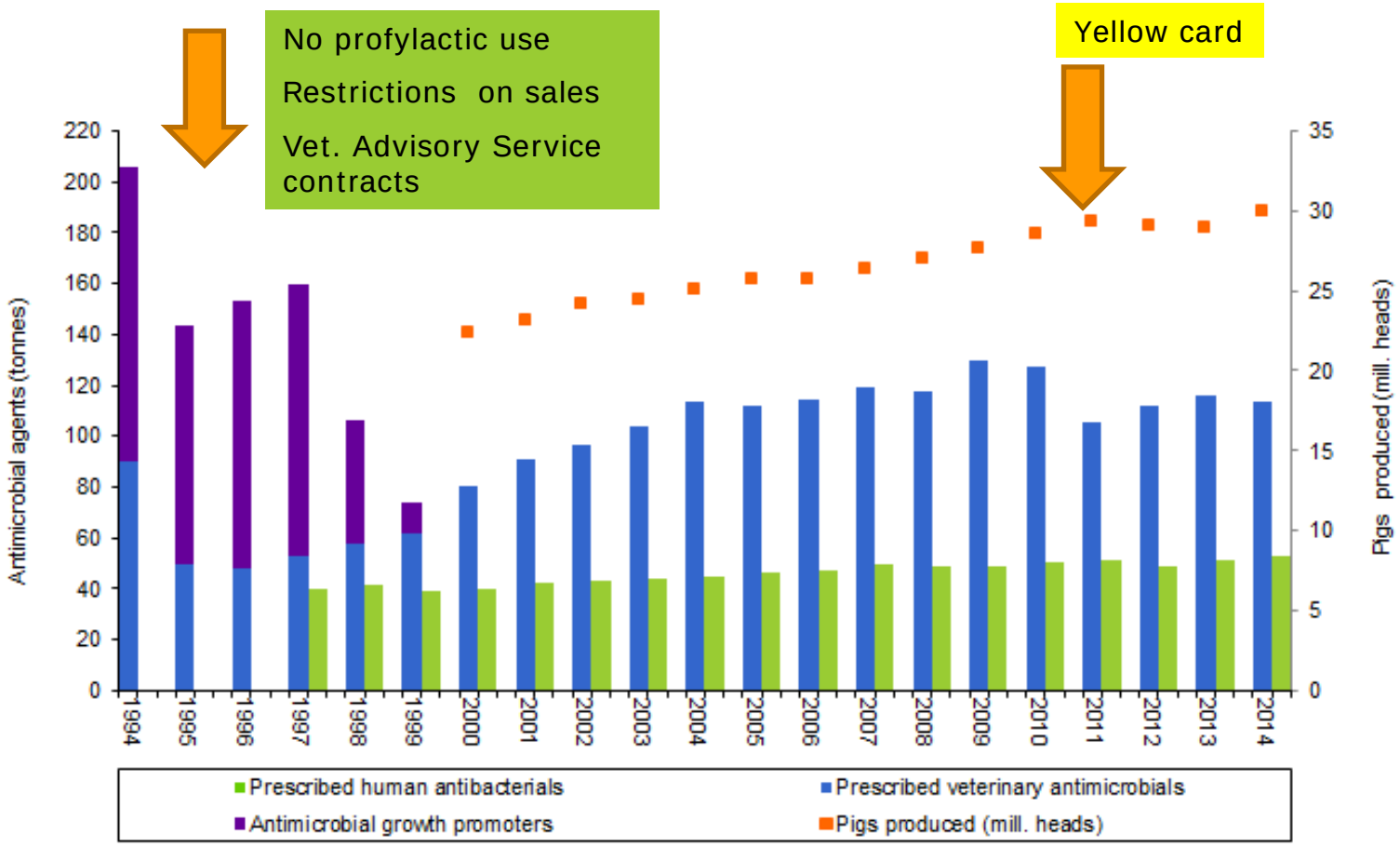
DANMAP 2014



Figur 4.2. Live biomass (mill kg) and antimicrobial consumption (kg) in main animal species, Denmark

Note: The live biomass is estimated from census data (pigs, cattle and pet animals) and production data (poultry, fur animals, aquaculture). For poultry: the figures comprise only the biomass for the main production types (turkey and broiler production). The live biomass estimates for cattle, broiler, turkey, fur animals, aquaculture and pet animals based on 2012 data. The estimation procedures are described in Chapter 9.

Antimicrobial consumption in Denmark 1990-2014



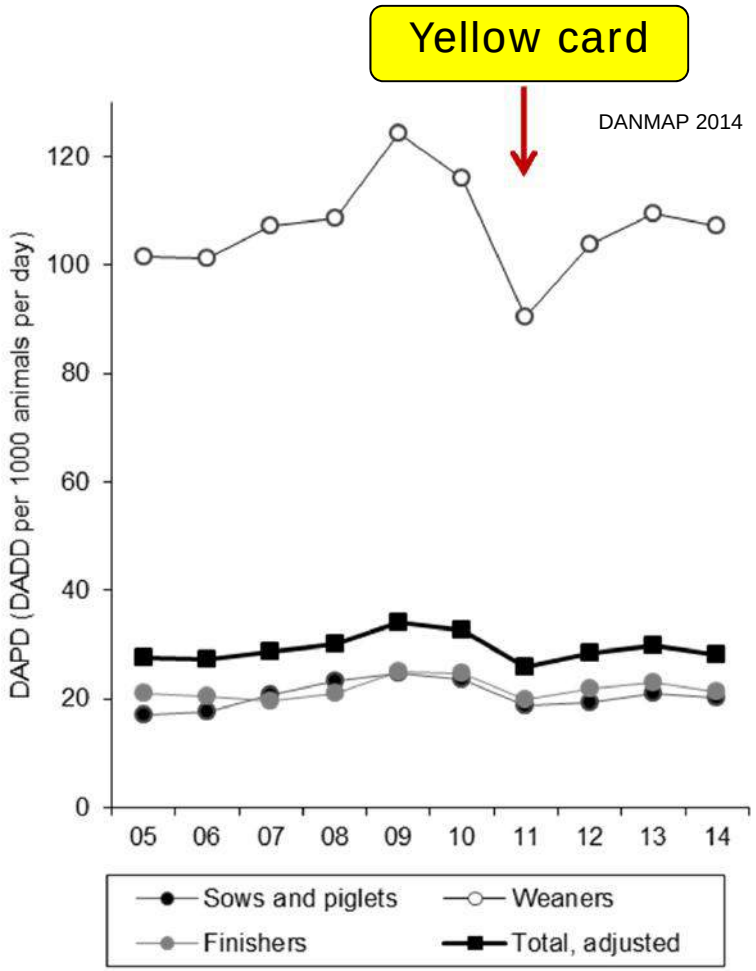
Source. DANMAP 2014

Antimicrobial consumption in pigs

Consumption 14 % compared with 2009

- Total consumption in pigs reduced by 5% (DAPD).
  - 2% weaners
  - 7% slaughterpigs
  - 5% sows and piglets
  - Same levels as in 2008

- Most frequently used :
  - tetracyklines, penicillines, pleuromutilines, makrolider
  - Reduction mainly caused by a reduced usage of tetracyklines and to a lesser extent reduced use of pleuromutilines and makrolides



Source. DANMAP 2014

Consumption of critically important antimicrobials in pigs and cattle

- 3. and 4. generation cephalosporines:
  - Pigs: reduced to almost zero (3-4 kg).
  - Cattle: reduced since 2008:
    - Intramammary (4kg)
    - systemic (29kg)
    - Voluntary stop, July 2014
  - Poultry: intet forbrug

- Fluoroquinolones (19 kg):
  - Ca. 47% (9 kg) pets
  - Pigs (4 kg)
  - Fur animals (mink) (almost zero)
  - Horses (6 kg)

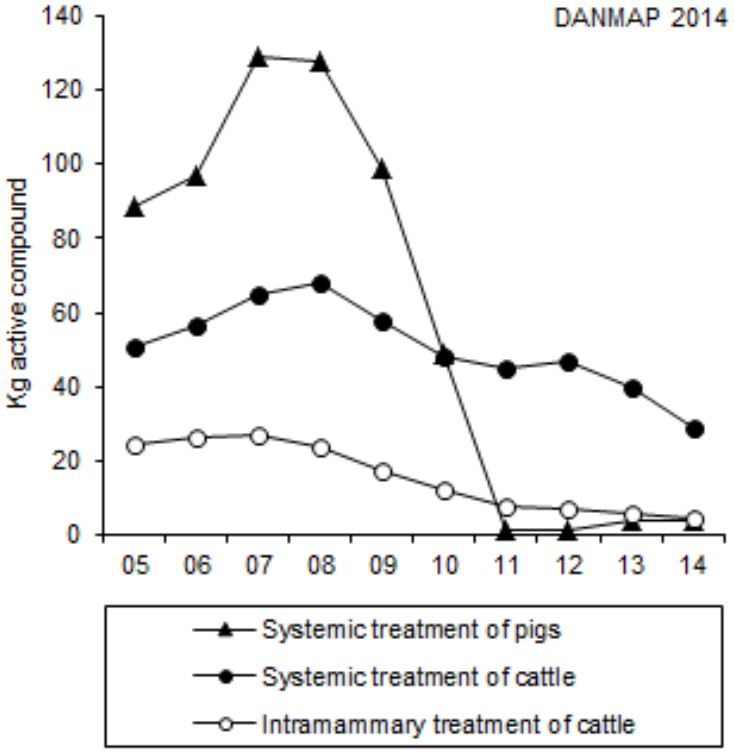
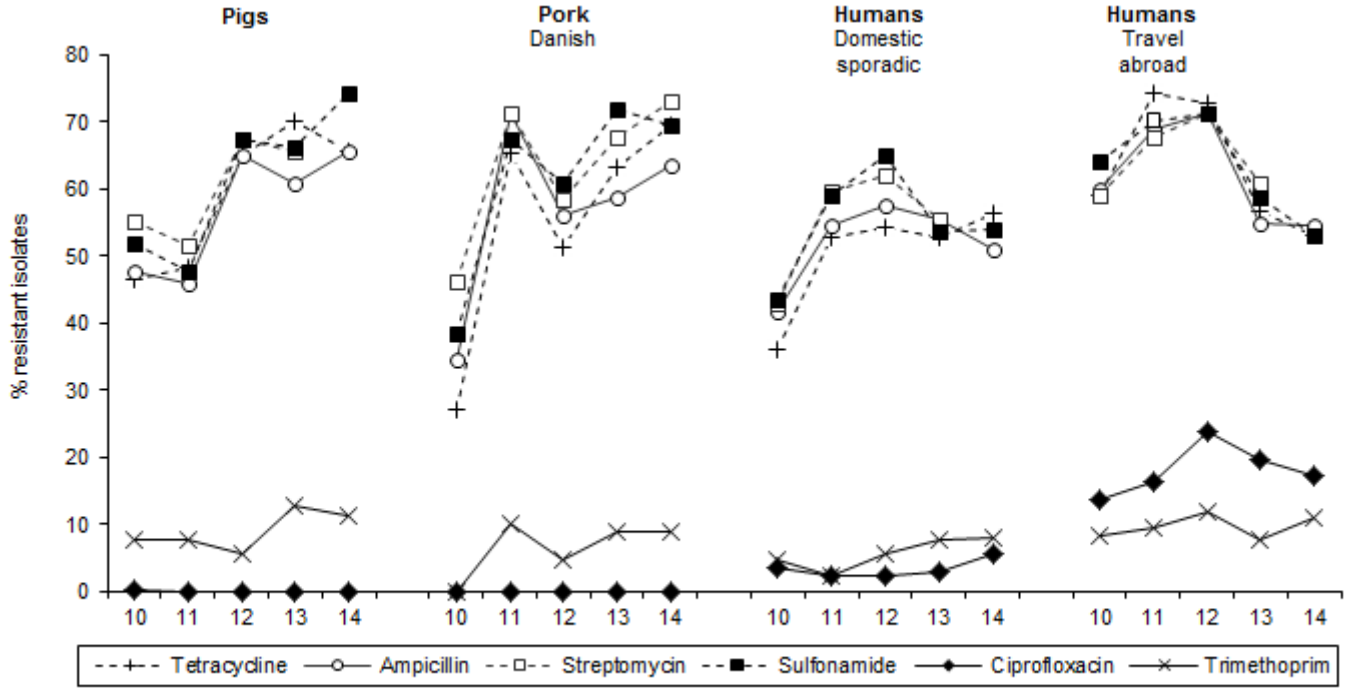
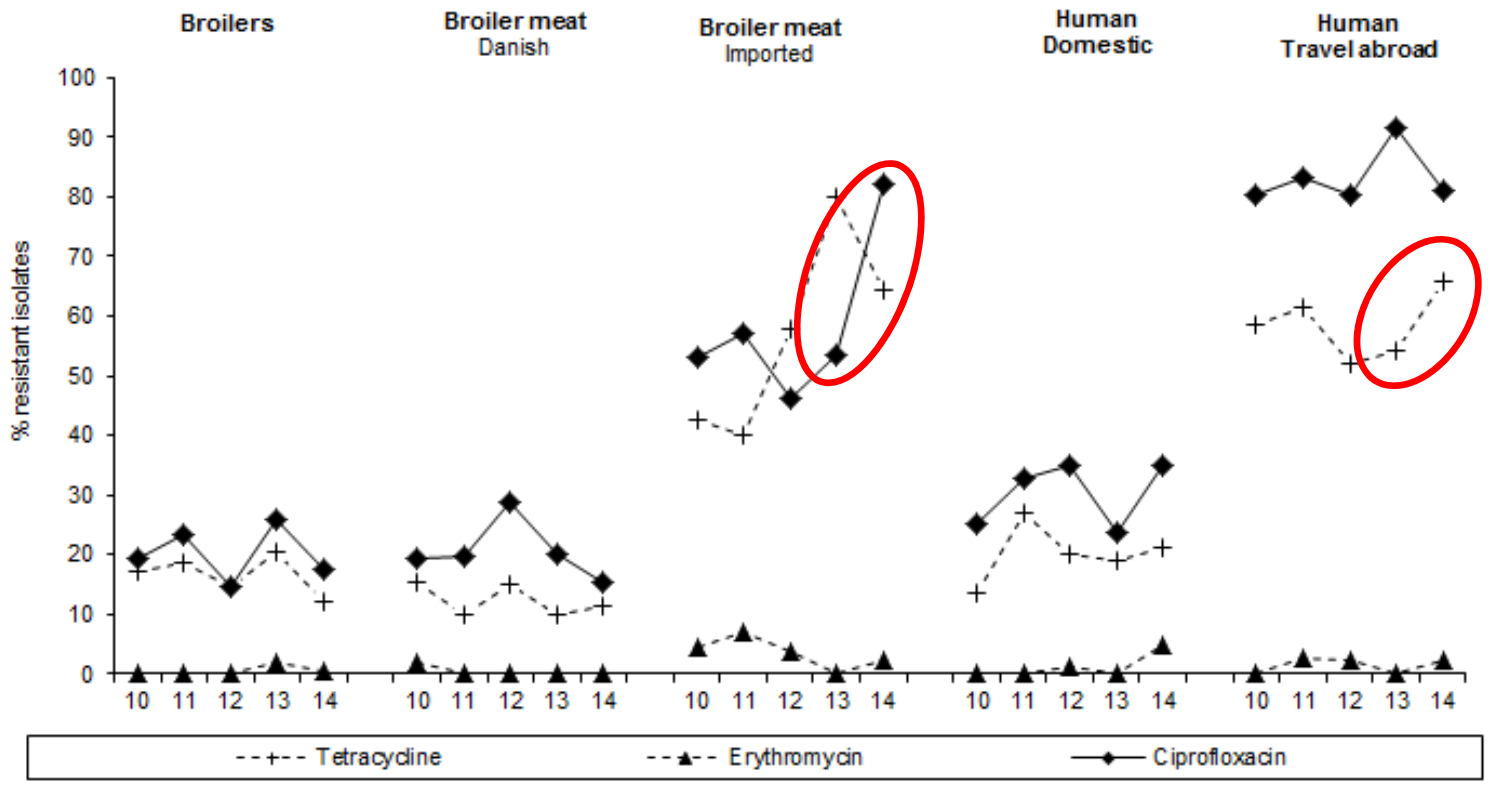


Figure 4.5. Consumption of 3rd and 4th generation cephalosporins in pigs and cattle, Denmark

Antimicrobial resistance – S. Typhimurium *in pigs, pig meat and humans, 2010-2014*



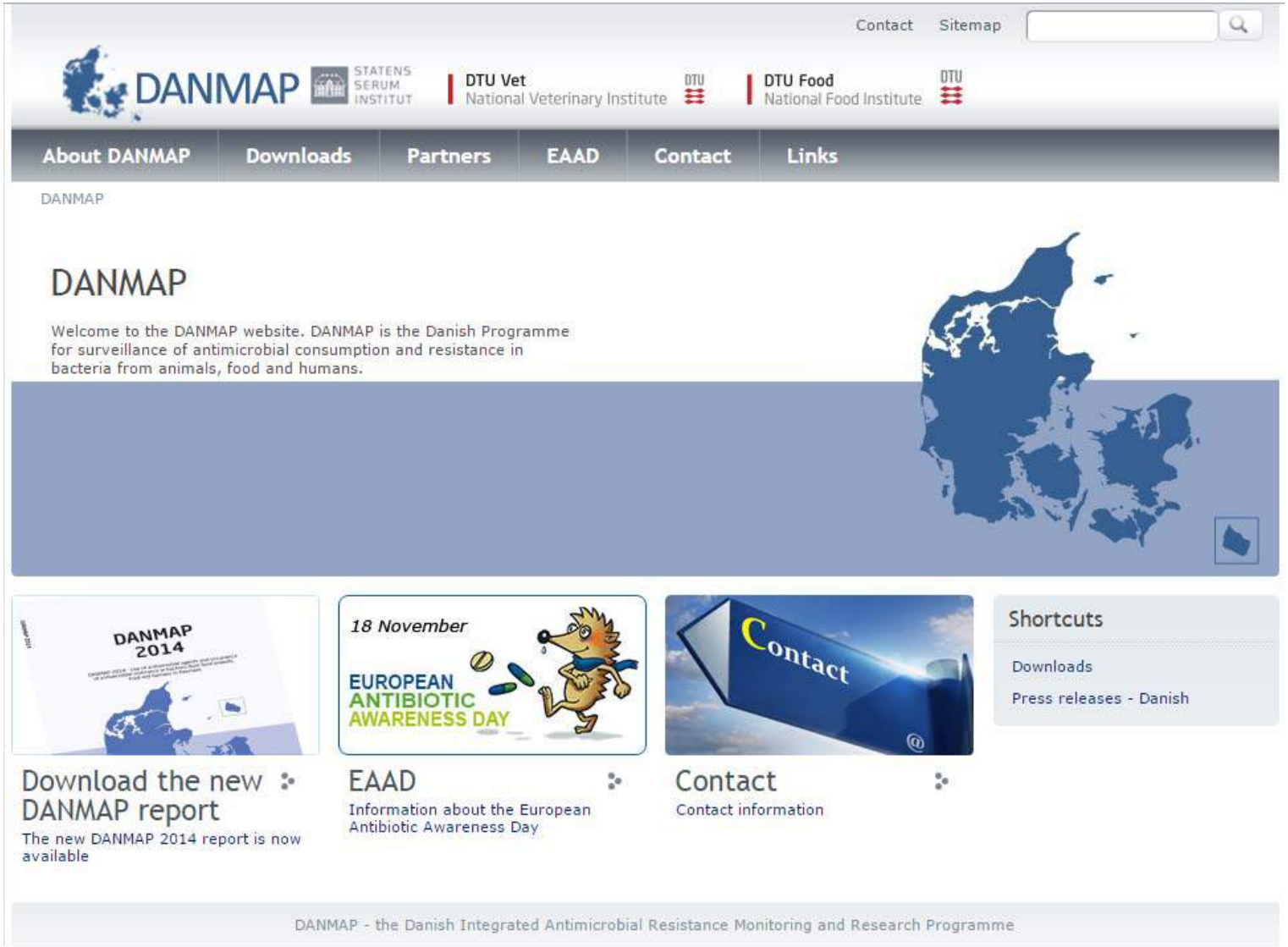
Antimicrobial resistance – C. Jejuni in broiler, broiler meat and humans, 2010-2014



Communication of data

- The DANMAP report is sent to a large number of people both in and outside of Denmark
- Press releases (3-4) are made from the new report every year
- Data are reported in EPI-News
- A yearly symposium on the European Antibiotic awareness day (Nov 18th)
- Two half yearly meetings with the microbiologists at the hospital labs
- Data are used for the EFSA/ECDC, EARS-Net (ECDC) and WHOnet

DANMAP website – www.danmap.org



SWEDRES2004

A Report on Swedish Antibiotic Utilisation and Resistance in Human Medici

STRAMA

2003

NORM
NORM-VET

Usage of Antimicrobial Agents and Occurrence of Antimicrobial Resistance in Norway

ance Surveillance System

EUROPE
into the New Millennium

rence
n Europe

Coordination Committee (BAPCOC)

NETHMAP
2005

Consumption of antimicrobial agents and antimicrobial resistance among medically important bacteria

GERMAP 2008

Antibiotika-Resistenz und -Verbrauch

Bericht über den Antibiotikaverbrauch und die Verbreitung von Antibiotikaresistenzen in der Human- und Veterinärmedizin in Deutschland

onsumption

Challenges – Dataflow – example from the veterinary side

Raw data

- DVFA data – From LIMS – DVFA DWH - Automated transfer to DTU DWH
- DTU data - From labsystem (ESTER) – DTU Datawarehouse

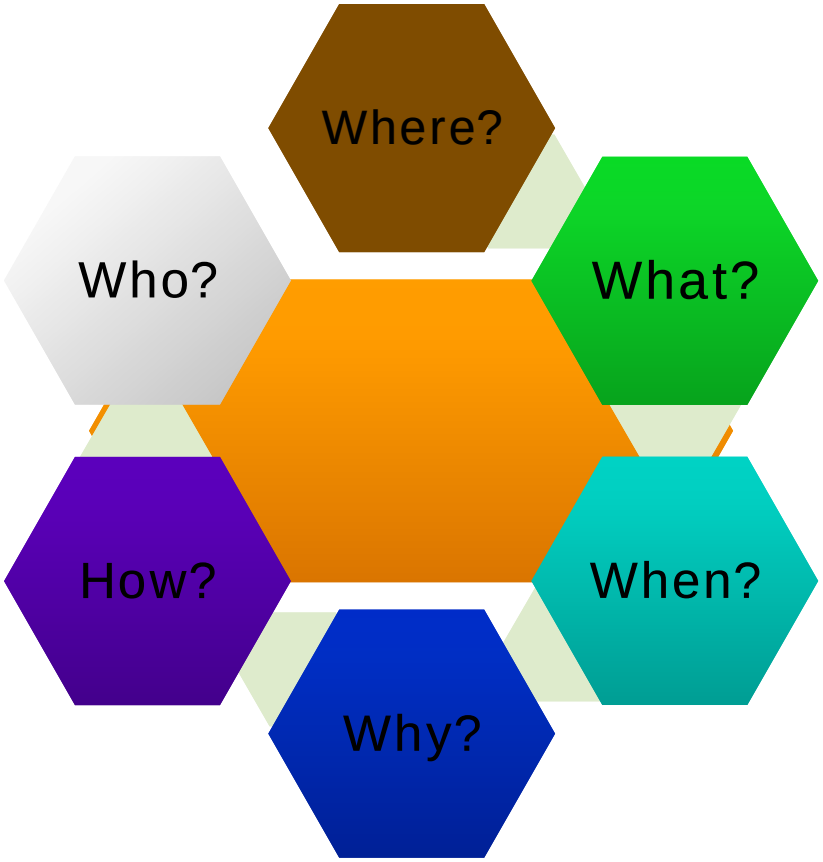
Data validation

- Import into SAS
- Harmonisation of variable and labels to DANMAP format
- Only one isolate/serotype per epidemiological unit
- 2015 merged with historic DANMAP datasets stored in Oracle

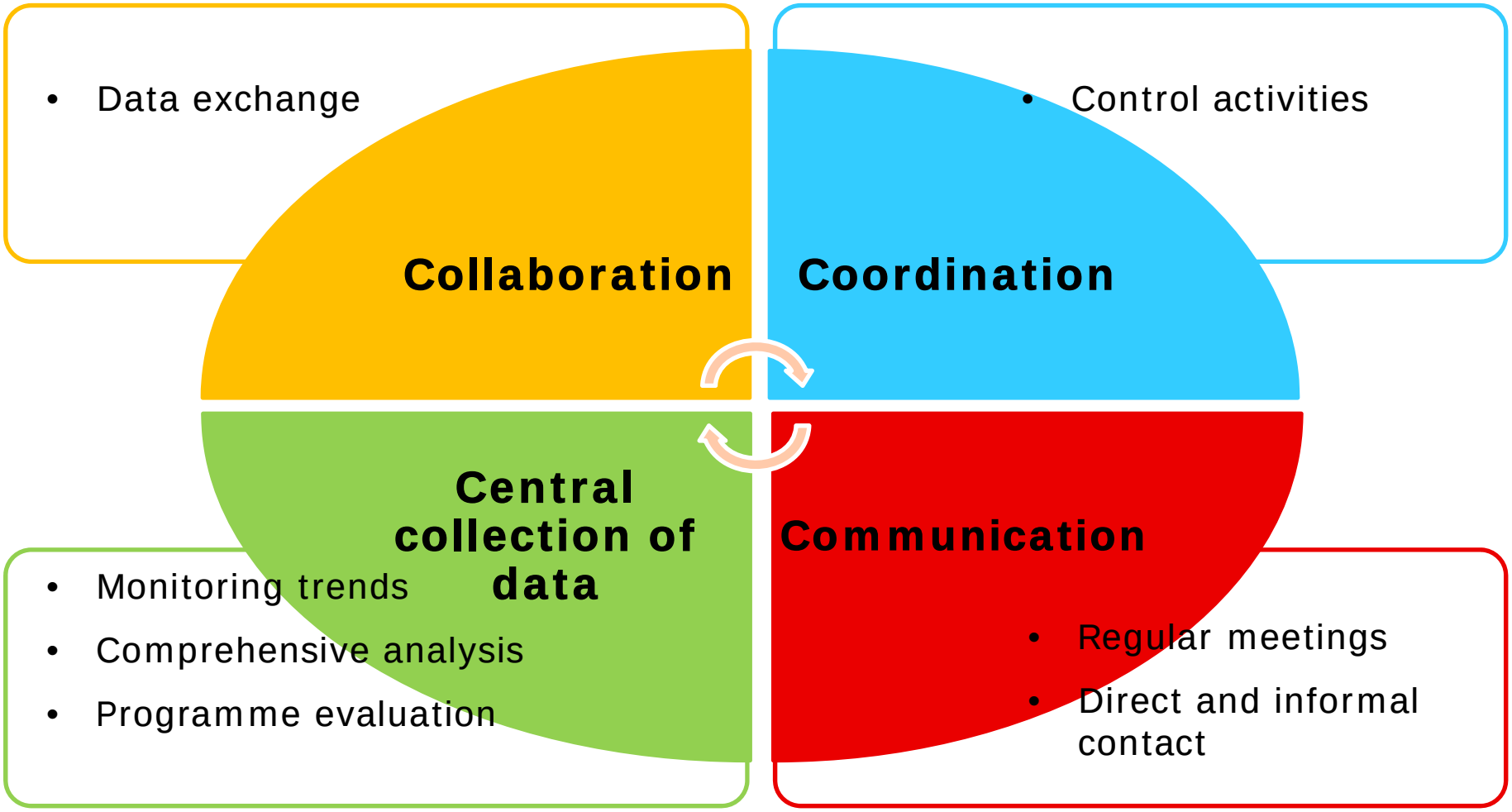
Data transmission

- Loading of EFSA catalogues and pick lists in web application and XML functions
- Mapping of metadata – translation between DANMAP format and EFSA XML codes
- EFSA XLM codes for metadata, MIC ranges and EFSA cut-offs added to the Oracle dataset
- Validation and submission to EFSA via through Data Collection Framework

Challenges - Data information needs

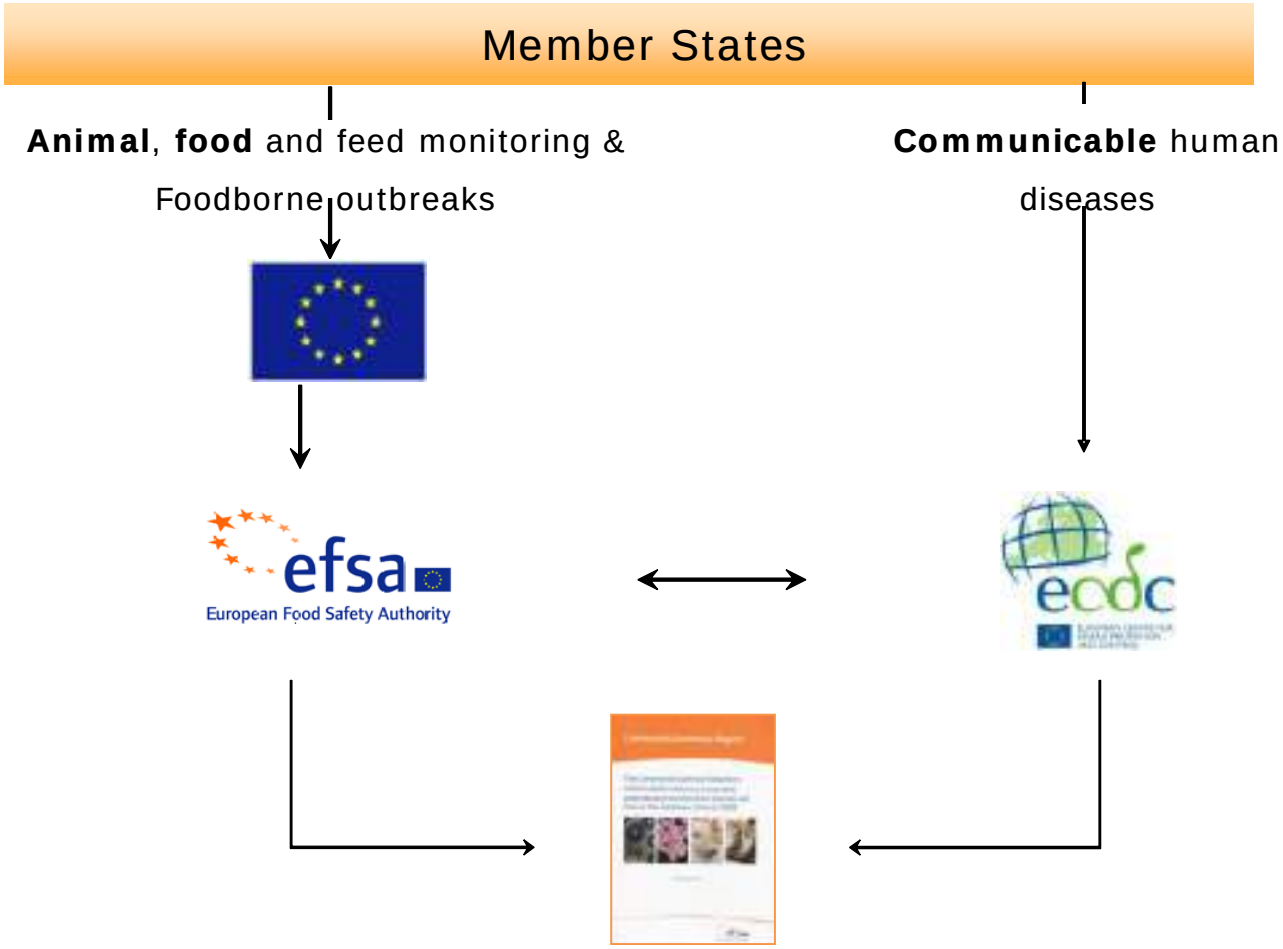


Challenges - the 4 C's of Integrated Surveillance



Reporting – EU level

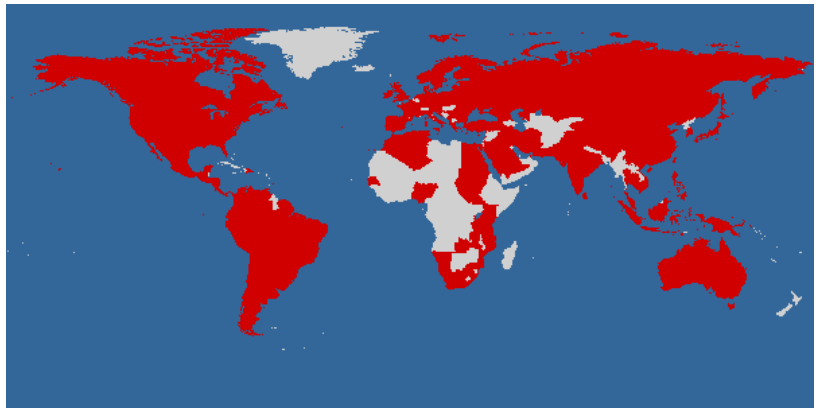
Directive 2003/99/EC (Zoonoses directive)

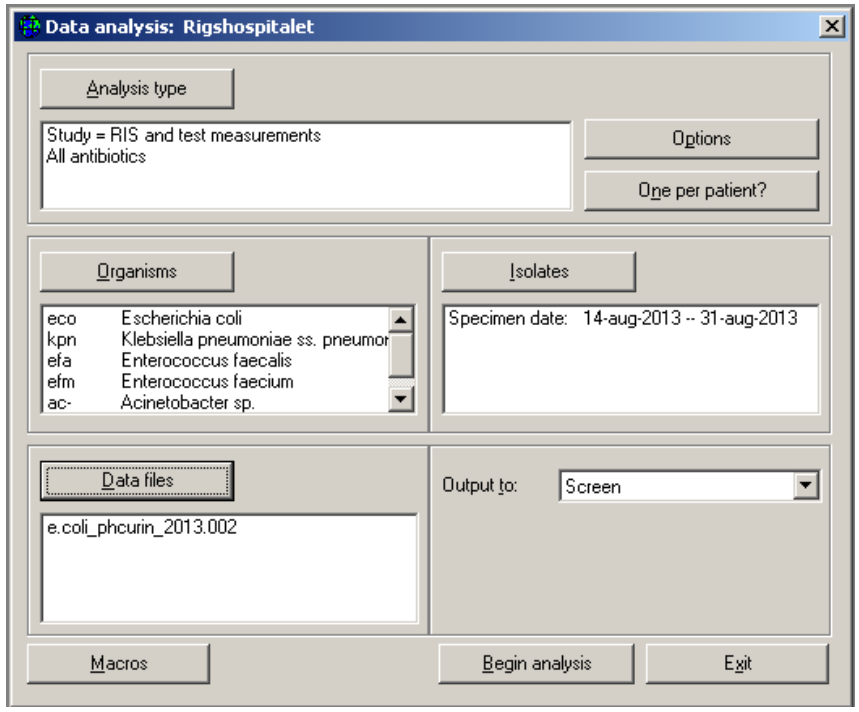


European Antimicrobial Resistance Surveillance - Network

WHONET software for AMR data

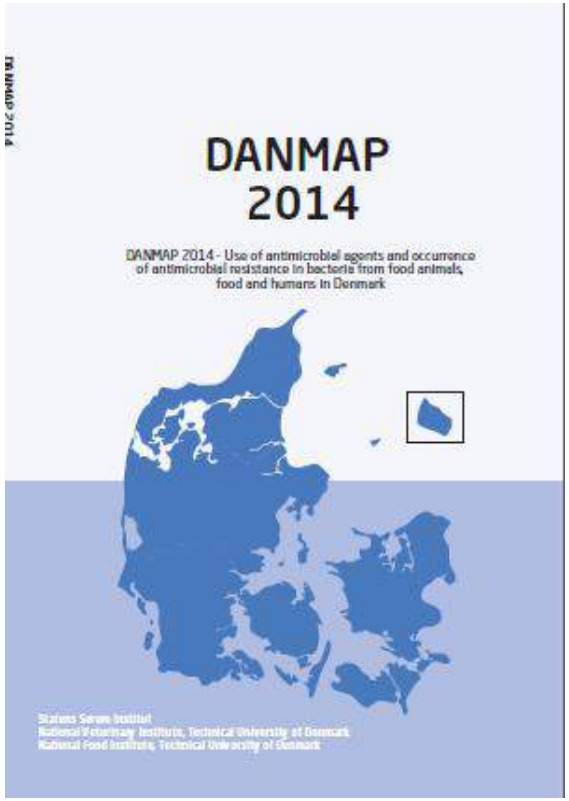
- Free software for analyzing AMR data
- Used all over the world at DCMs and for national surveillance
- Different kinds of analyzes, graphs, cluster alerts, resistance profiles, %RIS, automated analyzes etc.





Concluding Remark

Thank you for your attention!



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