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Implementing a One Health approach: the example of Antimicrobial Resistance – the UK perspective

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Director General, Public and International Health Directorate.
Department of Health

UK

Paris, 30 June 2015

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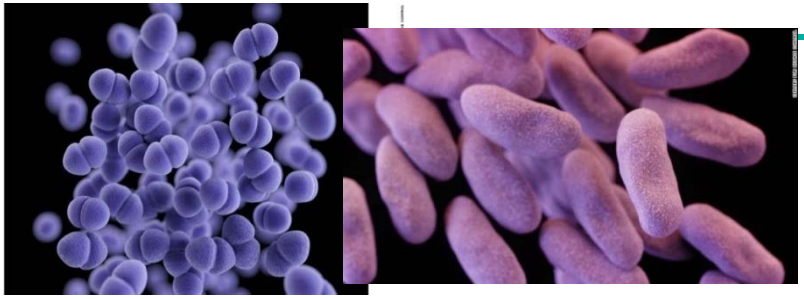
The scale of the threat



- 25,000 people per year in Europe die of infections caused by resistant bacteria. **€1.5 billion** in hospital and societal costs.
- Globally, by 2050 drug-resistant infections could cause **10 million extra deaths a year** and have a cumulative cost of **US$ 100 trillion**.
- 5,000 patients die in the UK of Gram-negative sepsis each year, half with a resistant organism.
- 23,000 deaths/year from sepsis caused by resistant bacteria in United States (a conservative estimate).
- Lack of new classes of antibiotics.

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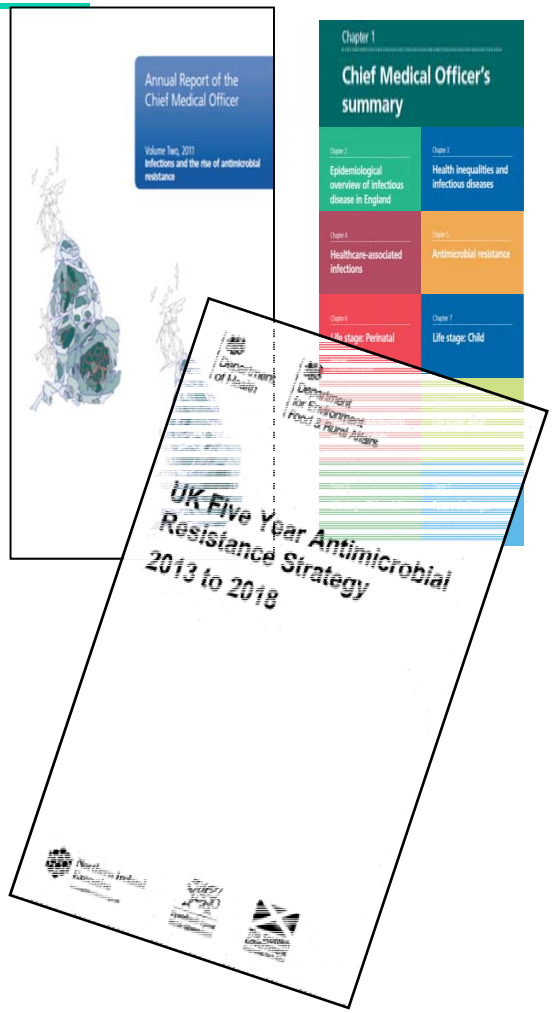
AMR: ONE HEALTH, ONE PROBLEM

- Key goal of the UK five year Antimicrobial Resistance (AMR) Strategy (2013 to 2018) to improve the knowledge and understanding of AMR through cross-professional collaboration in human and veterinary medicine.
- AMR features on the cross-government National Risk Register



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Key aims of the UK strategy

- **PREVENT** (people from being infected – infection prevention and control)
- **PRESERVE** (the antibiotics we have – good stewardship)
- **PROMOTE** (development of new antimicrobials, new approaches, better diagnostics – the independent review by Jim O'Neill)

Underpinned by:

- Surveillance
- R&D
- One Health approach
- International collaboration

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One health: A Comprehensive, Integrated Programme

- Implementing the Strategy: We cannot deliver the actions alone.

- Contributions secured across several sectors:

  - ❑ Human Health and Social Care;
  - ❑ Livestock, food retail and veterinary;
  - ❑ Research councils, academics institutions;
  - ❑ The pharmaceutical industry.

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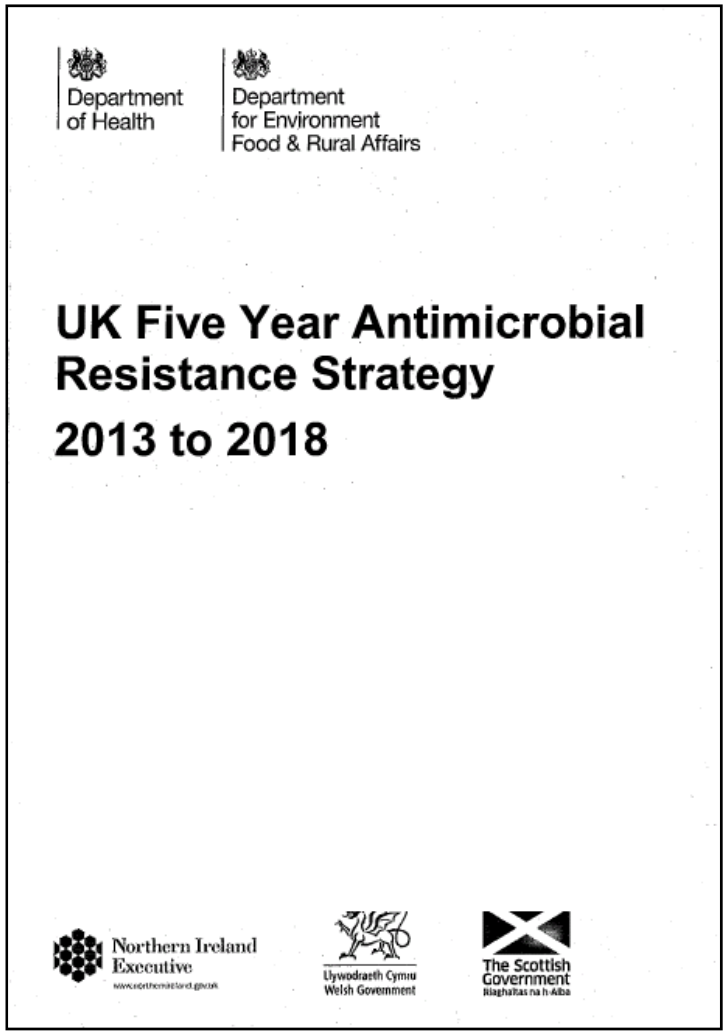
SEVEN KEY AREAS: NATIONAL ACTION

1. Improving infection prevention and control practices in human and animal health
2. Optimising prescribing practice
3. Improving professional education, training and public engagement
4. Developing new drugs, treatments and diagnostics
5. Improving use of surveillance data
6. Improving identification and prioritisation of AMR research
7. Strengthening international collaboration



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We have clear outcome measures

- Trends in changes in resistance in key infections;
- Improvement in knowledge of antimicrobials and their use;
- Address use of antibiotics in animals – in particular, the Critically Important Antibiotics (CIAs),
- Global alignment in addressing AMR.
- Improvements in the quality of prescribing in primary and secondary care compared to baseline.
- Explicit aims - first annual report and implementation plan published in December 2014.

Antimicrobial Prescribing, England

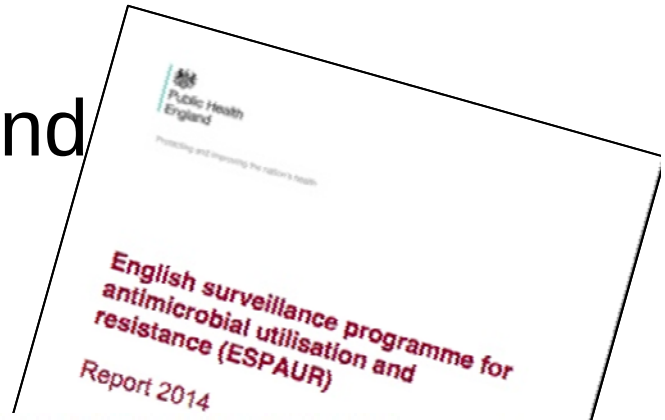

Table ES.2. Summary of total antibiotic use in England and comparisons with Europe

Antibiotic group	England 2013 (DDD per 1000 inhabitants per day)	England 2013 compared to England 2010	Europe 2011 (Median DDD per 1000 inhabitants per day)
Penicillins	13.7	↑	10.4
Other β-lactam antibacterials	0.6	↓	2
Tetracyclines	4.9	↑	2.2
Sulfonamides and trimethoprim	1.9	↑	0.5
Macrolides & similar	4.1	↑	3
Quinolones	0.6	↓	1.5
Other	1.7	↑	1.7
Total	**27.4**	↑	**21.3**

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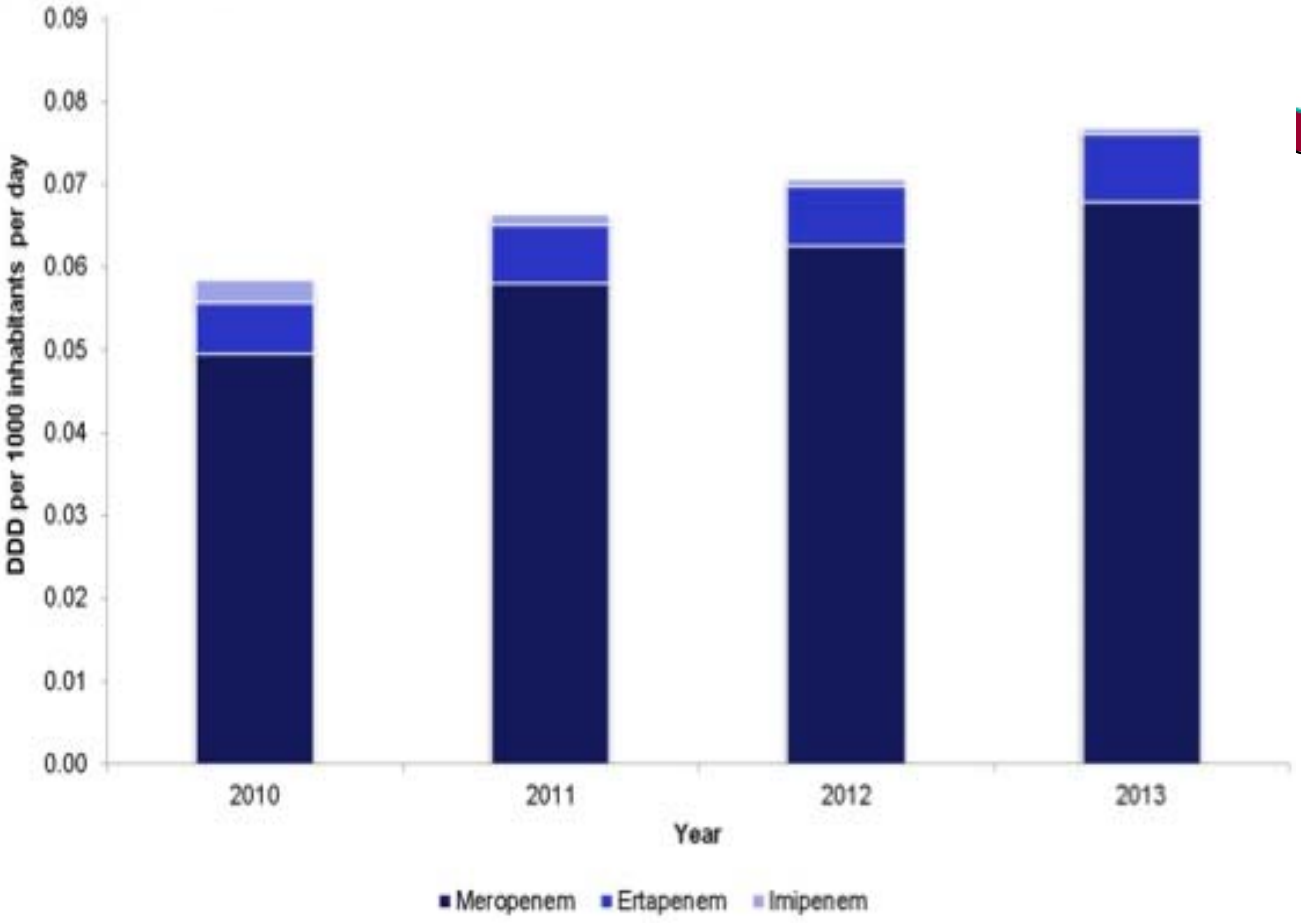
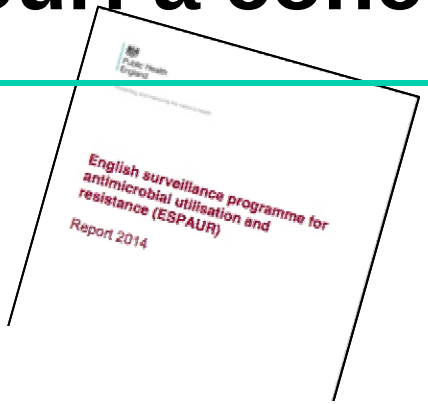
Prescribing behaviour: a concern

Antibiotic prescribing is increasing: Carbapenem usage





- Carbapenems = 0.3% of total antibiotic consumption in 2013
- BUT use increased by 31.3% in England between 2010 and 2013
- Mostly in the hospital sector, <1% in primary care.
- Meropenem = 89% of carbapenem use

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We want to change behaviour

Knowledge → Attitude → Behaviour

Goal: Improving antimicrobial stewardship and conserving existing treatments

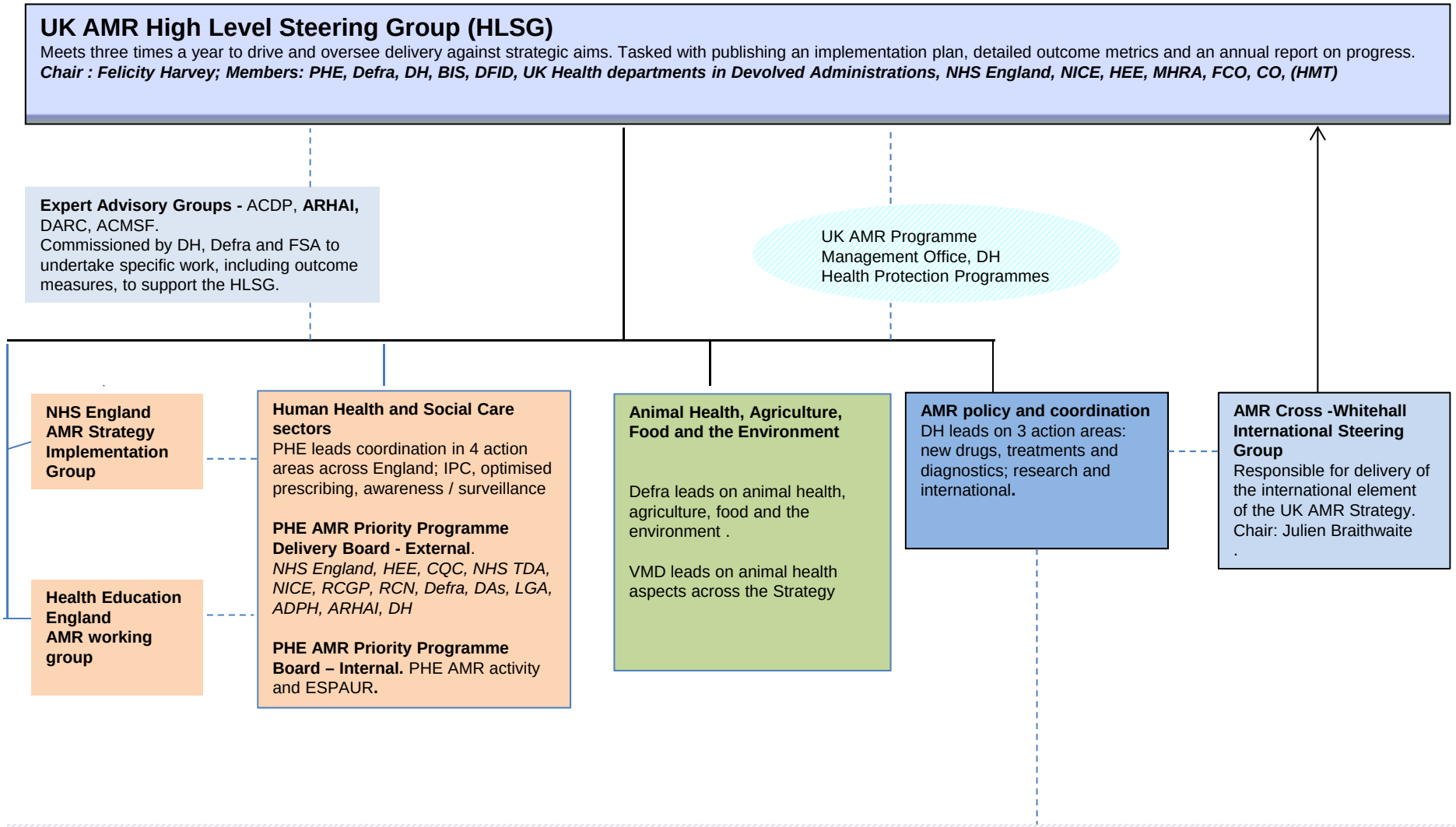
- ***Professionals****:* improving prescribing practices

  Primary care: GP prescribing

  Secondary care: hospital prescribing

- ***Public****:* improving understanding about appropriate antibiotic use

UK 5 year AMR strategy implementation programme, structure chart



DARC – Defra antimicrobial resistance coordination group; ACDP - Advisory Committee on Dangerous Pathogens; ARHAI – Advisory Committee on Antimicrobial Resistance and Healthcare Associated Infection; ACMSF – Advisory Committee on Microbiological Safety of Food; ESPAUR – English Surveillance Programme for Antimicrobial Usage and Resistance;

O'Neill: Five steps to be taken *now*

INDEPENDENT REVIEW COMMISSIONED BY THE PRIME MINISTER, JULY 2014 TO REVITALIZE ANTIBIOTIC DISCOVERY – FOCUSED ON ECONOMICS.

1. **Set up a global AMR innovation fund to boost the number of early research ideas:** Too many good ideas are not being pursued for lack of funding.

2. **Make existing drugs go further:** dosing or combining them with other agents or other antimicrobials could slow down the spread of drug resistance.

3. **Support the development and use of relevant diagnostic technologies:** if we had the right diagnostics, more patients would receive the right antibiotic to treat their infection, but fewer antibiotics would be prescribed unnecessarily.

4. **Attract and retain a high calibre skills base.** Invest in the people who will solve the problem.

5. **Modernise the way surveillance of drug resistance is done and used globally:** improve access to real time global-scale surveillance information.

Review on Antimicrobial Resistance

Tackling drug-resistant infections globally

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Turning the tide in the UK : human and animal health

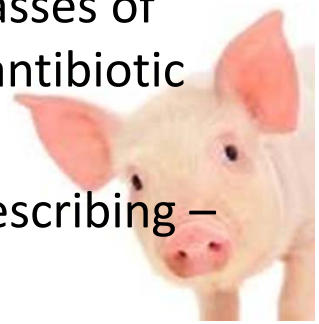
So where do we want to get to?

Human health

- We aim to return antibiotic prescribing to 2010 levels in primary care and 2012 levels in secondary care. Changes will be measured in 2014/15 by:
- In **Primary Care** – the total antibiotic consumption, and proportion of antibiotics prescribed from the cephalosporin & fluoroquinolone classes;
- In **Secondary Care** - the total antibiotic consumption per annum and total carbapenem antibiotic consumption per annum.

Animal health

- Reduce antimicrobial use in livestock production in real terms over the next four years;
- Ensure that sales of fluoroquinolone and modern cephalosporin classes of antibiotics remain low and reduce further as a proportion of total antibiotic sales;
- Improve prescribing by focussing on measuring changes in total prescribing – particularly in terms of the Critically Important Antibiotics.



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The global perspective: UK action

Participating on AMR work in a wide range of international forums. We:

- Champion new work to implement the new WHO AMR Global Action Plan in a way which applies a “One-Health” approach,

- Influence further tripartite working with the OIE and FAO to deliver actions that will support of the One-Health approach,

- Develop the Commonwealth laboratory twinning initiative between higher and lower income countries to contribute to strengthening control of AMR, and Contribute to the Global Health Security Agenda.

- Good communication and collaboration between countries is critical!

Ministerie van Economische Zaken

Use of Antibiotics in Livestock

The Dutch Policy

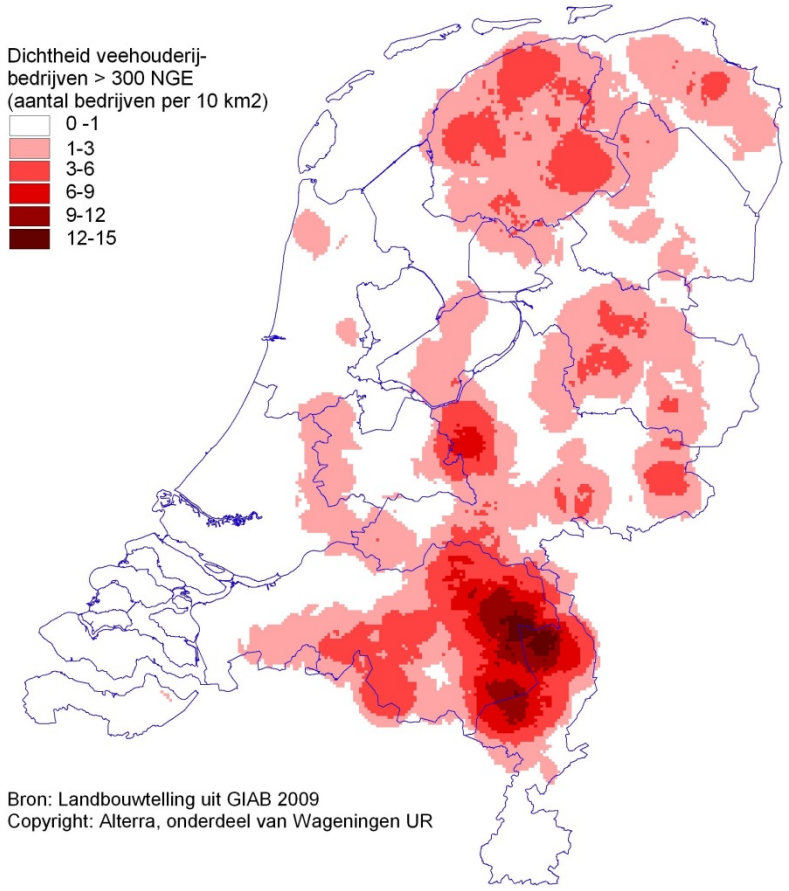
Christianne Bruschke
Chief Veterinary Oficer

Livestock production in The Netherlands

- 4 million cattle
- 12 million swine
- 325.000 horses
- 1,5 million sheep and goats
- 100 million poultry

share 34,000 sq km land

- with 17 million people



Antibiotic reduction policy

Primary motivation reduction policy in public health: low level of AMR in human population

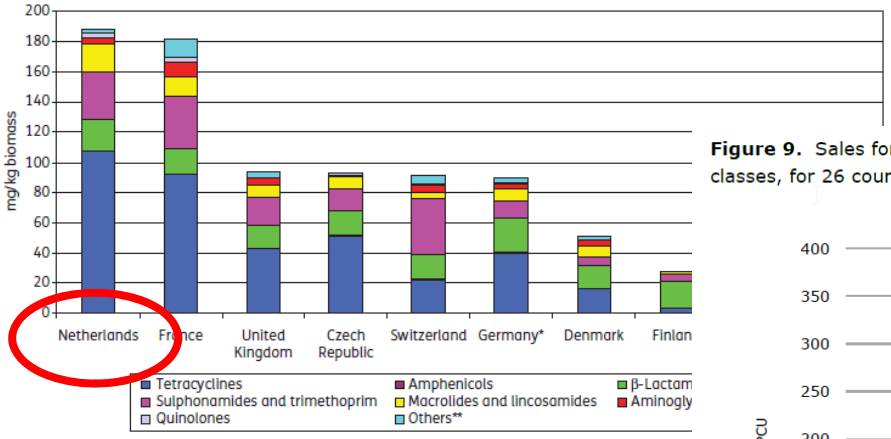
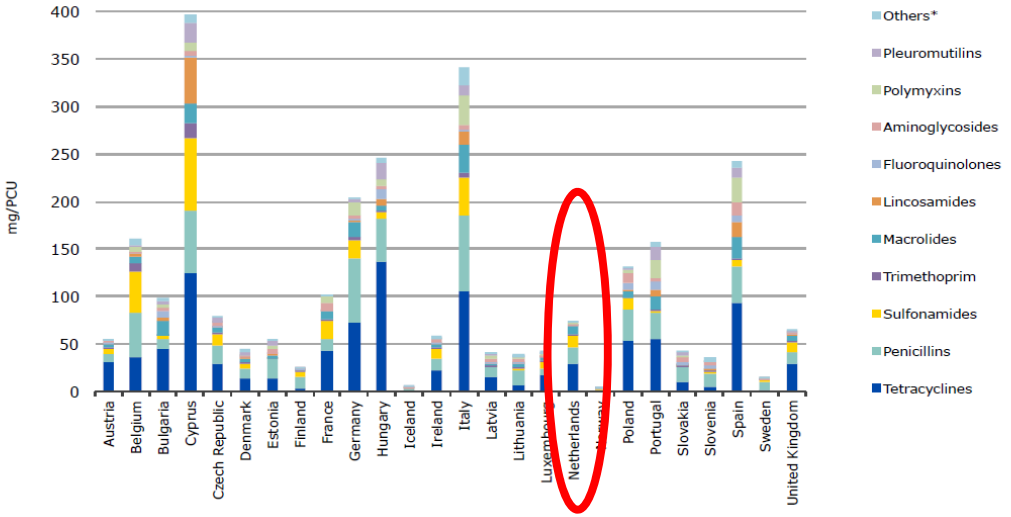


Figure 1. Amounts, in mg, of veterinary antibacterial agents sold in 2007 per kg biomass of pig meat, poultry m estimated live weight of dairy cattle. *2005 data. **The substances included vary from country to country.

Figure 9. Sales for food-producing species, including horses, in mg/PCU, of the various veterinary antimicrobial classes, for 26 countries in 2012[1]

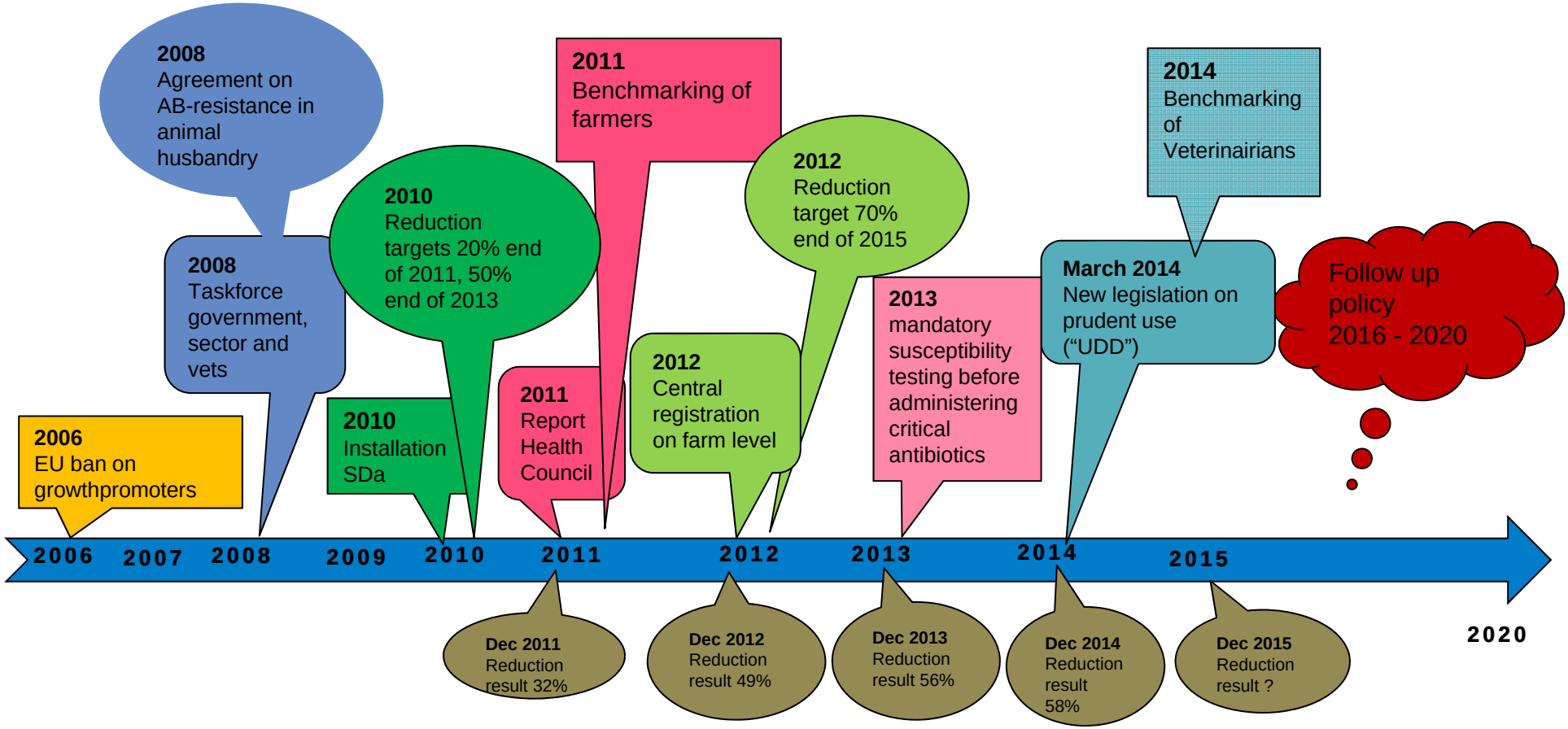


* Amphenicols, cephalosporins, other quinolones and other antibacterials (classified as such in the ATCvet system). [1] Differences between countri can partly be explained by differences in animal demographics, in the selection of antimicrobial agents, in dosage regimes and in type of data sources, among other factors.

Key elements of antibiotic reduction policy

- self-regulation, responsibility where it belongs
- Transparency
- Independent monitoring and benchmarking
- Political will (e.g. reduction targets: -20%, -50%, -70%)

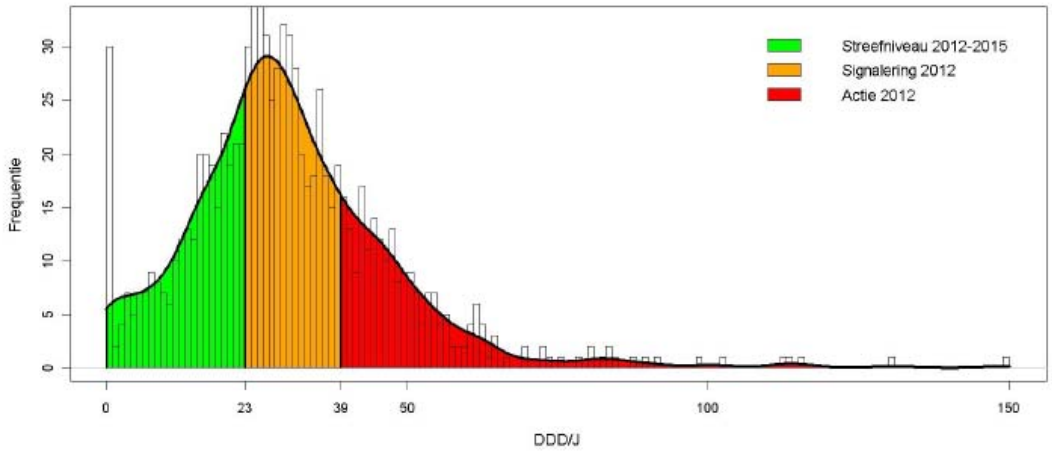
Timeline


2008
Agreement on AB-resistance in animal husbandry
2008
Taskforce government, sector and vets
2010
Reduction targets 20% end of 2011, 50% end of 2013
2011
Benchmarking of farmers
2012
Reduction target 70% end of 2015
2014
Benchmarking of Veterinairians
2006
EU ban on growthpromoters
2010
Installation SDa
2011
Report Health Council
2012
Central registration on farm level
2013
mandatory susceptibility testing before administering critical antibiotics
March 2014
New legislation on prudent use ("UDD")
Follow up policy 2016 - 2020
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2020
Dec 2011
Reduction result 32%
Dec 2012
Reduction result 49%
Dec 2013
Reduction result 56%
Dec 2014
Reduction result 58%
Dec 2015
Reduction result ?

Benchmarking approach

Example: frequency distribution of ADD/Y

red: immediate action required by vet and farmer
orange: attention required
green: no specific action

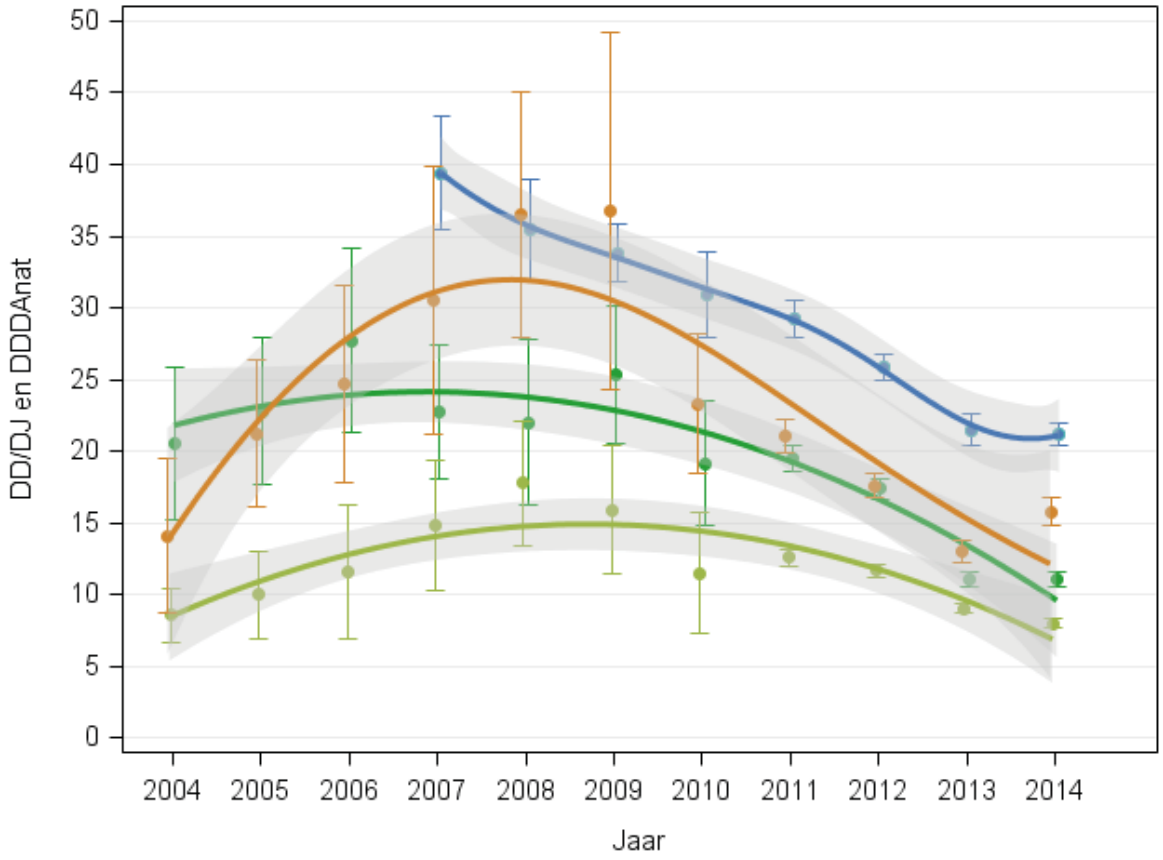


Results benchmarking 2012-2014

Shifts in the proportion of livestock farms in the various benchmark zones between 2012 and 2014

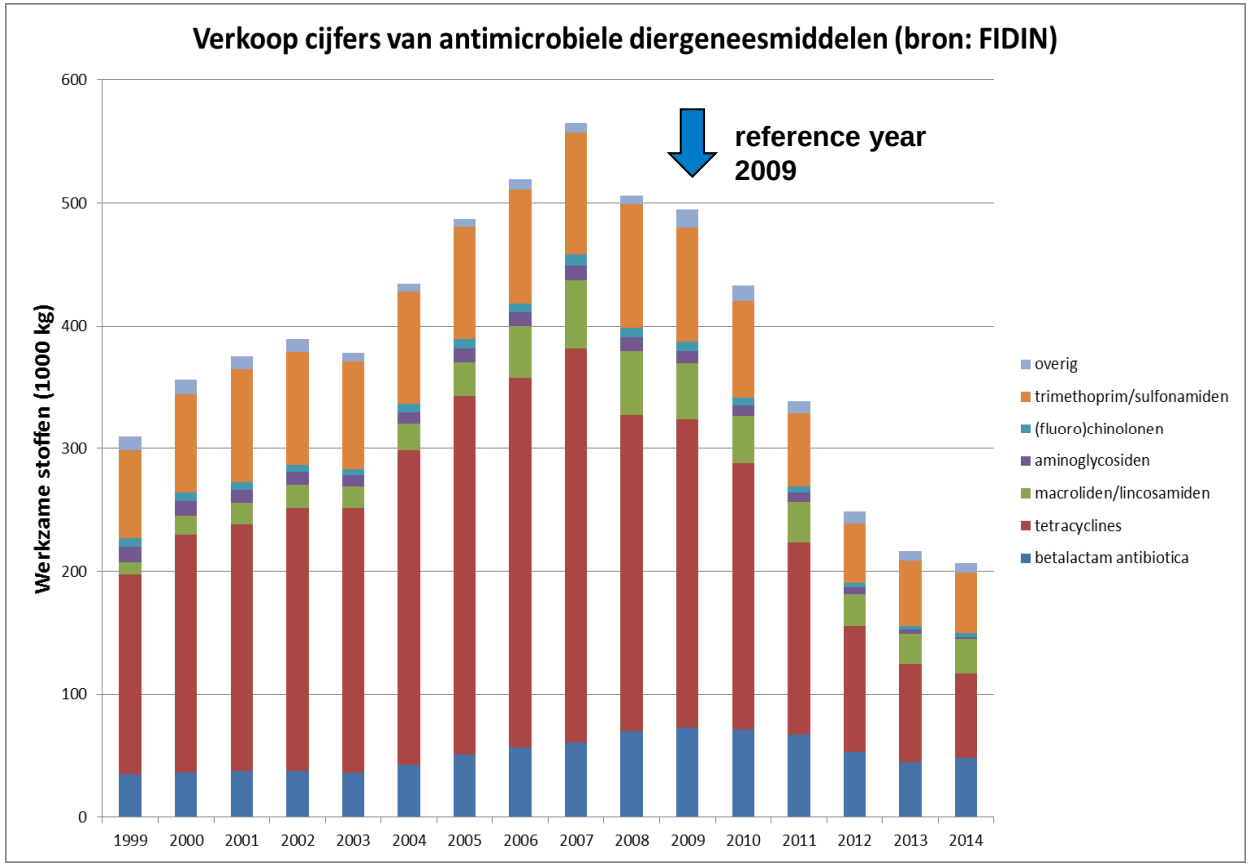
Type of Livestock	Type of livestock farm	Target zone %			Signaling zone %			Action zone %		
Year		'12	'13	'14	'12	'13	'14	'12	'13	'14
Veal calves	White veal farms	33	49	48	50	41	44	17	10	8
	Rosé veal starter farms	36	39	33	48	48	56	16	13	11
	Rosé veal fattening farms	38	46	48	33	33	34	29	21	19
	Rosé combination farms	-	60	50	-	30	40	-	10	10

Long term development in antibiotic use based on MARAN and SDa data

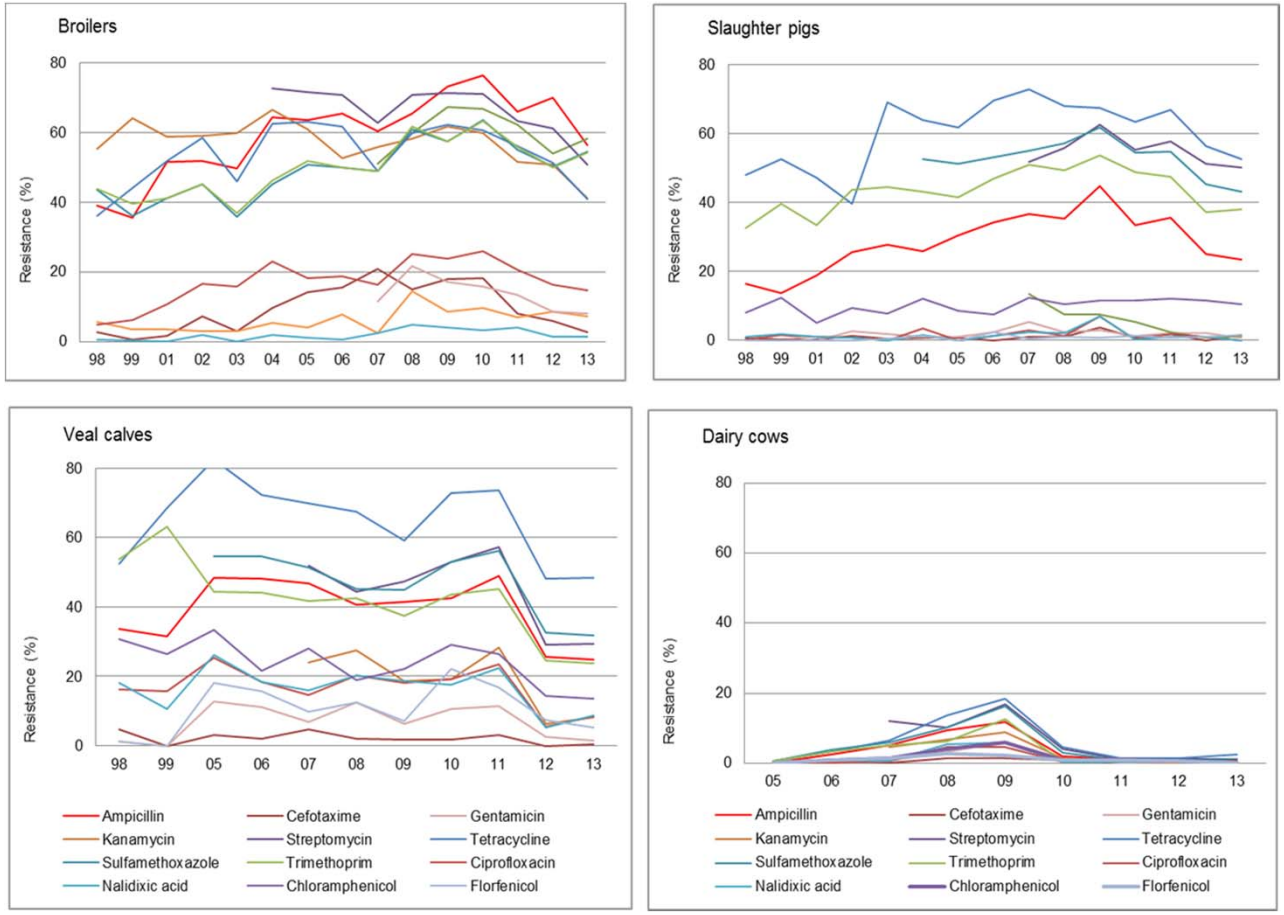


Veal: blue
Poultry:orange
Sows:dark green
Fattening pigs: light green

Results: 58% reduction in 2014



Decrease of antimicrobial resistance in broilers, veal calves and pigs: policy is effective



Our future policy, 2016 and onwards

The follow up policy:

- prevent development and spreading AMR
- increase in basic animal health (including pets)

Using:

- Update of report 2011 from The Health Council
- Advice from the Dutch Council for Animal Affairs on preserving animal health and animal welfare

2016: follow up of the Dutch policy on AMR during the Dutch EU-presidency.

Dutch policy objectives for regulation veterinary medicinal products

- Harmonisation of market authorisation at EU level
- More emphasis on risk of resistance in market authorisation procedure
- Re-evaluate and restrict of off-label use (cascade)
- International cooperation to combat illegal (internet) trade

Further international policy objectives

- Towards concrete plans for restrictive and responsible use in all MS
- Discouragement of use of CIA’s for veterinary purposes
- No new veterinary authorizations for critical and new antimicrobials
- Mandatory susceptibility testing before using critical antibiotics

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Turning the tide: we are in it together!

A one health approach to changing our habits on antibiotics:

- As patients

- As doctors

- As animal keepers and veterinarians