

Key messages:

- There is no EU-wide policy that mandates countries to report their use of antimicrobials in animals.
- The size of the animal populations at risk is rarely known, thus limiting the usefulness of sales data.
- The AMR situation in companion animals, the environment and food is not routinely analysed.

Objectives

• The key question was: “If a (European) country wants to set up monitoring systems to control the use of antimicrobials and the development of resistance against antimicrobials in animals, to which guidelines and policies should the competent authorities refer?”

• As a follow-up, we mapped what countries participating in the EFFORT project are currently doing to monitor antimicrobial use and resistance

• Gaps were identified and recommendations formulated

Guidelines and policies	Current situation		
Essential monitoring actions	Country 1	Country 2	Country 3
Action 1	✓	✓	✓
Action 2	✓	✓	✗
Action 3	✗	✓	✗
Action 4	✓	✓	✓
Action 5	✗	✗	✗

About EFFORT

- Duration: 5 years (Dec 2013- Nov 2018)
- Project coordinator: Jaap Wagenaar (Utrecht University)
- Objectives: To understand the...
 - **epidemiology** of AMR in the food chain
 - **ecology** of AMR in microbial communities
 - **relative contribution of the exposure routes** of AMR from animals to humans
 - **economic impact** and **animal welfare** aspects of AMR in the food chain

Partners



Results

• **Key related EU – policies:** Directive 2003/99/EC; Decision 2007/407/EC and Decision 2013/652/EU.

• Summary of the **activities to monitor antimicrobial use**, in animals, as of 2014, in the EFFORT participating countries:

	Data collection	Animal population unknown (=live; =slaughtered)
Belgium	Sales (feed companies and wholesalers)	Cats (l); Dogs (l); Ducks (s); Fish (l&s); Goats (s); Horses (s); Pigs: suckling piglets (l&s), weaners (s), sows/boars (s); Poultry: laying hens (s); Rabbits (s); Sheep (s); Turkey (s)
Bulgaria	Sales (wholesalers and pharmaceutical companies)	Cats (l); Dogs (l); Birds (non-poultry) (l&s); Ducks (l&s); Fish (l&s); Rabbits (l&s); Turkey (l&s)
Denmark	Automated data collection; Sales (pharmacies and feed companies); veterinary prescriptions	Birds (non-poultry) (l&s); Cats (l); Dogs (l); Donkeys (l); Fish (l); Horses (l&s); Pigs: suckling piglets (s), weaners (s), sows/boars (s); Poultry: laying hens (s); Rabbits (l&s); Sheep (l&s); Turkey (l&s)
France	Retrospective longitudinal study; Sales (pharmaceutical companies)	Birds (non-poultry) (l); Cattle: beef (s), dairy (s), veals (l); Ducks (l); Fish (l); Horses (s); Pigs: suckling piglets (l&s), weaners (l); finishers (l); Poultry: broilers (l), laying hens (l); Rabbits (l); Turkey (l)
Germany	Sales (pharmaceutical companies)	Birds (non-poultry) (l&s); Donkeys (l); Fish (l&s); Goats (l&s); Pigs: suckling piglets (l&s); Rabbits (l&s); Sheep (l&s)
Italy	Sales (pharmaceutical companies)	Cats (l)
Netherlands	Automated data collection; Sales (pharmaceutical companies); Veterinary prescriptions	Birds (non-poultry) (l&s); Ducks (l&s); Fish (l&s); Rabbits (s)
Poland	Sales (wholesalers)	Cats (l); Dogs (l); Birds (non-poultry) (l&s); Ducks (l&s); Fish (l&s); Rabbits (l&s); Turkey (l&s)
Spain	Sales (pharmaceutical companies)	Cats (l); Dogs (l); Birds (non-poultry) (l&s); Ducks (l&s); Fish (l&s); Rabbits (l&s); Turkey (l&s)
Switzerland	Sales (pharmaceutical companies)	Birds (non-poultry) (l&s); Cats (l); Cattle: beef (l), veals (l); Dogs (l); Donkeys (l); Ducks (l&s); Fish (l&s); Goats (l); Pigs: suckling piglets (l&s), weaners (l&s), sows/boars (s), finishers (l); Poultry: broilers (l), laying hens (l); Rabbits (l); Turkey (l&s)

• Summary of the **activities to monitor antimicrobial resistance**, in animals, as of 2014, in the EFFORT participating countries:

	Microorganisms tested	Animals species tested
Belgium	<i>Campylobacter coli</i> ; <i>Campylobacter jejuni</i> ; <i>Salmonella</i> ; <i>E. coli</i> ; <i>Enterococci</i>	Poultry (broilers, laying hens and turkey); Pigs (finishers); Cattle (beef, dairy, veals)
Bulgaria	<i>Campylobacter coli</i> ; <i>Campylobacter jejuni</i> ; <i>E. coli</i> ; Carbapenemase producers; ESBL producers; <i>Salmonella</i> , <i>Staphylococcus spp.</i>	Poultry (broilers, laying hens); Pigs (finishers); Cattle (beef, dairy, veals); Sheep
Denmark	<i>Campylobacter coli</i> ; <i>Campylobacter jejuni</i> ; <i>E. coli</i> ; <i>Enterococci</i> ; <i>Salmonella spp.</i> ; <i>Staphylococcus spp.</i>	Poultry (broilers); Pigs (sows/boars, finishers); Cattle (beef); other
France	<i>Campylobacter coli</i> ; <i>Campylobacter jejuni</i> ; <i>E. coli</i> ; <i>Enterococci</i> ; <i>Pasteurella spp.</i> ; <i>Salmonella spp.</i> ; <i>Staphylococcus spp.</i> ; <i>Streptococcus spp.</i>	Birds (non-poultry); Cats; Cattle (beef, dairy, veals); Dogs, Donkeys, Ducks, Fish, Goats, Horses, Pigs (suckling piglets, weaners, sows/boars, finishers); Poultry (broilers, laying hens); Rabbits; Sheep; Turkey
Germany	<i>Campylobacter coli</i> ; <i>Campylobacter jejuni</i> ; <i>E. coli</i> ; <i>Salmonella spp.</i> ; Methicillin-resistant <i>Staphylococcus spp.</i> (MRSA); In addition several animal pathogens (passive system)	Poultry (broilers, laying hens and turkey); Pigs (sows/boars, finishers); Cattle (beef, dairy, veals)
Italy	<i>Campylobacter coli</i> ; <i>Campylobacter jejuni</i> ; <i>E. coli</i> ; Carbapenemase producers; ESBL producers; <i>Salmonella spp.</i> ; AmpC producers	Poultry (broilers, laying hens and turkeys); Cattle (beef); Pigs (finishers)
Netherlands	<i>Campylobacter jejuni</i> ; <i>Salmonella spp.</i> ; <i>Enterococci</i> ; AmpC producers; Carbapenemase producers; <i>E. coli</i> ; ESBL producers; MRSA; <i>Pasteurella spp.</i> ; <i>Staphylococcus spp.</i> ; <i>Streptococcus spp.</i> ; <i>Listeria spp.</i> ; <i>Mannheimia haemolytica</i> ; <i>Histophilus somni</i> ; <i>Klebsiella</i> ; <i>Enterobacter</i> ; <i>Actinobacillus pleuropneumoniae</i> ; <i>Bordetella bronchiseptica</i> ; <i>Haemophilus parasuis</i>	Poultry (broilers, laying hens, turkeys); Cattle (dairy, veals); Pigs (suckling piglets, weaners, sows/boars, finishers); Horses; Sheep; Goat
Poland	<i>E. coli</i> ; <i>Salmonella spp.</i> ; <i>Staphylococcus spp.</i> ; <i>Streptococcus spp.</i> ; MRSA; <i>Pasteurella</i> ; mastitis agents	Poultry (broilers, laying hens and turkeys); Cattle (beef and dairy); Pigs (suckling piglets, weaners, sows/boars, finishers)
Spain	<i>Campylobacter spp.</i> ; <i>Enterococcus spp.</i> ; <i>E. coli</i> ; <i>Salmonella</i>	Cattle; <i>Gallus gallus</i> (fowls); Broilers; Laying hens; Pigs (fattening)
Switzerland	<i>Campylobacter coli</i> ; <i>Campylobacter jejuni</i> ; <i>Enterococci</i> ; Carbapenemase; <i>E. coli</i> ; ESBL producers; <i>Salmonella spp.</i> ; AmpC producers; MRSA	Poultry (broilers); Cattle (veals); Pigs (finishers)

Discussion

- The appropriate monitoring of antimicrobial use and resistance is critical for the **quantification of the importance of the different recognized transmission pathways** and the **identification of best practices**.
- **Addressing the gaps identified in our work will lead to stronger policies, essential if one is to achieve the control of this phenomenon.**

