

Introduction to Antimicrobial Resistance and Dubai Municipality Measures to Combat AMR in Veterinary Sector

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Introduction to Antimicrobial Resistance

- Antimicrobial Resistance (AMR) is the ability of bacteria and other microorganisms to resist the effects of an antimicrobial agent to which they were once sensitive
- Antimicrobial resistant micro-organisms can spread through the food chain and the environment
- AMR is a major threat to both human and animal health and ecosystem



Antimicrobial Resistance



- AMR is a general term for many types of resistance such as antiviral, antibacterial, anti-parasitic and antifungal drugs
- Antimicrobials especially antibiotics, have saved countless lives from infectious diseases ever since their discovery over eight decades ago
- However, over the years, the slow but steady emergence and spread of antimicrobial resistance is causing serious public and animal health concerns

Causes

Individual Level

- Improper use of over-the-counter antibiotic drugs
- Prescriptions of wide spectrum of antibiotic drugs for the patient as a treatment

National Level

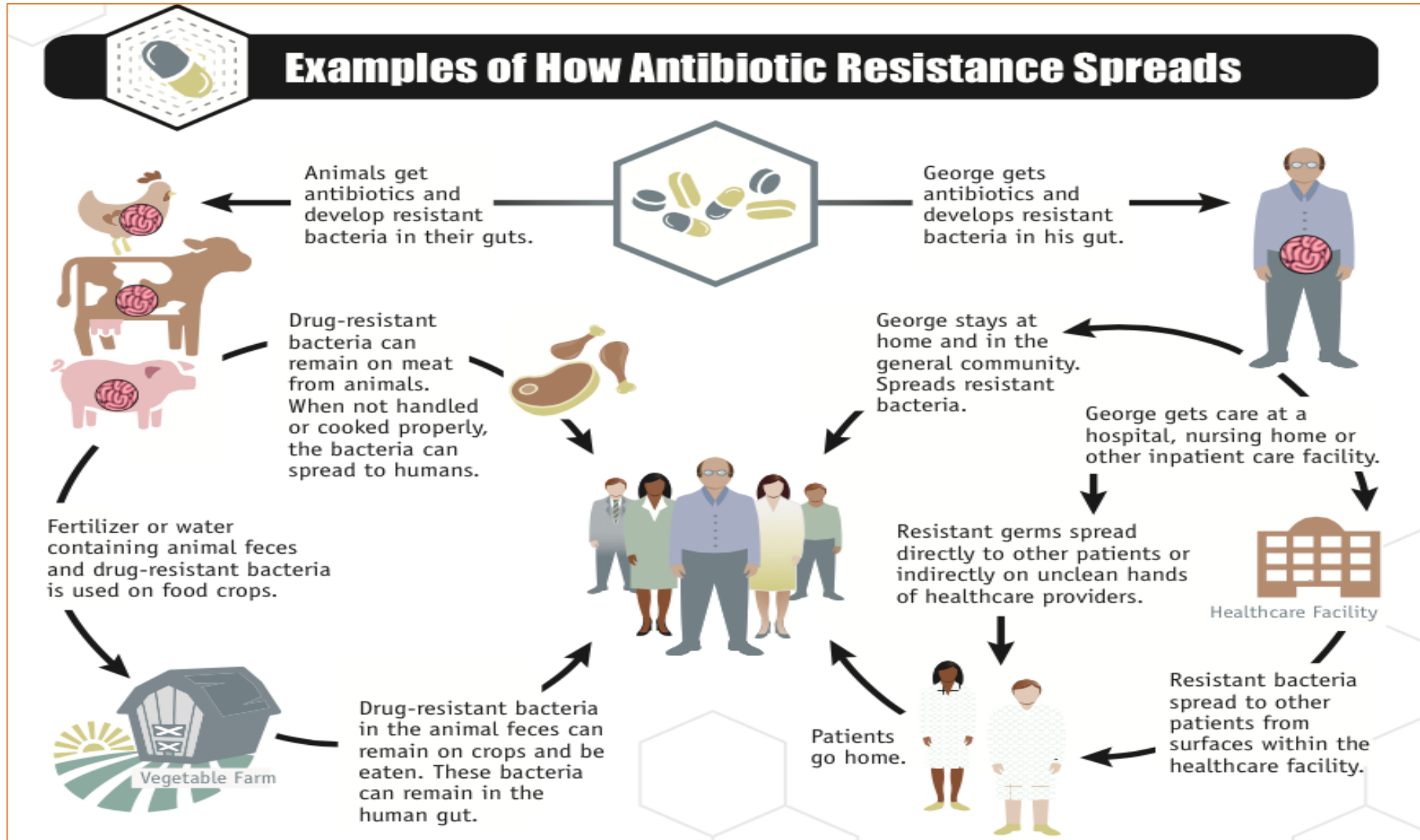
- Low-quality medicine due to lack of diagnosis
- Poor infection prevention and control in some organizations, hospitals, and health care centers
- Spread of drugs without control from governments

Global Level

- We are in need of stricter laws and supervision to control irrational and illegal use of medicines

How Antimicrobial Resistance occur?

- Non-rationale use of antimicrobials in human and animal health sectors
- Non-adherence to established infection prevention and control standards
- Non-adherence to bio-safety/bio-security protocols



Classification of Antibiotics

Antibiotics are classified in several ways:

- According to mode of action
- According to spectrum of activity

According to mode of action

Bacteriostatic Antibiotics

- Tetracyclines
- Spectinomycin
- Sulphonamides
- Macrolides
- Chloramphenicol
- Trimethoprim

Bactericidal Antibiotics

- Penicillins
- Cephalosporins
- Fluoroquinolones
(Ciprofloxacin)
- Glycopeptides (Vancomycin)
- Monobactams
- Carbapenems

According to spectrum of activity

Broad spectrum

- Amoxicillin
- Tetracycline
- Cephalosporin
- Chloramphenicol
- Erythromycin

Narrow spectrum

- Penicillin –G
- Cloxacillin
- vancomycin
- Bacitracin
- Floxacillin

OIE LIST OF ANTIMICROBIAL AGENTS OF VETERINARY IMPORTANCE

World Animal Health Organization (OIE) antimicrobial agents of veterinary importance are grouped into the following 3 categories:

- (1) Veterinary Critically Important Antimicrobial Agents (VCIA)
- (2) Veterinary Highly Important Antimicrobial Agents (VHIA) and
- (3) Veterinary Important Antimicrobial Agents (VIA)

OIE List of Antimicrobial Agents of Veterinary Importance – Content

Antimicrobial agents	VCIA	VHIA	VIA
Aminocoumarin			x
Aminoglycosides	x		
Ansamycin-Rifamycins		x	
Arsenical			x
Bicyclomycin			x
Cephalosporins 1 st and 2 nd generations		x	
Cephalosporins 3 rd and 4 th generations	x		
Fusidic acid			x
Ionophores		x	
Lincosamides		x	
Macrolides	x		
Orthosomycins			x
Penicillins	x		
Phenicols	x		
Phosphonic acid		x	
Pleuromutilins		x	
Polypeptides		x	
Quinolones 1 st generation		x	
Quinolones 2 nd generation	x		
Quinoxalines			x
Sulfonamides	x		
Sulfonamides+Diaminopyrimidines	x		
Diaminopyrimidines	x		
Streptogramins			x
Tetracyclins	x		
Thiostrepton			x

Strategy of DM Veterinary Services Section to combat AMR

The strategy of Dubai Municipality Veterinary Service Section for combating AMR is based on the OIE strategy for the responsible and prudent use of antimicrobials and in accordance with the following:

- 1) UAE National Strategy and Action Plan for Combatting Antimicrobial Resistance -2019- 2023 (NAP – AMR)
- 2) FAO Action Plan on Antimicrobial Resistance (2021 – 2025)
- 3) International Health Regulations 2005

Measures and Programs

Strengthening the governance

Promoting responsible use of antibiotics in accordance with the Antibiotic Stewardship Program (ASP) protocols



Increasing stakeholder awareness and engagement

Strengthening AMR surveillance to support evidence based decisions

Enhancing good practices in Infection Prevention & Control (IPC)

Awareness

Improving awareness and understanding among veterinarians and stakeholders about AMR by conducting awareness programs by highlighting the issue through platforms symposiums and seminars

1. Knowledge and information sharing on antibiotics to veterinarians
2. Creating awareness among animal farm owners and other stakeholders with regards to withdrawal periods

DM Antibiotic Stewardship Program (ASP)

Veterinary antimicrobial stewardship Program comprises measures and programs to control, supervise, monitor, manage and promote responsible use of antimicrobials in animal sector especially in food producing animals



Implementation of ASP

- ✓ Antimicrobial use should only be under the supervision of a veterinarian
- ✓ Use only antimicrobials for which a marketing authorization has been granted for UAE
- ✓ Curb the use of counterfeit veterinary medical products
- ✓ Complete prohibition of abuse, overuse and misuse of antibiotics in food producing animals
- ✓ Selection of appropriate antimicrobials for therapeutical purposes
- ✓ Strictly comply to the dosage regime and withdrawal periods
- ✓ Use antimicrobials as per label recommendations and storage conditions

Implementation of ASP (Contd.)

- ✓ Implement awareness program for responsible and prudent use of antimicrobials
- ✓ Implementing a policy to reduce the quantity of antibiotics to be used for veterinary treatment purpose by 5%
- ✓ Using only high quality antimicrobials
- ✓ Supporting public-private partnerships in AMR research and risk management activities

Alternatives to antibiotics as growth promoters

An obvious choice is the development of alternatives to antibiotics as growth promoters like:

- In-feed enzymes produced as fermentation products from fungi and bacteria to maximizing feed conversion efficiency
- Competitive exclusion products are in-feed microbes consisting of a variety of species of bacteria
- Probiotics: Especially in young animals functions as Competitive exclusion products

DM Measures for Infection Prevention Control (IPC) and Biosecurity

- Decreasing exposure to microorganisms is the most important aspect of disease control
- Hospital Acquired Infections (HAIs) can have financial, social and environmental impacts on patients, clients and staff
- Every veterinary clinic, regardless of type or size, should have a formal infection control program
- Routine Practices that are critical to prevention and control:
 - a. Hand hygiene
 - b. Risk reduction strategies, particularly those related to use of PPE, routine C&D, waste ,
 - c. Risk assessment of animals and personnel with regard to disease transmission and susceptibility
 - d. Education and training of Veterinary personnel, animal owners and public

Model Infection Control Plan for Veterinary Practices

ACTIONS	COMPONENTS
PERSONAL PROTECTIVE ACTIONS & TOOLS	Hand hygiene – Hand protection - Gloves – Facial protection - Masks - Respiratory tract protection - Respiratory tract protection -
PROTECTIVE ACTIONS DURING VETERINARY PROCEDURES	Patient Intake - Animal handling and injury prevention - Examination of animals - Injections, venipuncture, and other procedures – Obstetrics –Surgical procedures - Necropsy - Diagnostic specimen handling -
ENVIRONMENTAL INFECTION CONTROL ACTIONS	C & D of floor and equipment and other environmental surfaces of equipment and environmental surfaces - Isolation of infectious animals - Spill response and decontamination – Hazardous veterinary medical and biological wastes - Rodent and vector control
OCCUPATIONAL HEALTH MEASURES	Pre-exposure rabies vaccination, Tetanus vaccination, Influenza vaccination, Documenting and reporting exposure incidents, Staff training and education on Infection control and hazard awareness

FARM IPC and BIOSECURITY

- Implementing best practices in animal production and health management plans
- Implementing the key elements of biosecurity programs like movement control, cleaning and disinfection, isolation/quarantine
- Isolation of sick animals and hygienic disposal of dead animals following approved protocols
- Establishing animal disease preventive programs like vaccination, control procedures of internal and external parasites
- Reporting infectious and contagious disease outbreaks

FARM IPC and BIOSECURITY (Contd.)

- Conducting proper investigations on recurrent disease problems
- Addressing AMR under 'one health' approach
- Monitoring and improving Farm programs through better use of data and diagnostics
- Appropriate diagnostic testing, in particular, bacterial culture and sensitivity tests
- Strict compliance to regulatory guidance regarding animal husbandry and farm health practices

AMR SURVEILLANCE

- Regulatory surveillance and monitoring systems and developing a data base of antibiotics used and the trends on their use over time
- Continuous monitoring to ensure that the food of animal origin entering the food supply chain is safe from farm to fork
- Laboratory capacity and capability in place for monitoring antimicrobial residues in meat for human consumptions and generating laboratory data
- Implementing animal health surveillance program for high risk animal diseases

Thank you for your attention