



# **ANTIMICROBIAL RESISTANCE: Renewed Focus**

By

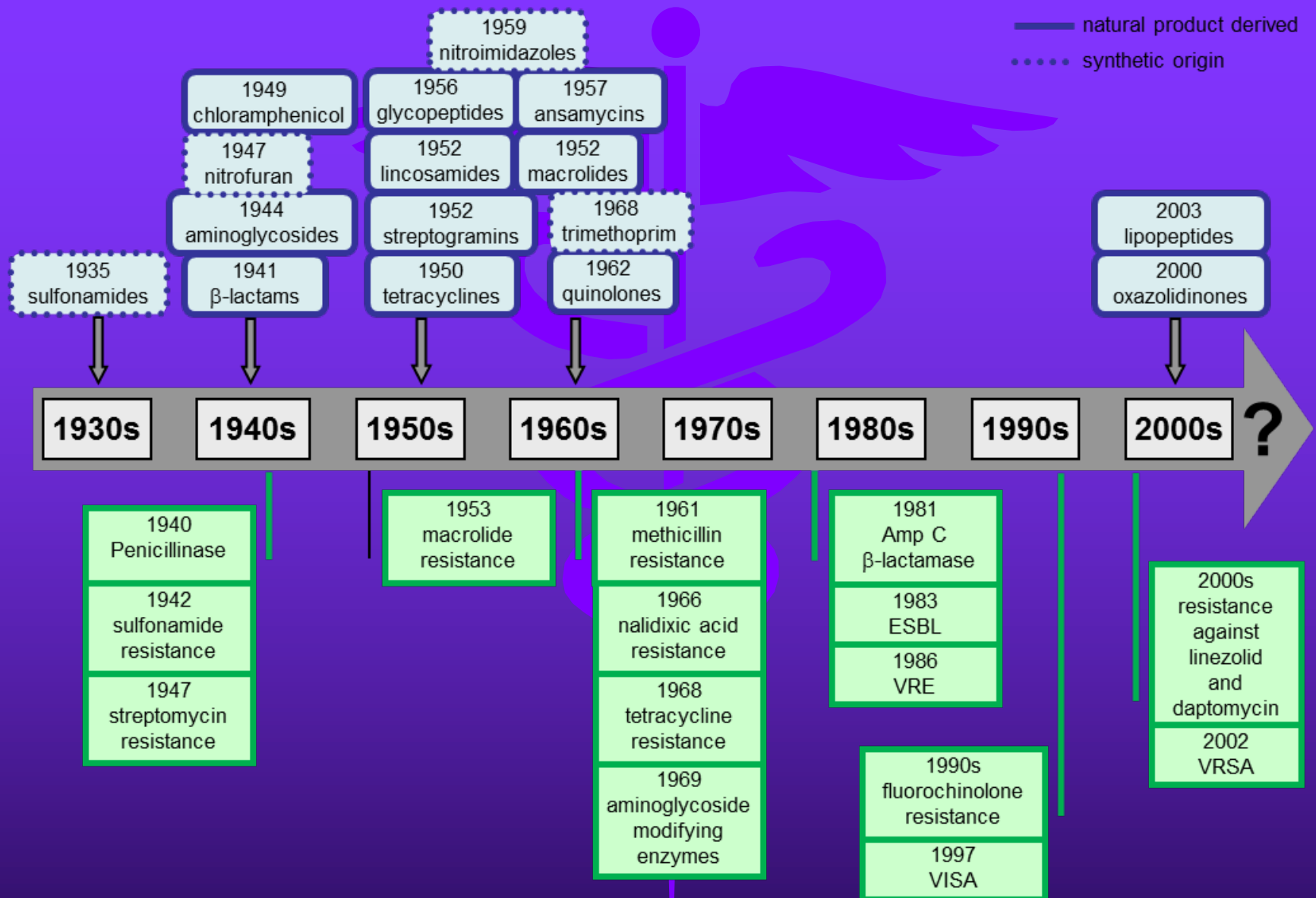
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# Introduction

- The modern age of therapeutics was launched:
  - 1930s → sulfonamides
  - 1940s → penicillin
- Since then, many antibiotic drugs have been developed
- These drugs have played an important role in the dramatic decrease in morbidity and mortality due to infectious diseases

# Introduction of new antibiotic classes



## Development of bacterial resistance

# Introduction

- Since the 1990s, new antibiotic development has fallen sharply while bacterial resistance continues to increase
- It took less than 20 years for, bacteria to show signs of resistance



# Resistance



- Antimicrobial resistance can be either acquired or naturally occurring
- Resistance is a natural biological unstoppable phenomenon
- Resistance is generally slow and can be reversible or irreversible

# Resistance



- Can be accelerated through inappropriate use of antimicrobials
- Develop due to poor compliance
- Develop through the use in other settings such as plant and animal health, food safety and the environment



# Superbugs

Accumulation of resistance to multiple antibiotics

Self medication and poor compliance

Inappropriate use of antibiotics  
selection & multiplication of resistant strains

Weak surveillance & regulatory systems

Continuous natural evolution of resistance in bugs

Known but neglected.  
Need immediate action

Known but  
inevitable

\*\* Methicillin resistant *Staph aureus*, MDR-and XDR Mycobacteria, ESBL producing Gram negative bacteria and NDM-1 producing enterobacteriaceae bacteria are few examples of superbugs because these fail to respond to large number of commonly used

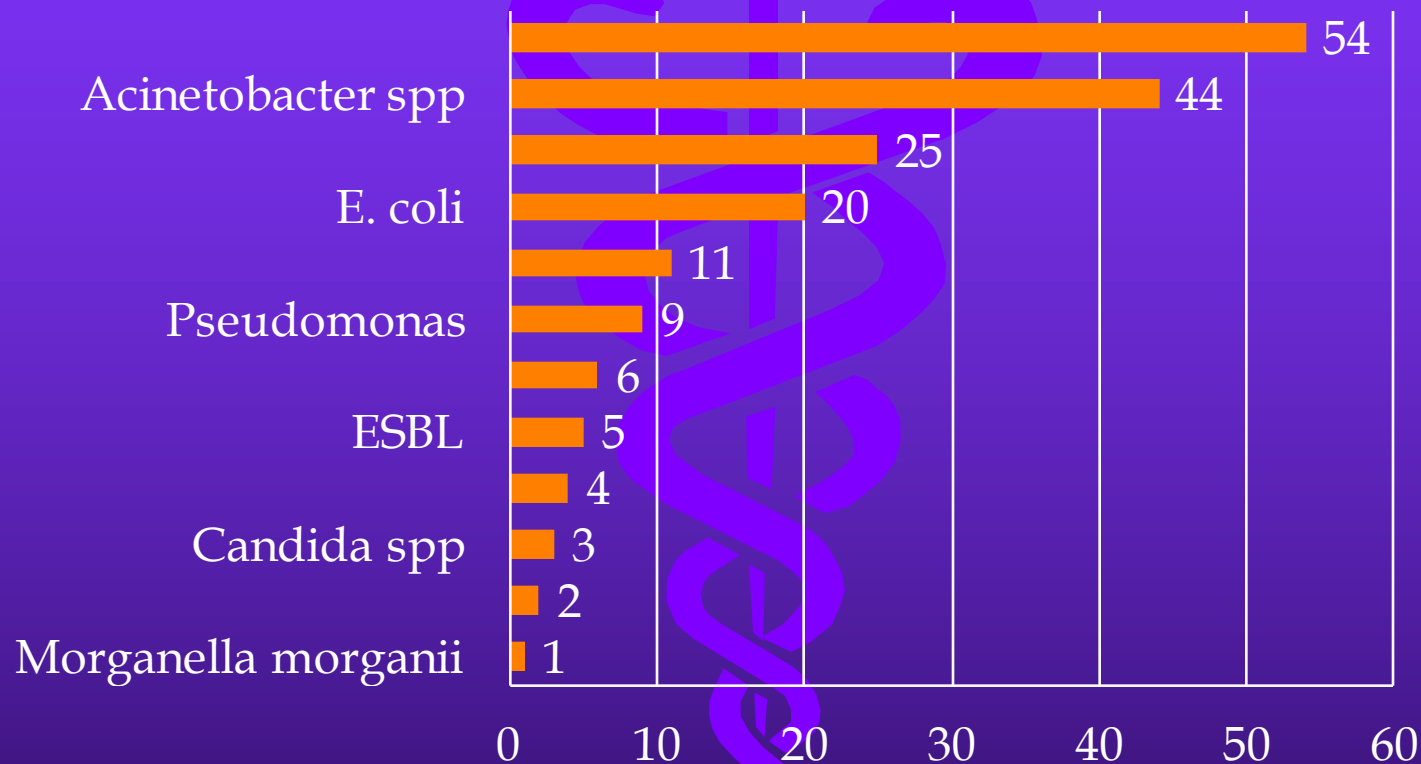
# Infectious Diseases Society of America Superbug Hit List

- Methicillin-resistant *Staphylococcus aureus*
- Vancomycin-resistant *Enterococcus faecium* (VRE)
- *Escherichia coli*
- *Klebsiella* species
- *Pseudomonas aeruginosa*
- *Acinetobacter baumannii*

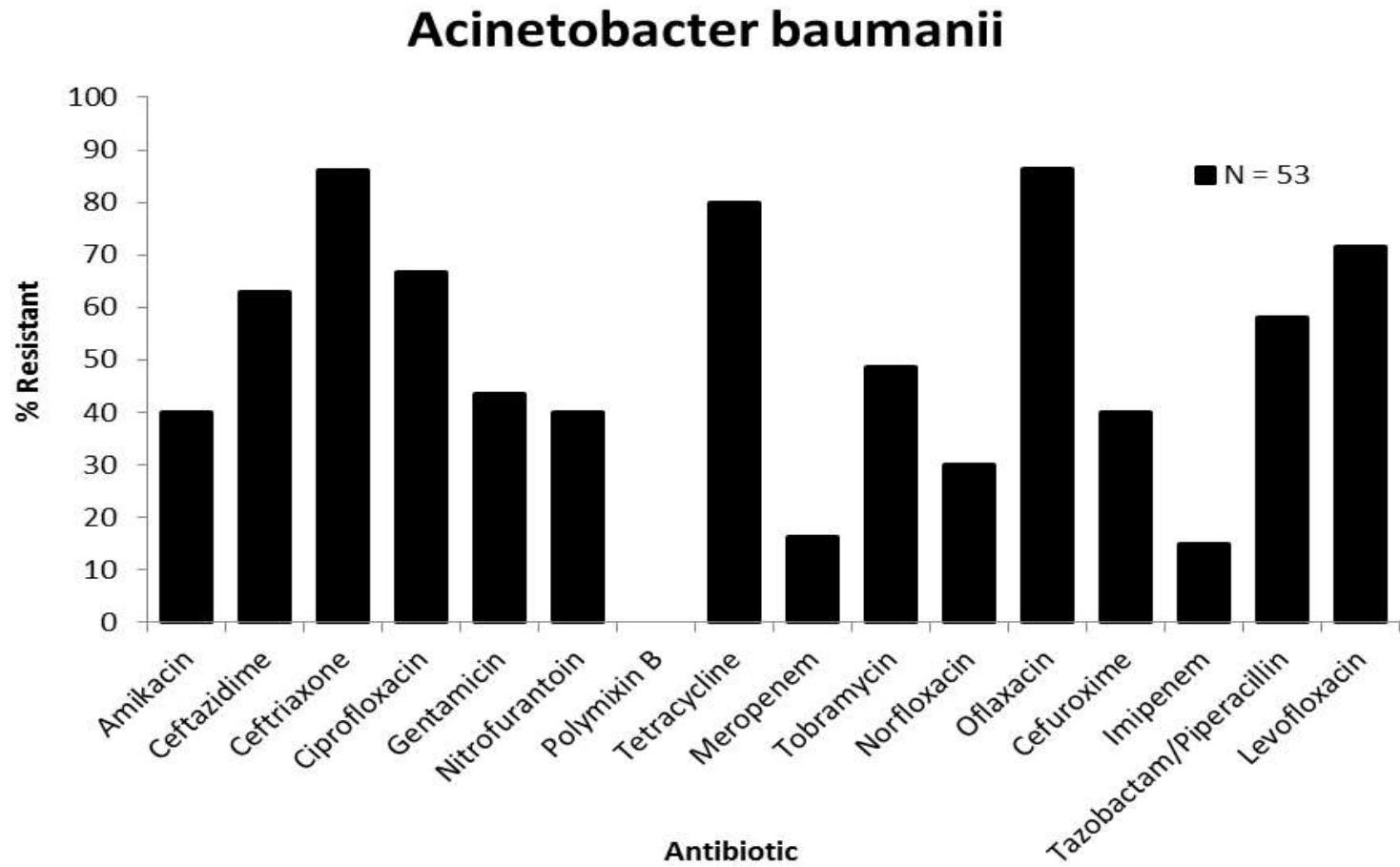




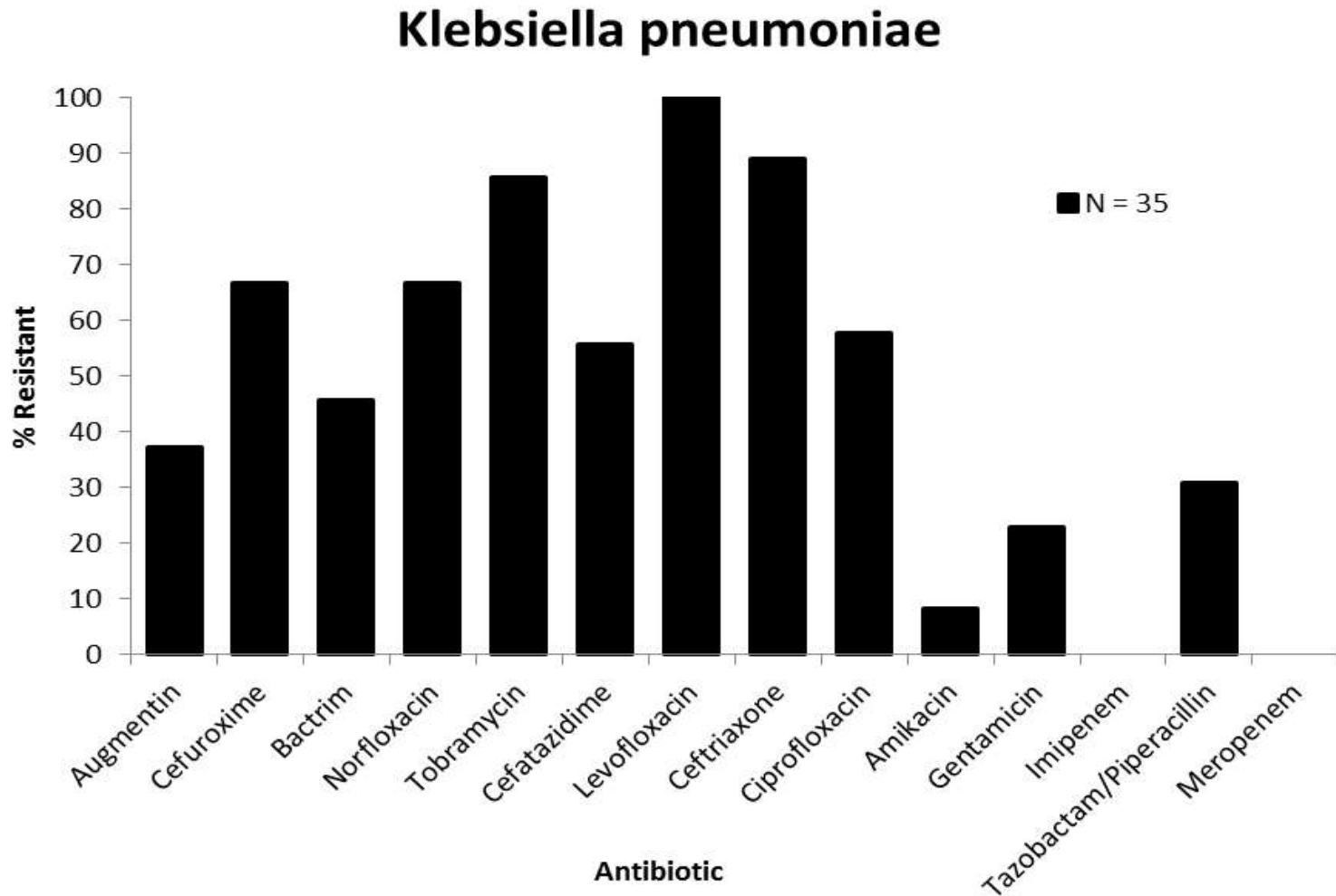
# MULTI-DRUG RESISTANT ORGANISMS 2016



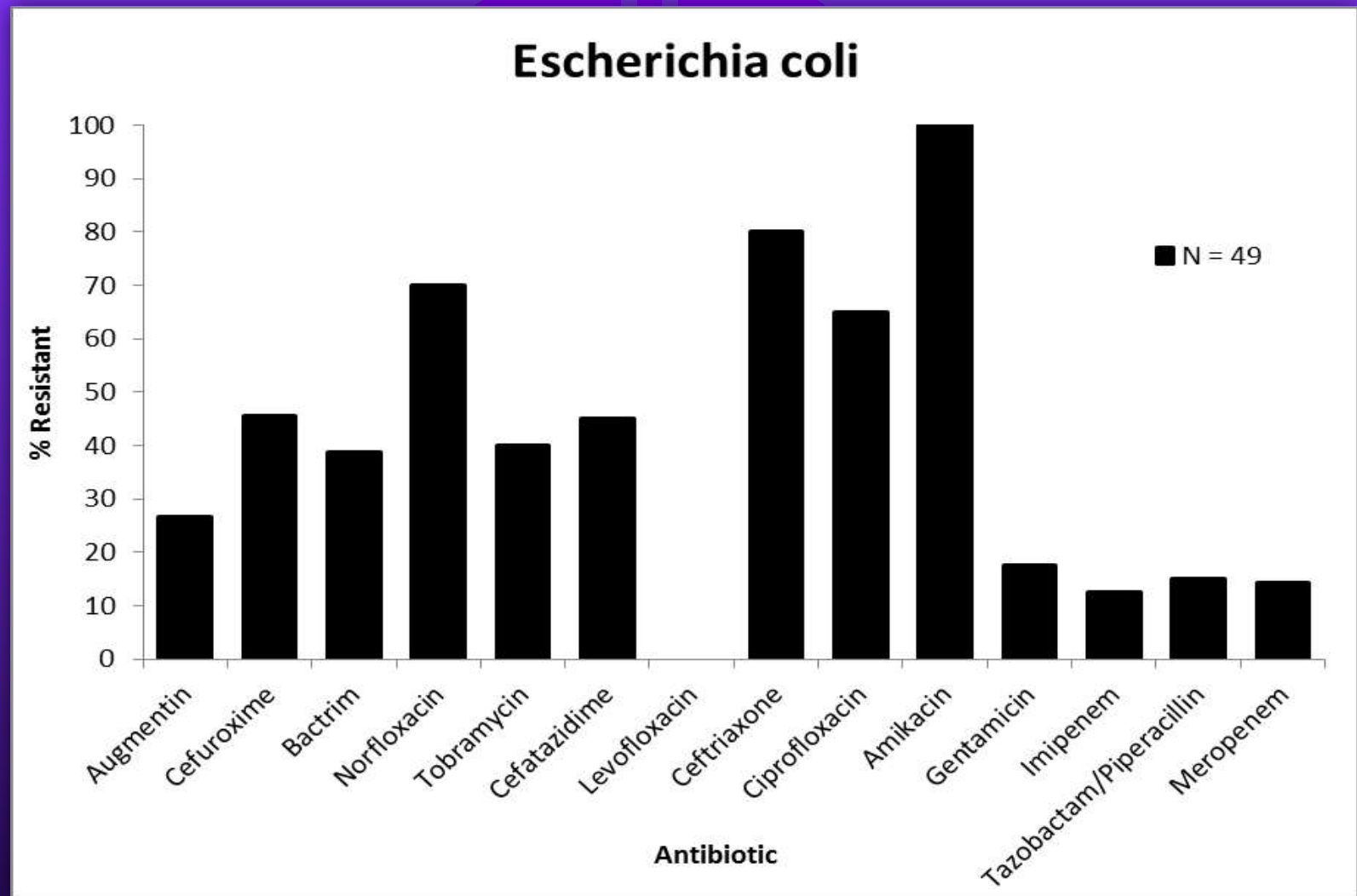
# LOCAL PATTERNS OF RESISTANCE



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# DRUG RESISTANCE AND TB



- WHO estimates in 2014, there were about 480 000 new cases of multidrug-resistant tuberculosis (MDR-TB).
- Jamaica has identified 2 cases of MDR-TB in 2010 and 2012 and continues to screen and test susceptible populations.



# DRUG RESISTANCE AND HIV



- In 2010, an estimated 7% of people starting antiretroviral therapy (ART) in developing countries had drug-resistant HIV and in developed countries as high as 10–20%. Some countries have recently reported levels at or above 15% amongst those starting HIV treatment, and up to 40% among people re-starting treatment.



**RENEWED FOCUS**

# ONE HEALTH APPROACH TO AMR



- WHO Recommendations:
- Addressing the rising threat of AMR requires a holistic and multi-sector (One Health) approach because antimicrobials used to treat various infectious diseases in animals may be the same or be similar to those used in humans.

# ONE HEALTH APPROACH TO AMR



- Resistant bacteria arising either in humans, animals or the environment may spread from one to the other, and from one country to another.
- AMR does not recognize geographic or human/animal borders

# ONE HEALTH APPROACH TO AMR



- The WHO, the Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE) speak with **one voice** and take collective action to minimize the emergence and spread of AMR.
  - Ensure that antimicrobial agents continue to be effective and useful to cure diseases in humans and animals
  - Promote prudent and responsible use of antimicrobial agents
  - Ensure global access to medicines of good quality



# ONE HEALTH APPROACH TO AMR



- In resolution WHA68.7 (2015) the Health Assembly urged Member States to adapt the global action plan to their national priorities and specific contexts, and to have national action plans on antimicrobial resistance in place by the Seventieth World Health Assembly( May 22, 2017)

# ACTIONS FOR AMR



- Improve surveillance of antibiotic consumption and resistance patterns
- Increase awareness for AMR
- Expanding antibiotic stewardship programmes for which the prime focus is management of antimicrobial resistance.

# ACTIONS FOR AMR

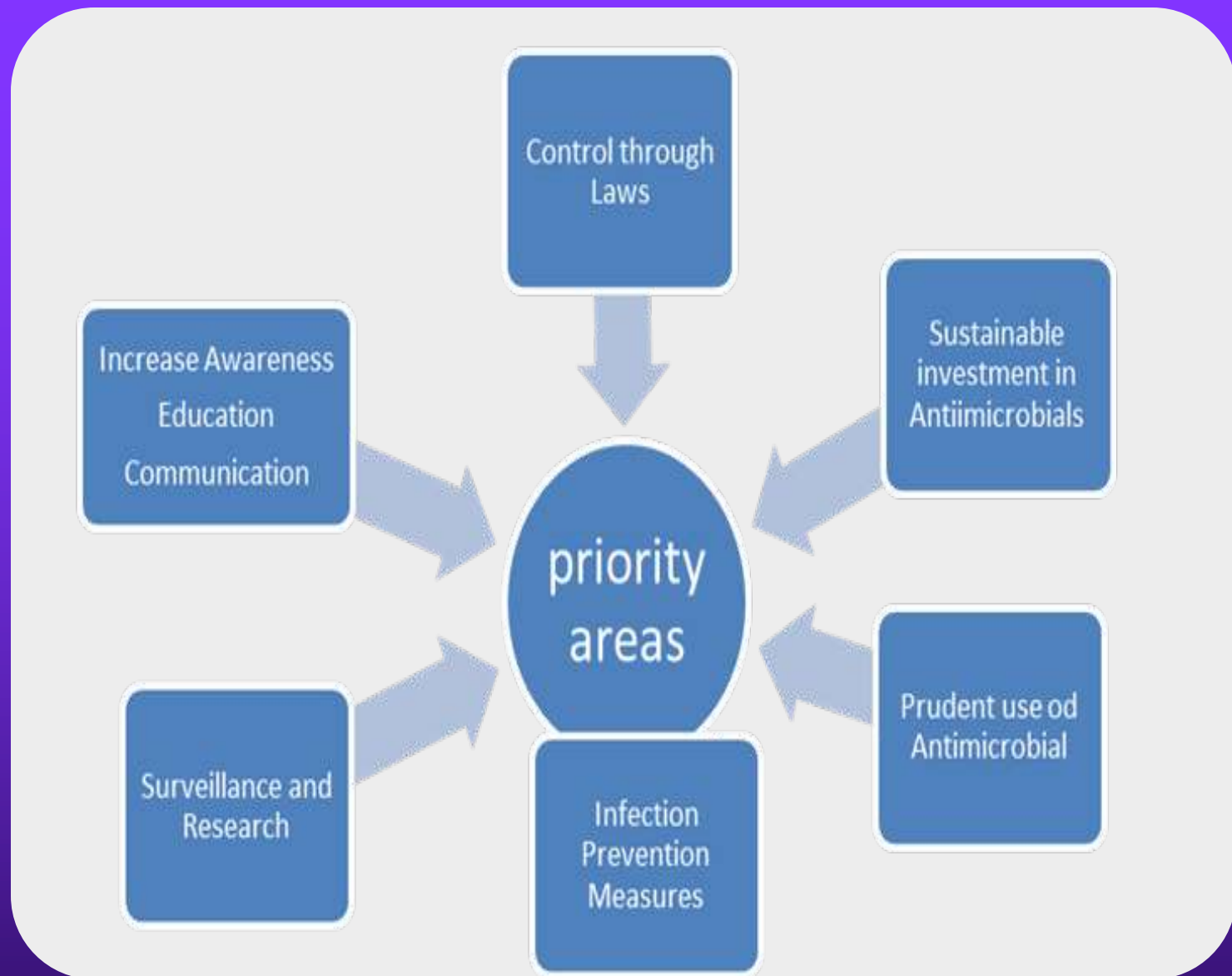


- Improve infection prevention and control
- Enhance the regulation medicines and management
- Immunization
- Strengthening of water sanitation and hygiene provisions

# NATIONAL ACTION PLAN FOR JAAMAICA



- In progress
- There are three goals
  - To increase awareness of AMR and adopt the “One Health Approach” in the prudent use of Antimicrobials across all sectors
  - To ensure continuity of national programmes geared towards successful treatment and prevention of infectious diseases with effective and safe medicines
  - To strengthen the quality assurance programmes for both therapeutics and diagnostic analysis







# KEY POINTS FOR PHARMACY

# WHO CRITICALLY IMPORTANT ANTIMICROBIAL LIST

- The list ranks antimicrobial agents according to their importance in human medicine, with the objective of helping to prioritize antimicrobial resistance containment strategies related to their non-human use.
- WHO is currently developing a guideline on the use in food-producing animals of the antimicrobials included in the list, with the objective of preserving their effectiveness and protecting public health

# WHO CIA (Adapted)



- Aminoglycosides
- Carbapenems
- Cephalosporins (3<sup>rd</sup> , 4<sup>th</sup> and 5<sup>th</sup>)
- Glycopeptides
- Macrolides
- Penicillin
- Polymixins
- Quinolones

# STANDARDIZATION OF REPORTING FOR ANTIMICROBIAL CONSUMPTION

- WHO has standardized the methodology for monitoring antibiotic consumption at national levels
- 35 countries having been trained; a further three regional workshops are planned for the end of March 2017

# WHO MODEL LIST OF ESSENTIAL MEDICINES



- The antibiotic chapter of the WHO Model List of Essential Medicines, which is being updated and will be published in May 2017
- Several medications for tuberculosis, which are not yet on the Model List, are being considered for addition to the tuberculosis section of the List.
- Appropriate use of antibiotics is being supported through ongoing programmes in medicines management in many countries.



# WHO PRIORITY LIST OF ANTIBIOTIC RESISTANT PATHOGENS

- WHO has also issued a list of priority antibiotic-resistant bacterial pathogens where new medicines are most urgently needed.
- Work is ongoing to monitor the pipeline for new antibiotics under development

# SUMMARY



- The modern age of therapeutics was launched in the 1930's and these drugs have played an important role in the dramatic decrease in morbidity and mortality due to infectious diseases.
- Since the 1990s, new antibiotic development has fallen sharply while bacterial resistance continues to increase.

# SUMMARY



- To address the rising threat of AMR, a holistic and multi-sector **One Health approach** has been adopted by Jamaica
- The **One Health Approach** to AMR will ensure that antimicrobial agents continue to be effective and useful to cure diseases in humans and animals



*thanks*  
for always taking  
the time to listen