

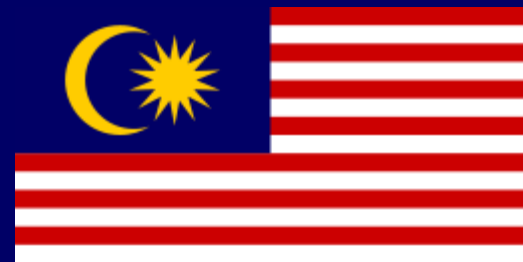
# **The Antibiotic Stewardship Programme in Malaysia**

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# Malaysia

- Developing economy in South East Asia
- Population : 31 million (2017)
- Per capita GDP : USD 28,900 (2017)
- Infant mortality rate : 6.7/1000 births (2016)
- Maternal mortality ratio : 29.1/100,000 live births
- Total expenditure on health : 4.5% of GDP



# Establishment of a National Strategy

- In 2003 the Ministry of Health with the assistance of WHO prepared a national strategy for the containment of antimicrobial resistance
- Measures included
  - Infection And Antibiotic Control Committees (IACC) at hospital, state and national levels
  - Strengthening the antibiotic resistance surveillance system
  - Developing and implementing antibiotic guidelines for primary care practitioners
  - Improving access to and upgrading the quality of microbiological diagnostic facilities
  - Increasing public awareness of antibiotic resistance
  - Controlling and regulating the use of antibiotics in agriculture

# Governance and Management

NATIONAL INFECTION AND  
ANTIBIOTIC CONTROL COMMITTEE



STATE INFECTION AND ANTIBIOTIC  
CONTROL COMMITTEE



HOSPITAL INFECTION AND  
ANTIBIOTIC CONTROL COMMITTEE

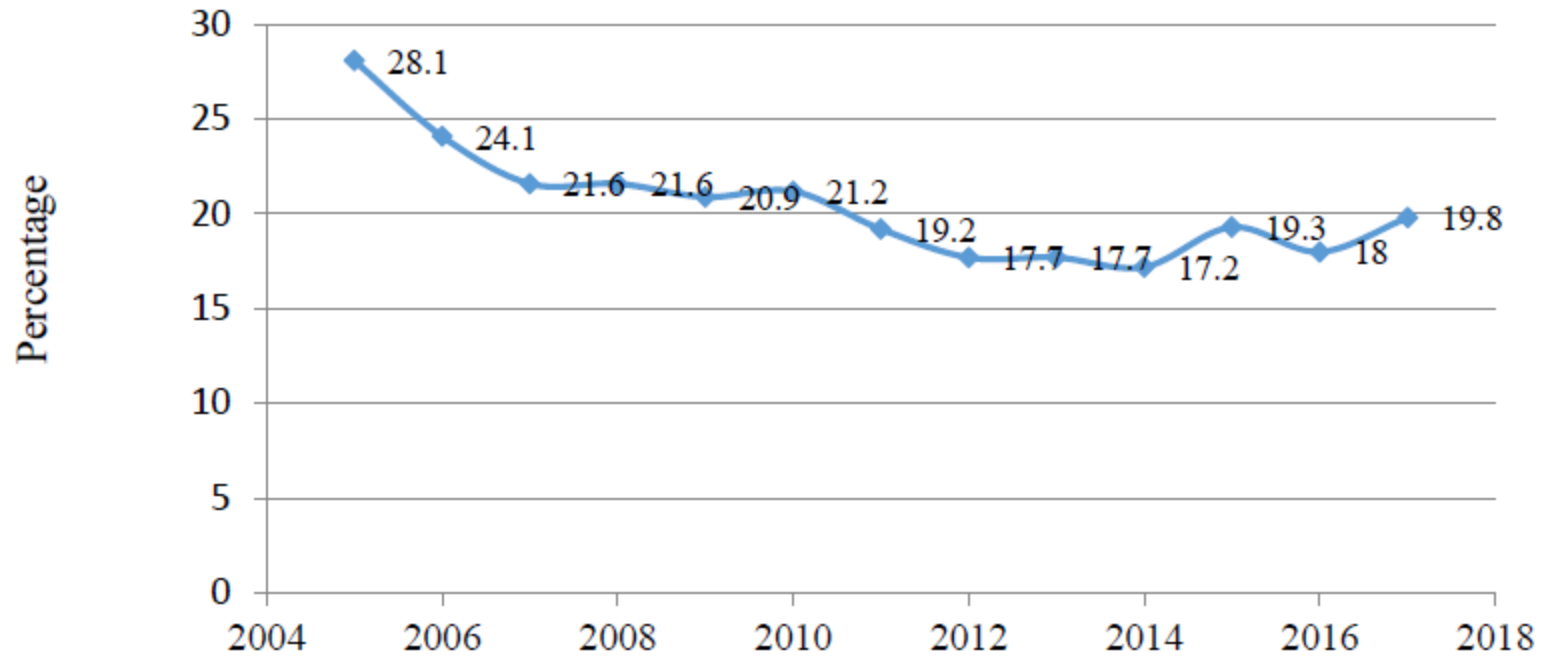
# National Committee

- Meets twice a year
- Chaired by the Director General of Health
- Attended by all state representatives and selected technical experts
- Reviews reports including
  - Antibiotic resistance surveillance
  - Nosocomial infection prevalence rates
  - Antibiotic utilisation rates
- Makes policies and recommendations based on the data collected

# Resistance surveillance programme

- National Surveillance of Antibiotic Resistance
  - Established in 1990
  - 42 participating laboratories; over 800,000 isolates in 2017
  - Standard methodology : CLSI and standard antibiotic panels
  - WHO Net software
  - Quality assurance

## MRSA



National Surveillance for Antimicrobial Resistance 2018.

<http://www.imr.gov.my/en/component/content/article/75-english-content/national-collabroration/1469-nsar-main.html>

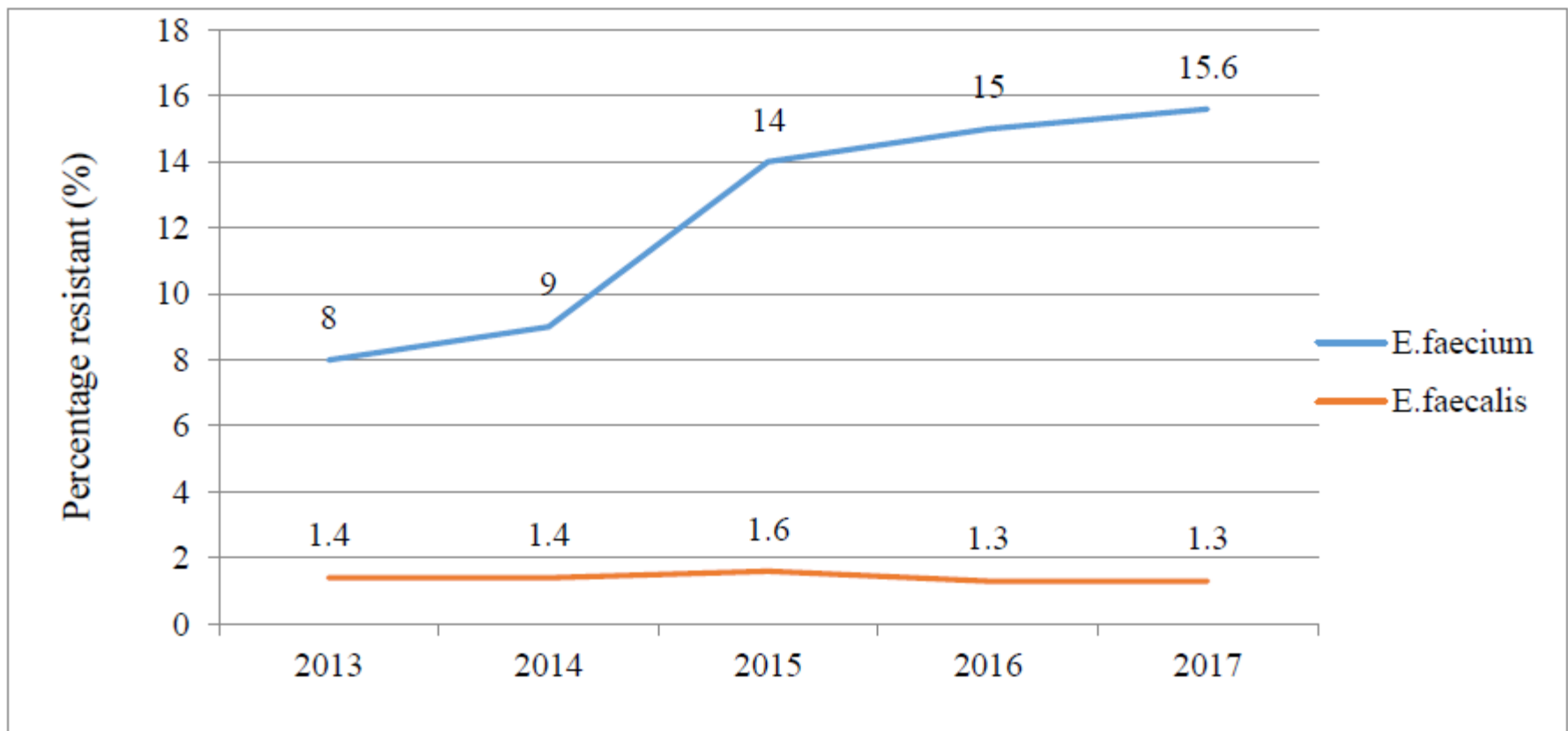


Figure 13: Trend of vancomycin resistance in *Enterococcus faecium* and *Enterococcus faecalis* from all clinical samples, 2013-2017.

National Surveillance for Antimicrobial Resistance 2018.

<http://www.imr.gov.my/en/component/content/article/75-english-content/national-collabroration/1469-nsar-main.html>



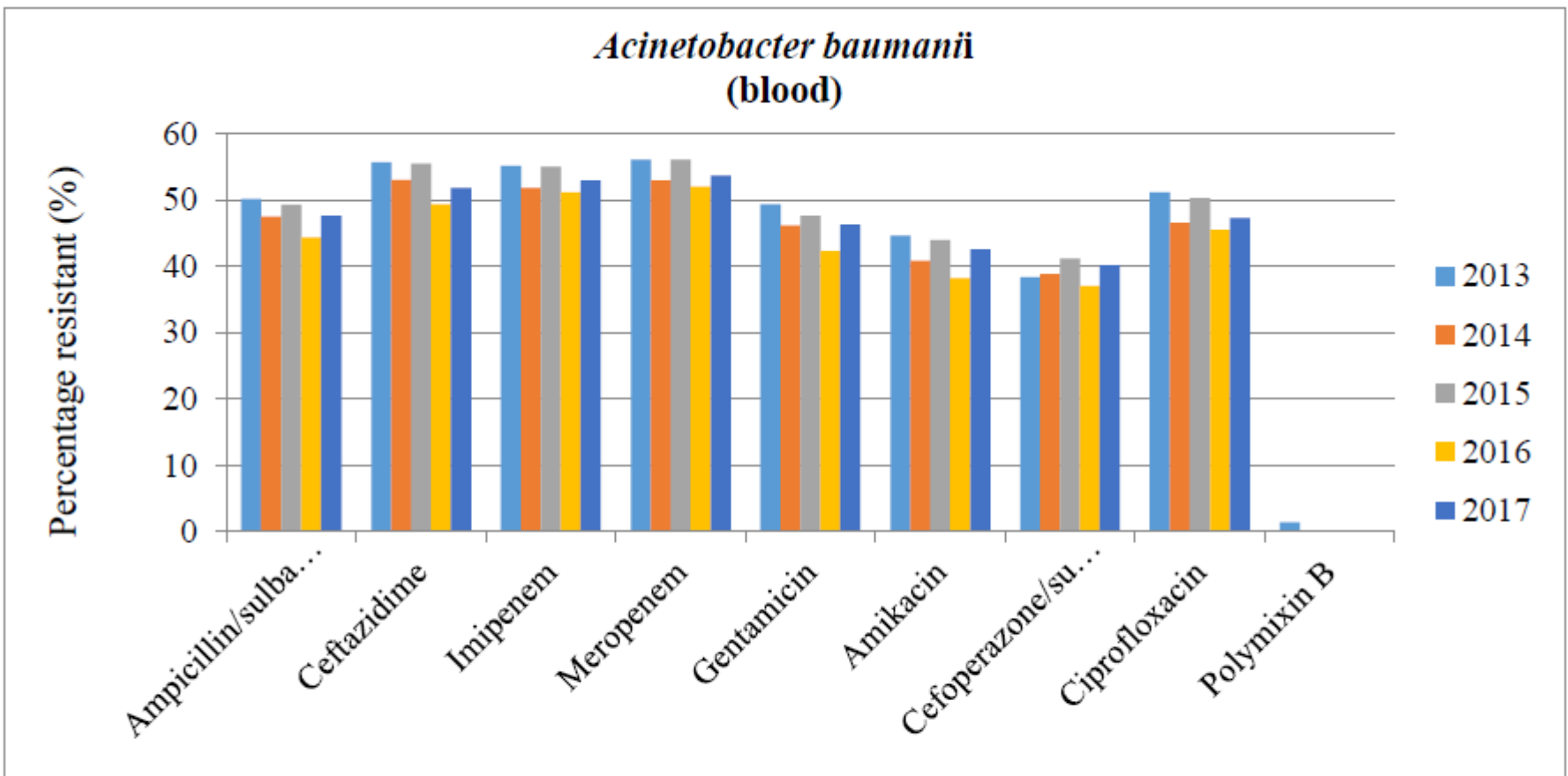


Figure 18: Antibiotic resistance trend for *Acinetobacter baumannii* isolated from blood, 2013-2017.

National Surveillance for Antimicrobial Resistance 2018.

<http://www.imr.gov.my/en/component/content/article/75-english-content/national-collabroration/1469-nsar-main.html>

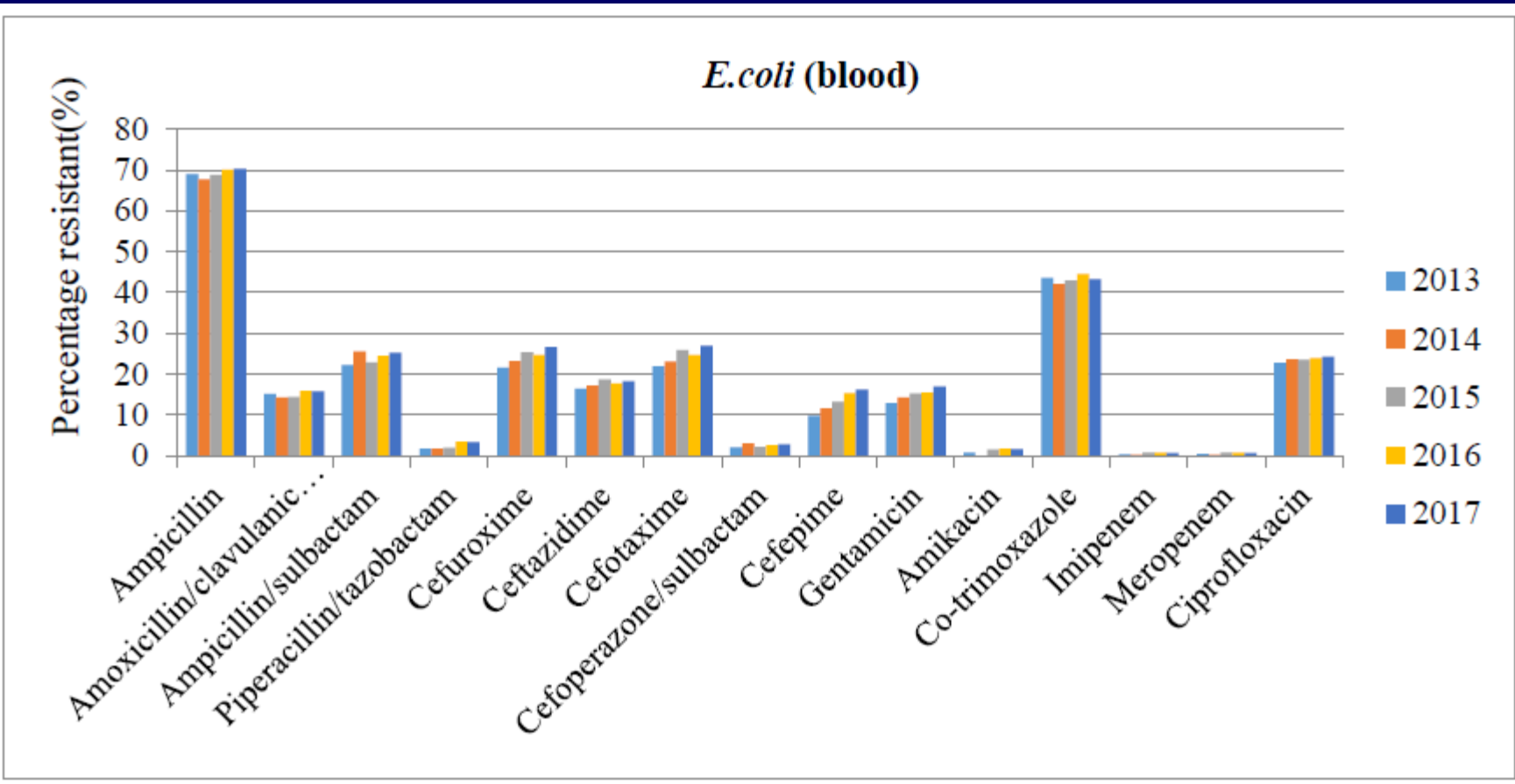


Figure 21: Antibiotic resistant trend for *E. coli* isolated from blood, 2013-2017.

# Carbapenem-resistant Enterobacteriaceae

## **E. coli**

Antibiotic	2013 (%R) (no. tested)	2014 (%R) (no. tested)	2015 (%R) (no. tested)	2016 (%R) (no. tested)	2017 (%R) (no. tested)
Imipenem	0.2 (12206)	0.3 (13654)	0.4 (13360)	0.9 (10871)	0.6 (12289)
Meropenem	0.2 (11838)	0.2 (13386)	0.5 (13167)	0.8 (10645)	0.7 (12439)

## **Klebsiella**

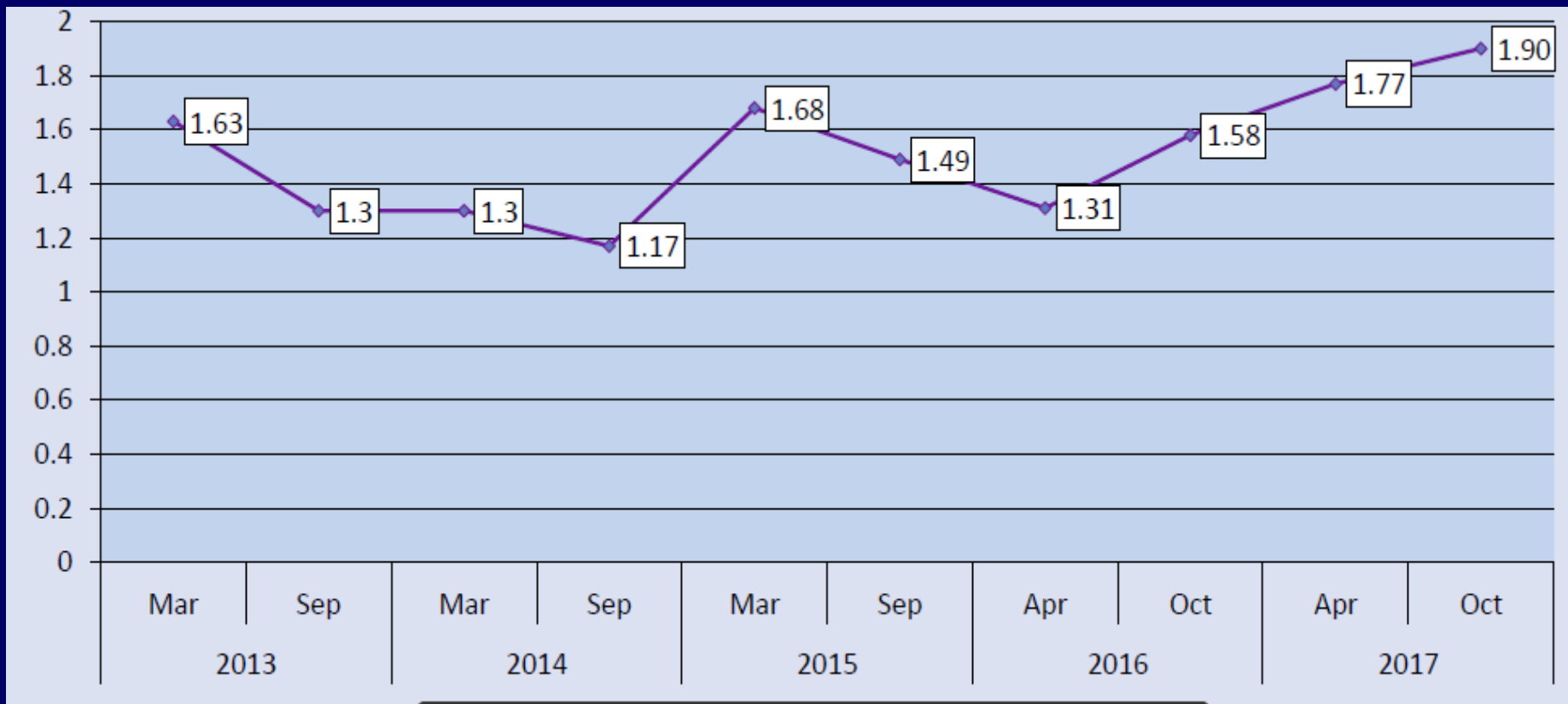
Antibiotic	2013 (%R) (no. tested)	2014 (%R) (no. tested)	2015 (%R) (no. tested)	2016 (%R) (no. tested)	2017 (%R) (no. tested)
Imipenem	1.5 (24477)	1.3 (28787)	2.4 (31025)	2.3 (29339)	2.7 (30319)
Meropenem	1.7 (23303)	1.6 (27911)	2.8 (30253)	2.6 (28254)	2.9 (31151)

National Surveillance for Antimicrobial Resistance 2018.

<http://www.imr.gov.my/en/component/content/article/75-english-content/national-collabroration/1469-nsar-main.html>

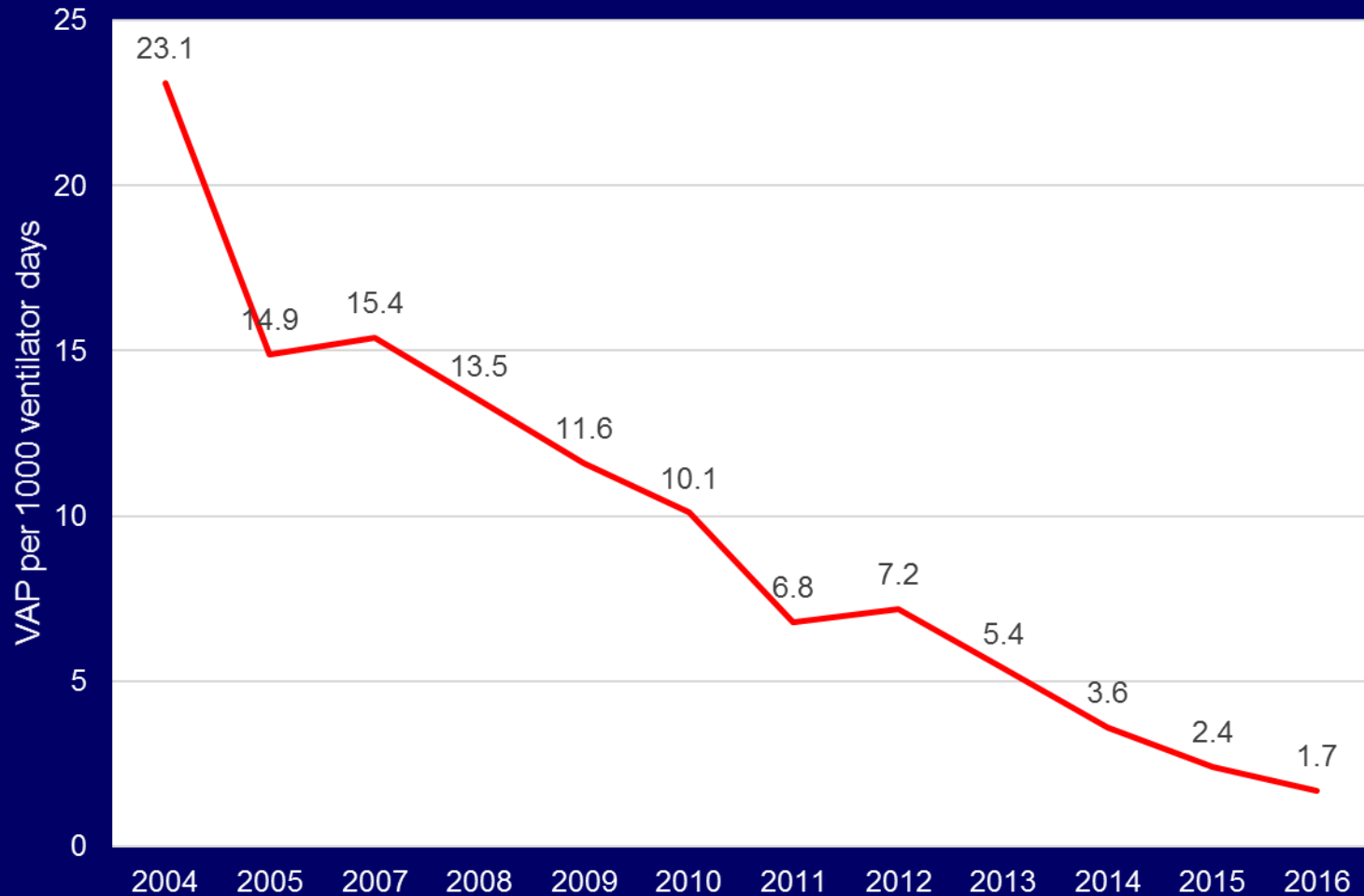
# National Hospital Associated Infection Surveillance Programme

- Prevalence studies conducted twice a year
  - CDC definitions of infections
  - Universal surveillance on a defined day
  - Data collected, analysed and published by the Quality Division of the Ministry of Health
- Malaysian Registry for Intensive Care
  - ventilator-associated pneumonia
  - CVC – BSI
  - 50 ICUs and 37,759 admissions in 2016



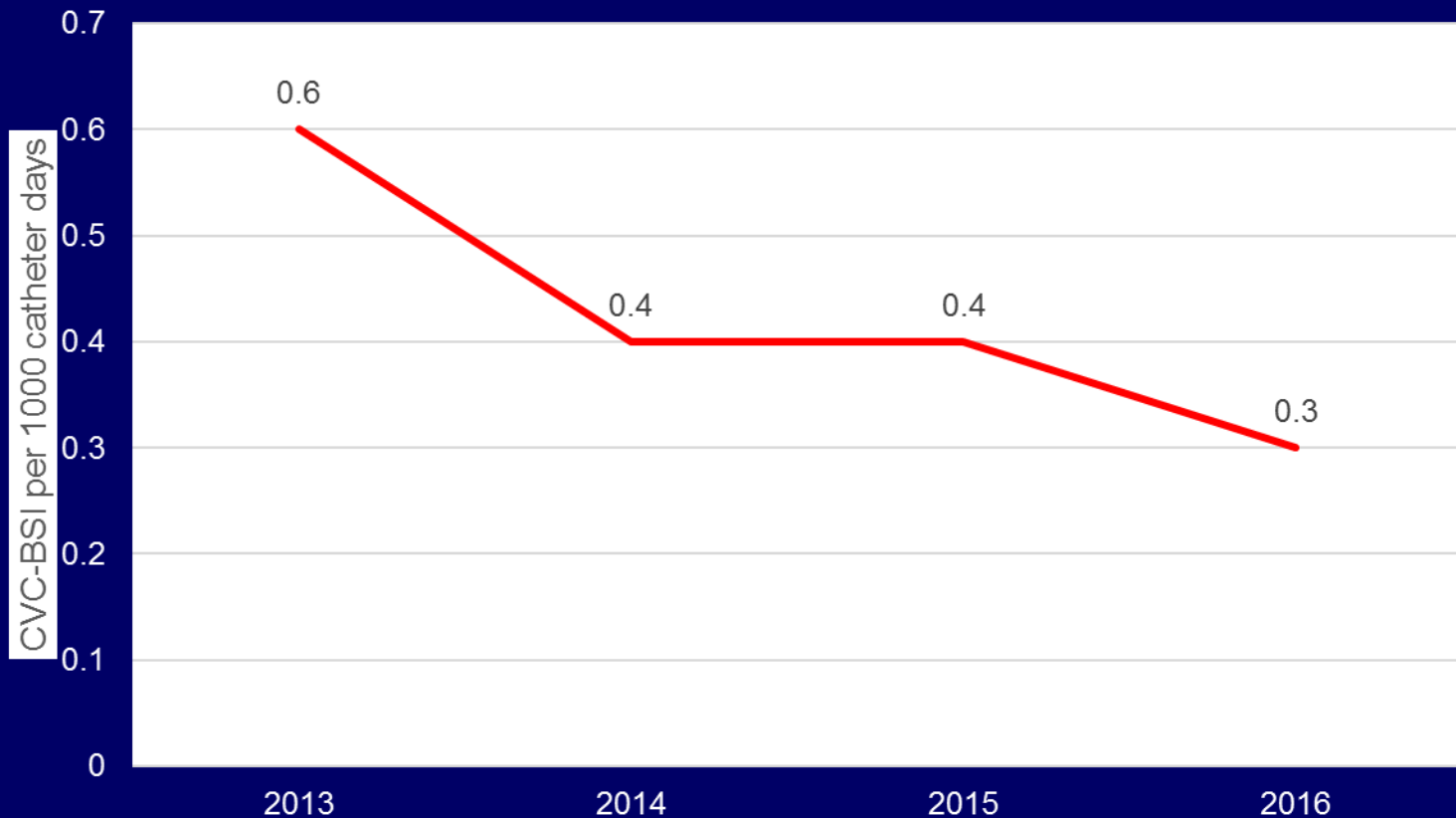
Medical Development Division, Ministry of Health of Malaysia, 2018

# Ventilator-associated Pneumonia



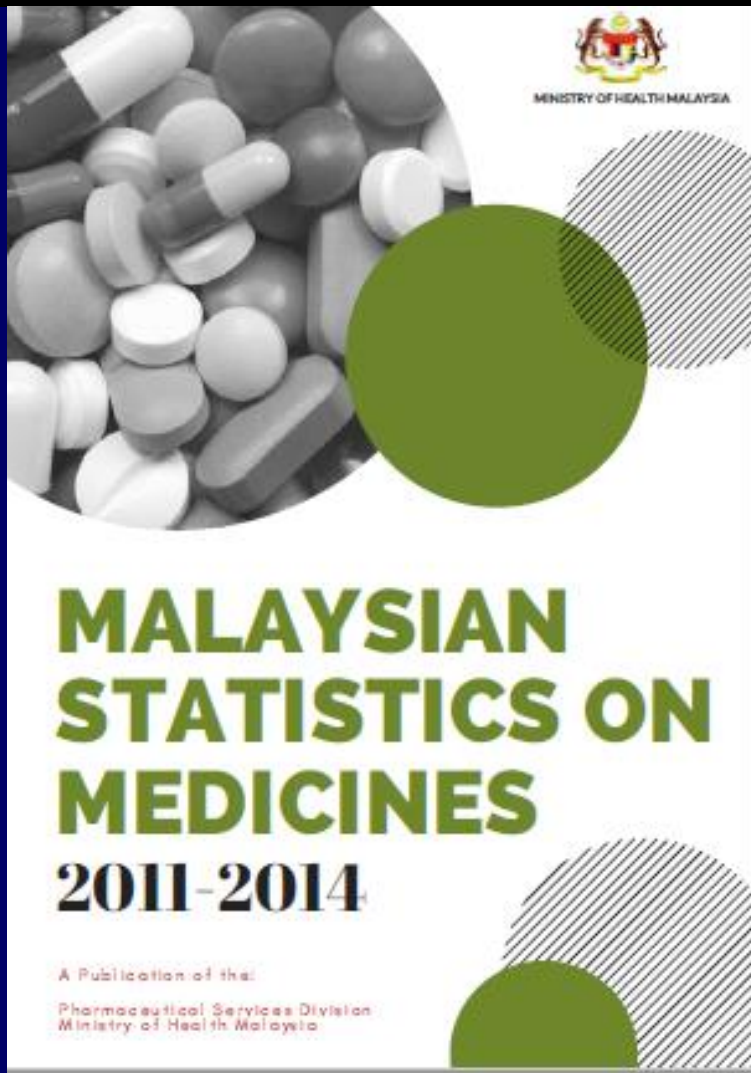
Malaysian Registry of Intensive Care 2016  
[https://www.crc.gov.my/wp-content/uploads/documents/report/mric\\_report\\_2016.pdf](https://www.crc.gov.my/wp-content/uploads/documents/report/mric_report_2016.pdf)

# CVC-BSI



Malaysian Registry of Intensive Care 2016  
[https://www.crc.gov.my/wp-content/uploads/documents/report/mric\\_report\\_2016.pdf](https://www.crc.gov.my/wp-content/uploads/documents/report/mric_report_2016.pdf)

# Antibiotic Utilisation Monitoring



- National drug utilization studies started in 2004 and conducted on an annual basis
- Data collected from both public and private sectors; primary to tertiary care facilities
- Uses the ATC classification system and unit of measurement expressed as daily defined doses according to WHO recommendations
- In 2014 the overall antibacterial (JO1) use : 10.87 DDD/1000 population/day

<https://www.pharmacy.gov.my/v2/en/documents/malaysian-statistics-medicines.html>



# Use of anti-bacterials 2011-2014

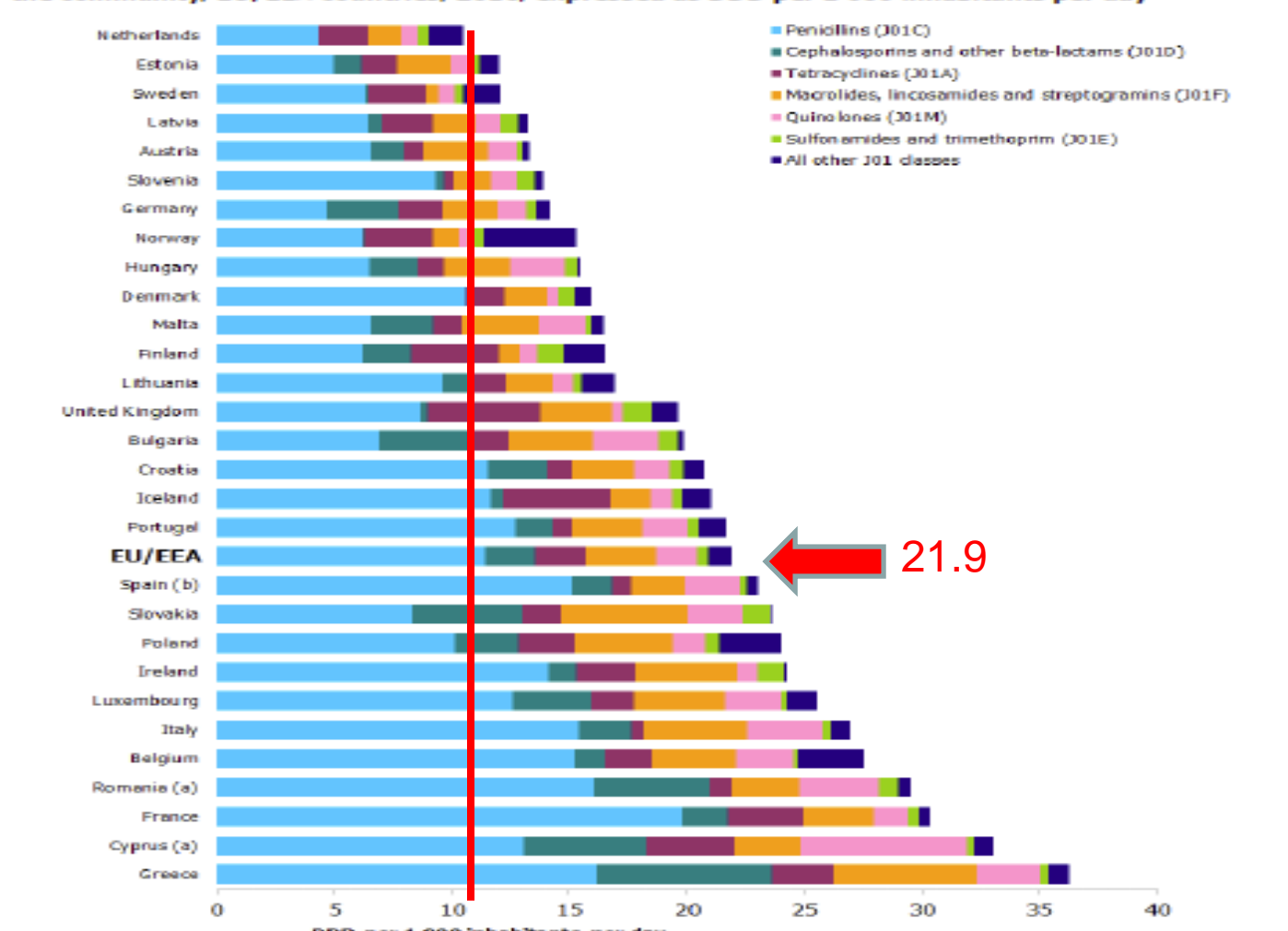
Table 15.1: Use of antimicrobial agents, by therapeutic group from 2011 to 2014.

ATC	Therapeutic Group	Sector	Utilisation (DDD/1,000 inhabitants/day)			
			2011	2012	2013	2014
J01	Antibacterials for systemic use	Public	3.4935	3.6324	3.7084	3.8052
		Private	6.0941	7.1103	7.1820	7.0650
		Total	9.5876	10.7427	10.8904	10.8702

- Significant increases in the use of
  - Cefepime (164%)
  - Piperacillin-tazobactam (66%)
  - Carbapenems (30%)

# Antibiotic Consumption (ATC Group J01) in Europe 2016

Figure 2. Consumption of antibacterials for systemic use (ATC group J01) and ATC group level 3 in the community, EU/EEA countries, 2016, expressed as DDD per 1 000 inhabitants per day



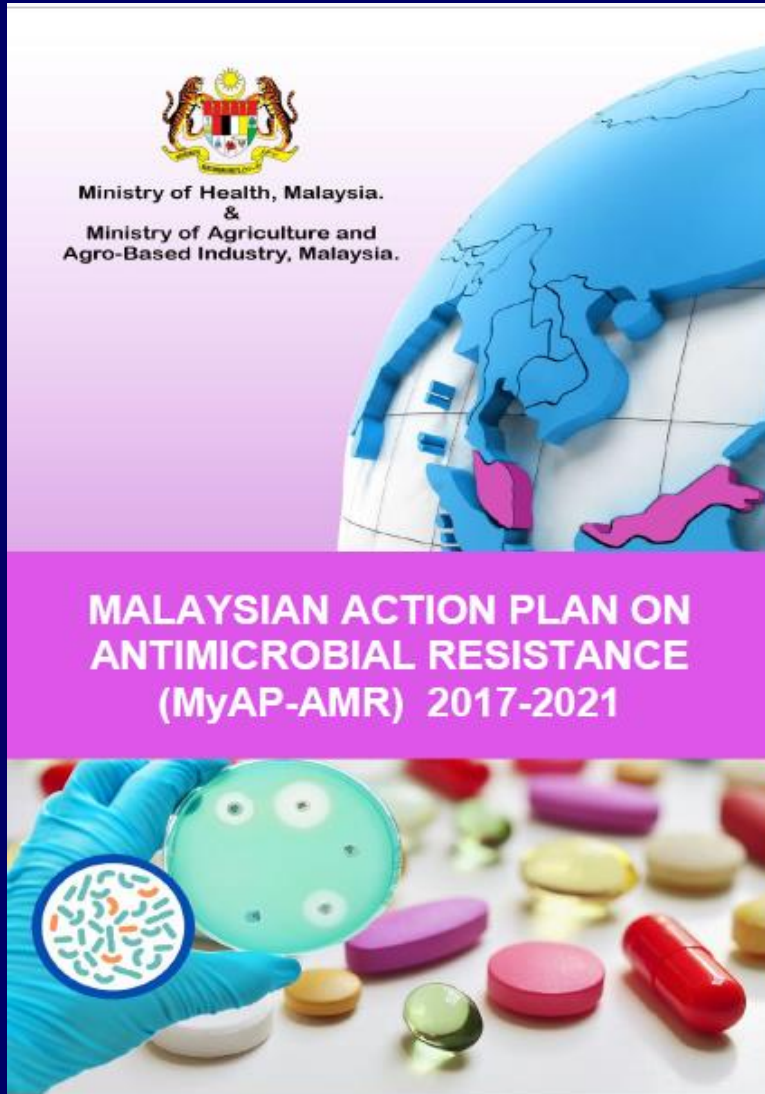
# Antibiotic use monitoring in government hospitals

- Monitoring of antibiotic utilisation in MOH hospitals and 1 private chain of hospitals
- Ongoing activity for certain classes of antibacterials
  - Cephalosporins
  - Quinolones
  - Carbapenems
  - Glycopeptides
- Data expressed as DDD/100 admissions
- Submission of data to National Infection and Antibiotic Control Committee
- Identification of outliers and discussion of remedial measures

# Formularies and guidelines

- Governmental sector
  - National antibiotic guidelines and national formulary
  - All hospitals can modify these guidelines to suit their needs
- Private sector
  - Doctors can use any product so long as it is registered by the Drug Control Authority
  - Independent contractors in private hospitals
  - Out-of-pocket payment
- Professional society practice guidelines
- Effectiveness of guidelines questionable

# MyAP-AMR 2017 - 2021



- Launched in 2017
- Joint programme by Ministries of Health and Agriculture
- In response to adoption of the Global Action of AMR by the World Health Assembly in 2015
- One Health approach

# Framework

Key Priority Areas	Objectives
1. Public Awareness and Education	Improve awareness and understanding of AMR through effective communication, education and training
2. Surveillance and Research	Strengthen the knowledge and evidence base through surveillance and research
3. Infection Prevention and Control	Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures
4. Appropriate Use of Antimicrobials	Optimize the use of antimicrobial medicines in human and animal health

# National Action Plan

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## OBJECTIVE

Improve Awareness and Understanding of Antimicrobial Resistance through Effective Communication, Education and Training

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### Strategies

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- 1.1 Increase national awareness of AMR through public communication programmes in human and animal health.
- 1.2 Establish AMR as a core component of professional education, training and development for the human and animal health sectors.
- 1.3 Include AMR in school extra-curricular activities in order to promote better understanding and awareness.
- 1.4 Provide the public media with accurate and relevant information on AMR.

- Under each objective
  - Strategies
    - Actions
    - Dates
    - Target groups
    - Responsible Units
    - Evaluation indices
  - Intensification of current activities as well as new initiatives
  - Working together

# Conclusions

- Efforts in antibiotic stewardship has been on-going for nearly 3 decades
- There has been some successes but major challenges still remain
  - Largely a top-down approach
  - High prevalence of antimicrobial resistance
  - Limited participation outside the Ministry of Health
  - Until recently little involvement of the agricultural sector