

# Global Impact Of An Antimicrobial Stewardship Program At A 430 Bedded Tertiary Care Hospital In The United Arab Emirates

Rayhan Hashmey, MBBS<sup>1</sup>, Asad Khan, MBBS<sup>1</sup>, Aqeel Saleem, MBBS<sup>1</sup>, Kholoud Jamal<sup>2</sup>, Dalal Mansouri<sup>1</sup> and Yousuf Naqvi, MBBS<sup>3</sup>  
(1)Dept. of Medicine, Tawam Hospital, Al Ain, United Arab Emirates, (2)Dept. of Pharmacy, Tawam Hospital, Al Ain, United Arab Emirates, (3)Health Regulation Division, Health Authority of Abu Dhabi, Abu Dhabi, United Arab Emirates

## Background:

Given the association between antimicrobial use and the selection of resistant pathogens, the frequency of inappropriate antimicrobial use is often used as a surrogate marker for the avoidable impact on antimicrobial resistance. The combination of effective antimicrobial stewardship with a comprehensive infection control program has been shown to limit the emergence and transmission of antimicrobial-resistant bacteria. A secondary goal of antimicrobial stewardship is to reduce health care costs without adversely impacting quality of care.

There is a lack of antibiotic stewardship programs in the UAE and unrestricted antimicrobial prescription is the norm. Baseline audits conducted in 2007 showed overuse of carbapenems, third generation cephalosporins and the fluoroquinolones at Tawam Hospital.

We implemented an antimicrobial stewardship program at our hospital in 2008 based on IDSA/SHEA guidelines in an attempt to decrease use of these antibiotics.

## Methods:

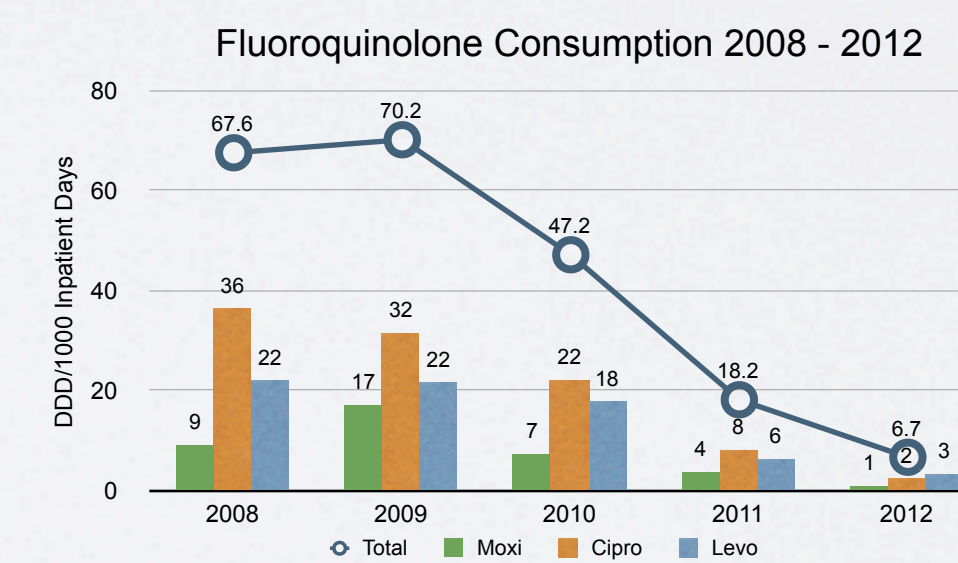
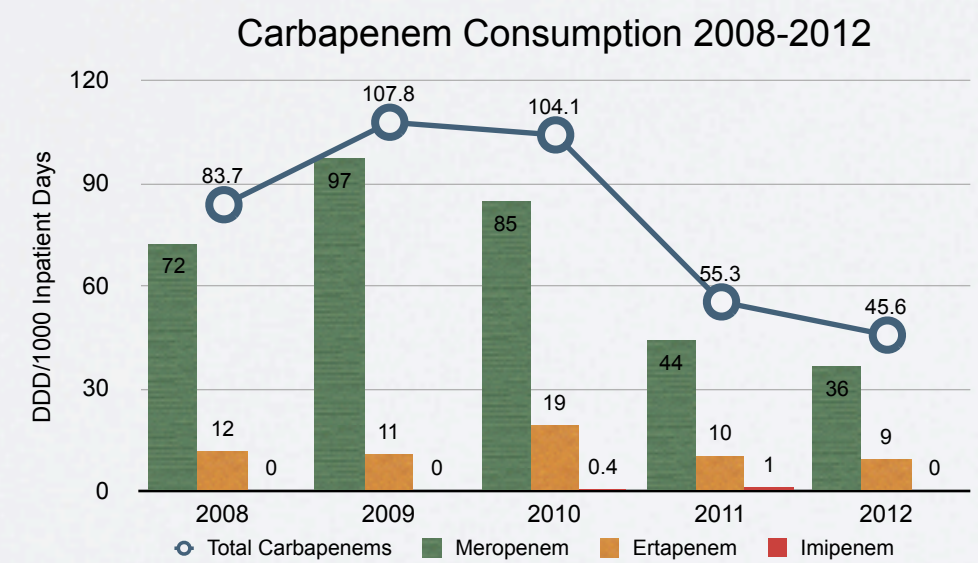
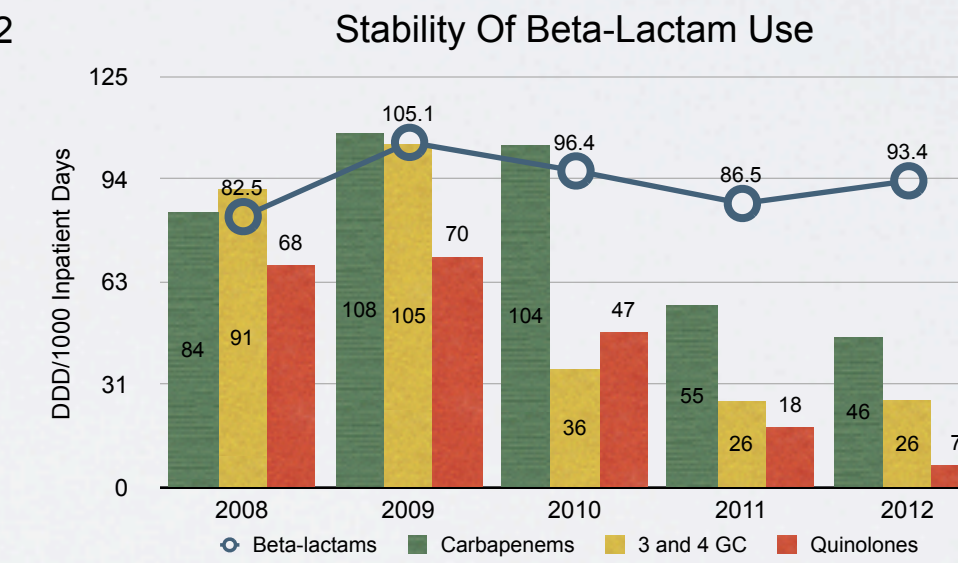
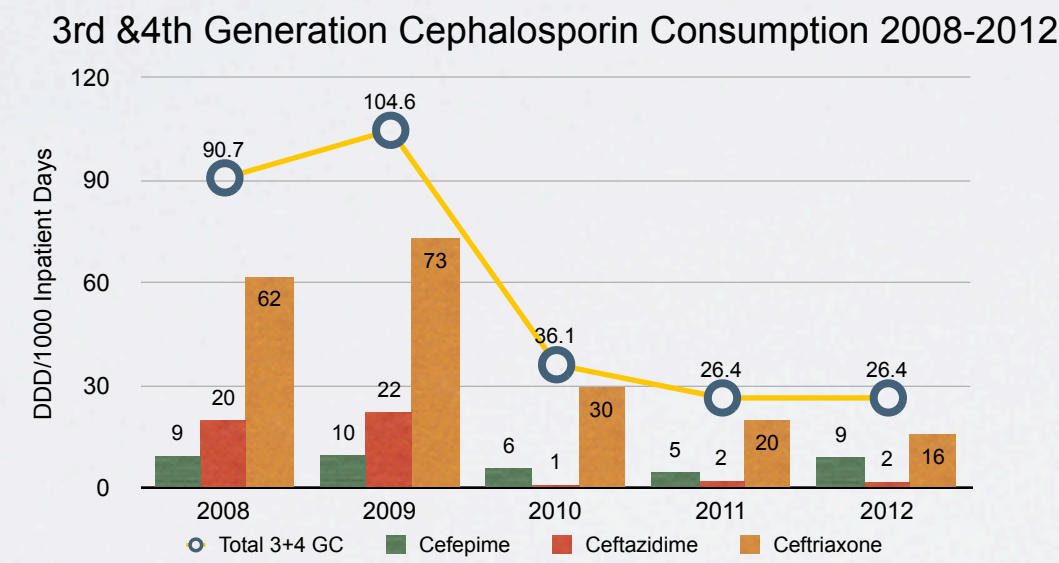
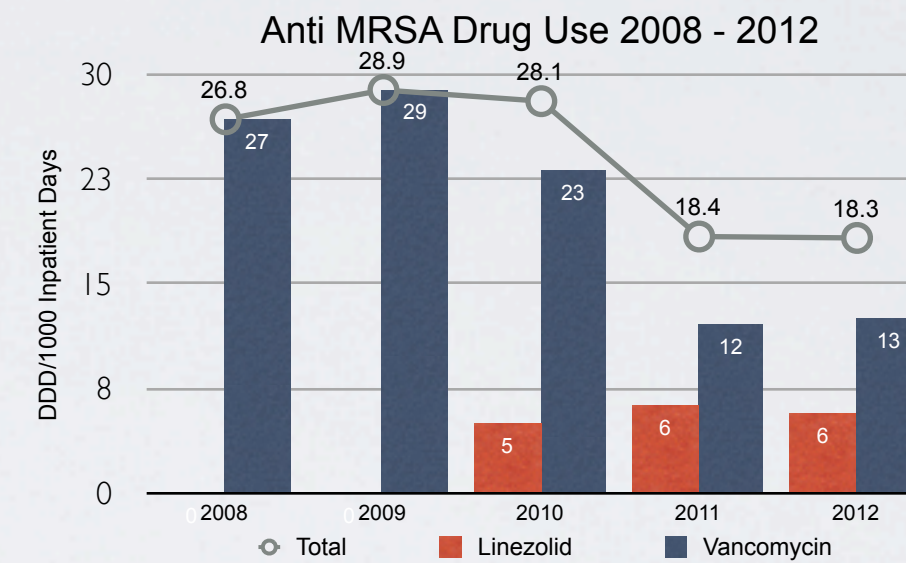
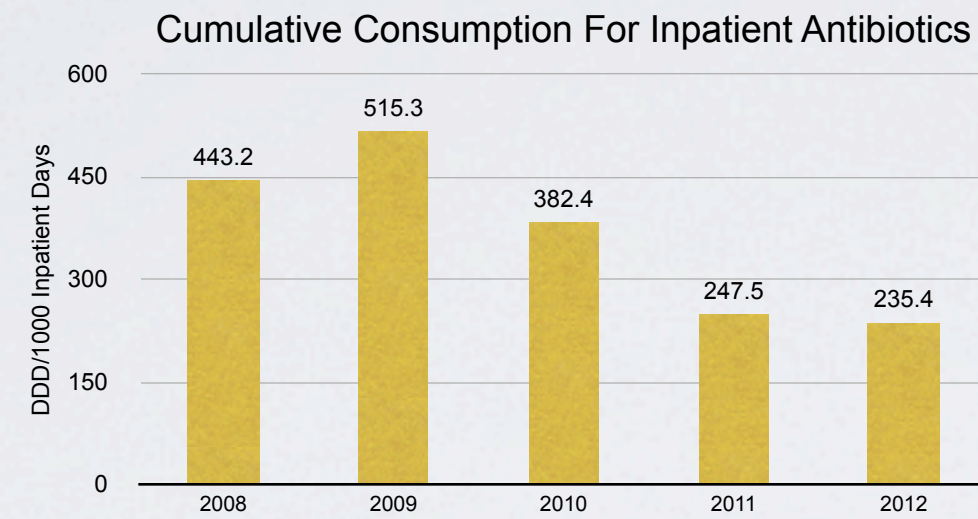
Over the past six years, Tawam Hospital has built a stewardship program that has incrementally incorporated recommended elements and strategies laid out in the IDSA/SHEA document.

The service, which reports quarterly through the Pharmacy & Therapeutics Committee to the Medical Executive Committee currently includes:

1. Five Infectious Disease consultants
2. Two Clinical Pharmacists with infectious diseases training
3. Clinical microbiology support
4. Information technology support
5. Department of Performance Innovation support (Quality).

The program employed formulary restriction, antibiotic use guidelines, computer-based antimicrobial management, formal scheduled rounds in high-risk units and one-on-one physician education. A 'stewardship' consult order has been created in the EMR with the ability to bill for services rendered.

Monthly audit of antimicrobial use is based on DDD/1000 inpatient days.



## Results:

The program has achieved remarkable success in reducing the use of the targeted antibiotic groups. Carbapenem use fell by 57.7% (107.8 to 45.6 DDD/1000 inpatient days), 3rd and 4th generation cephalosporin use by 74.8% (104.6 to 26.4 DDD/1000 inpatient days) and fluoroquinolone use by 90.5% (70.2 to 6.7 DDD/1000 inpatient days). Interestingly, use of drugs not targeted specifically by the program, like anti-MRSA agent (vancomycin), also fell by 57% (26.8 to 12.5 DDD/1000 inpatient days). Overall antibiotic consumption in the inpatient setting fell from a peak of 515.3 DDD/1000 inpatient days in 2009 to 235.4 DDD/1000 inpatient days in 2012, a reduction of 54%. ASP activities saved the hospital in excess of AED 4,000,000 (USD 1.1 million )/year in direct drug costs in alone. There was no drop in severity of illness scores as measured by the hospital Case Mix Index (CMI) during the study period.

ANTIBIOTICS REQUIRING ID APPROVAL		
Carbapenems	Ertapenem	ID Physicians / Intensivists - for 48 hrs
	Imipenem	
	Meropenem	
Fluoroquinolones (Oral & Parenteral)	Ciprofloxacin	ID Physicians/Urologists
	Levofloxacin	
	Moxifloxacin	
3rd & 4th Generation Cephalosporins	Cefotaxime	ID Physicians or ID approval Exception is made for the 1st dose in ER for Pediatrics for fever of unknown source in patients between ages of 3months to 3 years and in all cases of meningitis
	Ceftriaxone	
	Ceftazidime	
	Cefdinir	
	Cefixime	
	Cefepime	
Others (Oral & Parenteral)	Ampicillin/Sulbactam	ID Physicians
	Colistin	
	Linezolid	
	Tigecycline	

## Conclusions:

Being the first program of its kind in the UAE, the implementation of antimicrobial stewardship strategies at Tawam Hospital resulted in a progressive and sustained decrease in the use of targeted and non-targeted antibiotics, achieving a global reduction of 54% in inpatient antibiotic use. This is higher impact than similar programs reported in the literature suggesting a high level of inappropriate use at baseline.