



# Formulary Restriction

*Turning evidence into practice*

Anilawati Mat Jelani



Hospital Raja Perempuan Zainab II



# Hospital Raja Perempuan Zainab I

- Hospital under Ministry of Health located in Kota Bharu, Kelantan, Malaysia.
- Tertiary care centre
- 920 beds
- Service – Cardiology , Infectious diseases, Gastroenterology, Respiratory , Oncology , Hematology, Nephrology & Transplant , Surgical , Urology , Orthopedics , Pediatric, Gynecology, Burn unit , ENT , Ophthalmology etc
- 5 main general medical wards , 1 HDW, 3 surgical wards , 2 orthopaedics ward , 2 ICU , 1 CCU, 1 CICU etc
- AMS team – 3 ID physicians/2 Microbiologist/2 clinical pharmacists/10 Infection Control Nurses

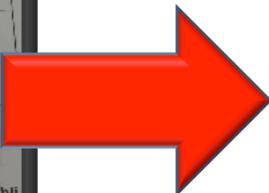


Hospital Raja Perempuan Zainab II

# AMS

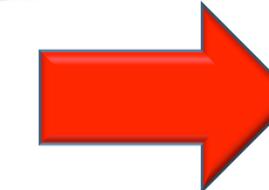


## 19<sup>th</sup> September 2013



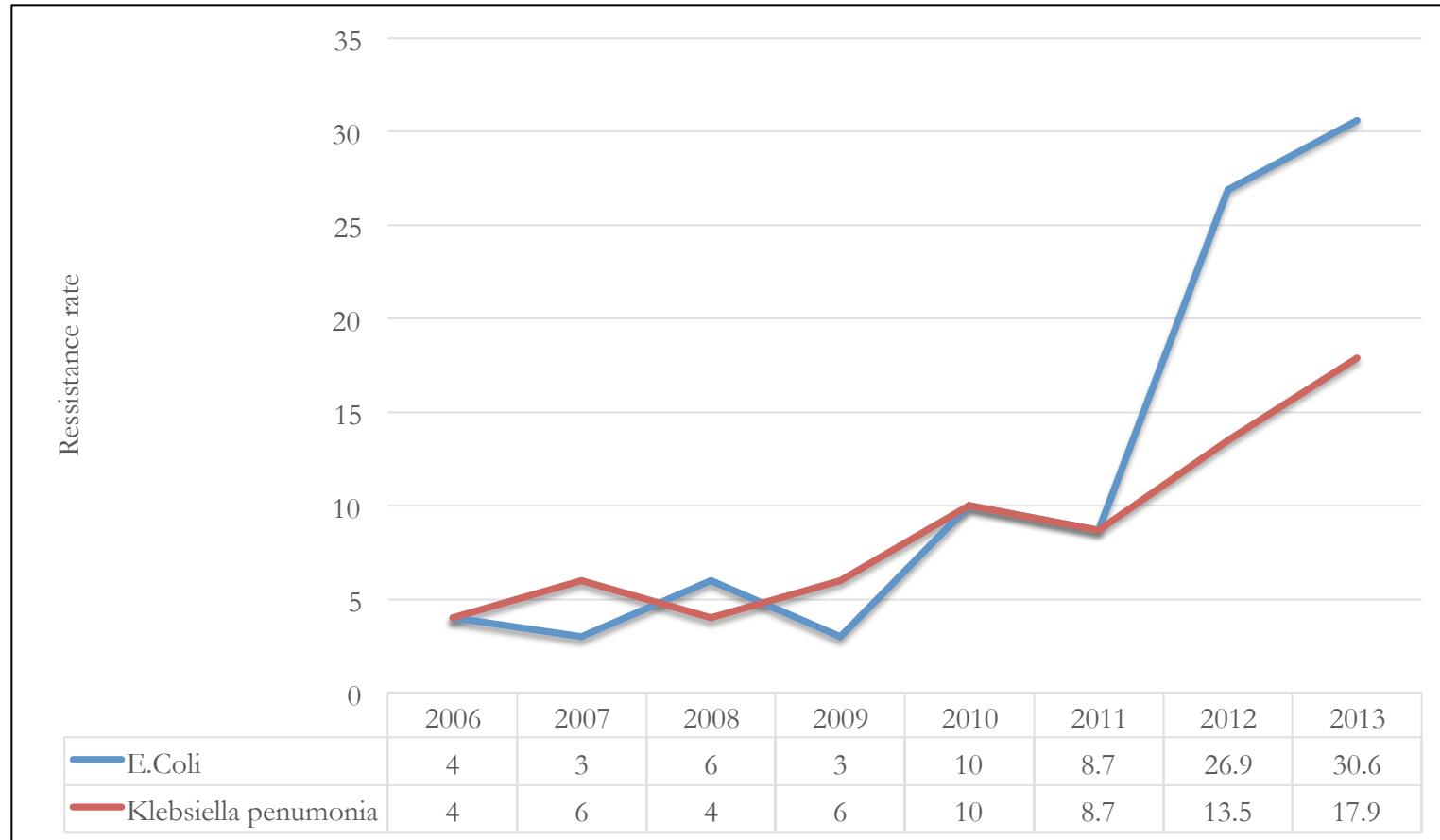
### EIGHT KEY STEPS for implementing an Antimicrobial Stewardship Program (ASP)

- 1 Assess the motivations
- 2 Ensure accountability and leadership
- 3 Set up structure and organization
- 4 Define priorities and how to measure progress and success
- 5 Identify effective interventions for your setting
- 6 Identify key measurements for improvement
- 7 Educate and Train
- 8 Communicate



Hospital Raja Perempuan Zainab II

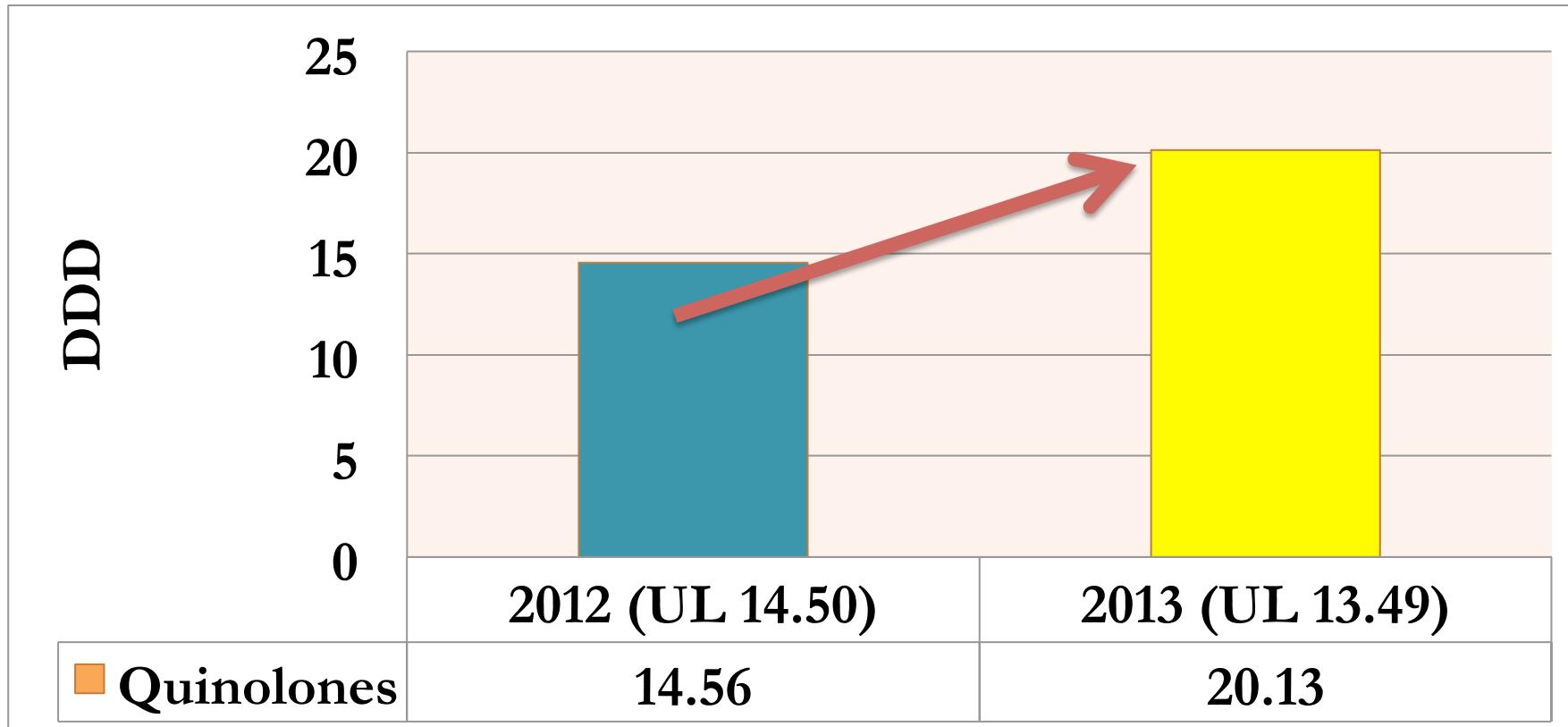
# Ciprofloxacin resistance for E.Coli & Klebsiella Pneumonia 2006-2013



Hospital Raja Perempuan Zainab II

Source : Dr.Nurahan Maning , Dr.Azura Husin  
Microbiology Unit , HRPZ II

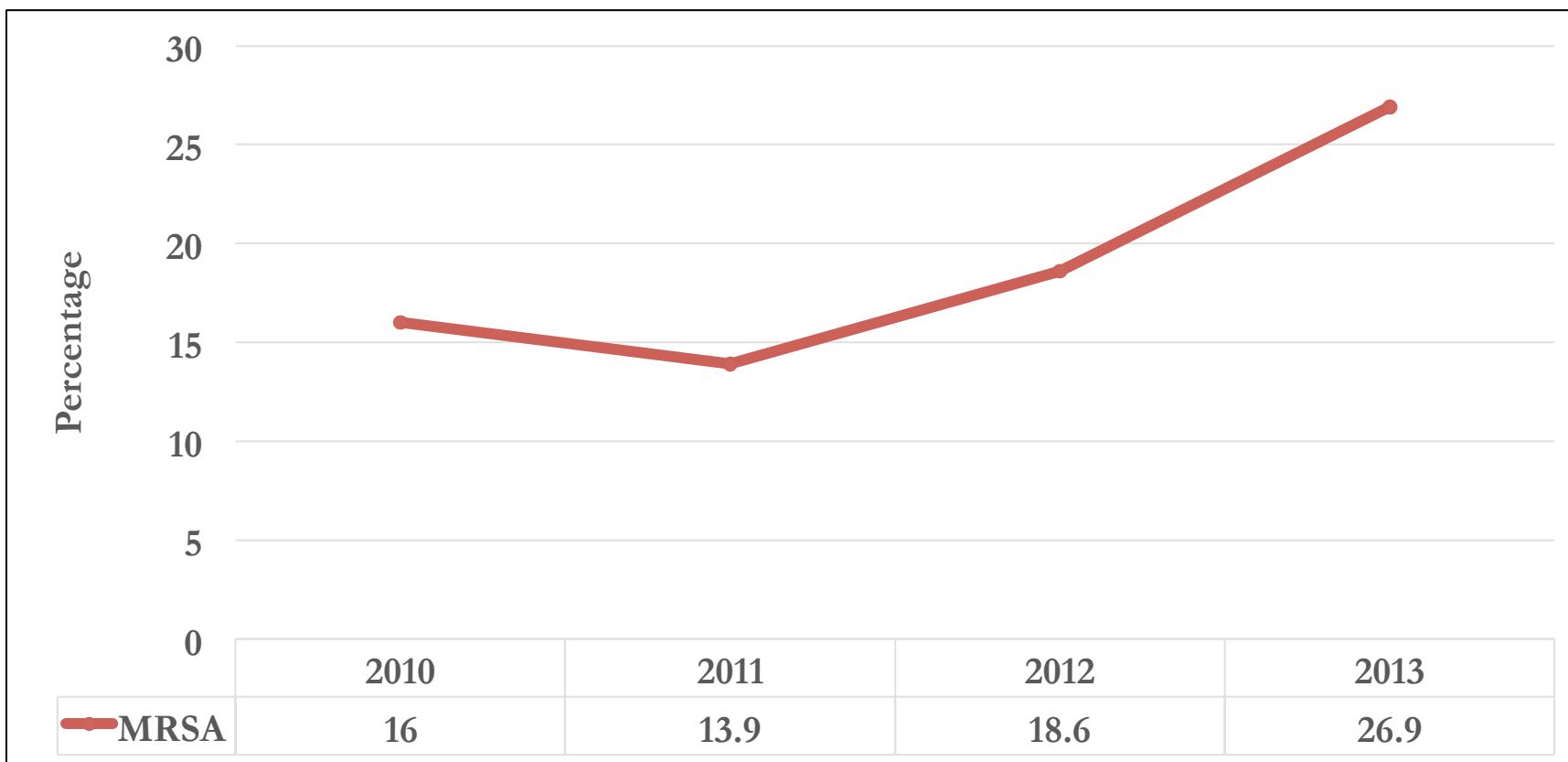
## Quinolones usage pattern 2012/2013



Hospital Raja Perempuan Zainab II

Source : Ms Kiren Kaur, Pharmacy Dept HRPZ II

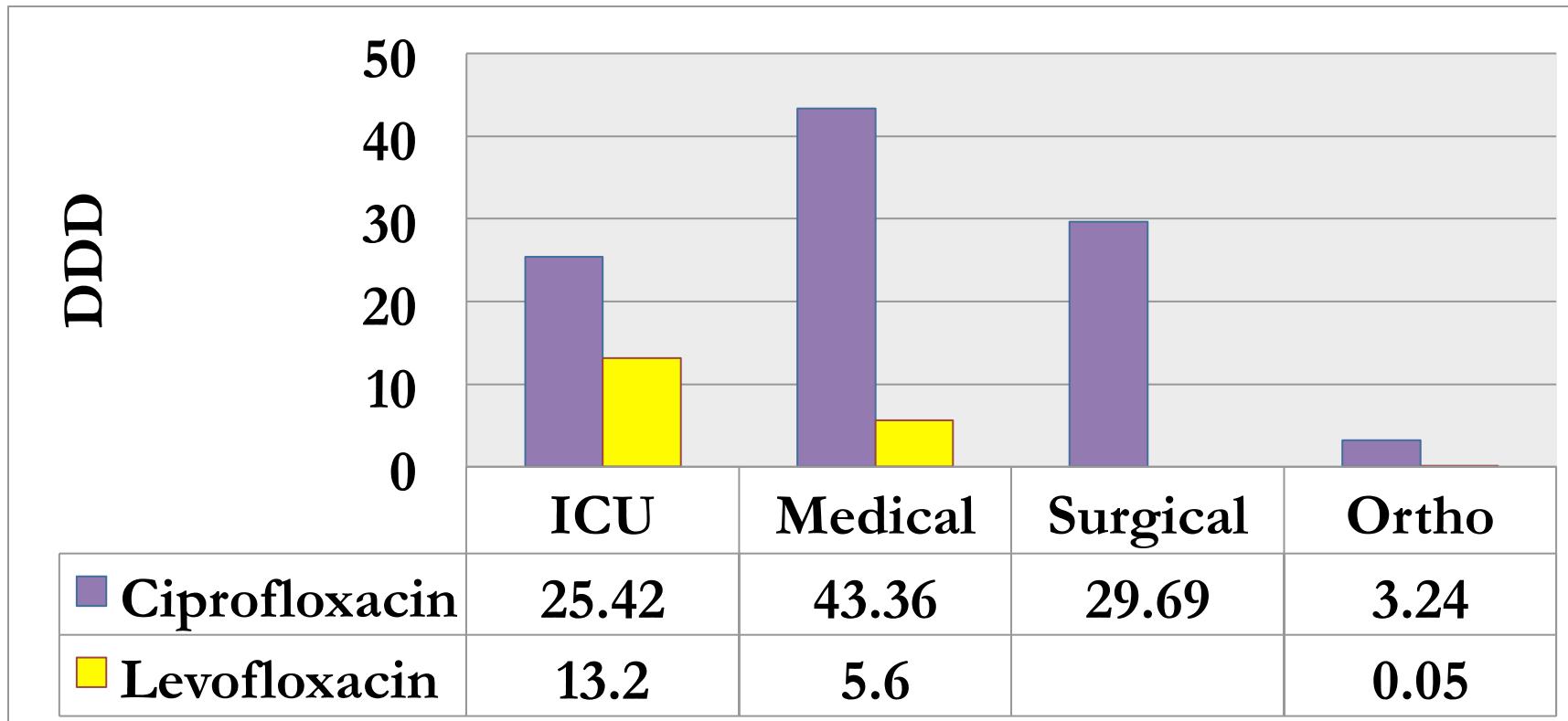
## MRSA trend 2010-2013



Hospital Raja Perempuan Zainab II

Source : Dr.Nurahan Maning , Dr.Azura Husin  
Microbiology Unit , HRPZ II

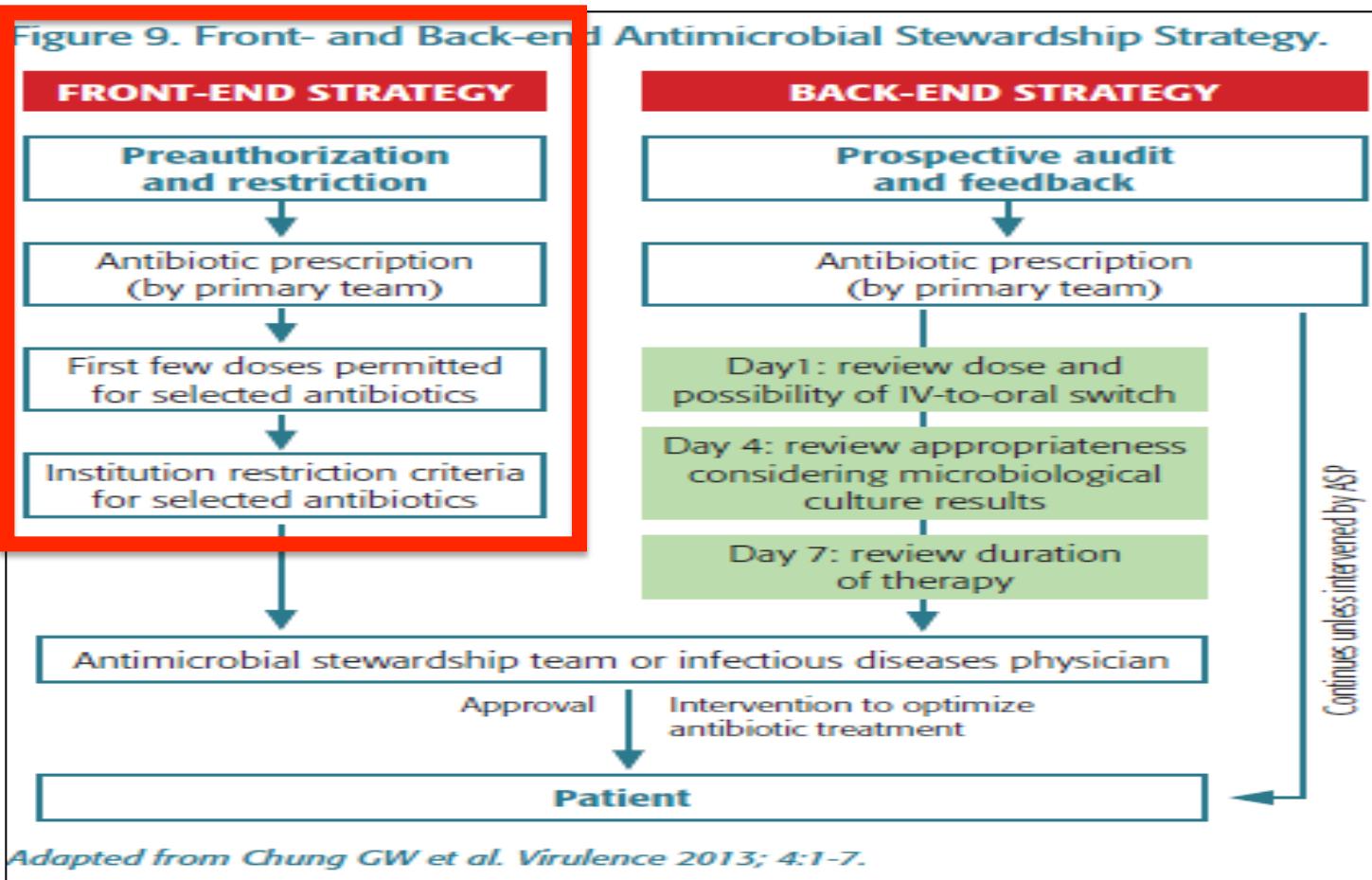
# Major department quinolones usage 2013



Hospital Raja Perempuan Zainab II

Source : Ms Kiren Kaur, Pharmacy Dept HRPZ II

# Which strategy fits best?



# Quinolones formulary restriction and pre-authorization

- ID approval for indications other than :
  - typhoid
  - alternative anti-TB drugs
  - confirmed pseudomonas infection susceptible to quinolones
- Official letter to all HODs/head of unit by Infection Control Committee Chairman and endorsed by Hospital Director
- Selective reporting of quinolones susceptibility

MEMO UNIT KAWALAN INFEKSI	
Ruj. Kami Tarikh	Bil ( 2 ) dim ICC / HRPZ II / 2014 6hb. Januari 2014
Tajuk	UBAT DARI KUMPULAN QUINOLONES HANYA BOLEH DI PRISKRIPSI UNTUK PESAKIT MDR-TB DAN TYPHOID SAHAJA
Daripada	Jawatankuasa Kawalan Infeksi & Antibiotik HRPZ II
Kepada	SENARAI SEPERTI EDARAN
S.K	AJK Kawalan Infeksi HRPZ II

Y.Bhg Dato'/Tuan/Puan,  
Dengan hormatnya perkara di atas dirujuk.

2. Untuk makluman bahawa penggunaan ubat dari kumpulan *Quinolones* hanya boleh di priskripsi untuk pesakit *MDR-TB* dan *Typhoid*.

3. Memandangkan peningkatan yang mendadak dalam kerintangan (*resistance*) terhadap bakteria gram-negatif seperti *Escherichia Coli* dan *Klebsiella pneumonia* (*ESBL*). Langkah-langkah kawalan infeksi perlu diambil untuk membendung daripada berlakunya peningkatan kadar multidrug resistance organism (*MRO/MDR*) dihospital.

4. Kerjasama daripada Y.Bhg Dato'/Tuan/Puan, amatlah diharapkan.

Sekian, terima kasih.

" PENYAYANG, BEKERJA BEKERJA BERPASUKAN & PROFESIONALISMA ADALAH BUDAYA KERJA KITA "

Yang menjalankan tugas

-----  
**( DR MAHIRAN BINTI MUSTAFA )**  
Pakar Perunding Perubatan (Penyakit Berjangkit)  
Gred Khas B  
Koordinator Kawalan Infeksi & Antibiotik HRPZ II



# Selective reporting of quinolones susceptibility

LABORATORY REPORT : 951600253338			
:	MRN	:	
	WAD MAWAR	HRPZ619270	Age : 35 Yr Register Date Time : 18/10/2016 1
		Sample Date Time : 18/10/2016 1	
		Report Status	: Final Report
Type : Swab - Abdomen			
RESULT	UNIT	REF. RANGE	
<b>Culture &amp; FEME</b>			
'AB Culture & FEME	1. Organism Isolated: Escherichia coli =====		
	Result		
	Amoxycillin-Clav	I	
	Ampicillin	R	
	Cefotaxime	S	
	Gentamicin	S	
	Pip/Tazobactam	S	
Comment : swab from abdomen.			



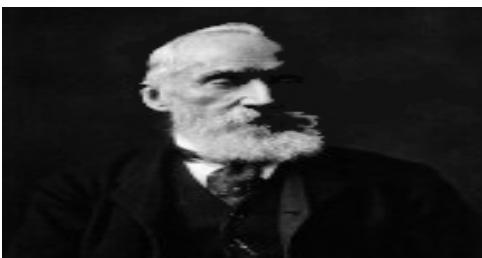
# Key measurements : Process & outcome

## Process measures

## Outcome measures

Did the intervention result in the desired change of antimicrobial usage

Did the process implemented reduce the unintended consequence ?

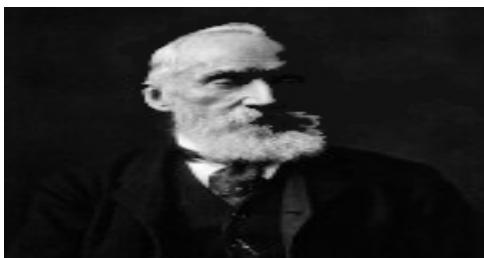


**"to measure is to know – if you cannot measure it, you cannot improve it"**  
– Lord Kelvin

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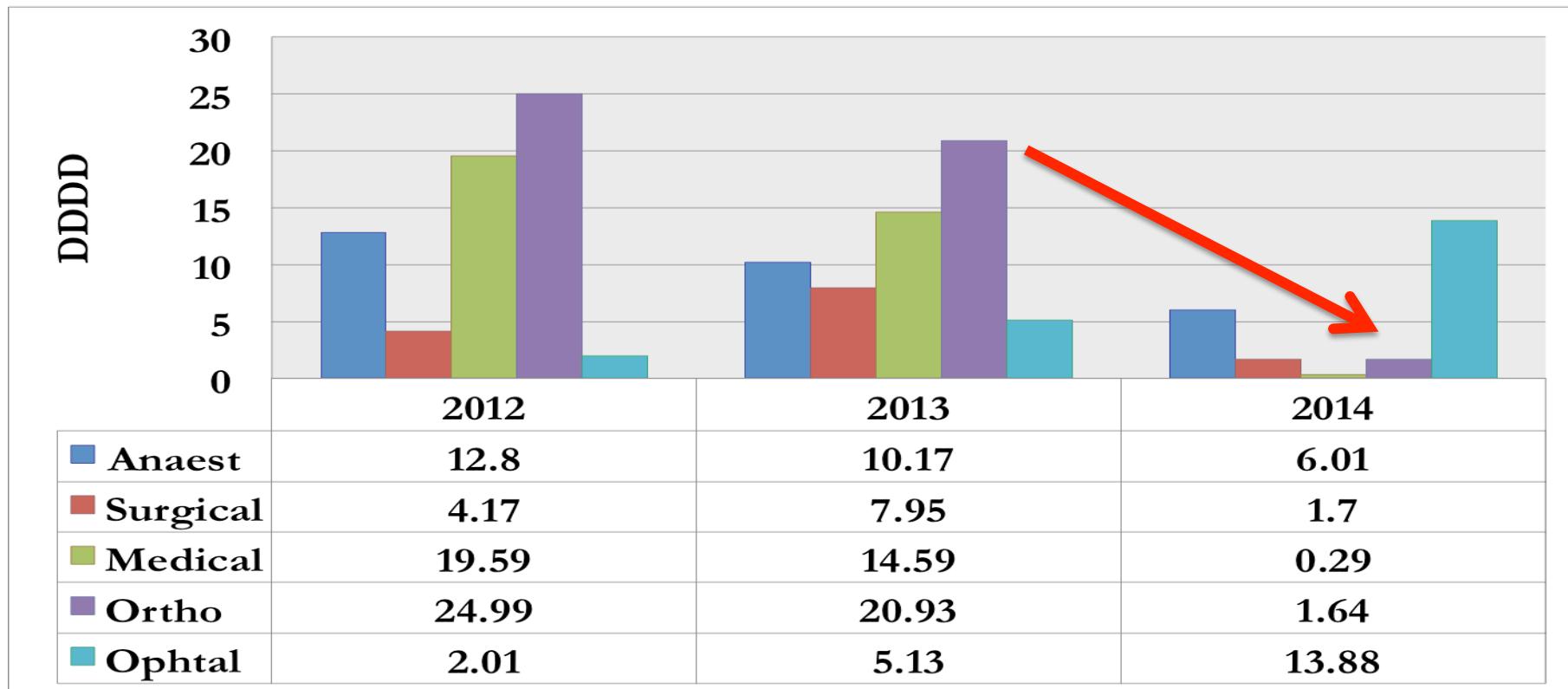
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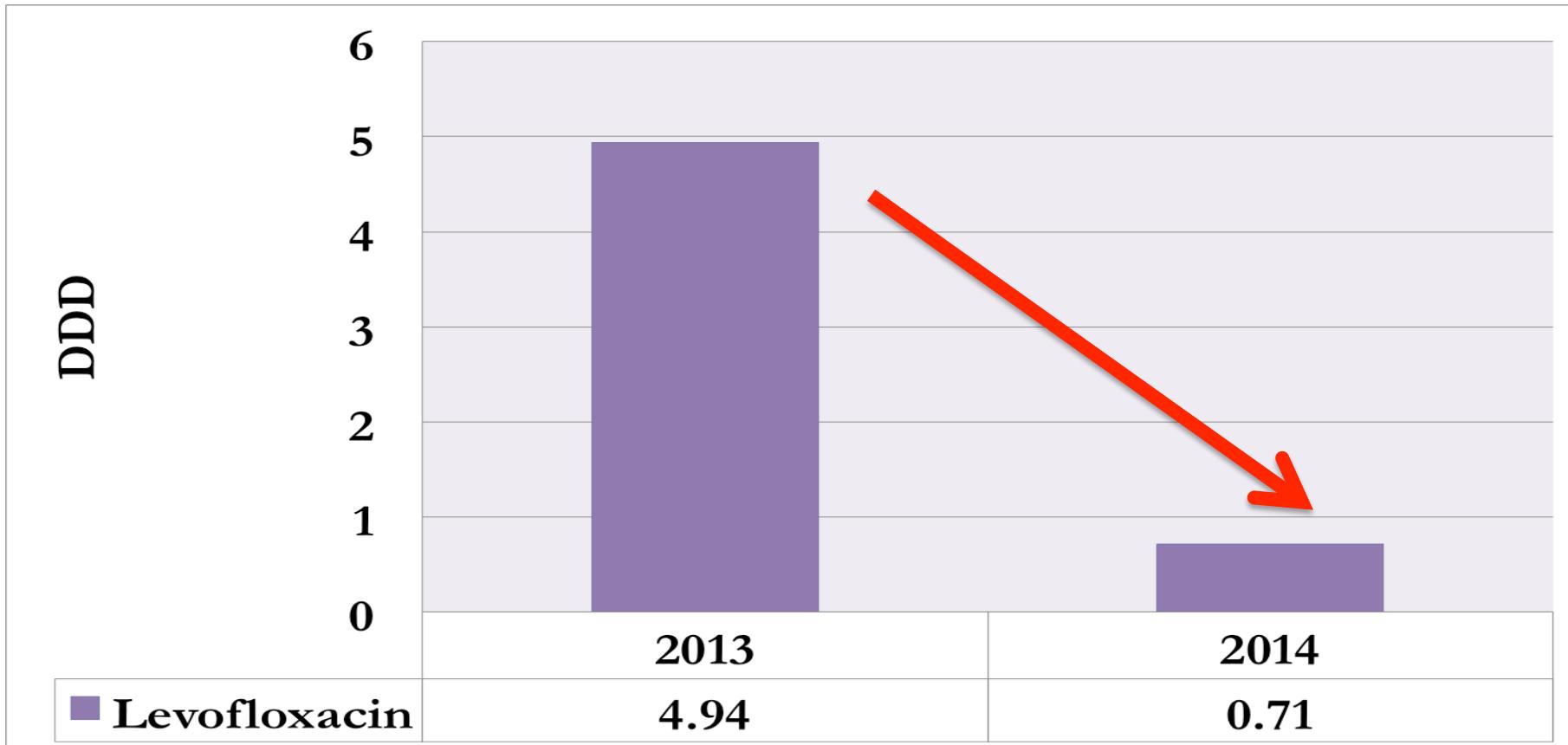
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# Ciprofloxacin Usage Pattern by Department 2012-2014



# Levofloxacin Usage Pattern

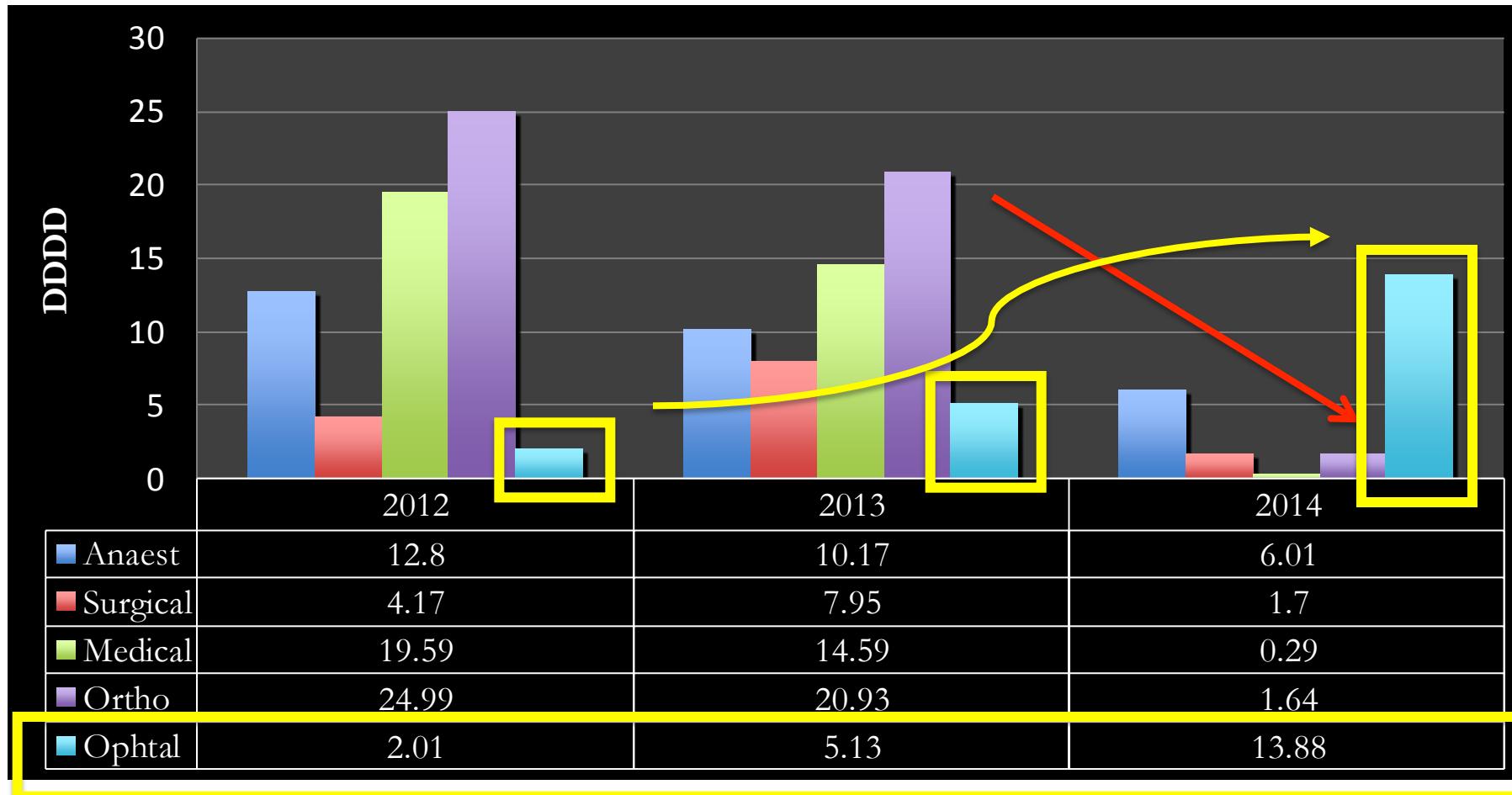
## 2013-2014



Hospital Raja Perempuan Zainab II

Source : Ms Kiren Kaur, Pharmacy Dept HRPZ II

# Increase in ciprofloxacin usage in ophthalmology



# How did we deal with this ?



**Justification of use of quinolones**

Reviewed all culture results from ophthalmology from Jan to April 2015

Only 2 out of 27 swabs and pus culture grew pseudomonas which justified use of quinolones

# How did we deal with this ?



## Justification of use of quinolones

**MEMO JABATAN PERUBATAN**

Ruj. Kami	Bil. f. 42/1/dm. IP/HIPZ II
Tarikh	10 Mei 2015
Tujuh	PENINGKATAN PENGGUNAAN ANTIBIOIK CIPROFLOXACIN DI JABATAN OFTALMOLOGI
Dari/pada	Ketua Jabatan Perubatan
Kepada	Ketua Jabatan Oftalmologi
Sek. : Pengarah Hospital	

Dato' / Datuk/Tuan/Puan,

Adalah diumumkan bahawa pada mesyuarat Jawatankuasa Kawalan Infeksi Hospital pada 24/5/2015 , jawatankuasa mendapati dari pemantauan terdapat penggunaan ciprofloxacin yang tinggi di jabatan tuan. Untuk maklumat pihak tuan , sejak Disember 2013 jawatankuasa Kawalan Infeksi hospital telah bersertai untuk menghadkan penggunaan Ciprofloxacin kerana peningkatan kadar kerintangan antibiotik tersebut yang tinggi iaitu sekitar 10% sahaja dalam 12 bulan. Dengan itu antibiotik kompleks quinolone (atau klasifikasi Ciprofloxacin) hanya boleh digunakan untuk kes typhoid dan MDR Tuberculosis. Untuk indikasi penggunaan selain daripada kejohanan dan justified hendaklah dilaksanakan kepada Pengurus Unit Kawalan Infeksi hospital.

2. Sesungguhnya dengan kami telah menyenang keputusan kultur bagi kes-kes di jabatan oftalmologi dari Januari hingga April 2015 sebagai justifikasi penggunaan antibiotik Ciprofloxacin di jabatan tuan. Kami dapat hanya 2 dari 27 kes yang memerlukan indikasi untuk penggunaan ciprofloxacin lajuu kes dimana keputusan kultur menunjukkan pseudomonas (rujuk lampiran 2) manakala kes-kes lain menunjukkan keputusan kultur organism i gram positif atau gram negatif yang mana penggunaan antibiotik ciprofloxacin adalah tidak perlu.

3. Kami berharap agar perkara diatas mendapat perhatian pihak tuan. Penggunaan antibiotik ciprofloxacin yang tidak terkawal boleh mengakibatkan kerintangan organisme dan seterusnya memberi impak negatif kepada pesakit secara khususnya . Sebarang kemungkinan bolehlah diajukan kepada pihak kami dan kami mengalu-alukan sebarang perbincangan untuk kebaikan pesakit.

Yang menjalankan tugas,

"BERKHIDMAT UNTUK NEGARA"

Yang menjalankan tugas,

(DATO' DR. HJH MAHIRAH MUSTAFA D.P.S.K)

Pengerusi Kawalan Infeksi

Pakar Perunding Perubatan / ID

Ketua Jabatan Perubatan

Hospital Raja Perempuan Zainab II Kota Bharu

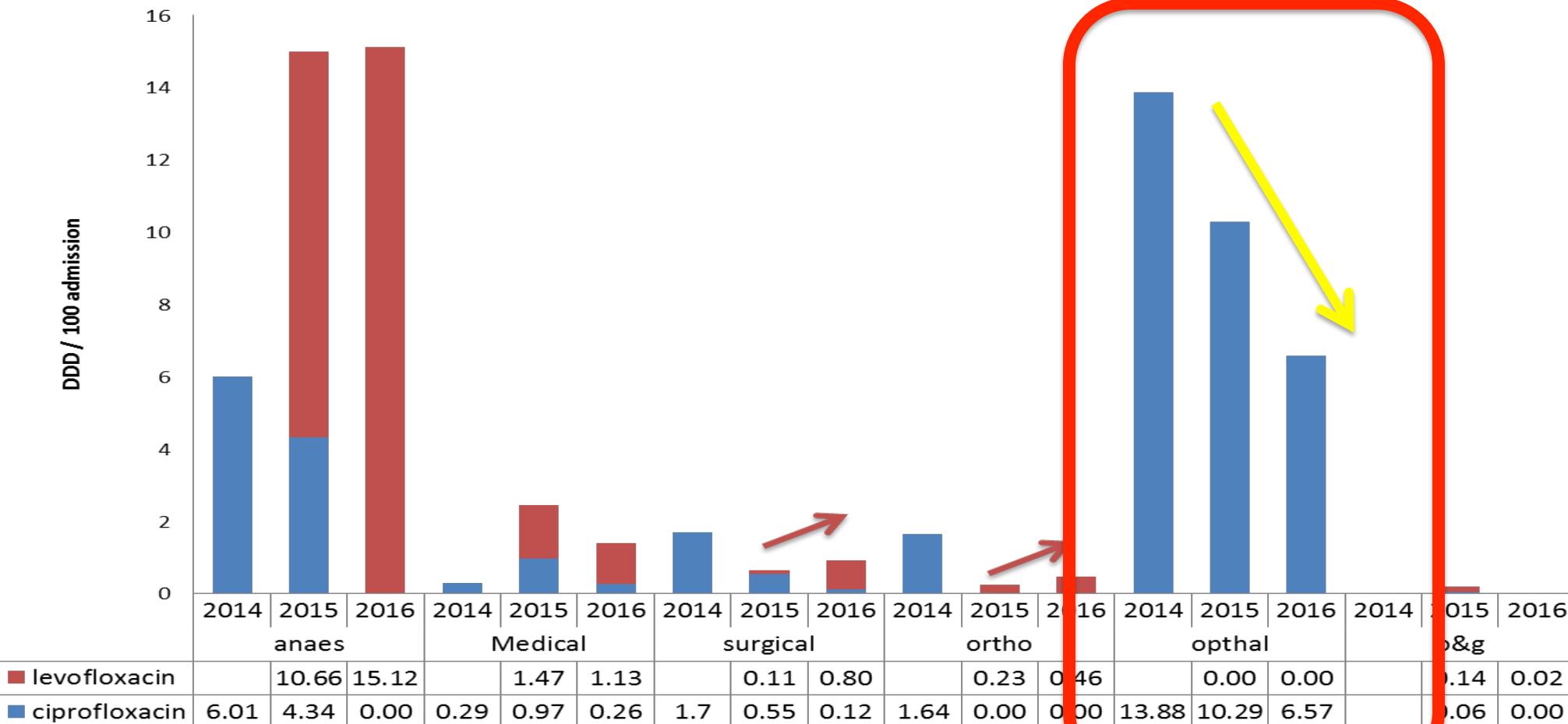
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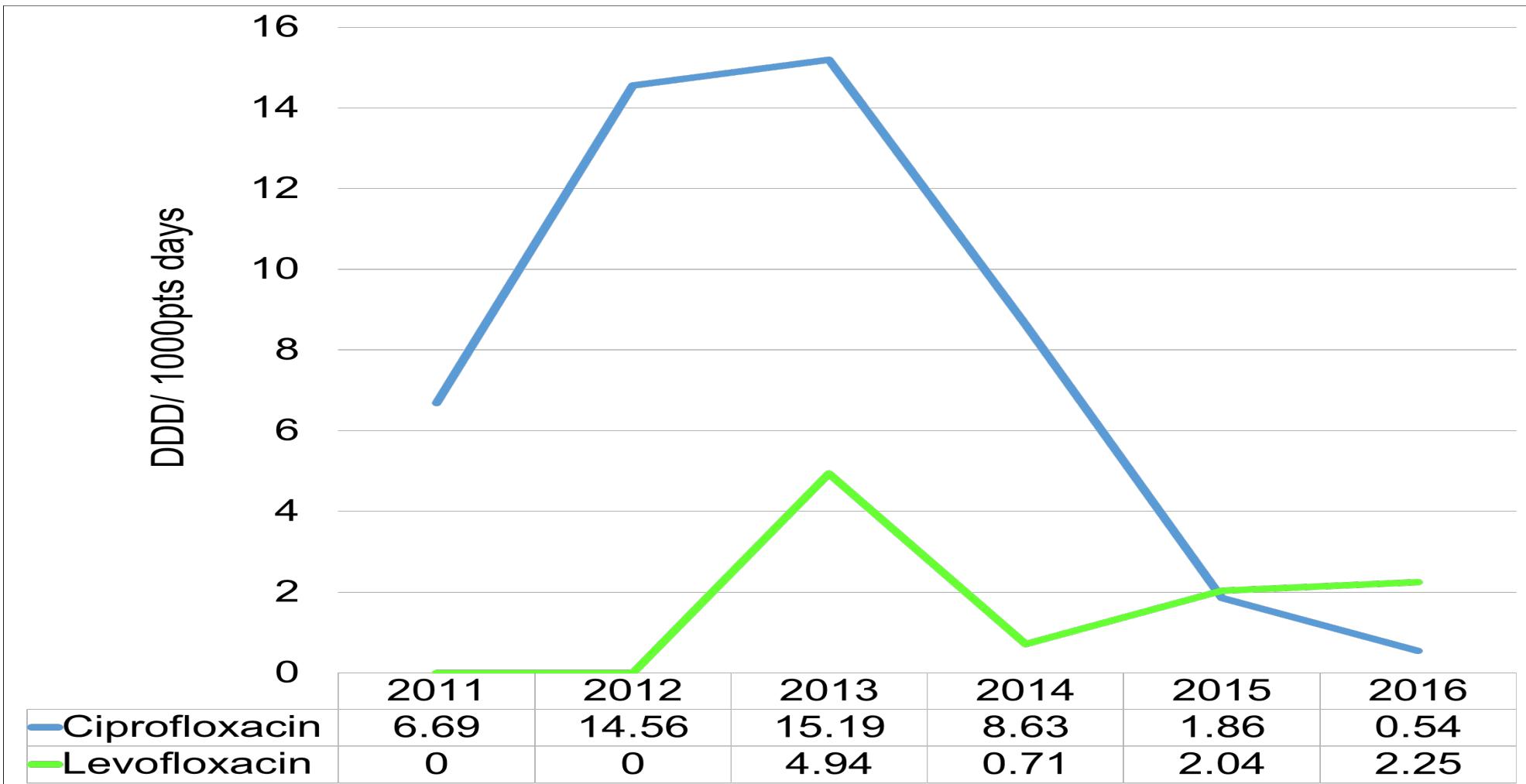
Only 2 out of 27 swabs and pus culture grew pseudomonas which justified use of quinolones

## Quinolones Utilisation in HRPZ II 2014 – 2016 By Departments

Ophthalmology



# Overall quinolones usage 2011-2016



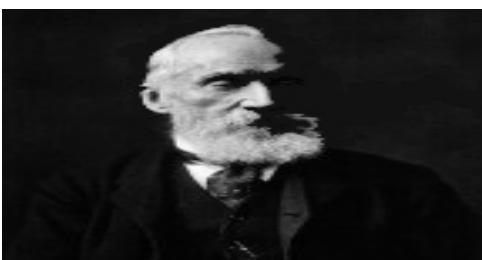
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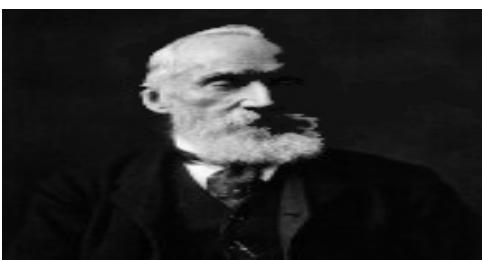


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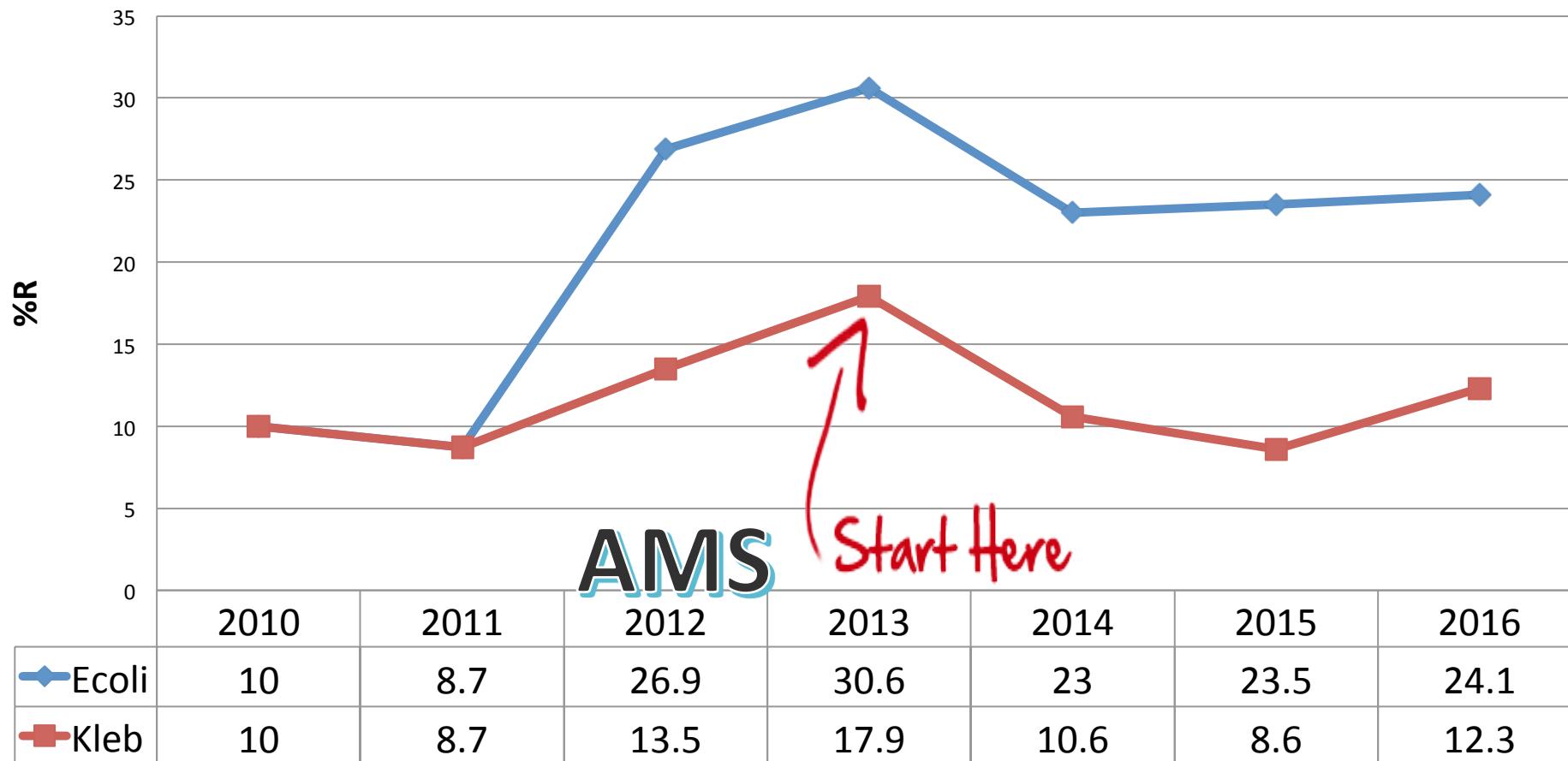
Outcome measures

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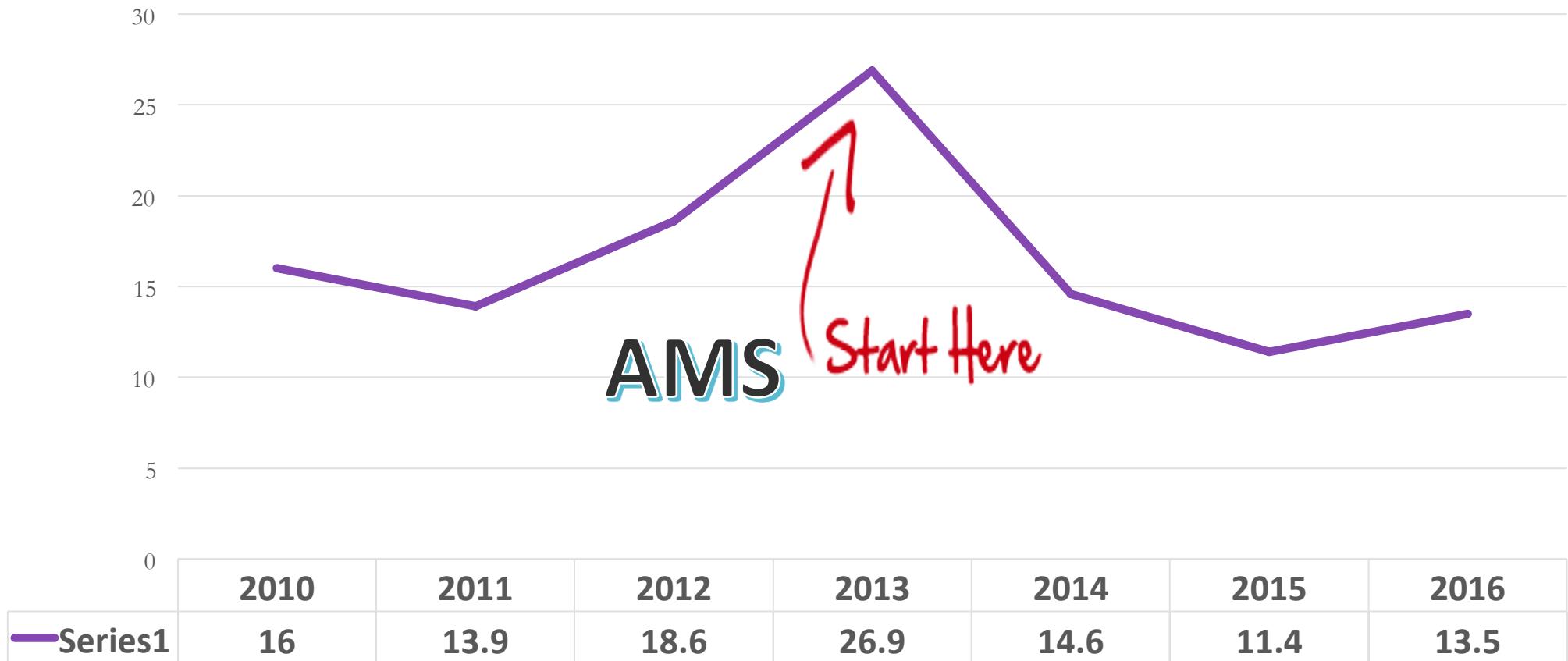


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# Resistant Trend of E coli and Klebsiella sp towards Ciprofloxacin since 2010 - 2016



## MRSA trend 2010 -2016



# Formulary restrictions

## Advantages

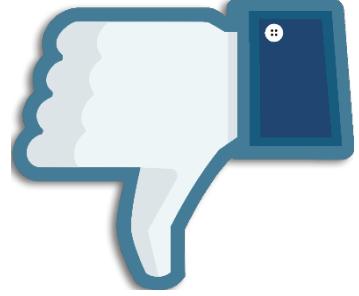


- Sends message that some antimicrobials require greater caution when prescribing.
- Provides guidelines for appropriate use antimicrobials.
- Cost savings
- Immediate and significant reductions in antimicrobial use, particularly if used with preauthorization.
- Decreased resistance rates in the restricted antibiotics in the short term
- Potential opportunity to provide prescriber education and/or recommendations for use of alternative agents or specialist consultation (if applicable).



# Formulary restrictions

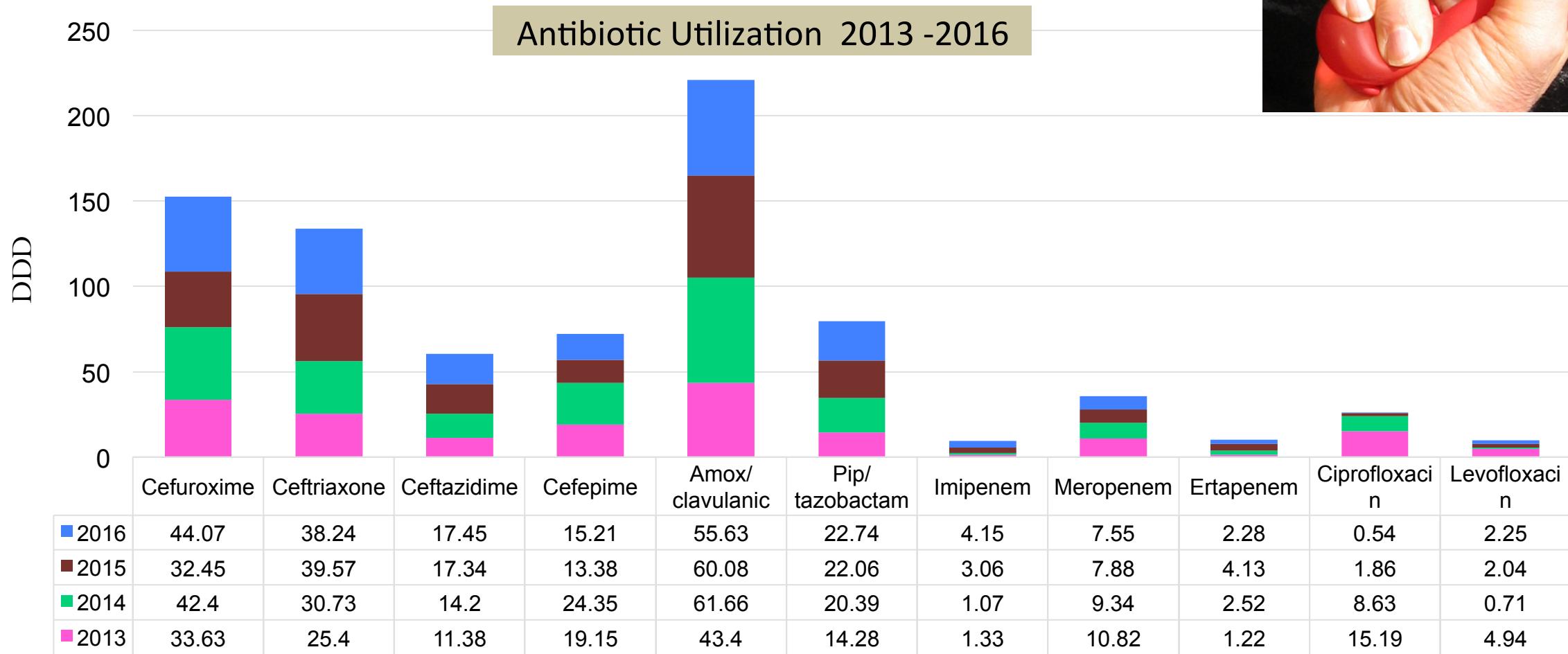
## Disadvantages



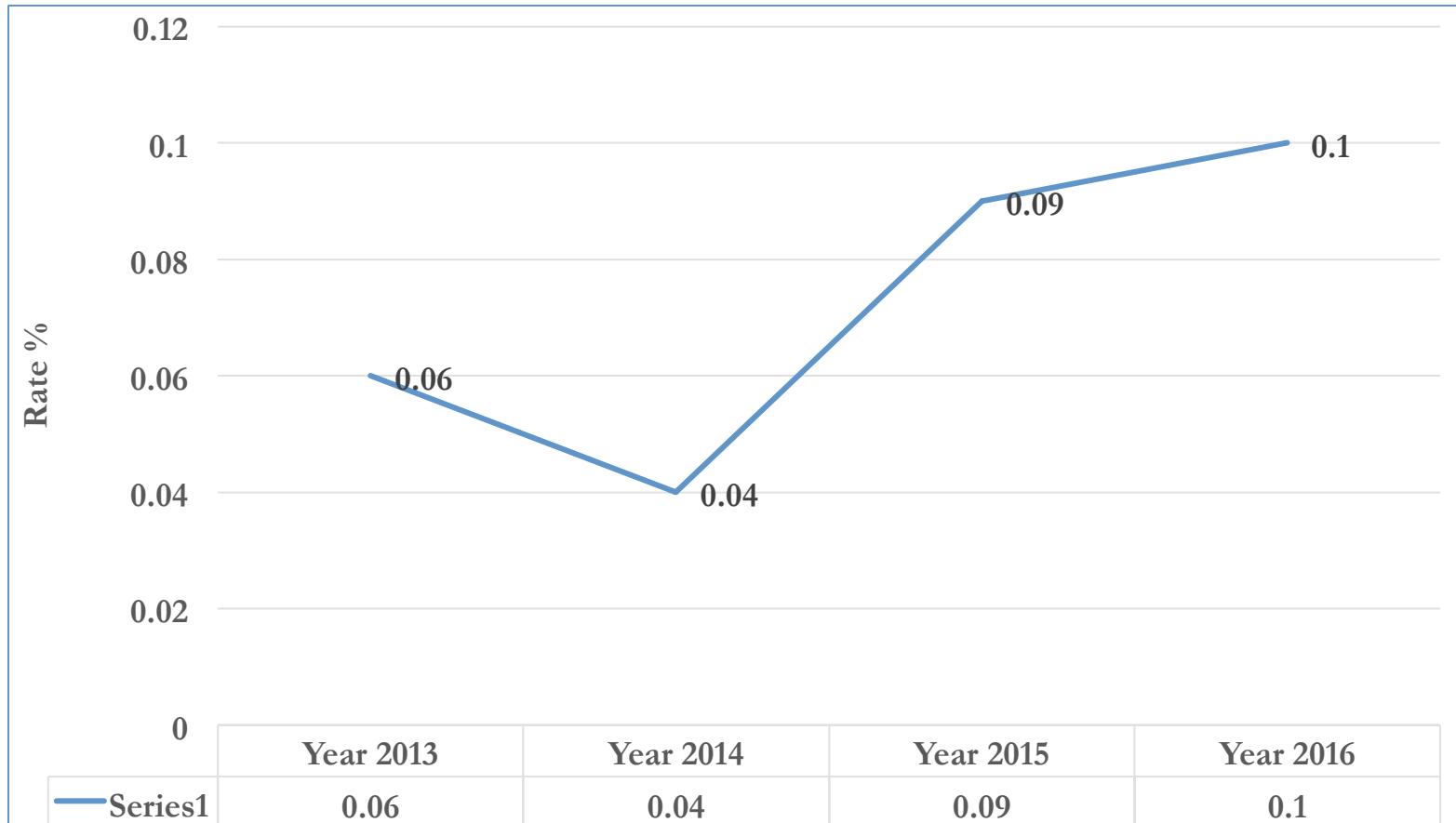
- Requires enforcement to be effective; prescribers may circumvent restrictions if there is no enforcement.
- Can lead to “squeezing the balloon,” with an increase in the use of and resistance to antimicrobial agents that are not restricted.
- Prescribers may see prescribing restrictions as a loss of autonomy.
- Delays in initiation of treatment may be a concern with preauthorization types of enforcement; this can be avoided by allowing a first dose or 24 to 72 hours of therapy before restriction is enforced.



# Are we “squeezing the balloon” ?



# ESBL Rate 2013-2016



# Conclusion

- Formulary restriction and preauthorization protocol has resulted in significant reduction of quinolones usage
- Decreasing trend of resistance of *E. coli* and *Klebsiella* sp isolates to quinolones was observed – sustainability ?
- Risk of trading resistance profiles with compensatory increase in the usage of other groups of antibiotics i.e ESBL

