Stewardship: Success and Failures
A Limited-Resources Approach

Presenter:

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Antibiotic Stewardship Pharmacist

Southwest Health System, Cortez, Colorado

Disclosures

None

Objectives

- Be able to describe guidance can drive stewardship efforts in hospital, LTC, and clinic settings.
- Have and understanding of data, tools, and interventions used to implement stewardship projects in a rural setting with limited resources in mind.
- Be able to promote the value of community stewardship efforts.

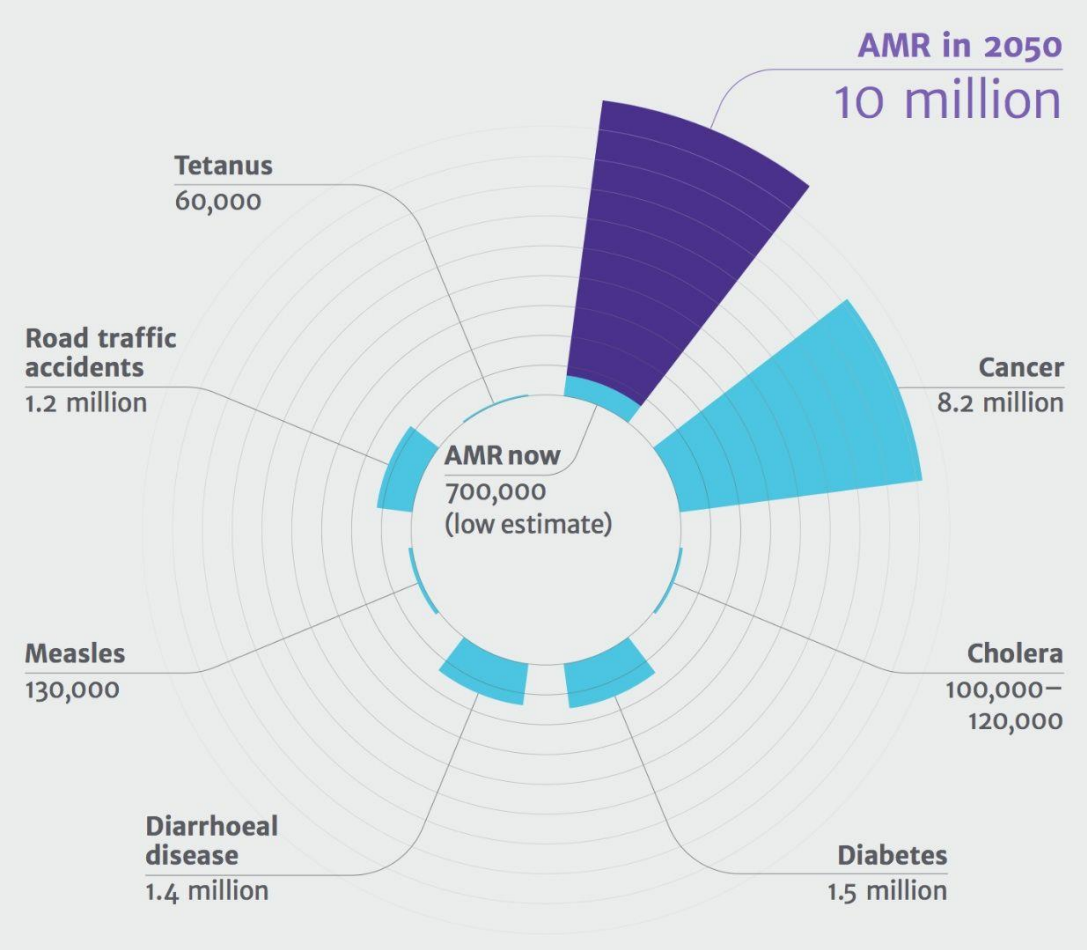
Organization

- Southwest Health System serves approximately 50,000 people in rural southwest Colorado, parts of Utah, Arizona, and New Mexico, and the Ute Mountain Ute and Navajo reservations.
- 25-bed critical access hospital (CAH) and multiple clinics
- We have a very diverse patient population that presents unusual challenges for a CAH.

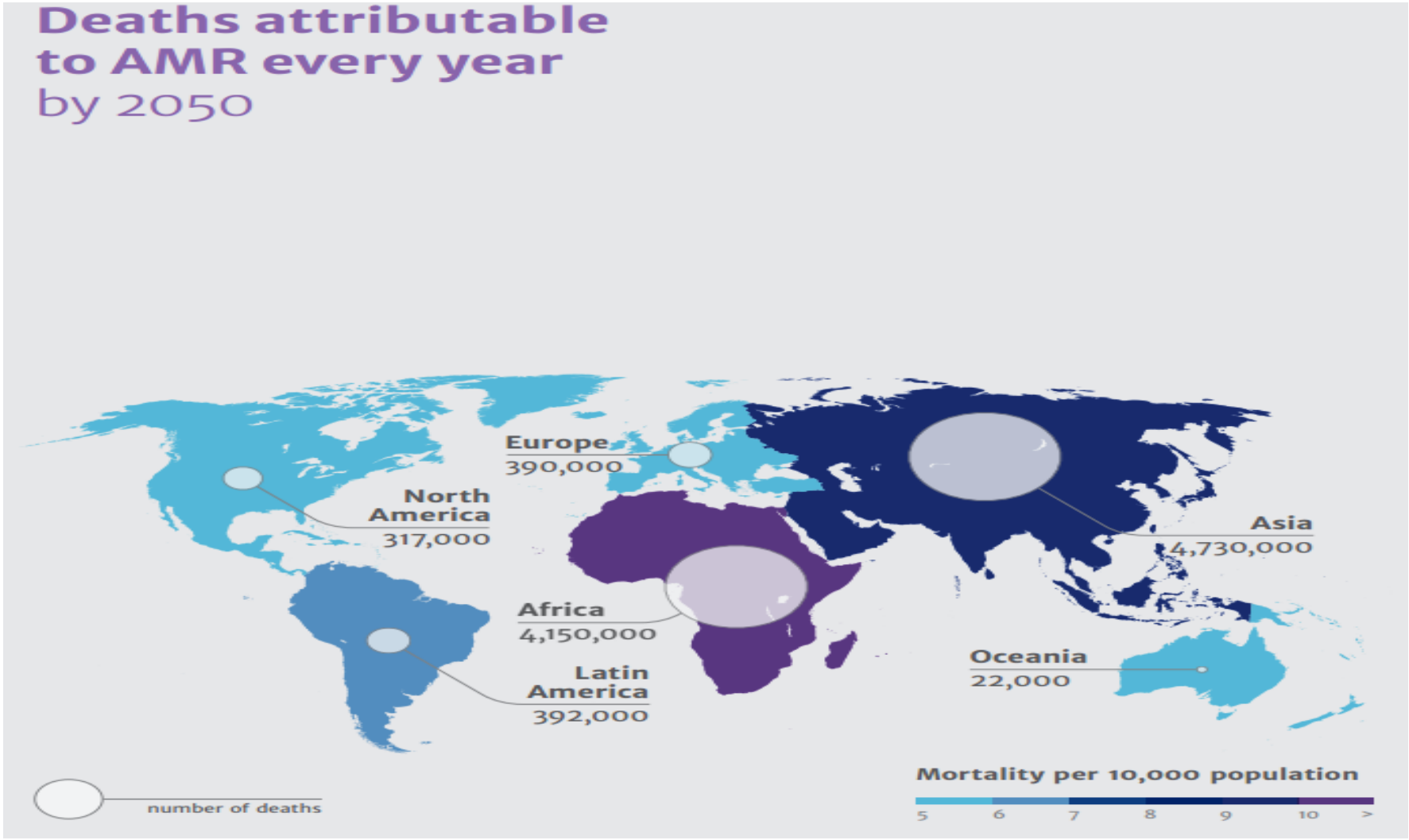
Overview

- Established 2014 in the hospital and expanded to clinic, long-term care, and dental stewardship education
- Pharmacist-led with microbiologist, hospitalist, emergency physician, clinic providers, educators and physical therapists

Gloom and Doom in 2050!



The Review on Antimicrobial Resistance, 2014



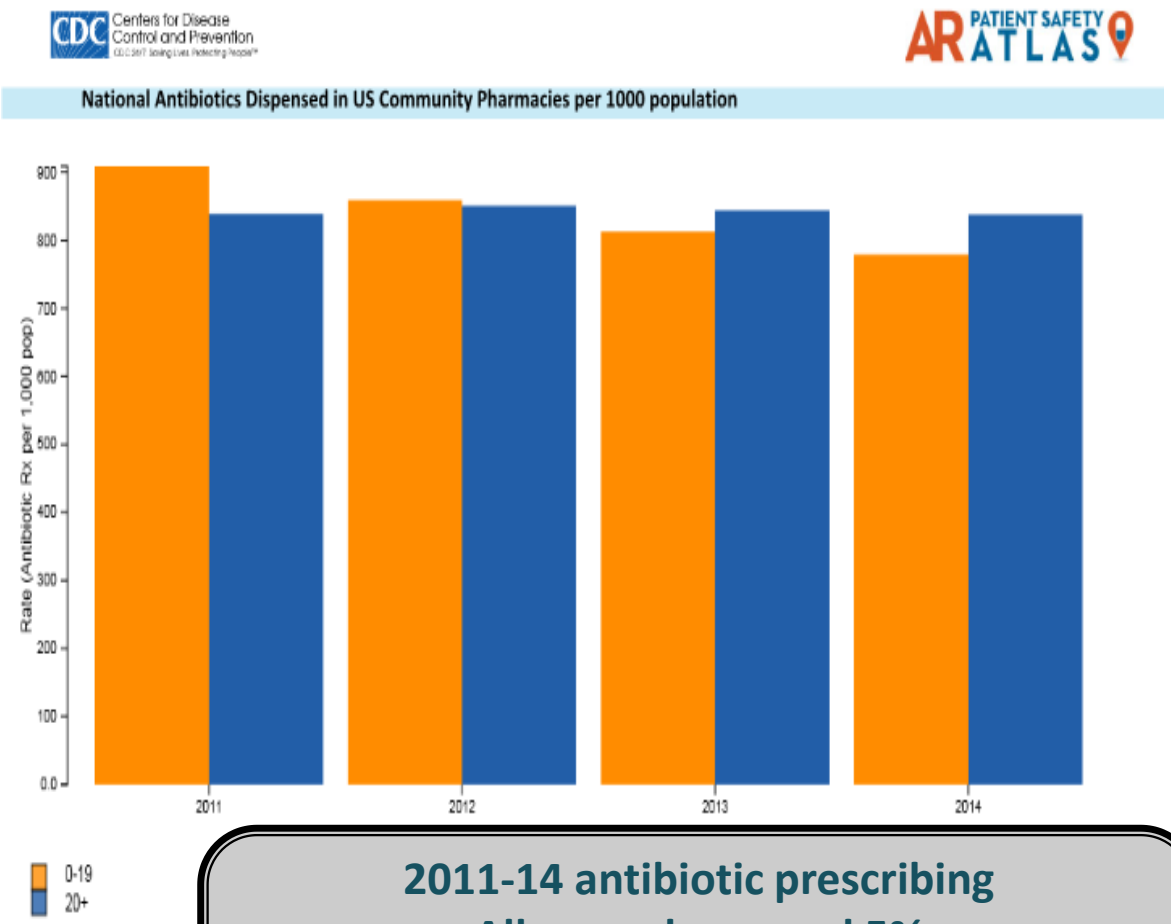
The Review on Antimicrobial Resistance, 2014

Antibiotic Resistance Today

$20 billion in added direct healthcare costs annually

CDC. Antibiotic resistance threats in the United States, 2013. www.cdc.gov/drugresistance/threat-report-2013/

Have we made any progress?



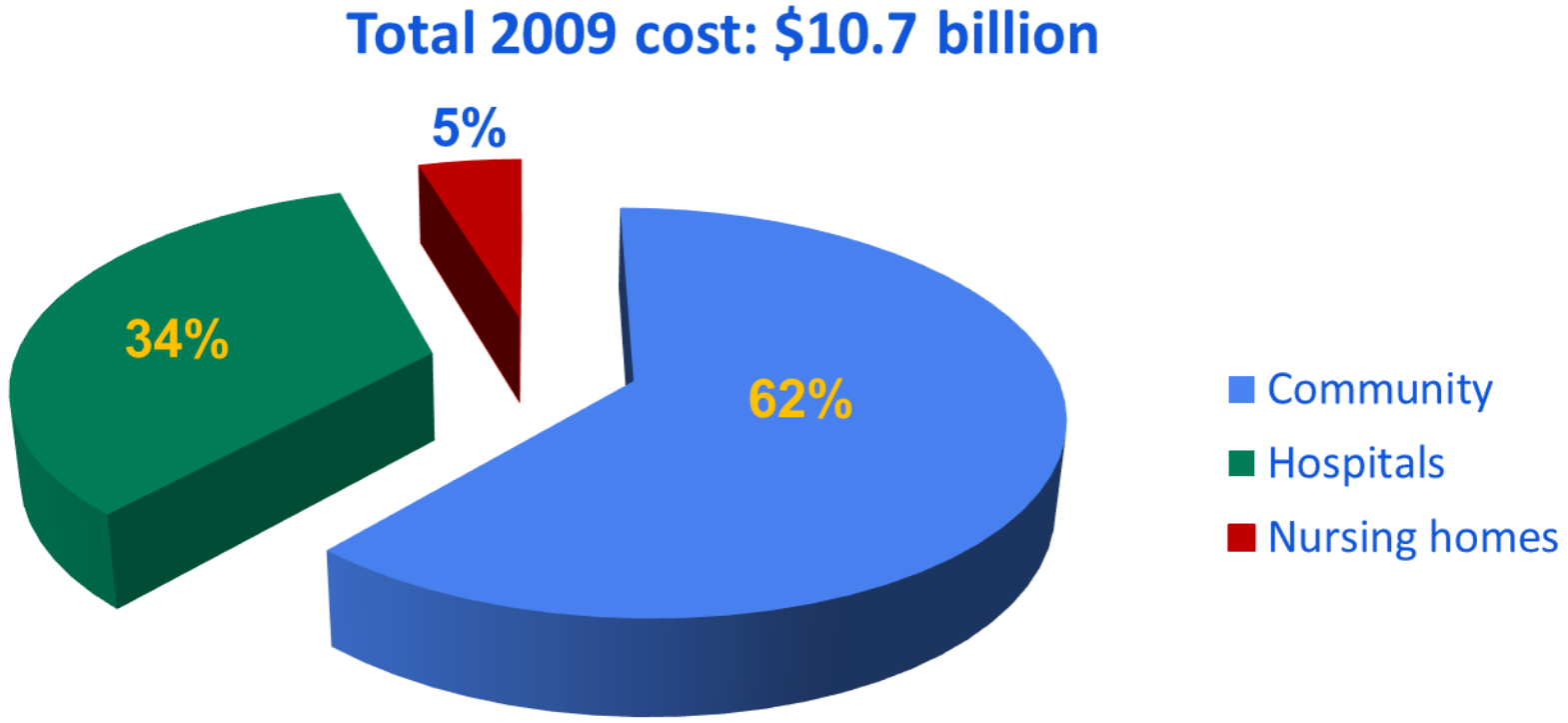
2011-14 antibiotic prescribing

All ages: decreased 5%

Pediatric: decreased 14%

Adults: no change

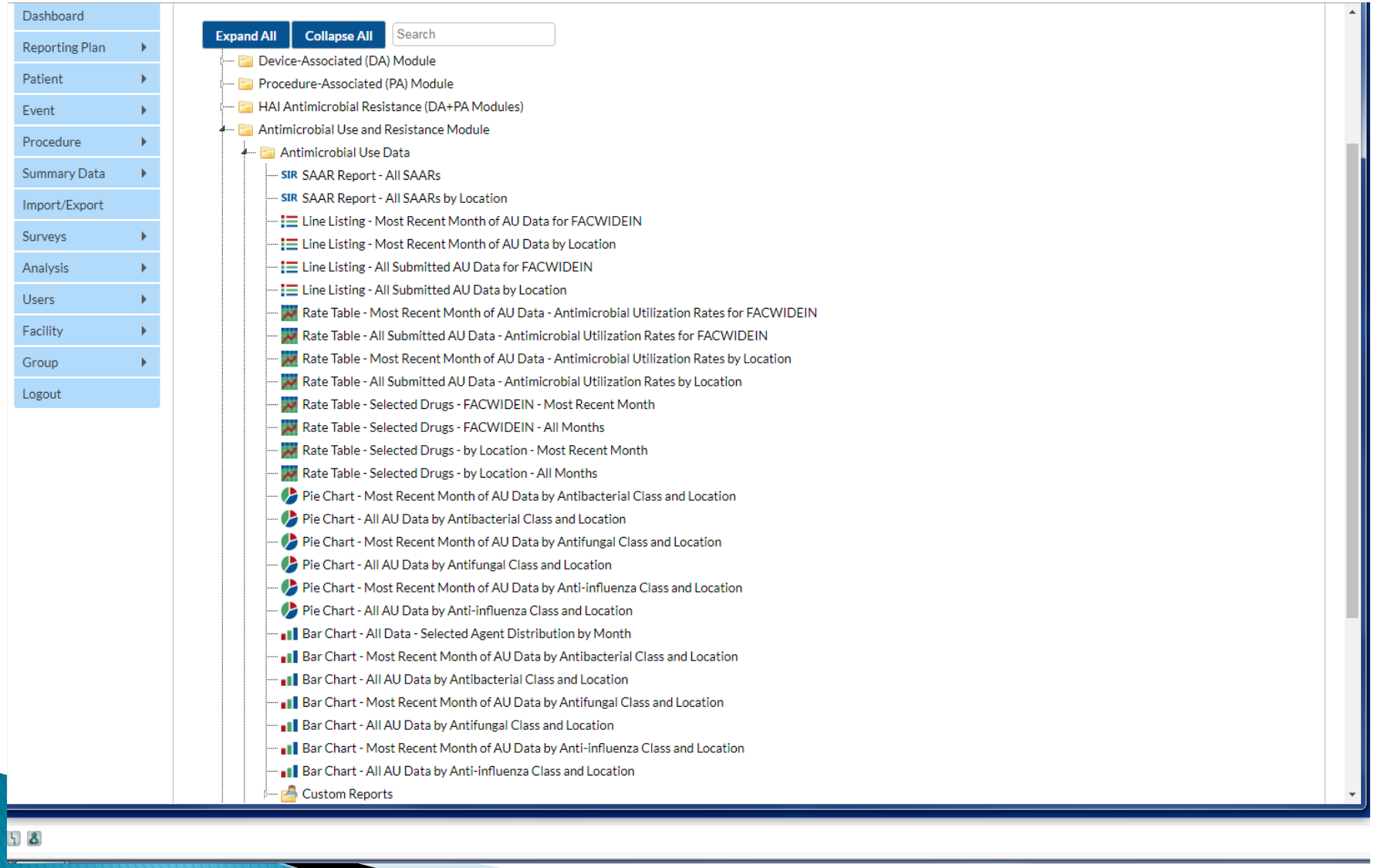
Antibiotic Costs



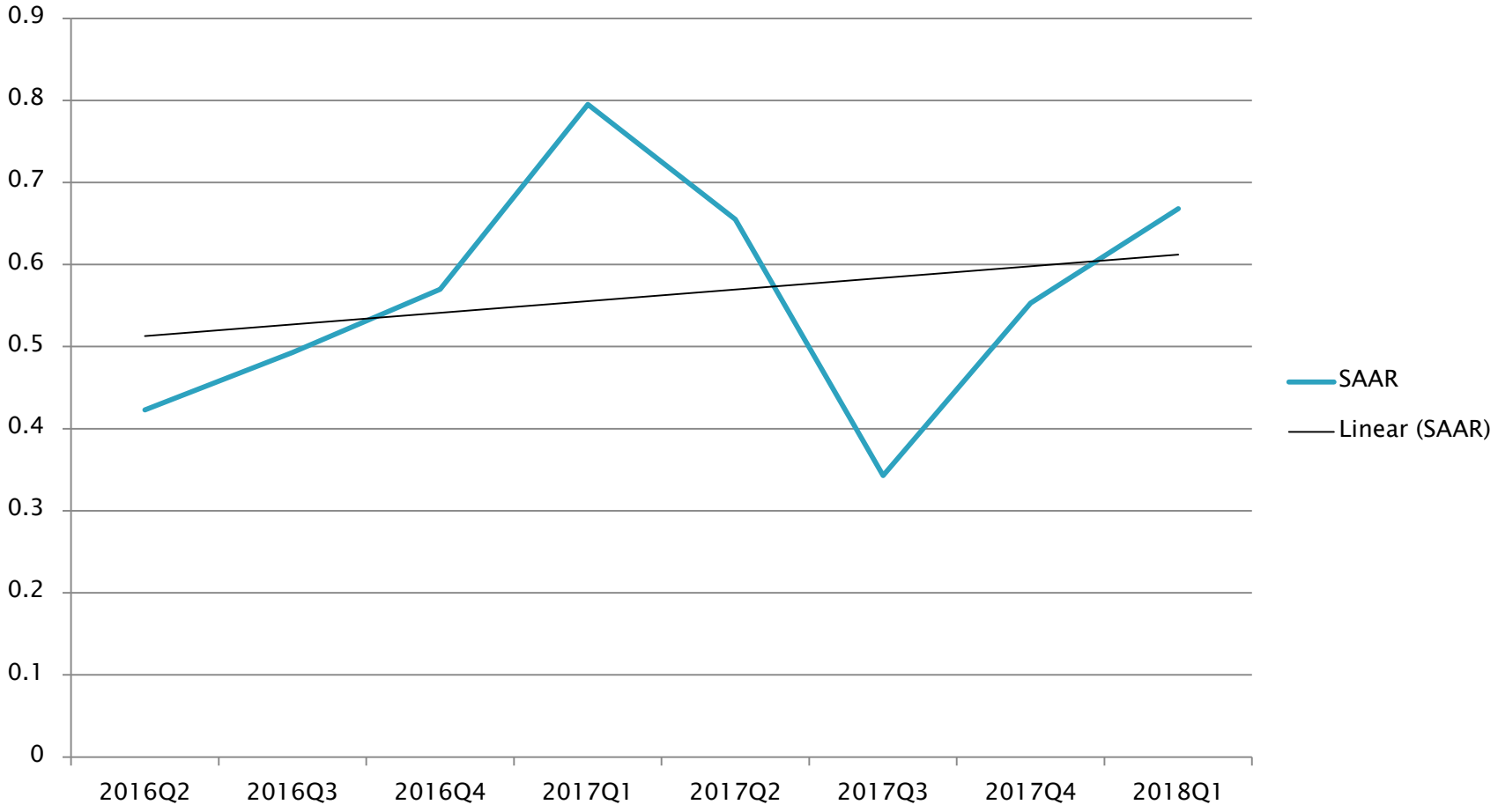
Asolva and NHSN Tools

- Asolva Medici
  - www.asolva.com
  - Medici AU costs $1 per bed per month
    - Pulls three files, MAR, Transfer, Admission
    - Customizable antibiotic usage data
    - Uploads to NHSN AU
    - Free trial period
- NHSN AU
  - Upload CDA files from Medici AU into NHSN
  - Benchmarking, SAAR (**standardized antimicrobial administration ratio**), rate days present
- NHSN LTC UTI and LabID

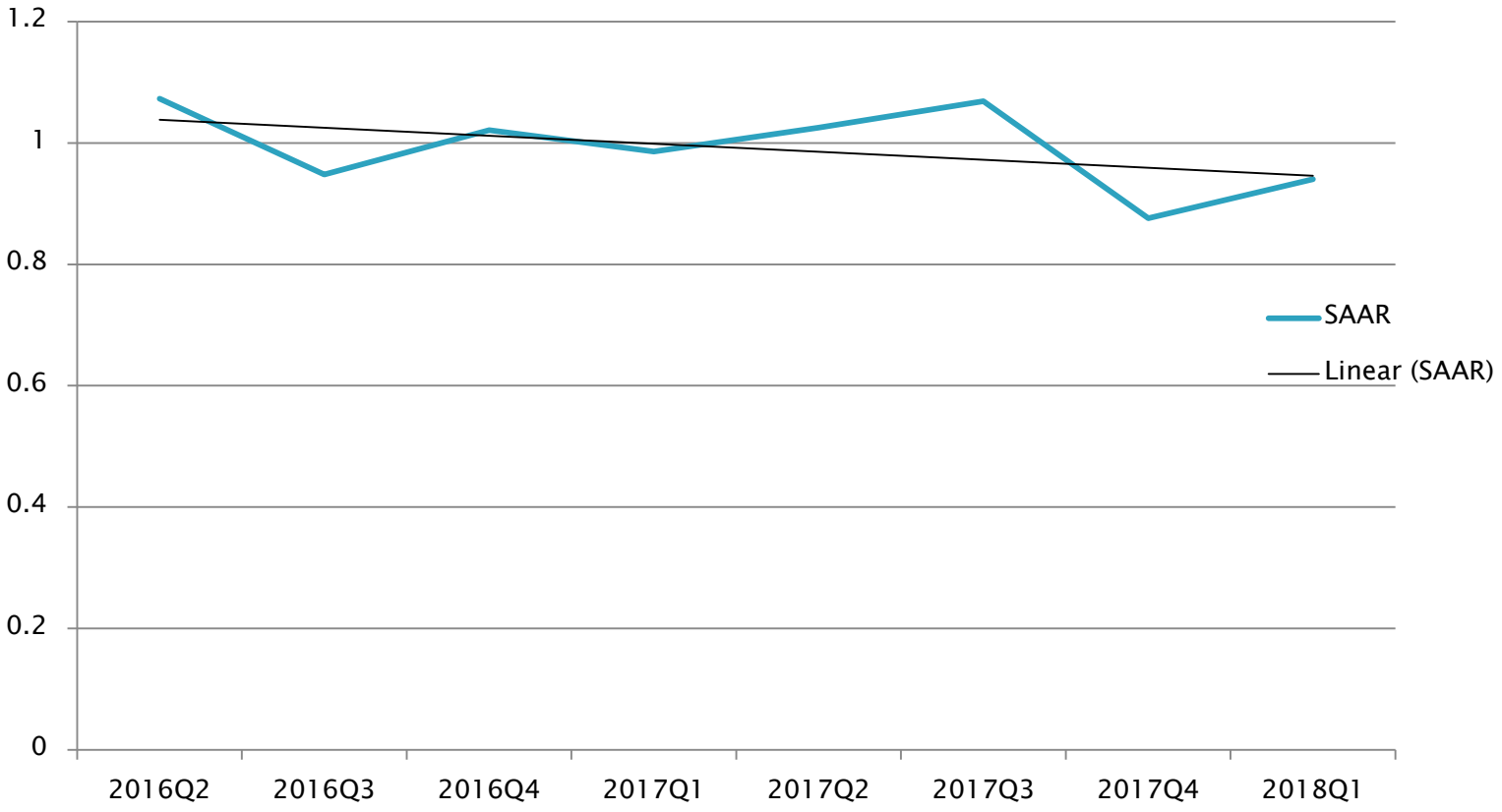
NHSN AU


Dashboard
Reporting Plan
Patient
Event
Procedure
Summary Data
Import/Export
Surveys
Analysis
Users
Facility
Group
Logout
Expand All
Collapse All
Search
Device-Associated (DA) Module
Procedure-Associated (PA) Module
HAI Antimicrobial Resistance (DA+PA Modules)
Antimicrobial Use and Resistance Module
Antimicrobial Use Data
SAAR Report - All SAARs
SAAR Report - All SAARs by Location
Line Listing - Most Recent Month of AU Data for FACWIDEIN
Line Listing - Most Recent Month of AU Data by Location
Line Listing - All Submitted AU Data for FACWIDEIN
Line Listing - All Submitted AU Data by Location
Rate Table - Most Recent Month of AU Data - Antimicrobial Utilization Rates for FACWIDEIN
Rate Table - All Submitted AU Data - Antimicrobial Utilization Rates for FACWIDEIN
Rate Table - Most Recent Month of AU Data - Antimicrobial Utilization Rates by Location
Rate Table - All Submitted AU Data - Antimicrobial Utilization Rates by Location
Rate Table - Selected Drugs - FACWIDEIN - Most Recent Month
Rate Table - Selected Drugs - FACWIDEIN - All Months
Rate Table - Selected Drugs - by Location - Most Recent Month
Rate Table - Selected Drugs - by Location - All Months
Pie Chart - Most Recent Month of AU Data by Antibacterial Class and Location
Pie Chart - All AU Data by Antibacterial Class and Location
Pie Chart - Most Recent Month of AU Data by Antifungal Class and Location
Pie Chart - All AU Data by Antifungal Class and Location
Pie Chart - Most Recent Month of AU Data by Anti-influenza Class and Location
Pie Chart - All AU Data by Anti-influenza Class and Location
Bar Chart - All Data - Selected Agent Distribution by Month
Bar Chart - Most Recent Month of AU Data by Antibacterial Class and Location
Bar Chart - All AU Data by Antibacterial Class and Location
Bar Chart - Most Recent Month of AU Data by Antifungal Class and Location
Bar Chart - All AU Data by Antifungal Class and Location
Bar Chart - Most Recent Month of AU Data by Anti-influenza Class and Location
Bar Chart - All AU Data by Anti-influenza Class and Location
Custom Reports

SAAR ICU


0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2016Q2
2016Q3
2016Q4
2017Q1
2017Q2
2017Q3
2017Q4
2018Q1
SAAR
Linear (SAAR)

SAAR MS


1.2
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2016Q2
2016Q3
2016Q4
2017Q1
2017Q2
2017Q3
2017Q4
2018Q1
SAAR
Linear (SAAR)

Why is ASP and IP Important?

Arjun Srinivasan MD

Associate Director for Healthcare Associated Infection Prevention Programs at the CDC

"Want to halt the spread of antibiotic resistance? Think infection prevention."

"Antibiotic stewardship and infection control need to be seen as inseparable sides of the same coin."

Let's look at some data……

Effect of antibiotic stewardship on the incidence of infection and colonization with antibiotic-resistant bacteria and Clostridium difficile infection: a systematic review and meta-analysis The Lancet, June 2017

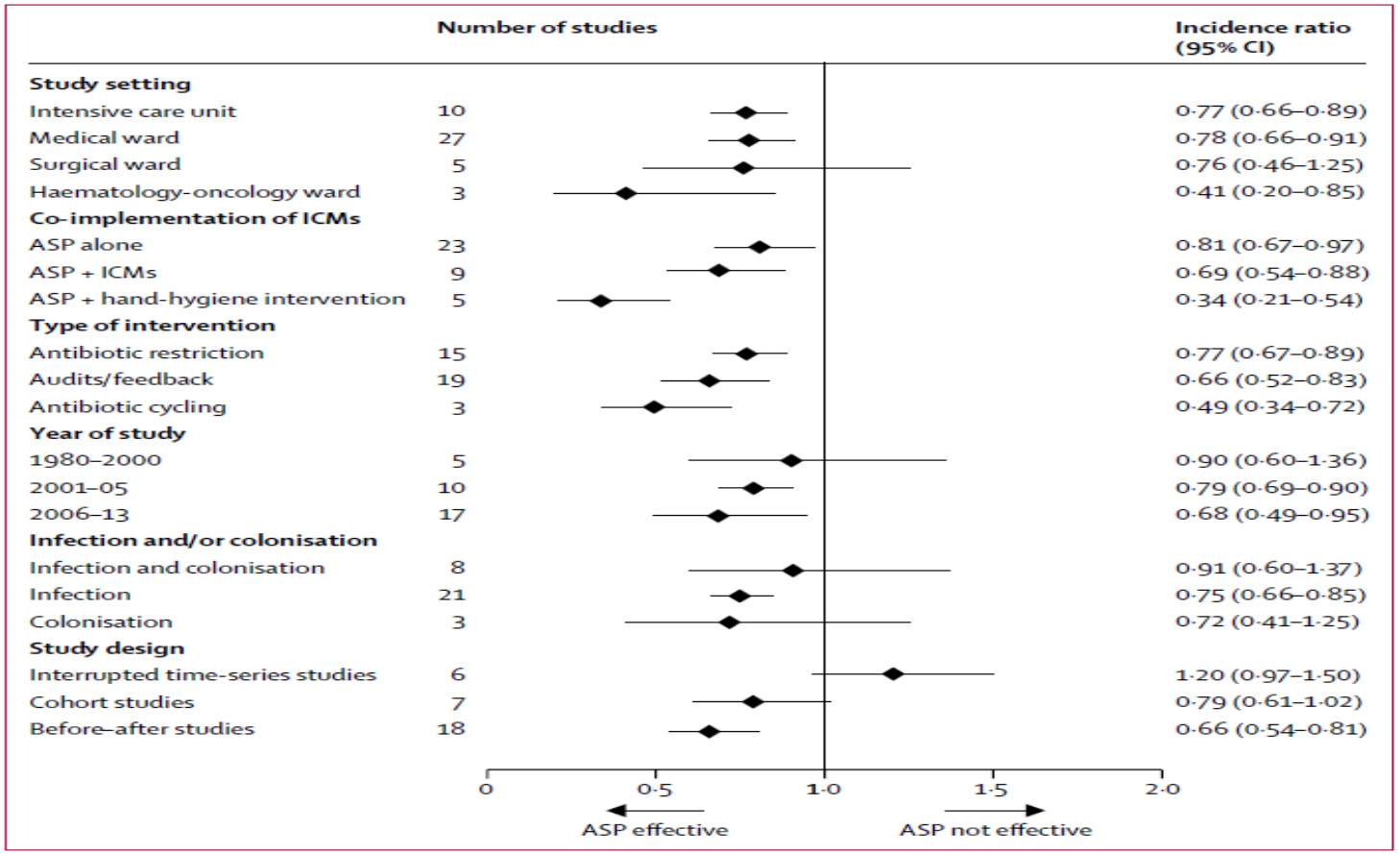


Figure 5: Summary forest plot of the incidence ratios for studies investigating the effect of ASPs on antibiotic resistance, according to study characteristics
ICM=infection control measure. ASP=antibiotic stewardship programme.

Does ASP Save Dollars?

?

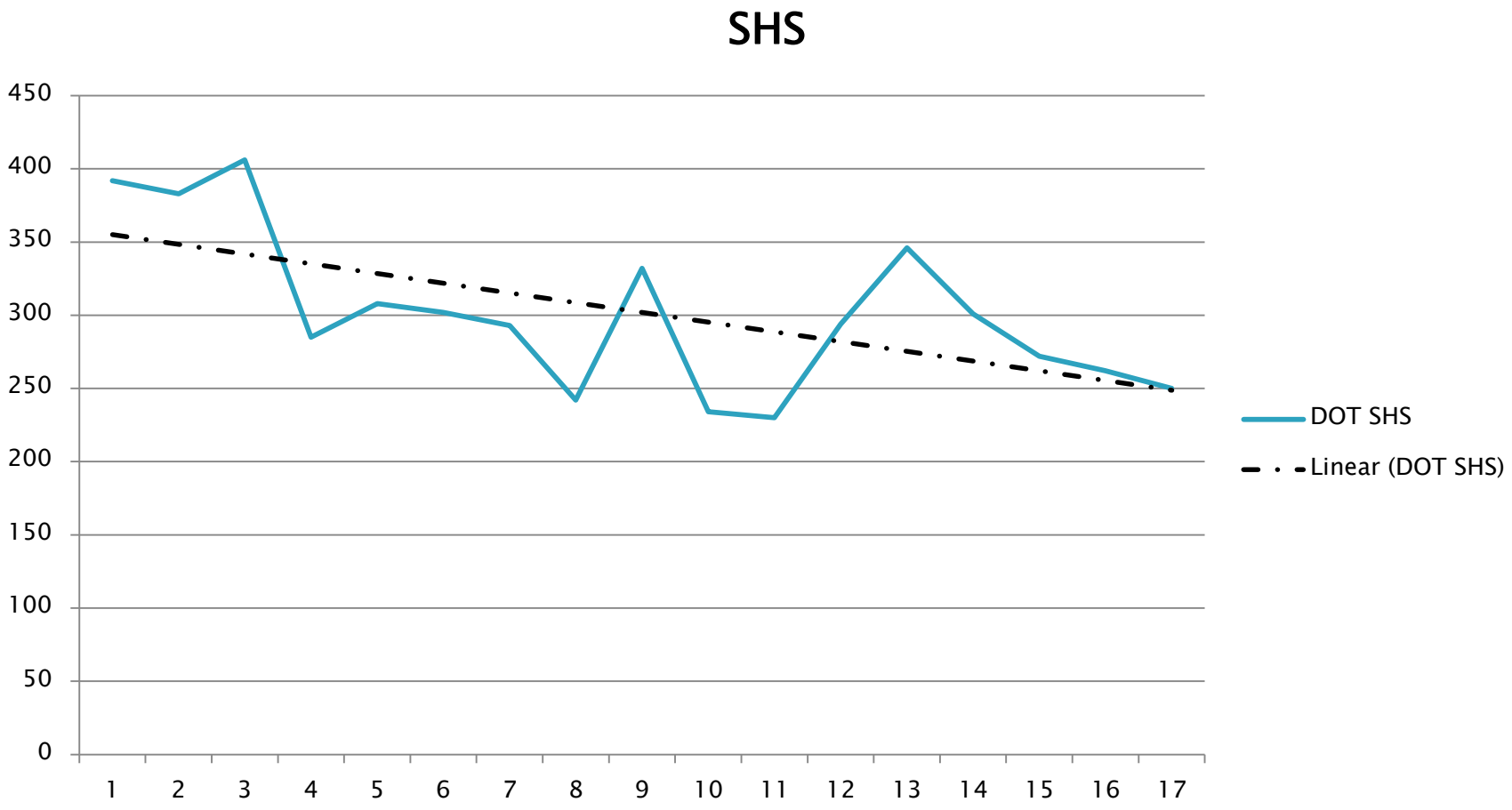
I believe ASP's are patient safety programs and it's all about doing what is right for the patient.

But let's take a look at some data and you decide!

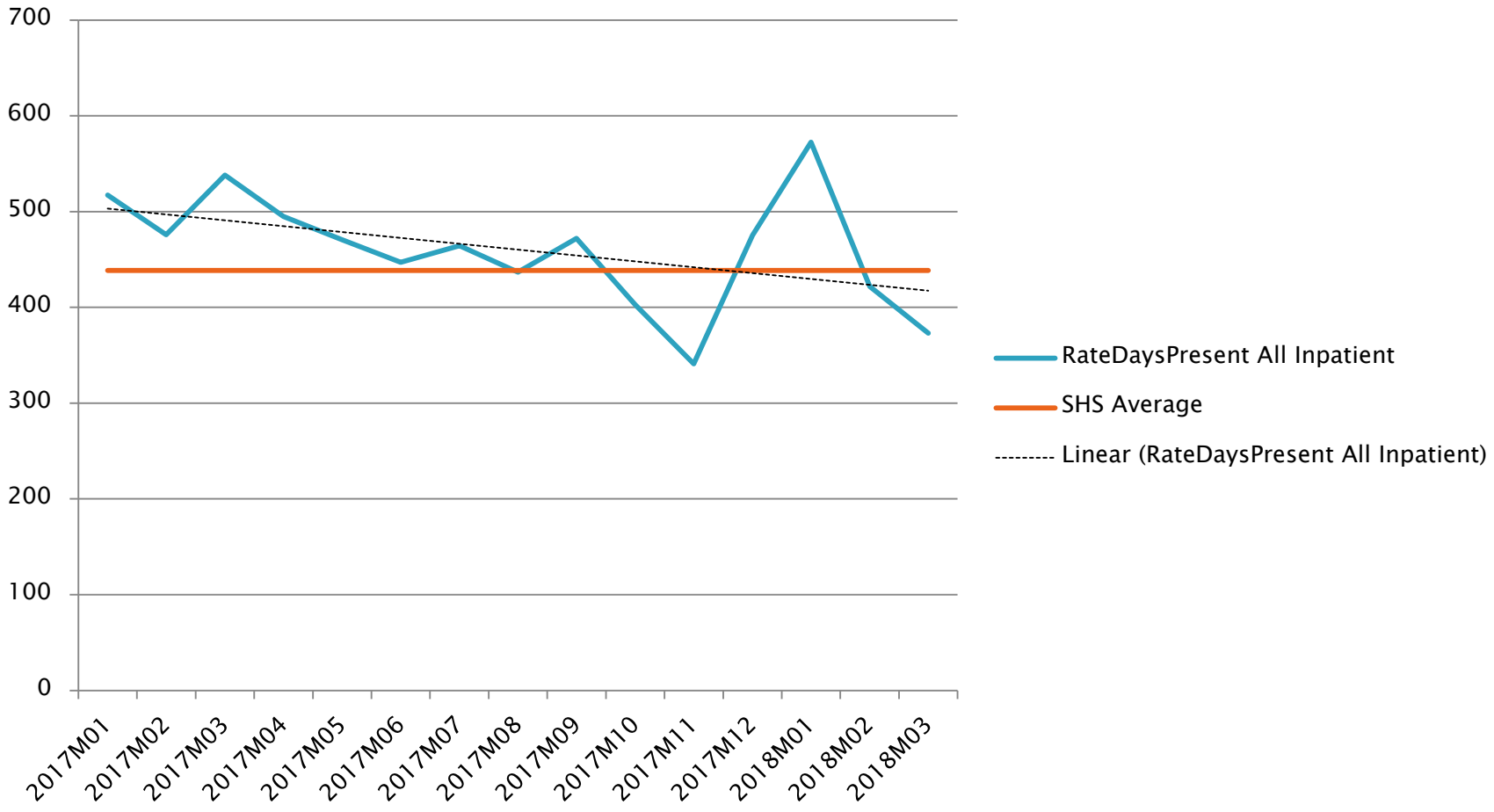
Impact of a National Effort

- According to the CDC, implementation of infection control and antibiotic stewardship will, in 5 years:
  - Reduce MDR HAIs or CDI deaths by 37,000.
  - Reduce MDR HAIs or CDI infections by 619,000.

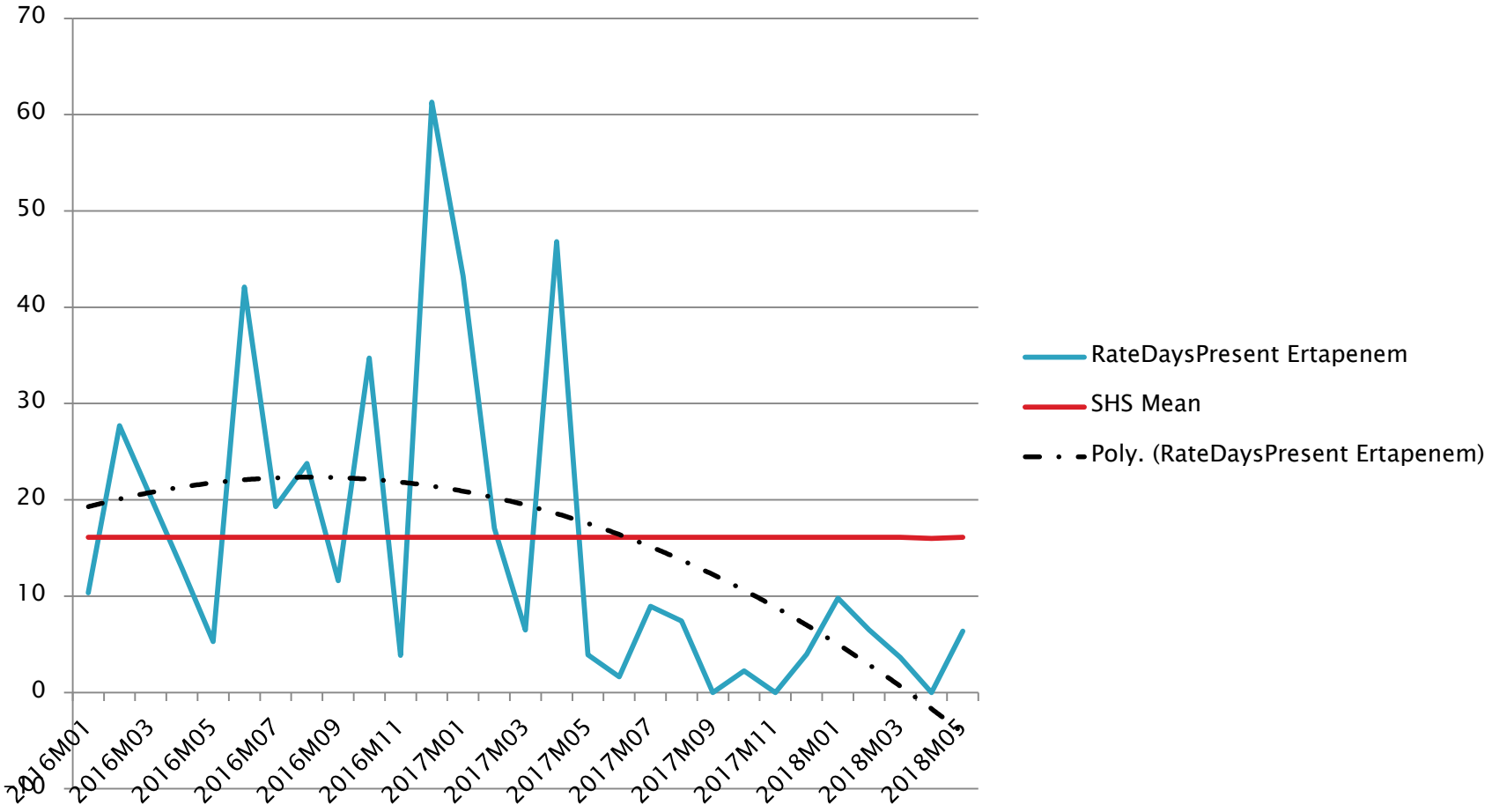
Does ASP save dollars: DOT



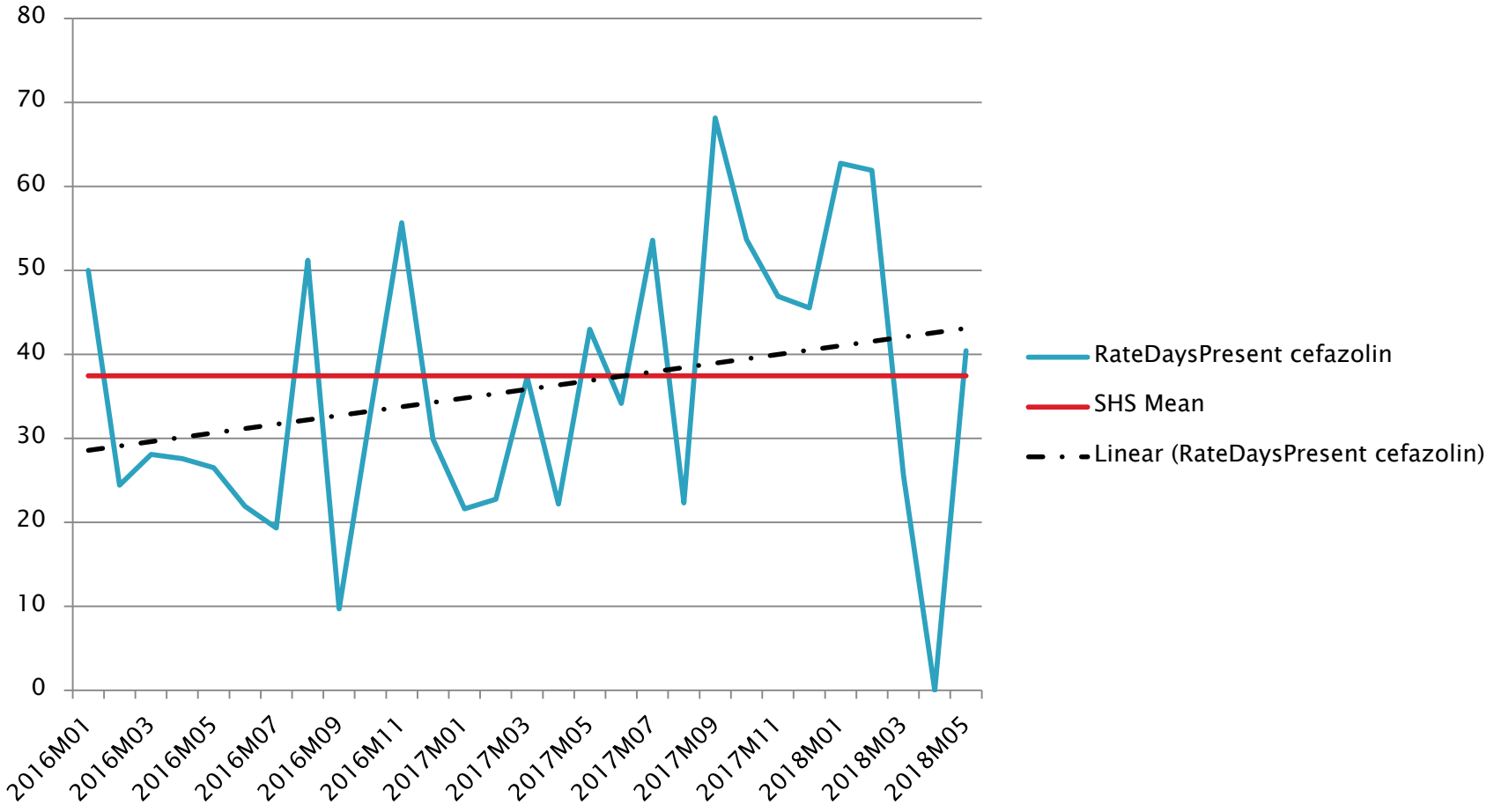
Does ASP save dollars: Rate Days



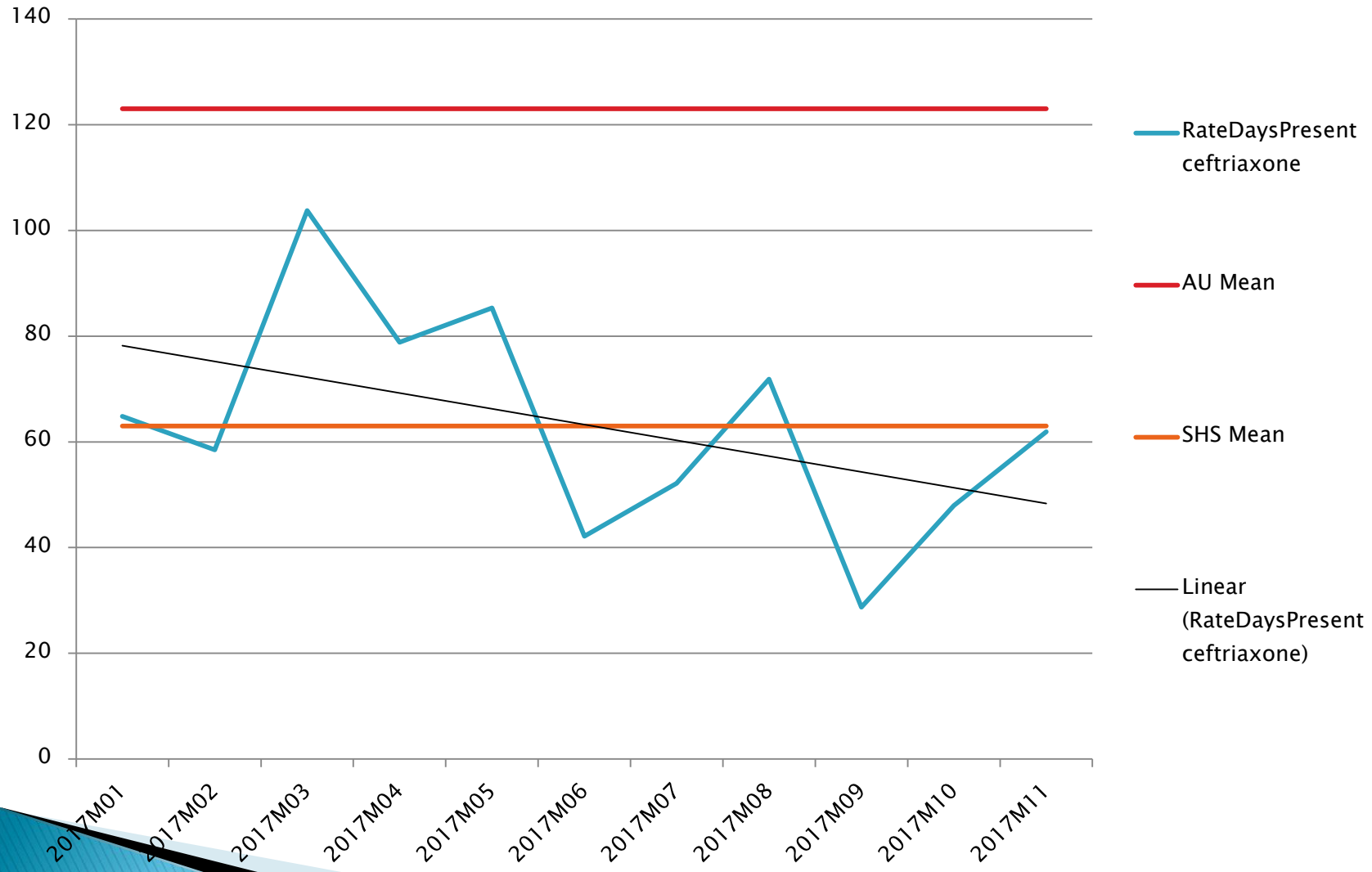
Use of Etrapenem



Use of Cefazolin



Use of Ceftriaxone



Shorter Is Better

Community-acquired pneumonia	5 -7 days
Nosocomial pneumonia	8-10 days
Pyelonephritis	5-7 days
Intra-abdominal infection	4 days
Acute exacerbation of chronic bronchitis and COPD	5-7 days
Acute bacterial sinusitis	5-7 days
Cellulitis	5-7 days
Chronic osteomyelitis	45 days

JAMA Internal Medicine September 2016 Volume 176, Number 9 , The New Antibiotic Mantra-“Shorter Is Better”

Does ASP Save Dollars?

Yes

How to Develop Guidance

- Pick your area of concern from your data.
- Do a search of professional societies for current guidances that match your area of concern.
- Pull current papers on your topic since the guidance was published; if no guidance is available, develop yours based on the studies.
- **Consider a collaborative effort with another hospital, clinic, LTC, hospital association, LTC association, APIC, or pharmacy groups.**
- You have a packet with all guidances we have used in the projects being discussed today.

Project Goals

- Keep them simple and measureable.
- Don’t look at too many items in your study.
- Do your own benchmarking with baseline data or make sure you can obtain a benchmark.
- Publish your goals and post your progress to your providers and staff.
- Readjust goals and guidance during the project if needed.

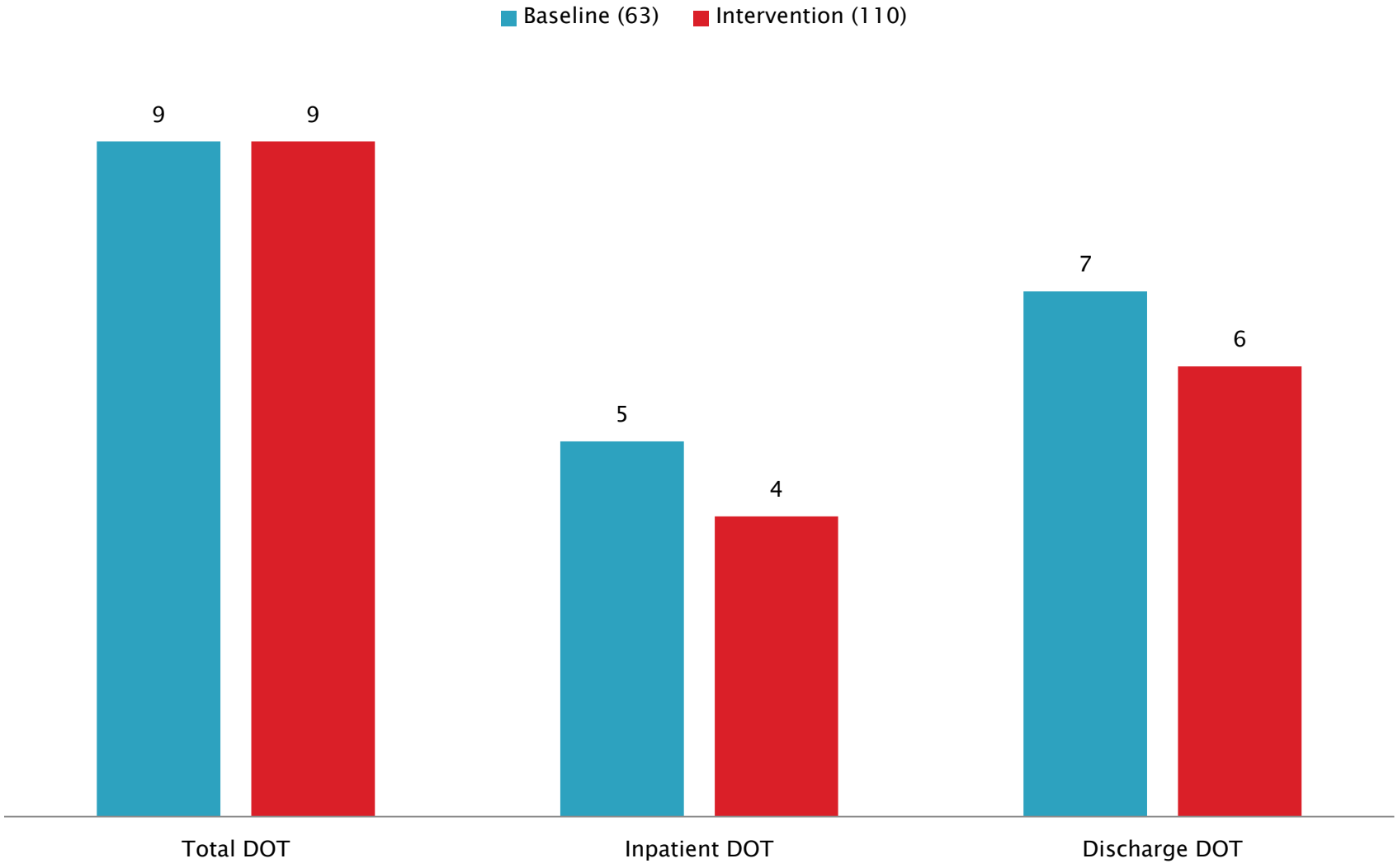
First Attempts

- Go slow, be successful!
- Suggested first projects
  - Form an official stewardship team
  - **Antibiogram program**
  - UTI, SSTI, URI, CAP/HAP guidance (IDSA, SHEA etc)
  - Guideline-based OR prophylaxis (IDSA, APHA, SHEA, College of Surgeons)
  - **Restrict your formulary**
  - Monitor new antibiotic IV starts
  - Monitor antibiotic total monthly costs
  - DOT monitoring if feasible
  - Choose an antibiotic class to monitor
  - **Review your handwashing program**
  - Antibiotic timeouts
  - **Daily patient care rounding as a team**

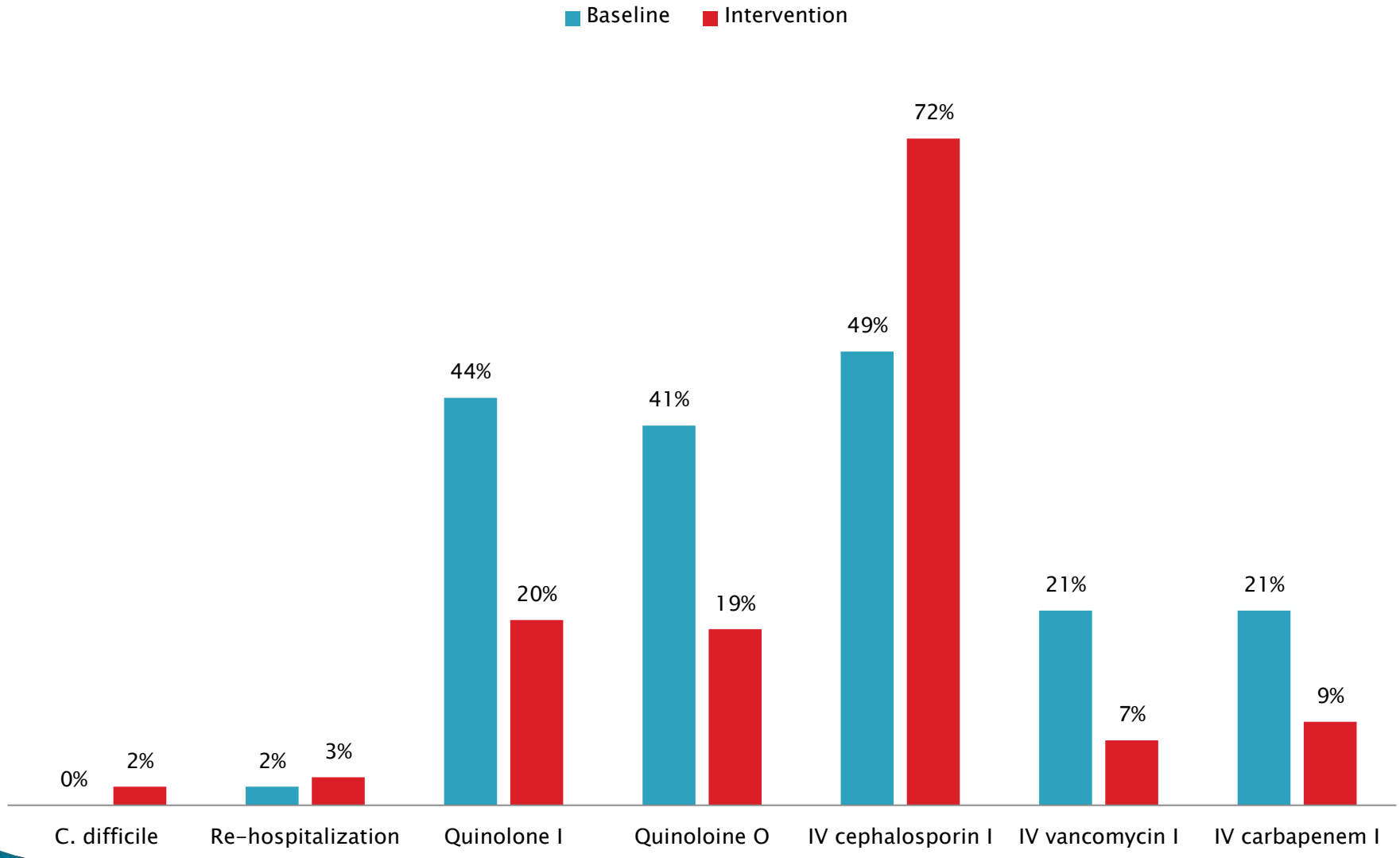
CHA UTI Project Goals

- 20% reduction from baseline in duration of treatment
- 30% reduction in inappropriate antibiotic selection
- Monitor *C. difficile* rates using NHSN
- Education event
- There will be a paper coming out soon with this data for the combined 28 hospitals

CHA UTI


Baseline (63)
Intervention (110)
9
9
5
4
7
6
Total DOT
Inpatient DOT
Discharge DOT

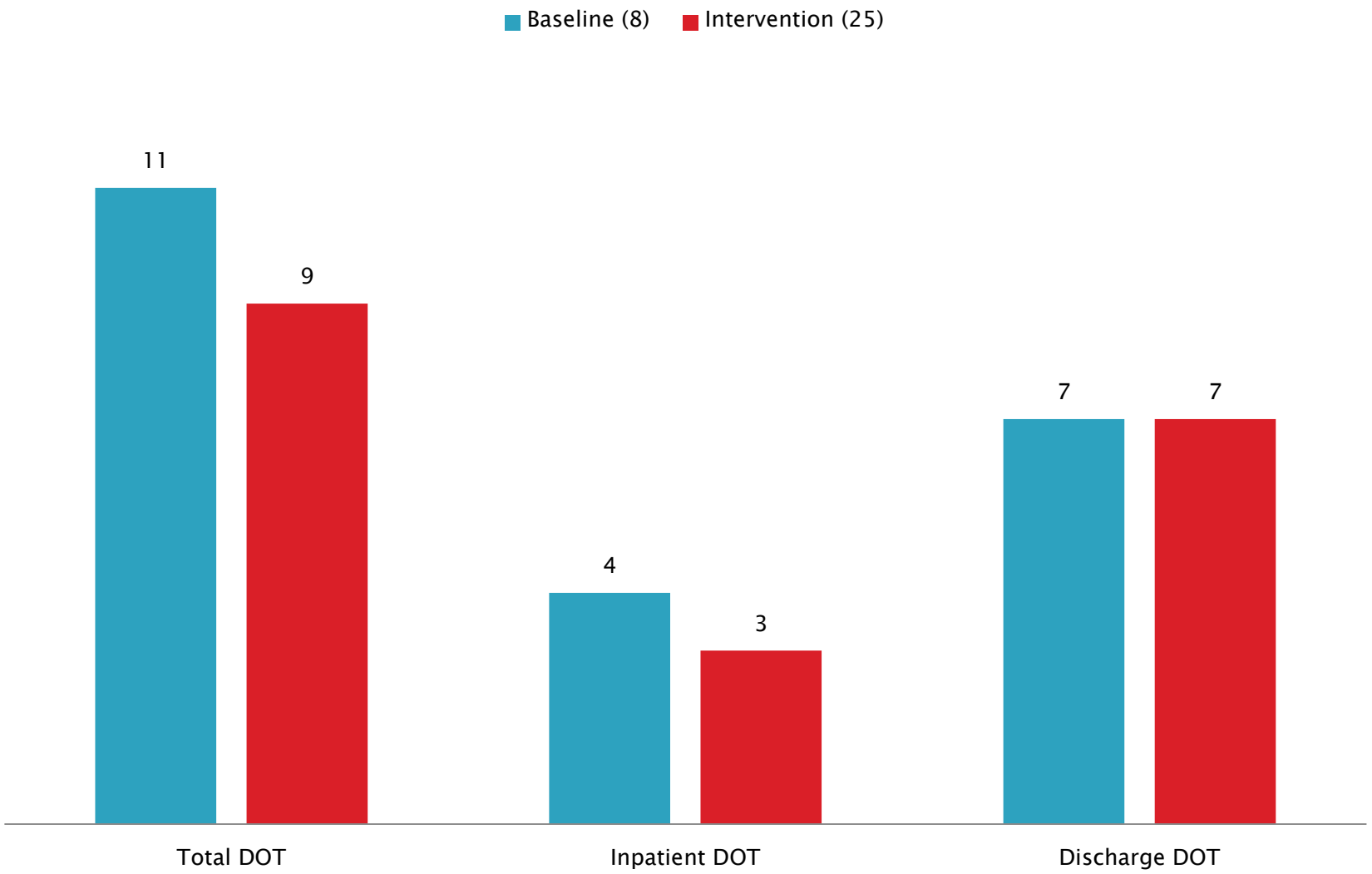
CHA UTI


Baseline
Intervention
0%
2%
2%
3%
44%
20%
41%
19%
49%
72%
21%
7%
21%
9%
C. difficile
Re-hospitalization
Quinolone I
Quinoloine O
IV cephalosporin I
IV vancomycin I
IV carbapenem I

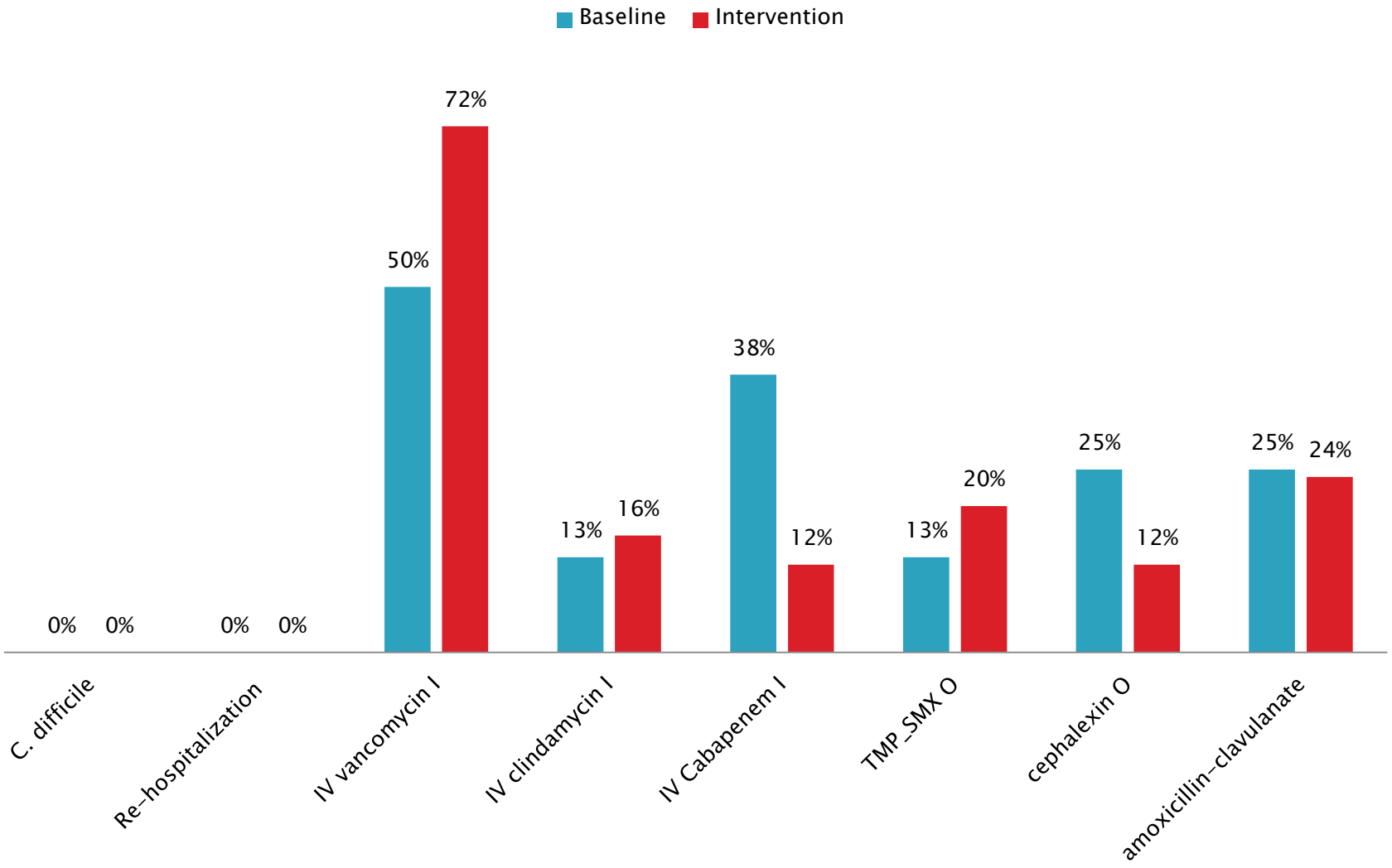
CHA SSTI Project Goals

- Reduction from baseline in duration of treatment
- Reduction from baseline in broad gram-negative antibiotic use
- Monitor *C. difficile* rates using NHSN
- Education event

CHA SSTI


Baseline (8)
Intervention (25)
11
9
4
3
7
7
Total DOT
Inpatient DOT
Discharge DOT

CHA SSTI

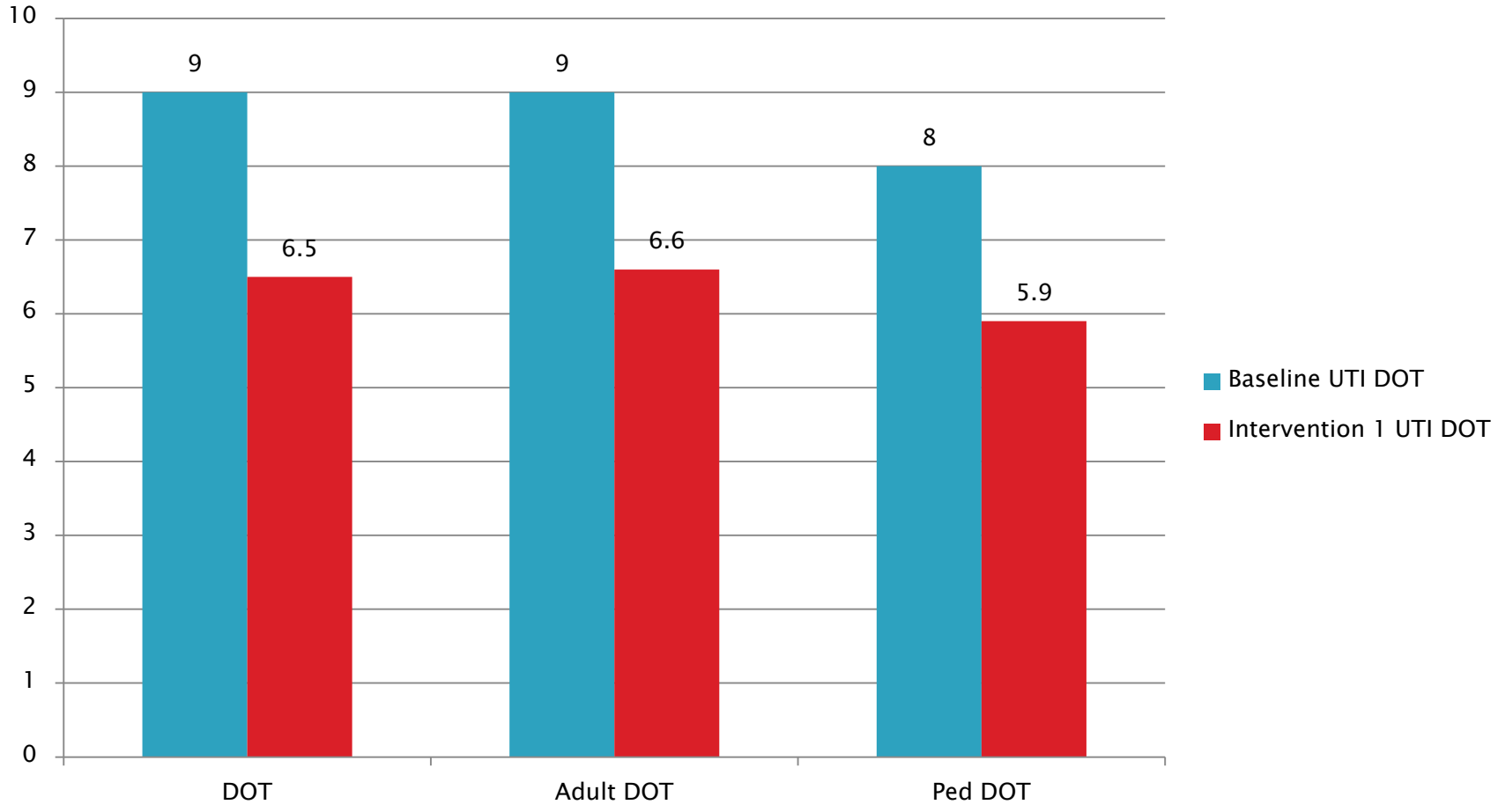

Baseline
Intervention
0%
0%
0%
0%
50%
72%
13%
16%
38%
12%
13%
20%
25%
12%
25%
24%
C. difficile
Re-hospitalization
IV vancomycin I
IV clindamycin I
IV Cabapenem I
TMP_SMX O
cephalexin O
amoxicillin-clavulanate

Clinic Project UTI

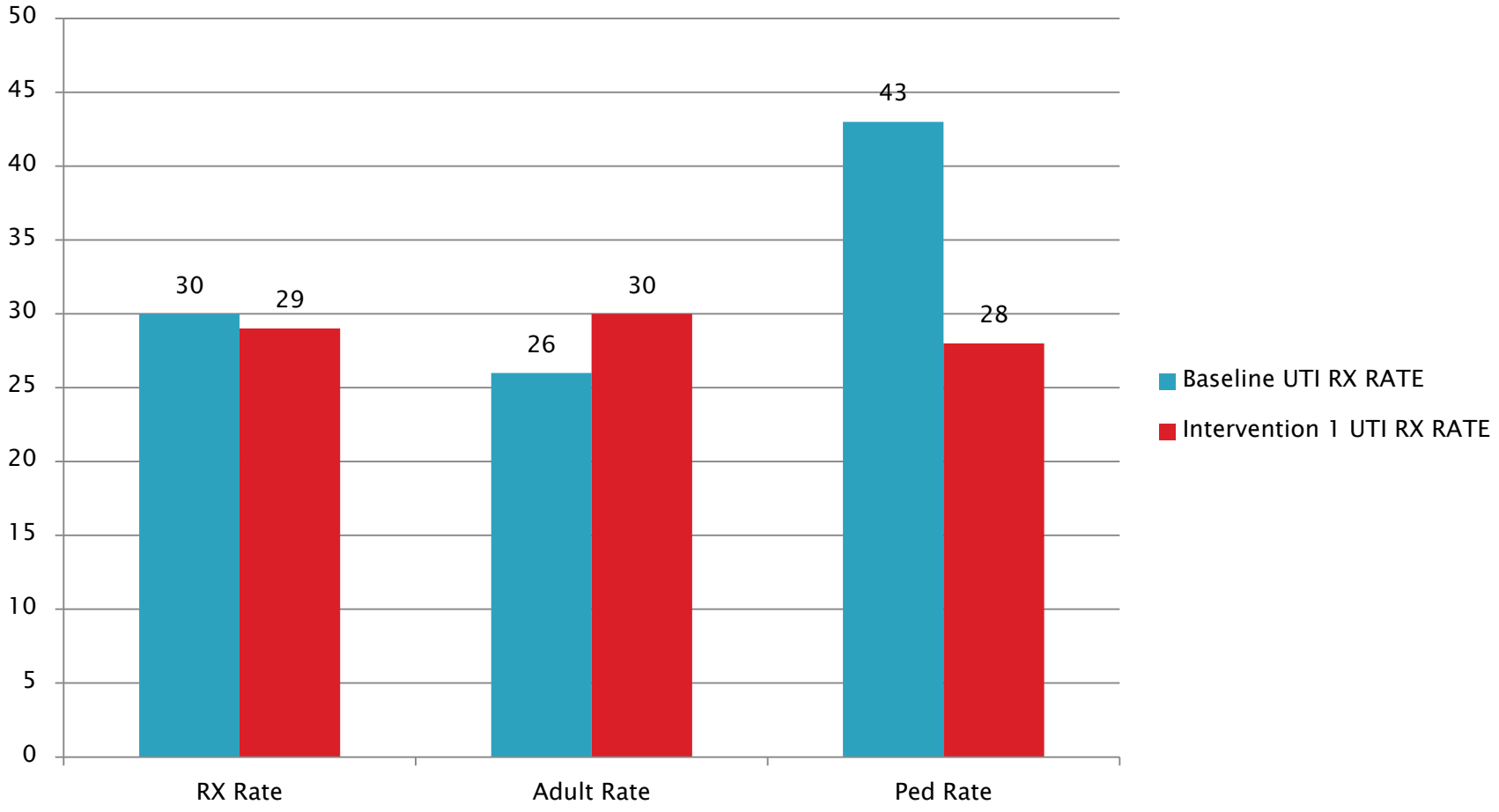
- Goals
  - Decrease DOT to 5-7 days adults, 7 to 14 days pediatrics
  - Decrease quinolone use over baseline

- Education events
  - Pediatric, Jason Newland, MD
  - Adult, Katherine Fleming-Dutra, MD

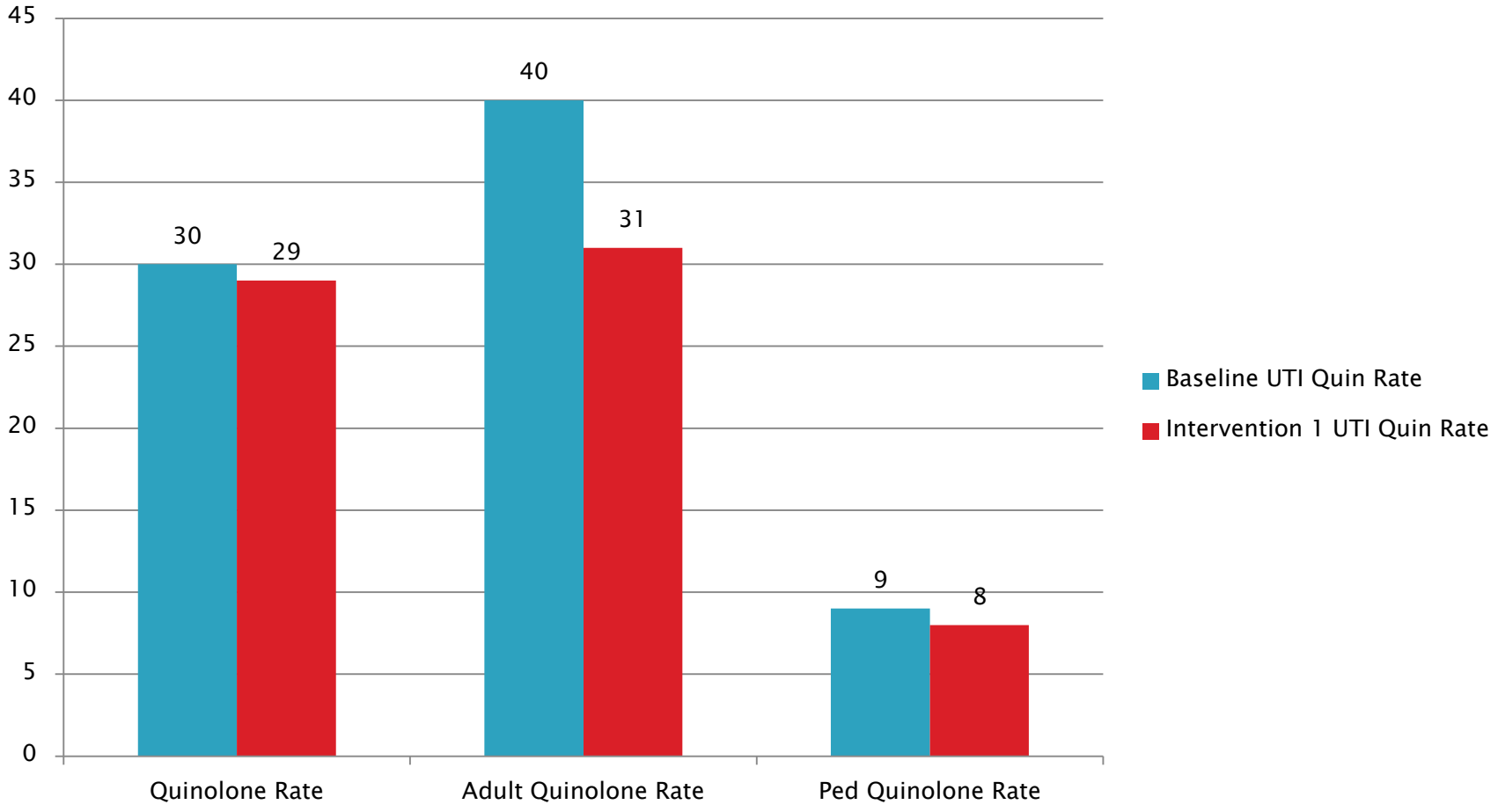
Clinic Data UTI



Clinic Data UTI



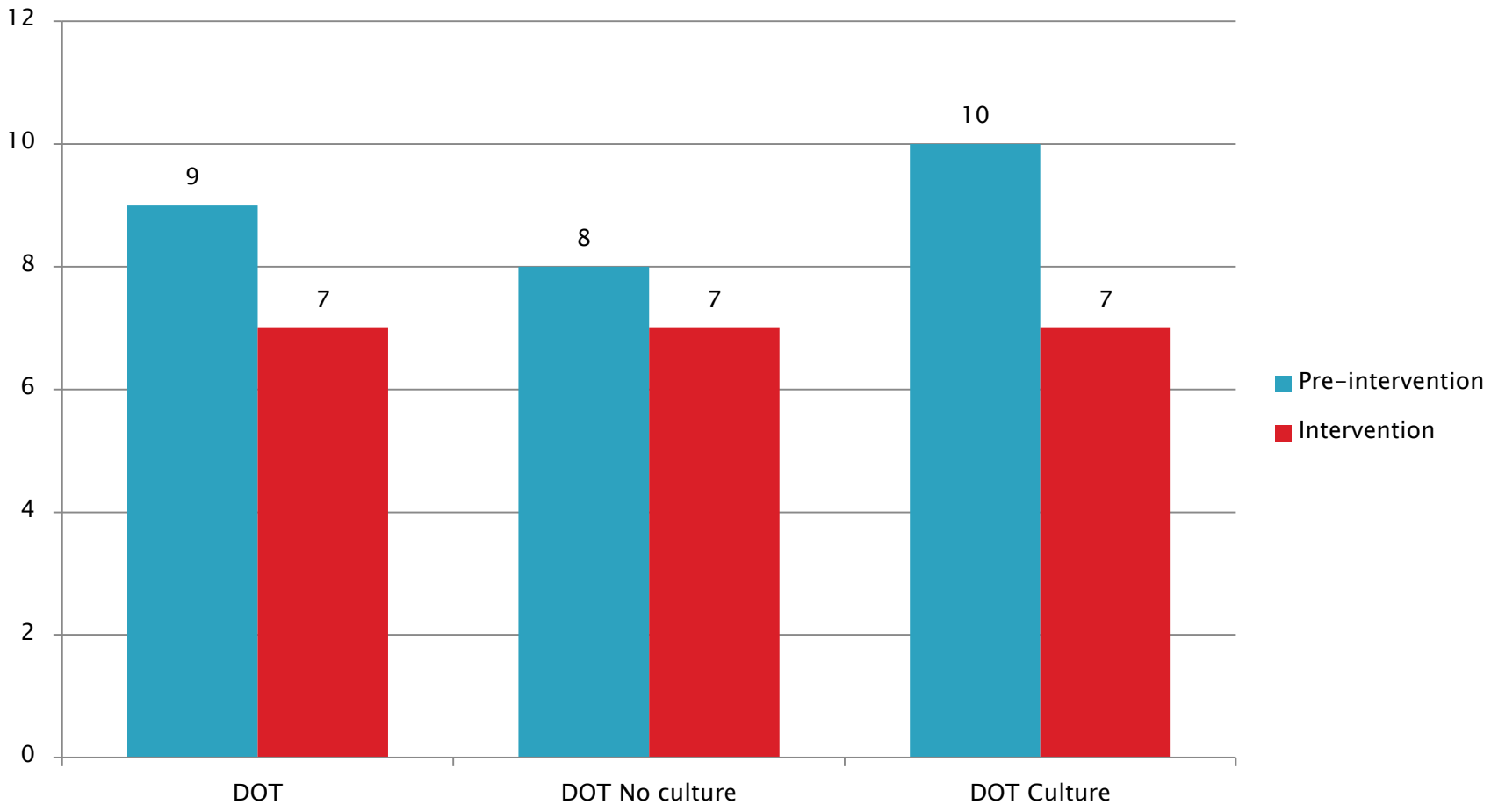
Clinic Data UTI



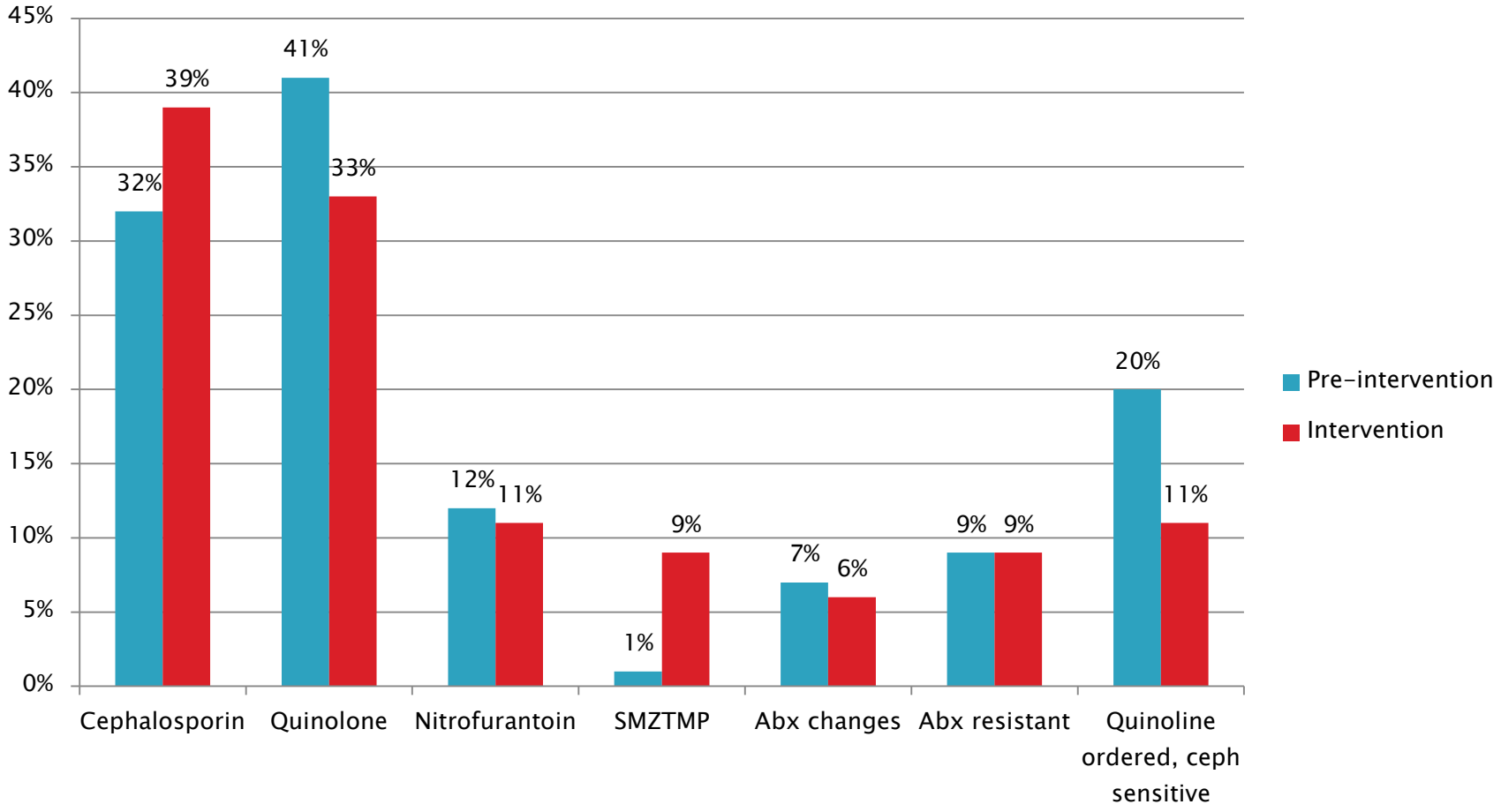
CG Healthcare LTC Project

- 20% reduction in total UTI's treated with antibiotics
- 20% reduction in total antibiotic days
- Shift the use of primary antibiotic away from fluoroquinolones to less broad spectrum agents
- Questions
  - Can guidance and education, along with support, foster a stewardship environment in LTC?
  - Does guidance have impact on cases meeting NHSN definition?
- Education event

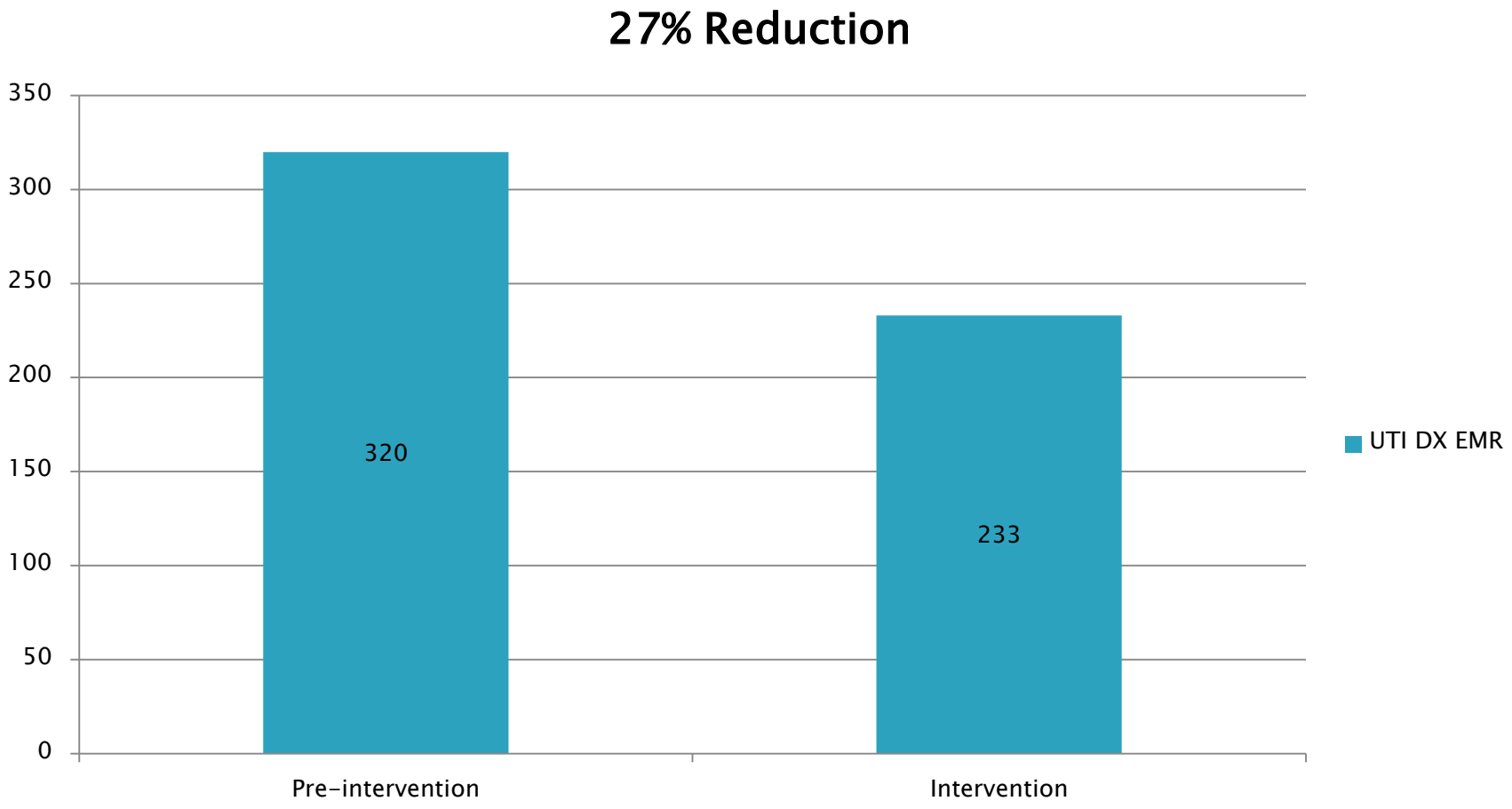
Days of Therapy



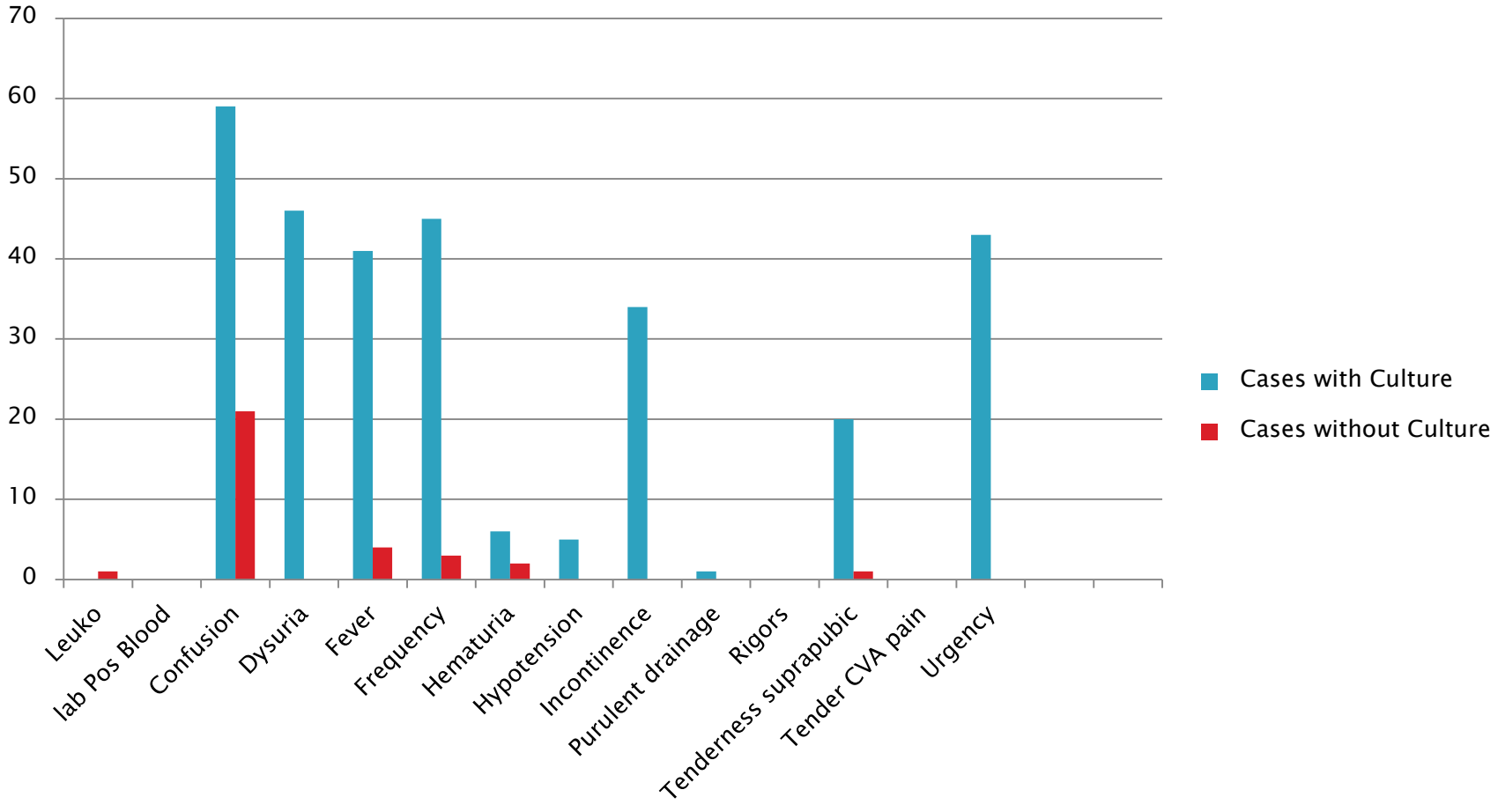
Antibiotic


45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
32%
39%
41%
33%
12%
11%
1%
9%
7%
6%
9%
9%
20%
11%
Cephalosporin
Quinolone
Nitrofurantoin
SMZTMP
Abx changes
Abx resistant
Quinoline ordered, ceph sensitive
Pre-intervention
Intervention

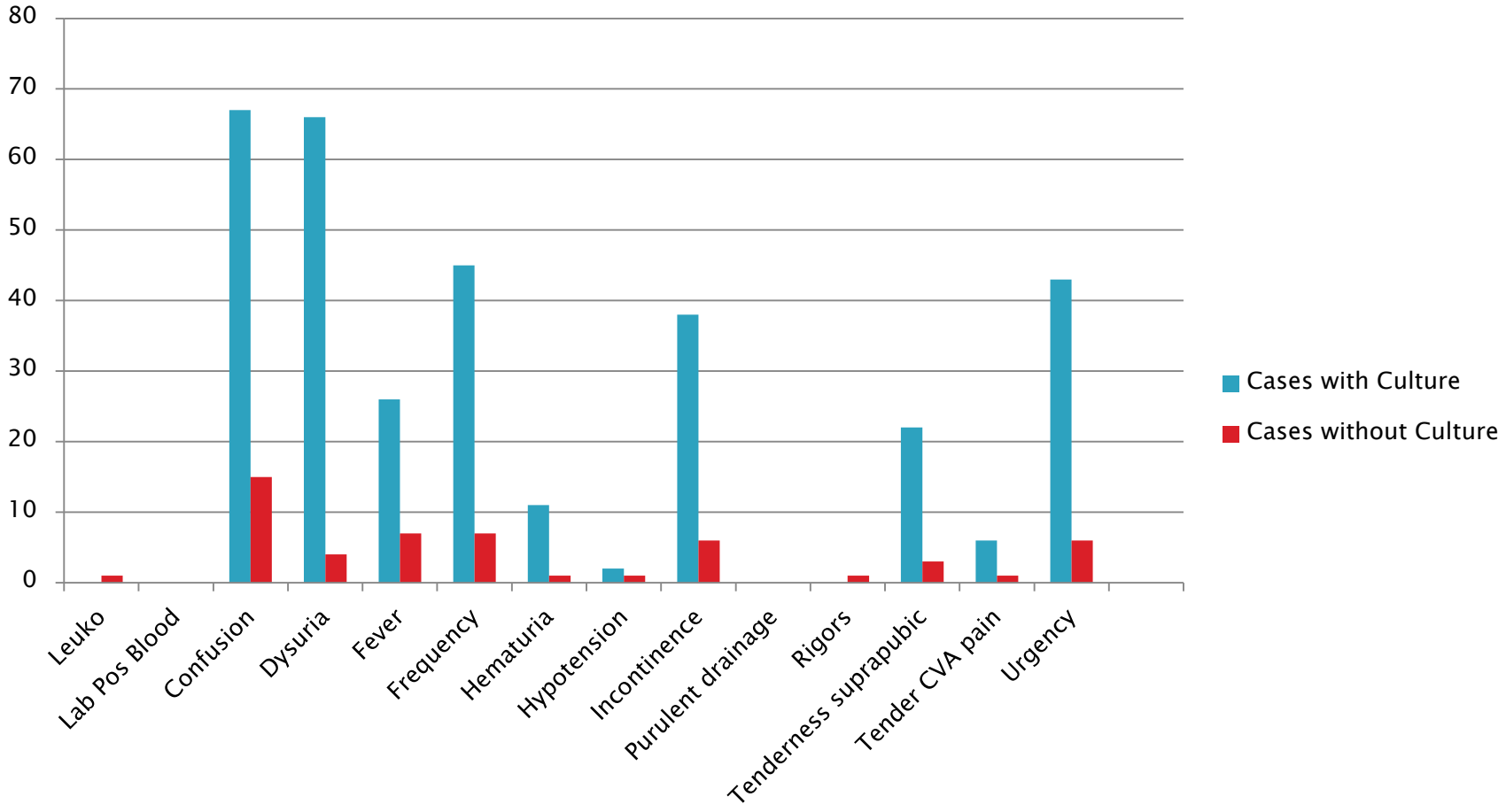
UTI's Qualifying for Antibiotics



Symptoms Pre-intervention



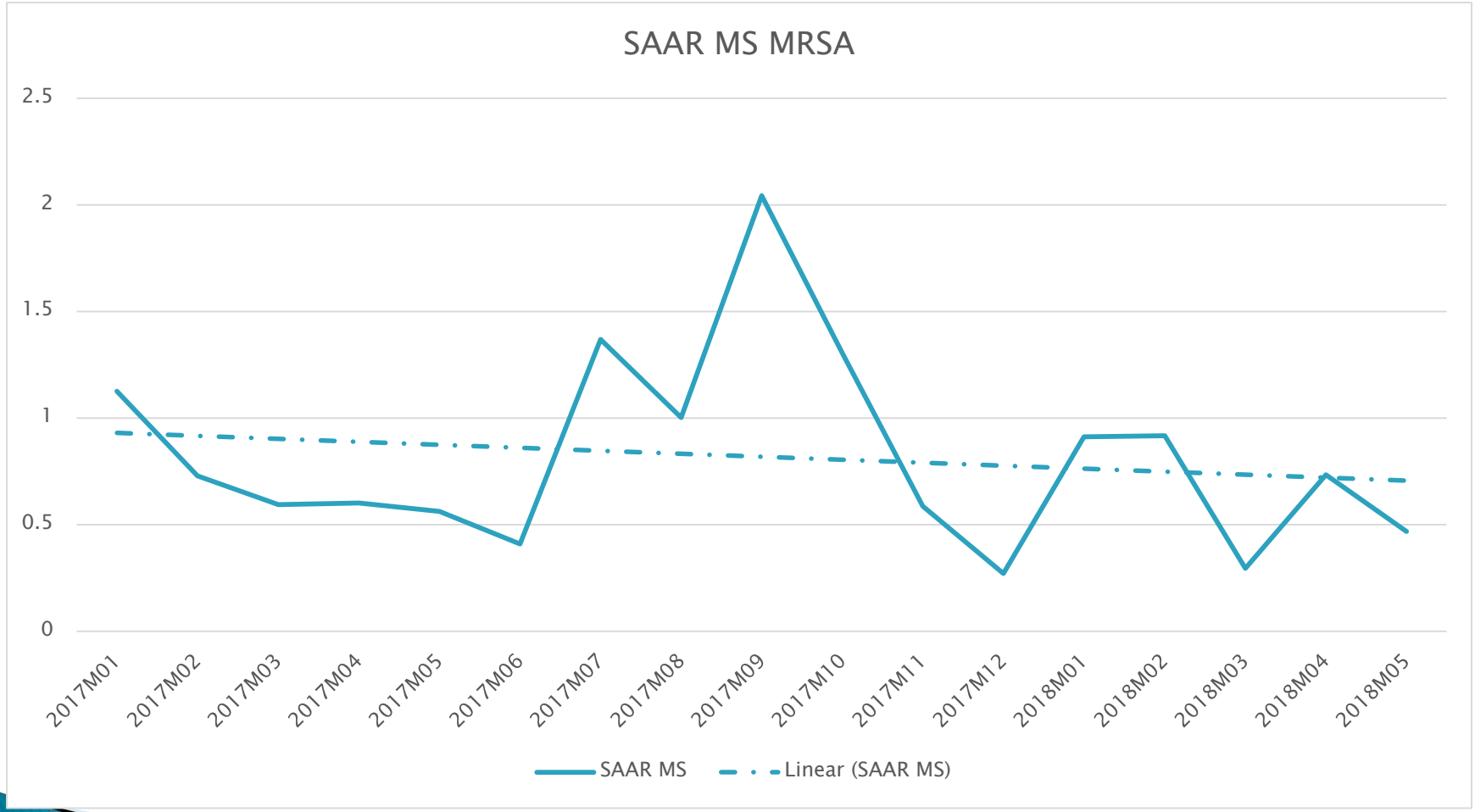
Symptoms Post-intervention



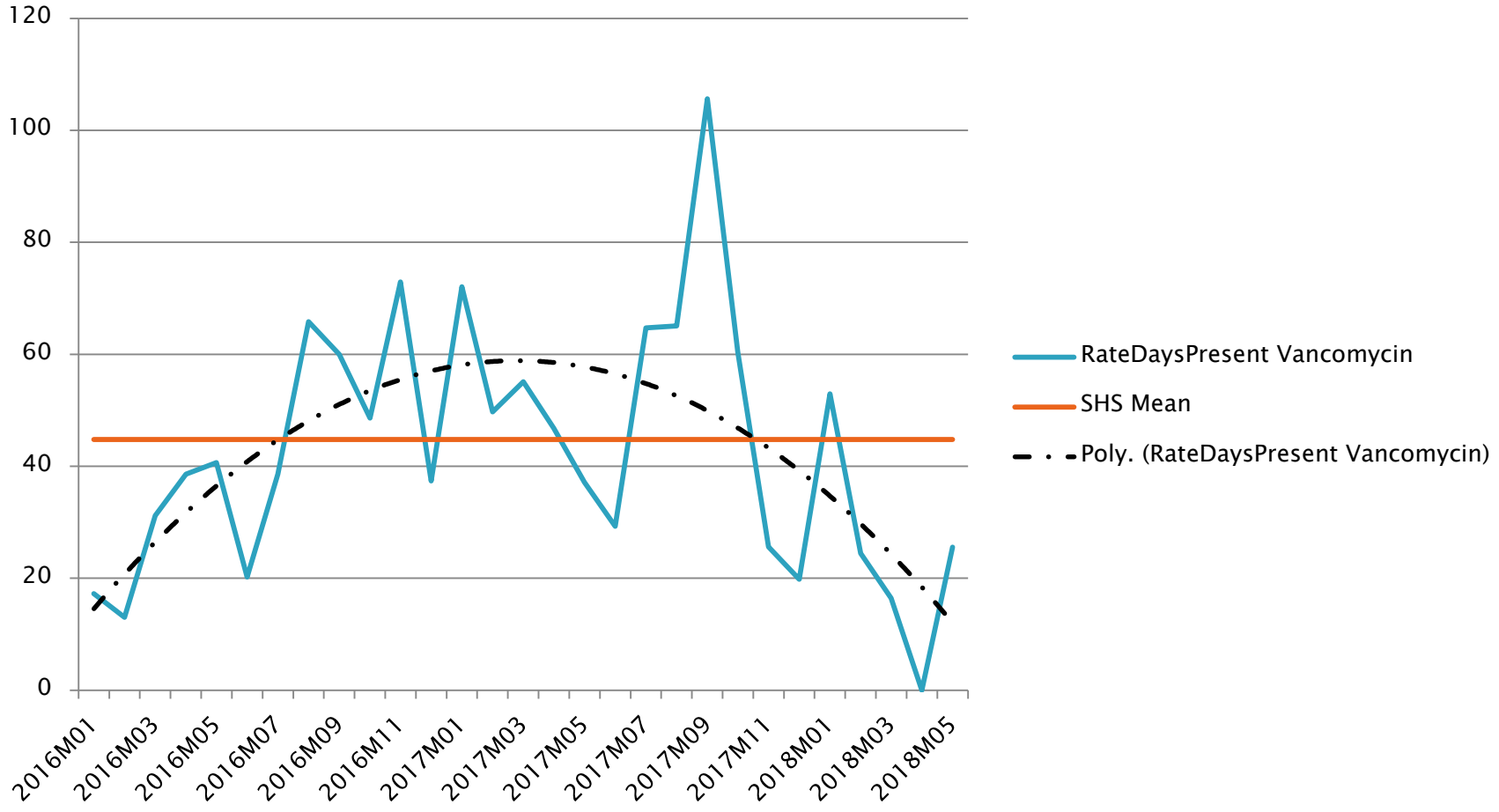
Did we meet goals?

- Can guidance and education, along with support, foster a stewardship environment in LTC?
  - Yes, reduction in DOT (22%) and UTI Dx (27%)
- Does guidance increase cases meeting NHSN definition?
  - No, 17% decline in case completion
- Can you use NHSN to drive stewardship projects?
  - Yes, custom data along with regular fields
- They will move forward with a Phase Two project

What Drives My ASP? MRSA SAAR



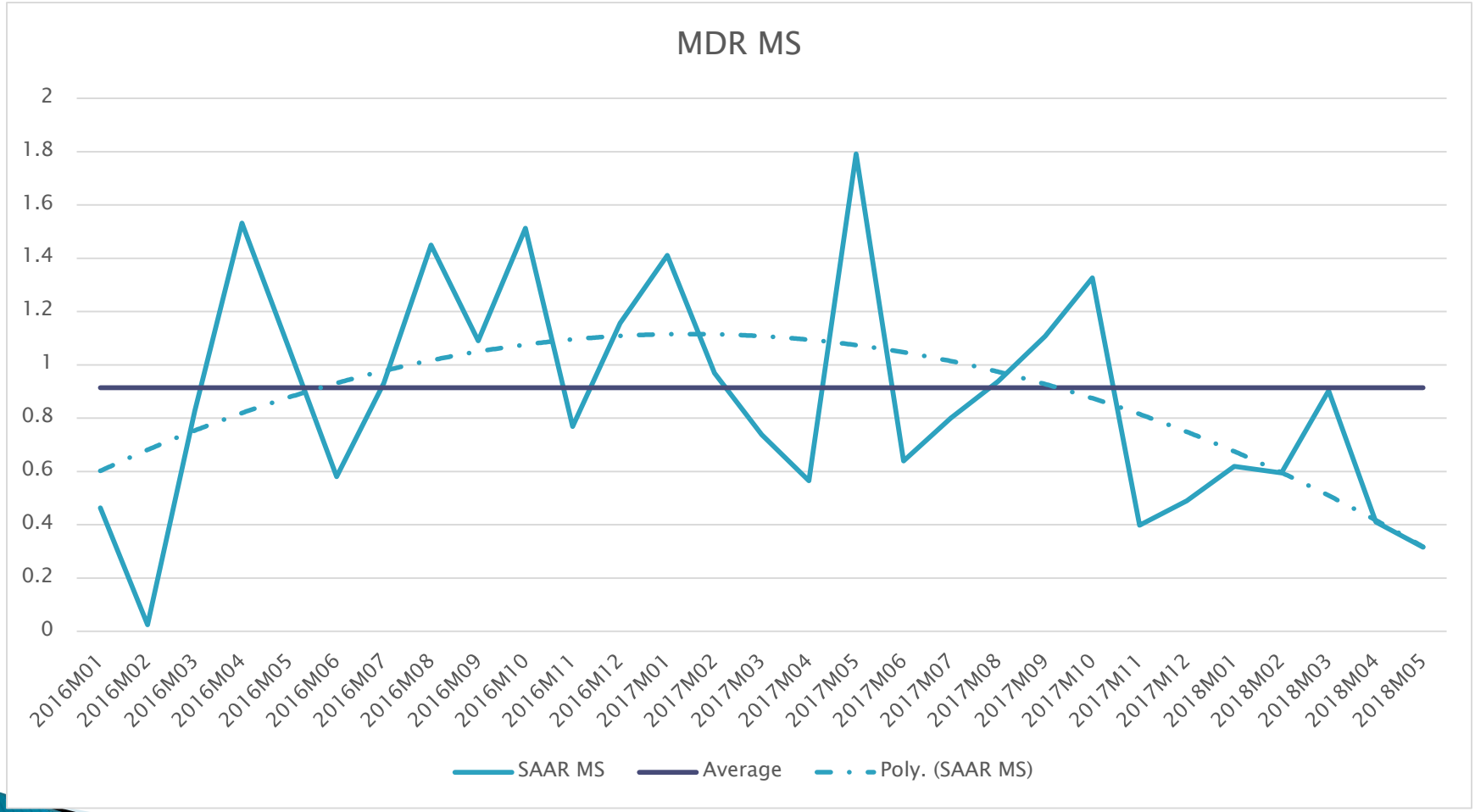
Vancomycin Rate Days



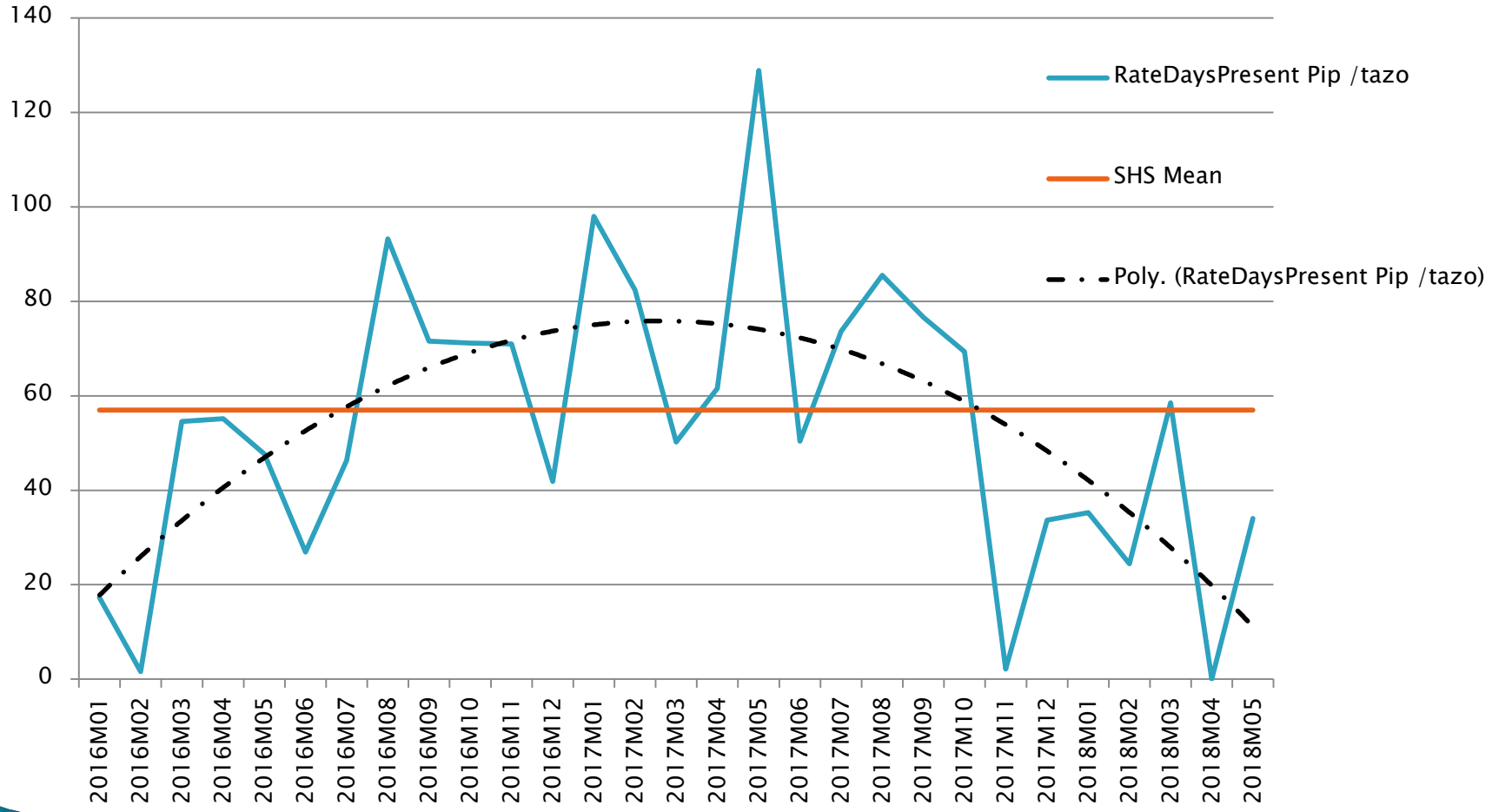
Vancomycin Audit

- 41 cases reviewed, mostly cellulitis
- 15% had a prior MDRO
- 17% had no culture
- 24% not de-escalated
- 58% met stewardship definition
- MRSA 17%, *E faecalis* 7%
- 60% sensitive to cefazolin
- We recommended that cefazolin be the drug of choice for cellulitis without history of prior MDRO or complications

What Drives My ASP? MDR SAAR



Rate Days Pip/Tazo



Facilities work together to protect patients.

Common Approach *(Not enough)*

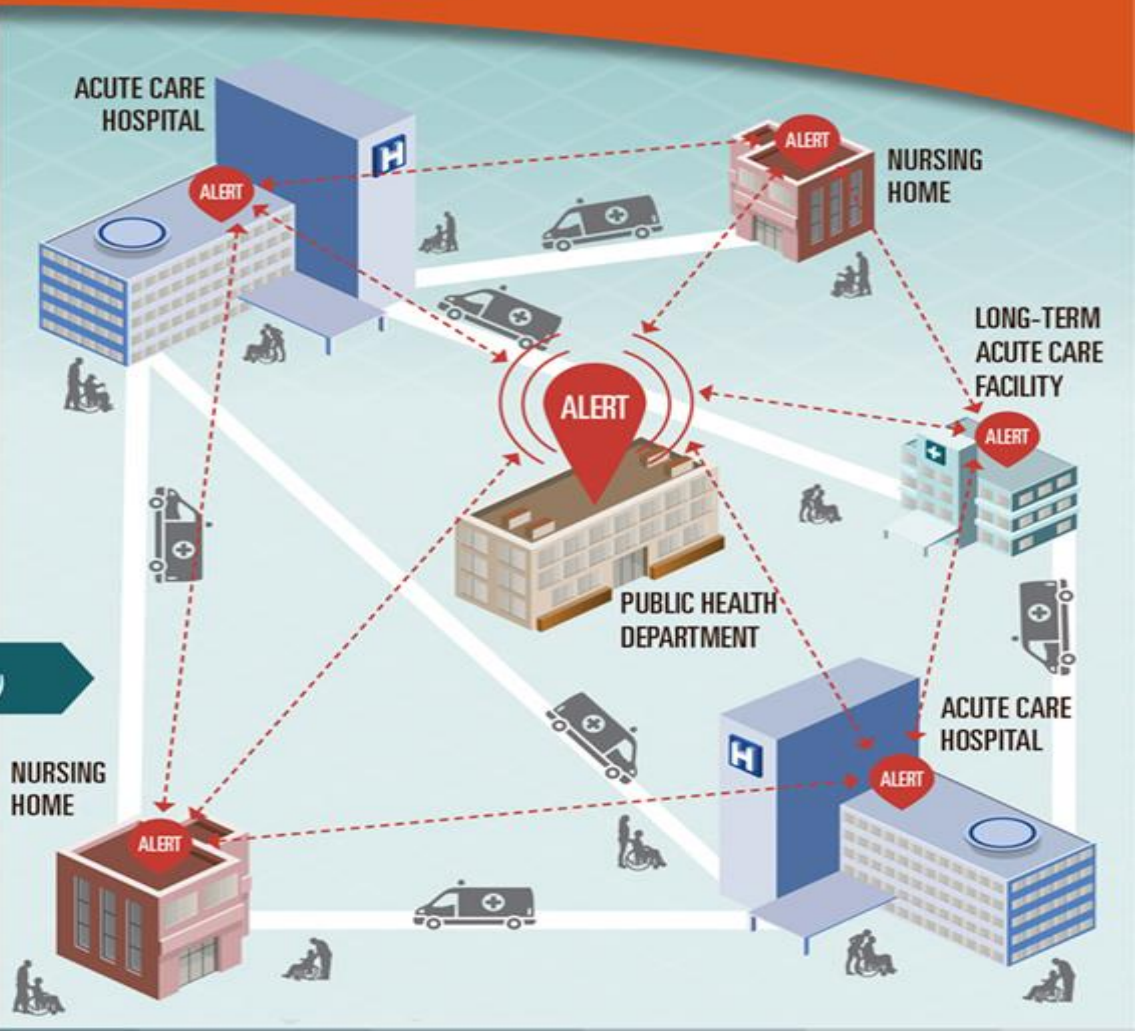
- Patients can be transferred back and forth from facilities for treatment without all the communication and necessary infection control actions in place.

Independent Efforts *(Still not enough)*

- Some facilities work independently to enhance infection control but are not often alerted to antibiotic-resistant or *C. difficile* germs coming from other facilities or outbreaks in the area.
- Lack of shared information from other facilities means that necessary infection control actions are not always taken and germs are spread to other patients.

Coordinated Approach *(Needed)*

- Public health departments track and **alert** health care facilities to antibiotic-resistant or *C. difficile* germs coming from other facilities and outbreaks in the area.
- Facilities and public health authorities share information and implement shared infection control actions to stop spread of germs from facility to facility.

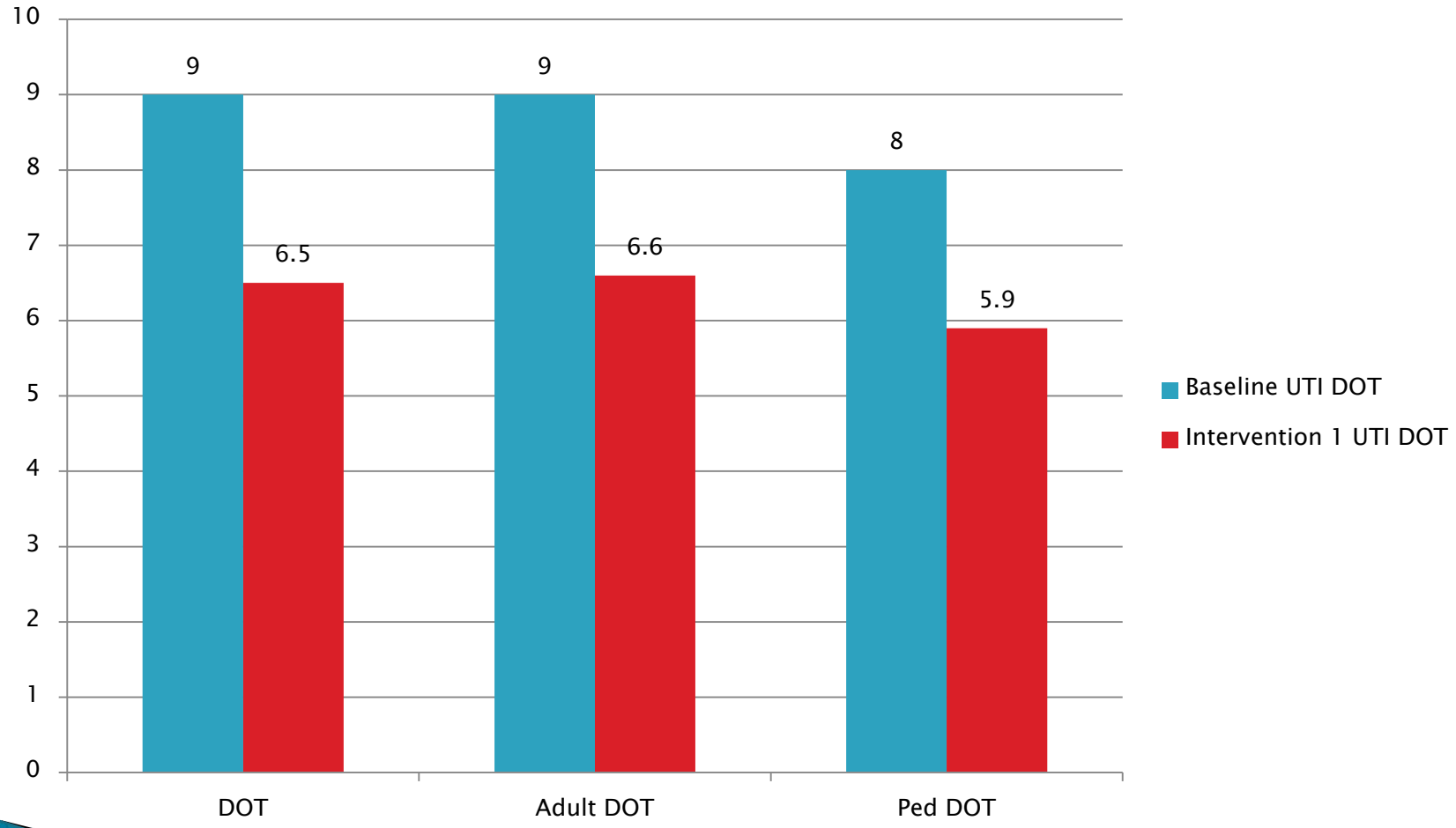


Community stewardship

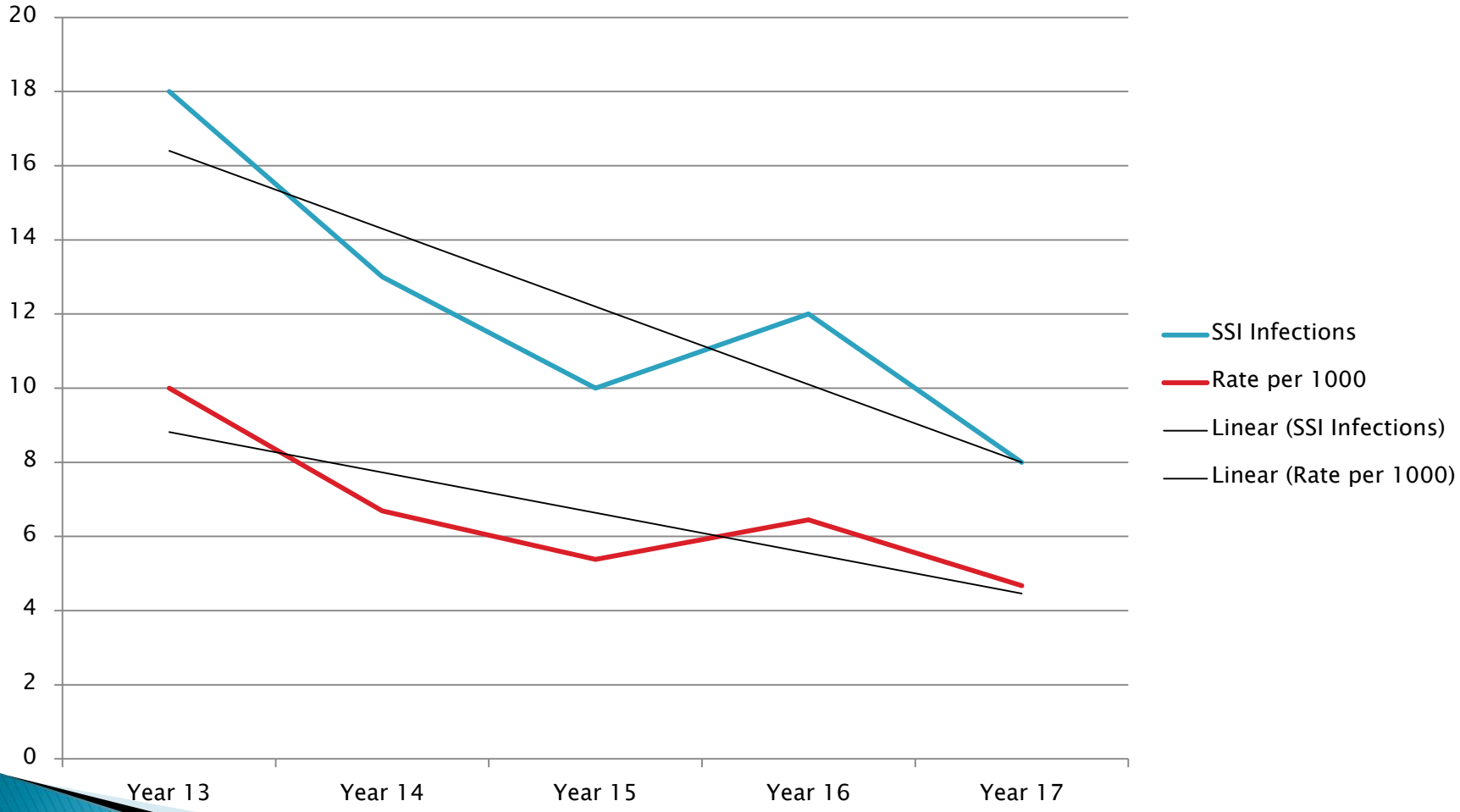
- Clinic stewardship
- Hospital stewardship
- LTC stewardship
- Dental stewardship

- Can they make an impact in small communities? You decide?

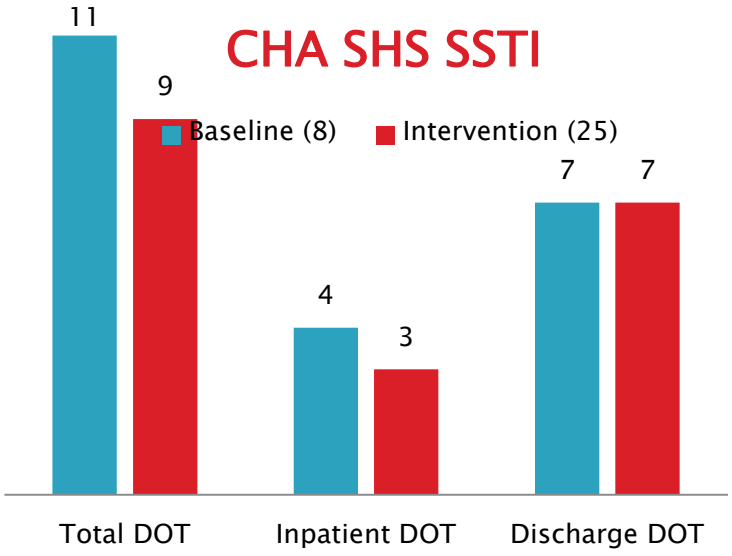
Successful Intervention: Clinic

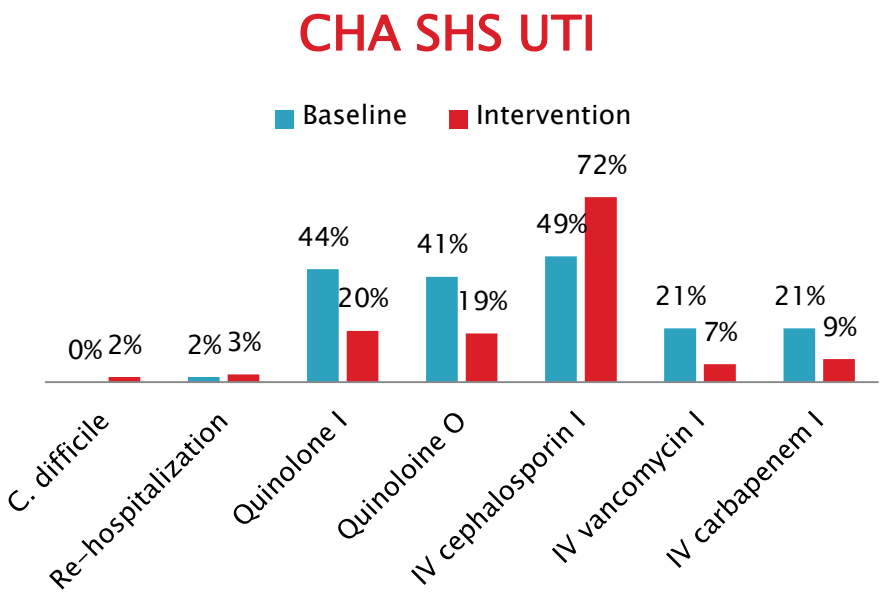


Successful Intervention: Hospital

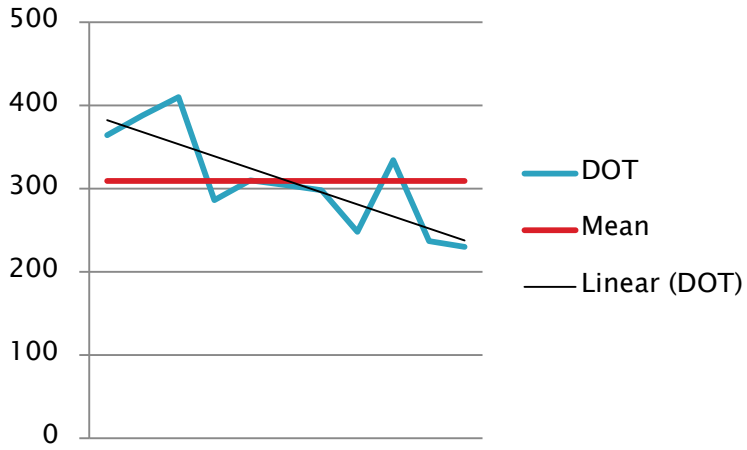


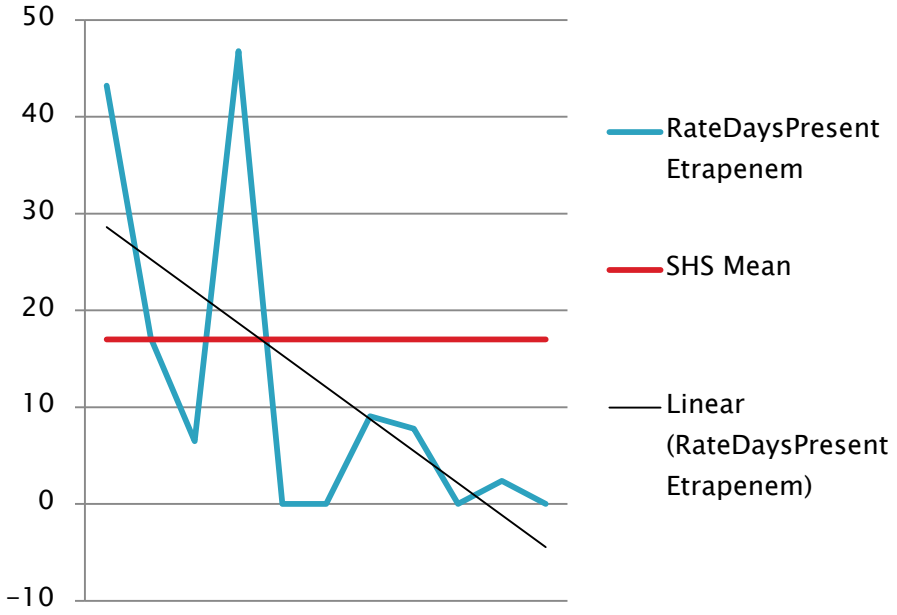
Successful Intervention: Hospital



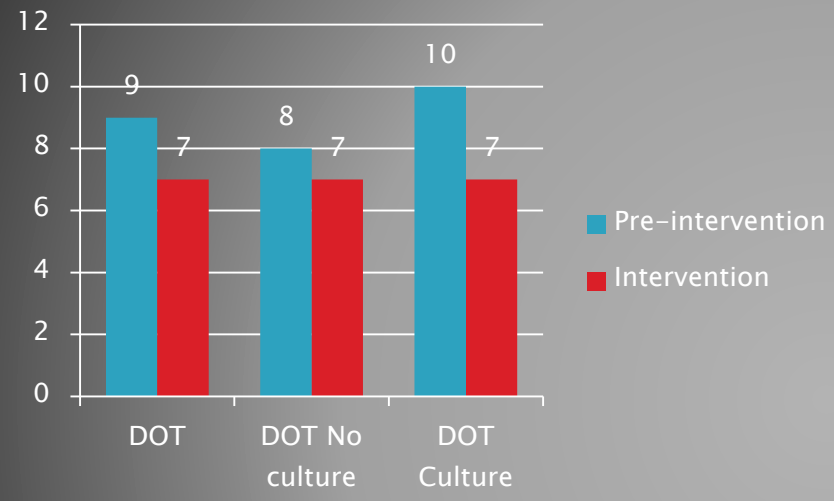


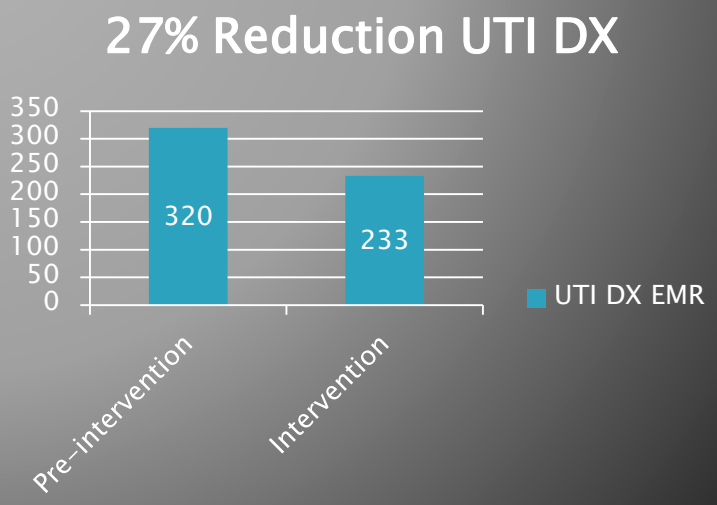
Successful Intervention: Hospital



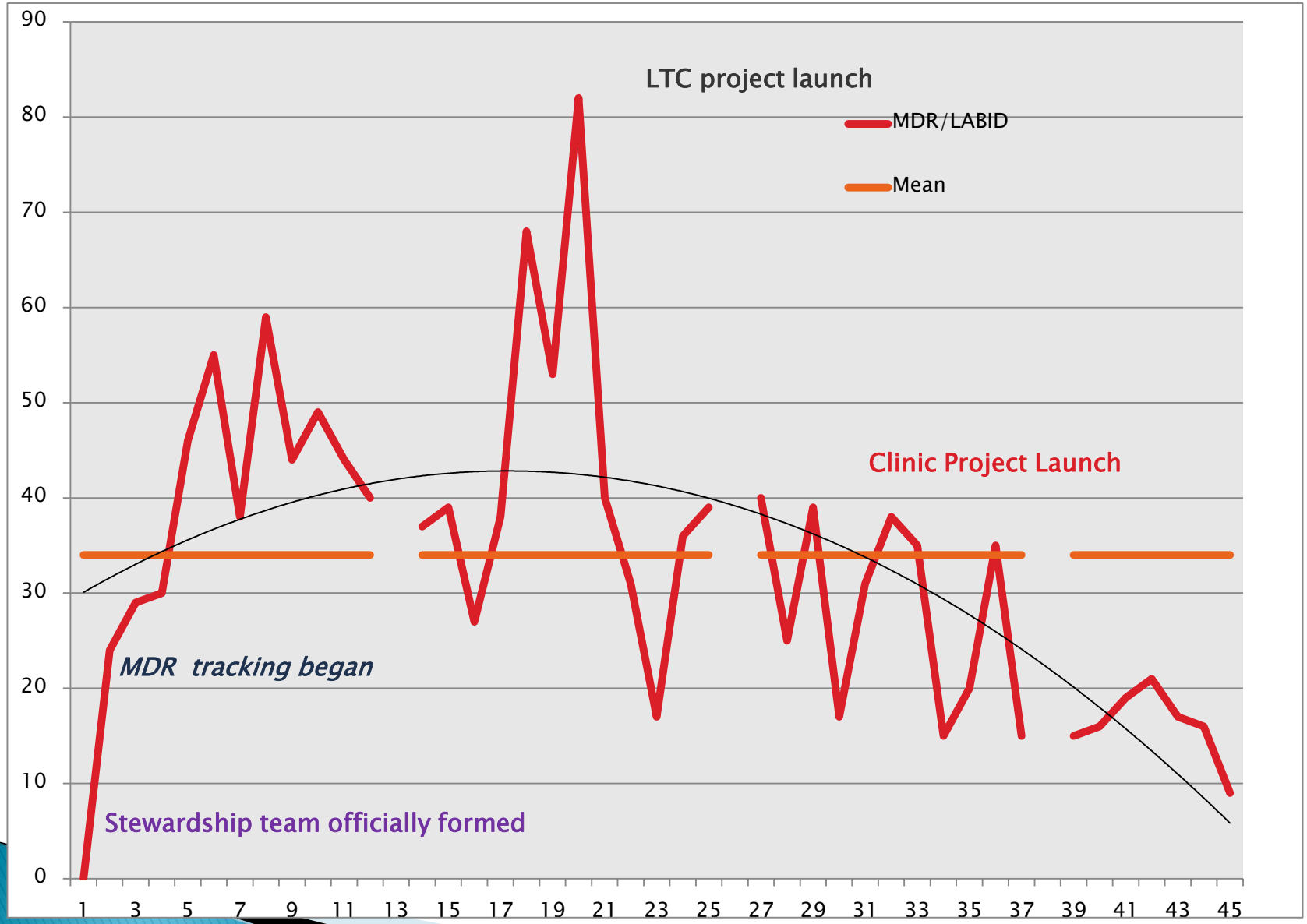


Successful Intervention: LTC





Community Stewardship: MDR Reduction



Conclusions

Stewardship along with infection prevention does save the health system money.

Stewardship is a data-driven quality learning process for all areas of the medical system.

The bulk of antibiotics are prescribed in the community setting, not the hospital. We need to fine-tune antibiotic usage in all care settings.

Feel free to call or email. Thanks

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