Antibiotic Stewardship Metrics and Measurement

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- Research best practice guidelines for metric suggestions
- Look for external benchmark data
- Outline internal benchmarks
- Determine what can be measured & collected from data available
- Establish your baseline
- Assign responsibility and frequency of measurement
- Monitor for program effectiveness
- Report out and take action

Antibiotic Stewardship Metrics and Measurement- Getting Started

Core Element 5: Tracking and Monitoring Antibiotic Prescribing, Use, and Resistance

Monitoring antibiotic prescribing and resistance patterns is critical to identify opportunities for improvement and to assess the impact of improvement efforts.

- Systematic collection of antibiotic use and resistance data allows facilities to assess, monitor, and improve prescribing practices.

Examples of Implementation

Basic:
Process Measures

- Adherence to documentation policies, e.g., requirement to document indications for antibiotic use and requirements to document performance of time-outs.
- Tracking of diagnosis, drug, dose, duration, and de-escalation with antibiotic time-out.
- Adherence to facility-specific treatment recommendations or guidelines.
- Adherence to specified interventions.
- Accurate antibiotic allergy and adverse reaction histories.

Intermediate:
Outcome Measures

- Sequential tracking of antibiotic resistance patterns (e.g., gram negative resistance).
- Tracking of *C. difficile* infection rates.
- 30-day readmission rates for pneumonia and *C. difficile*.

Advanced:
Antibiotic Use Measures

- Number of antibiotics administered to patients per day (i.e., days of therapy, or "DOT"). Hospitals can use the CDC National Healthcare Safety Network (NHSN) Antibiotic Use Option to track and benchmark days of therapy.
- Grams of antibiotics used (defined daily dose, or "DDD") could be used if DOT not available.
- Standardized antibiotic administration ratio (SAAR), an NQF-endorsed quality benchmarking measure for antibiotic use, available to hospitals enrolled in the NHSN Antibiotic Use Option.
- Direct antibiotic expenditures (purchasing costs).

Implementation Examples

Expenditure Measures

GUIDELINE XXI
What is the Best Measure of **Expenditures** on Antibiotics to Assess the Impact of ASPs and Interventions?

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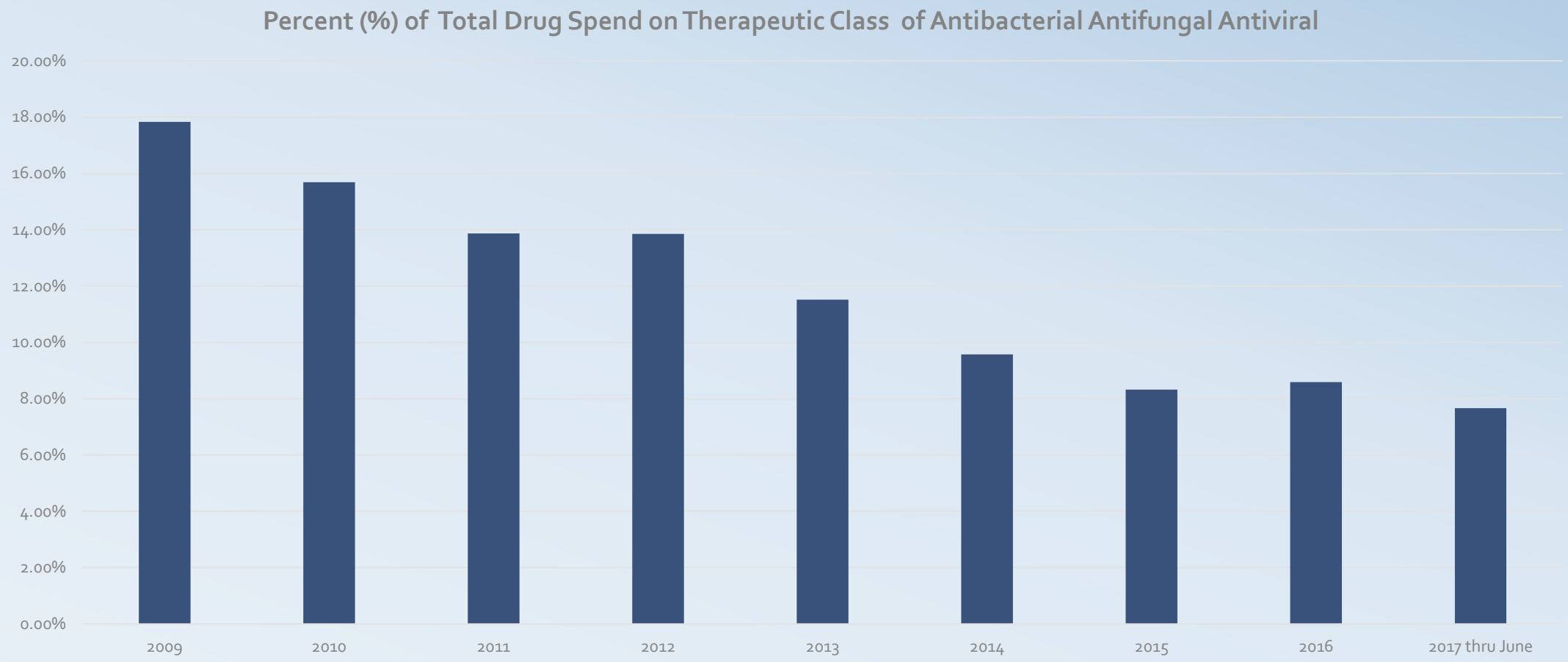
22. We recommend measuring antibiotic costs based on prescriptions or administrations instead of purchasing data. (*good practice recommendation)*

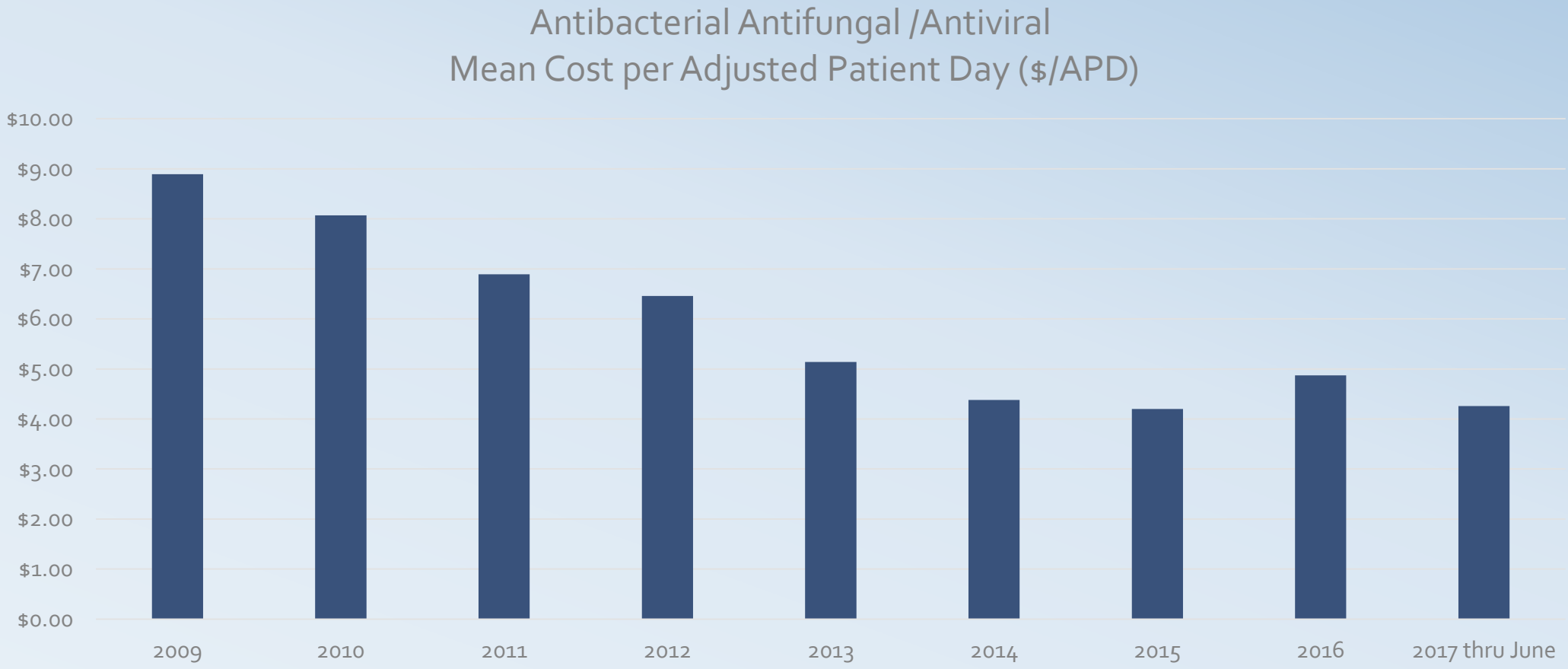
Metrics Guidelines

Clinical Infectious Diseases
IDSA GUIDELINE

Guideline for Implementing an Antibiotic Stewardship Program • CID 2016:62 (15 May) • e77


Percent (%) of Total Drug Spend on Therapeutic Class of Antibacterial Antifungal Antiviral
20.00%
18.00%
16.00%
14.00%
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
2009
2010
2011
2012
2013
2014
2015
2016
2017 thru June

Financial



Financial, cont'd

Antibiotic Use Measures

CDC recommends two different types of quantitative measurements as a numerator: Examples are Days of Therapy (DOT) and Defined Daily Dose (DDD)

Metrics Guidelines, [2]

https://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html

Metrics Guidelines, [3]

Clinical Infectious Diseases

IDSA GUIDELINE

GUIDELINE XX

Which Overall Measures Best Reflect the **Impact** of ASPs and Their Interventions?

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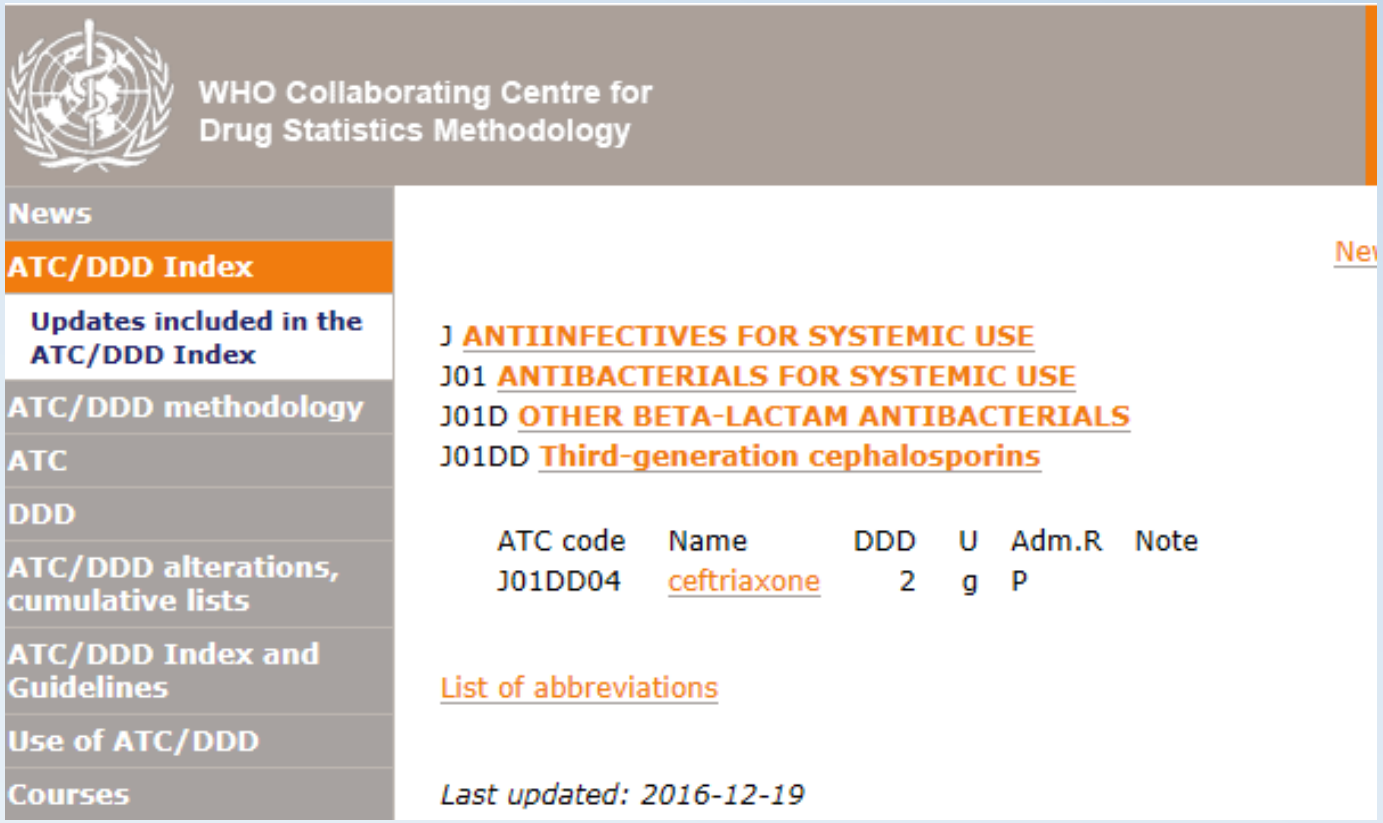
21. We suggest monitoring antibiotic use as measured by days of therapy (DOTs) in preference to defined daily dose (DDD).

(*weak practice recommendation, low-quality evidence)*

Guideline for Implementing an Antibiotic Stewardship Program • CID 2016:62 (15 May) • e77

The DDD is the assumed average maintenance dose per day for a drug used for its main indication in adults. https://www.whocc.no/atc_ddd_index/



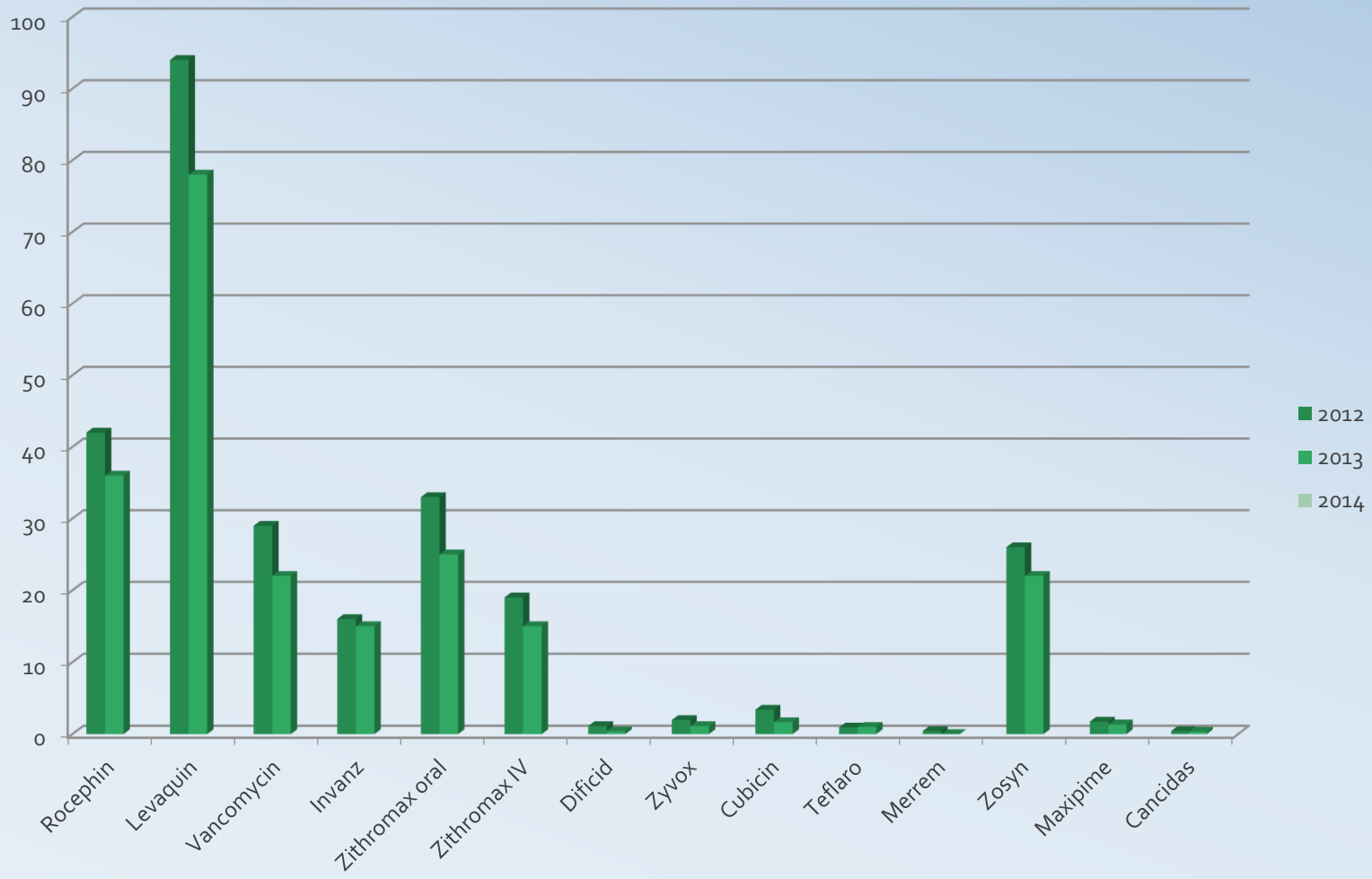
DDD of drug use per year Ceftriaxone (2)

2012	3103
2013	2730
2014	1964
2015	2173
2016	2106
2017	1227

Adjusted Patient Days (acute)

2012	73150
2013	74984
2014	67230
2015	63804
2016	66604
2017	32716

Defined Daily Dose and Adjusted Patient Day Data

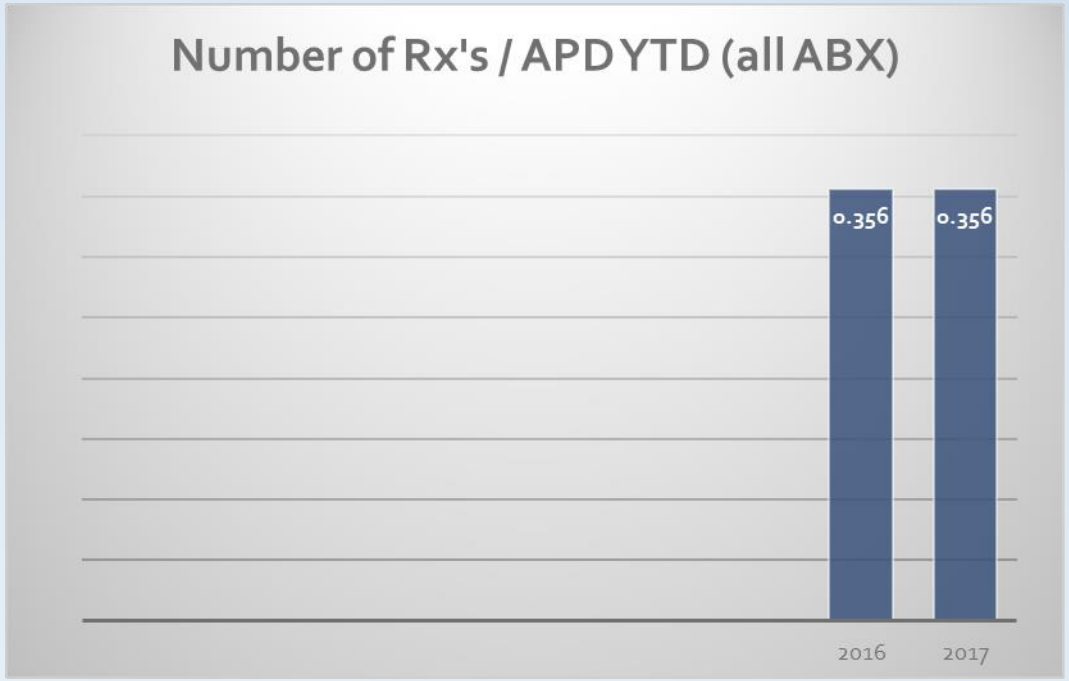


Defined Daily Dose (DDD) per Adjusted Patient Day/1000

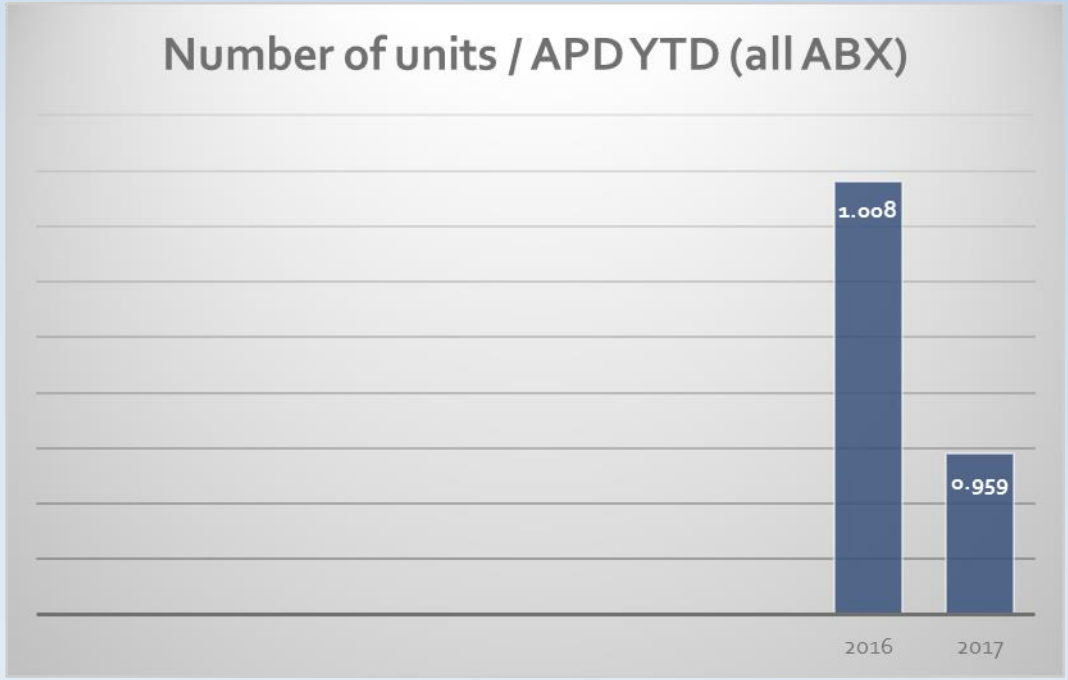
Internally Defined Measure

Metrics Guidelines, 4

Orders/Adjusted Patient Day



ABX Units/Adjusted Patient Day



Antibiotic Use Measure-Orders and Units/Adjusted Patient Day

Outcome Measures

- New Onset C-Diff Infection Rates
- Reducing Antibiotic Resistance

Metrics Guidelines, [5]

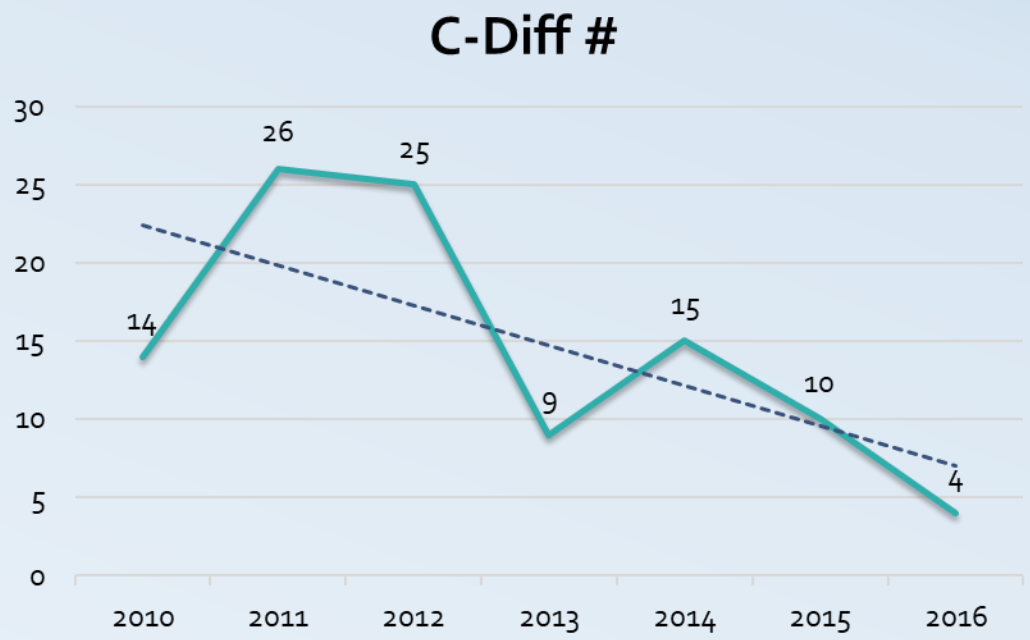
Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

https://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html

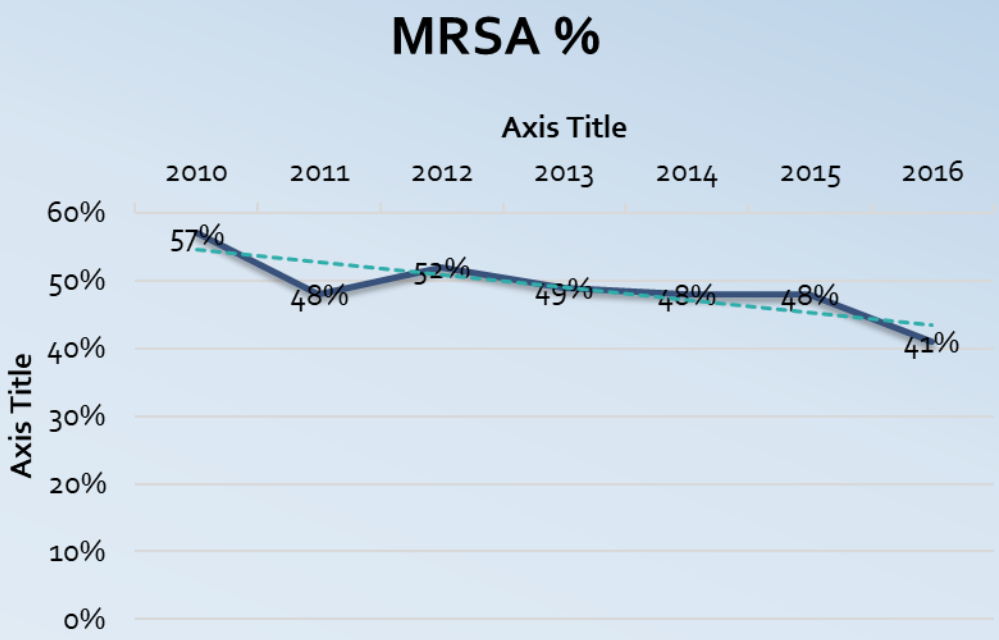
	2010	2011	2012	2013	2014	2015	2016	2017
C-Diff #	14	26	25	9	15	10	4	2
MRSA %	57%	48%	52%	49%	48%	48%	41%	41%
ESBL #	n/a	n/a	n/a	225	188	158	152	63
CRE #	n/a	n/a	n/a	n/a	7	25	17	0

Outcome Measure - Multi Drug Resistant Isolates & CDI

C-Diff



MRSA



Clinical Metrics-Multi Drug Resistant Isolates

Benchmarking

- Purchased Benchmarking Service
- NSHN-Antibiotic Use Module and standardized antibiotic administration ration (SAAR)
- Purchasing Group Benchmarking

Reporting and Action

- Pharmacy and Therapeutics Committee
- Infection Control
- Medical Staff
- Medical Executive committee