Antibiotic Stewardship - We're In This Together

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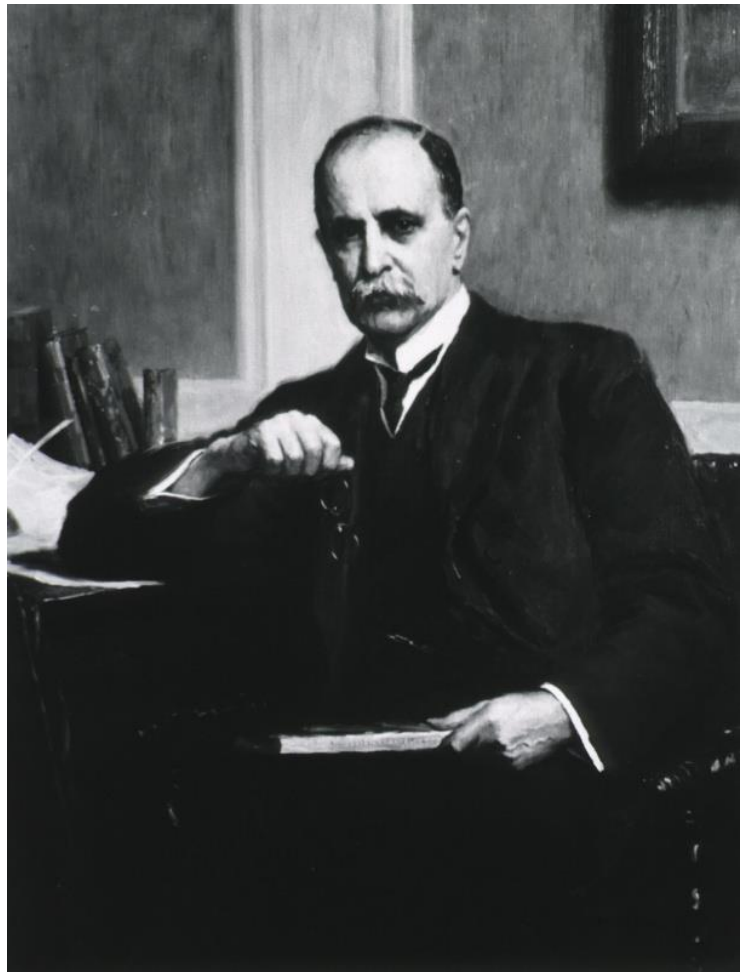
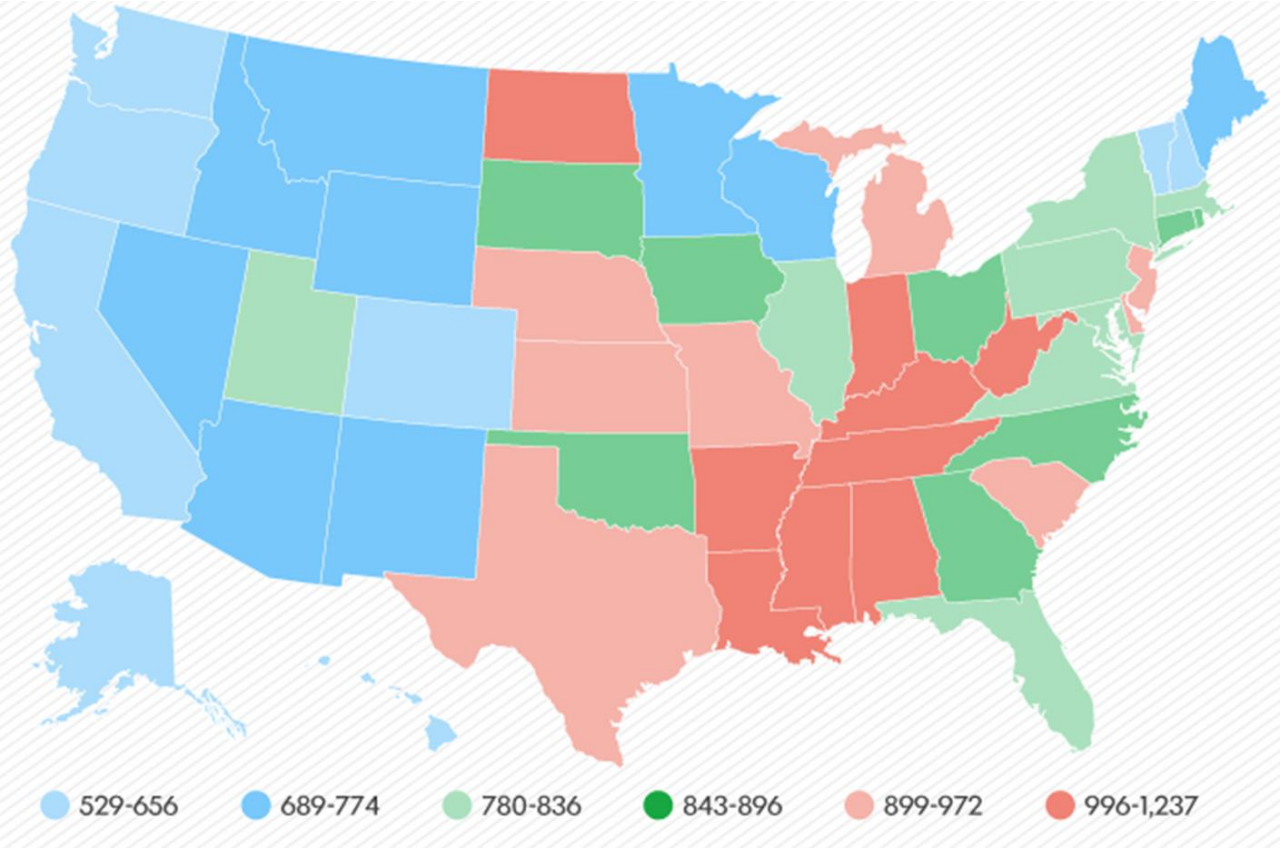
“A desire to take medicine is, perhaps, the greatest feature which distinguishes man from animals”

“One of the first duties of the physician is to educate the masses not to take medicines”

Sir William Osler



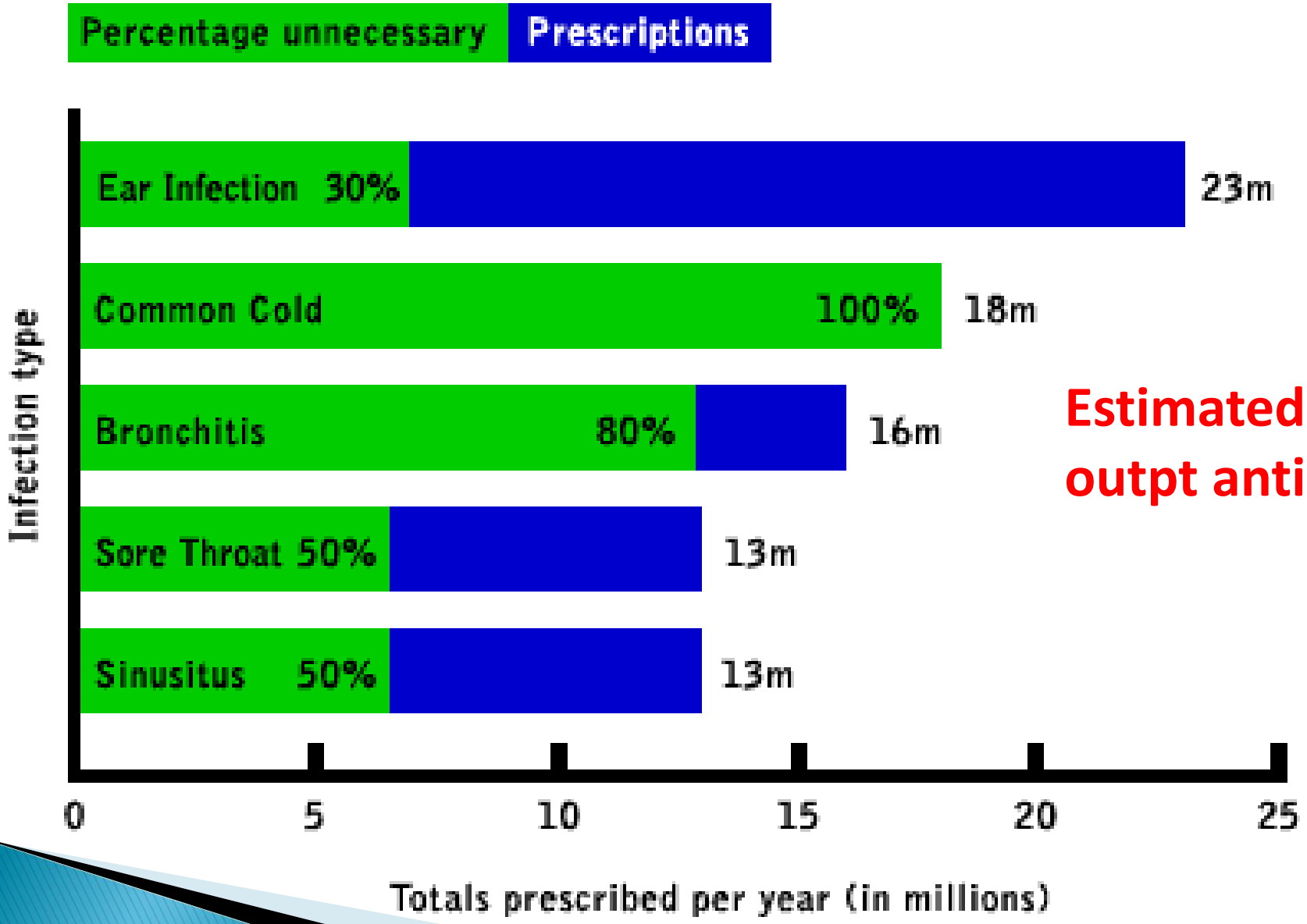
A Tale of Two Countries:
Rate of Outpatient Antibiotic Use, 2014



835 / 1000 population / yr

328 / 1000 population / yr

Unnecessary Antibiotic Prescriptions

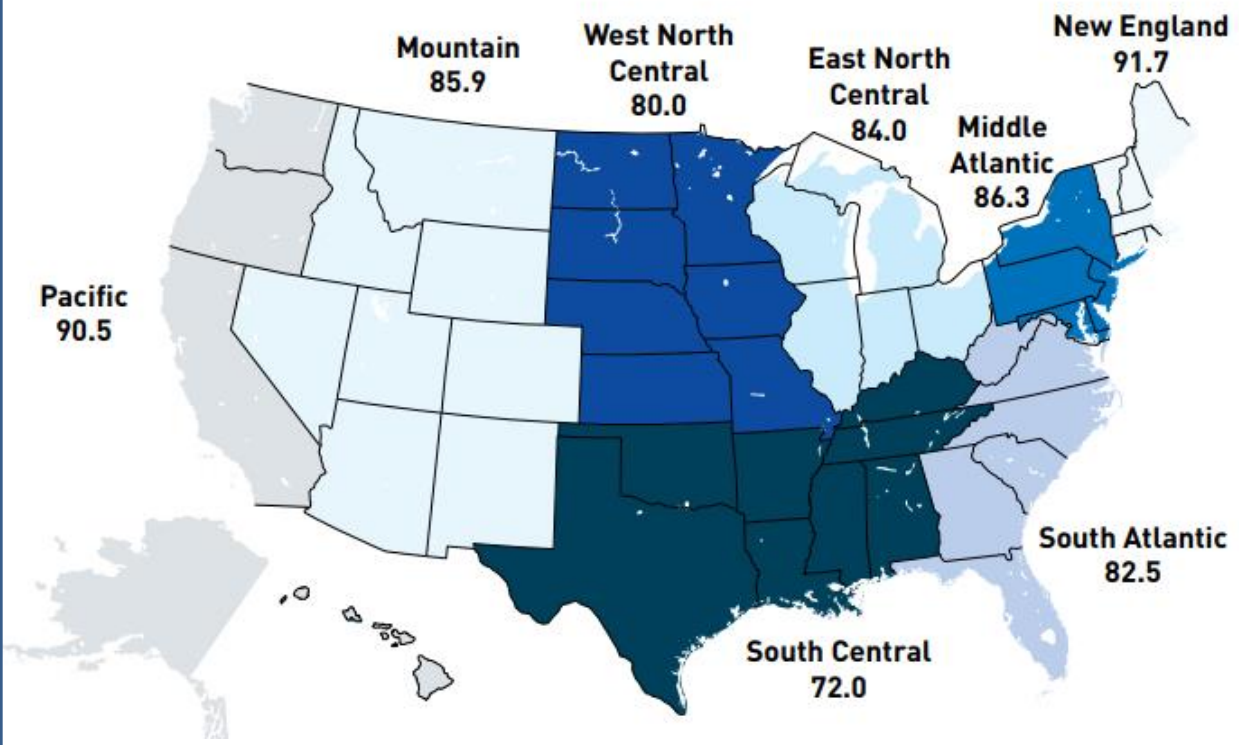


Estimated 50 million unnecessary outpt antibiotic prescriptions / yr

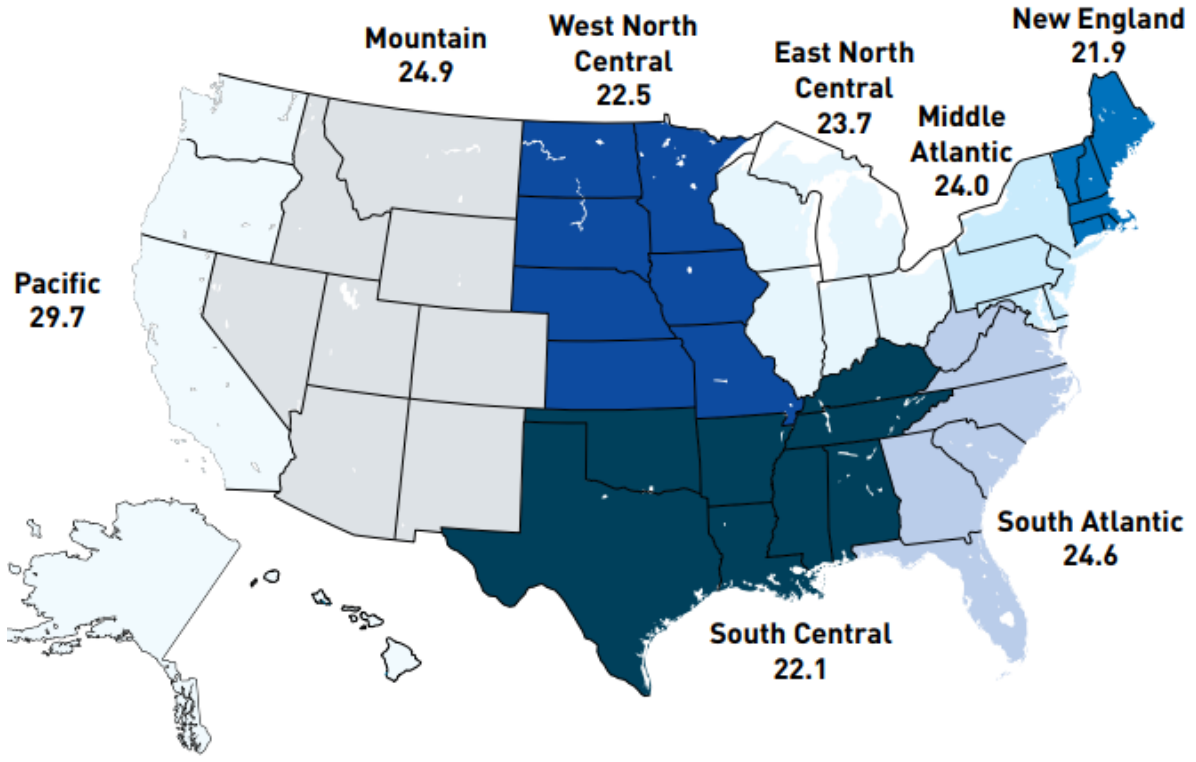
CDC

Geographic Variability in HEDIS Measures Related to Appropriate Antibiotic Use

Children diagnosed with VURI not receiving an antibiotic, 2008-2012

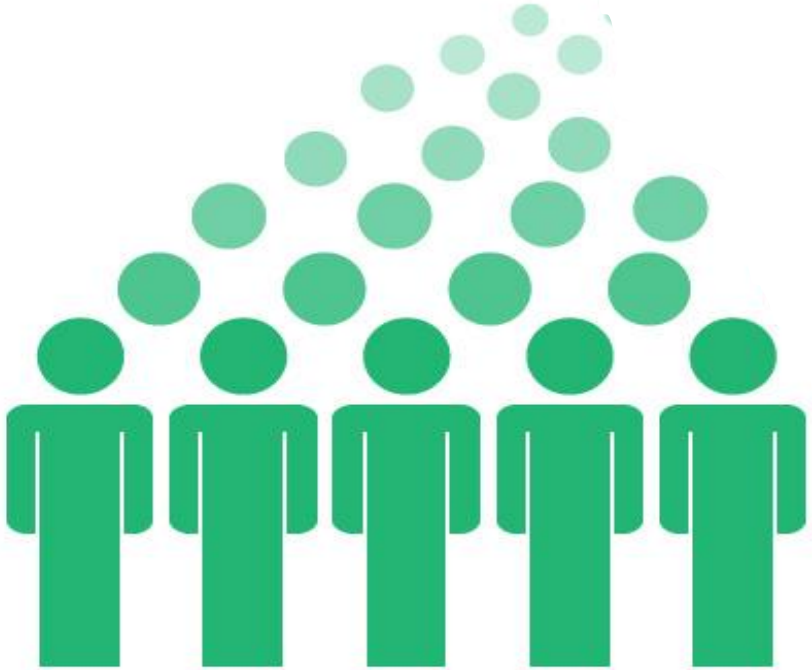


Adults with acute bronchitis not receiving an antibiotic, 2008-2012



Roberts RM. Am J Manag Care. 2016;22(8):519-23

Overuse of Antibiotics in Nursing Homes



50% of antbiotics will be unnecessary or inappropriate

70 - 80% will receive an antibiotic each year

- **2 million will receive unnecessary or inappropriate antibiotics**

Trends in Hospital Antibiotic Use

- Study of 22 academic medical centers from 2002-2006 with claims data

- **64% of all discharged patients received abx during hosp'n**
- There was a 7% overall increase in use of abx over time period
  - **Vancomycin** use **up 43%** - most commonly used drug in latter 2 yrs of study
  - **Carbapenem** use **up 59%**
  - **Pipracillin-Tazobactam** use **up 84%**
- Quinolones overall were most frequently used class
- Estimated **30-50% of inpatient antimicrobial use is inappropriate**

Hecker MT, et al. *Arch Intern Med*2003:163:972-978
Pakyz AL, et al. *Arch Intern Med. 2008;168(20):2254-2260*

Bad Bugs, No Drugs

As Antibiotic Discovery Stagnates ...
A Public Health Crisis Brews

IDSA
Infectious Diseases Society of America

July 2004

Bad Bugs
Need Drugs
10x'20

April 2010

ANTIBIOTIC RESISTANCE THREATS in the United States, 2013

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

NATIONAL SUMMARY DATA

Estimated minimum number of illnesses and deaths caused by antibiotic resistance*:

At least **2,049,442** illnesses,

23,000 deaths

**bacteria and fungus included in this report*

Estimated minimum number of illnesses and death due to *Clostridium difficile* (*C. difficile*), a unique bacterial infection that, although not significantly resistant to the drugs used to treat it, is directly related to antibiotic use and resistance:

At least **250,000** illnesses,

14,000 deaths

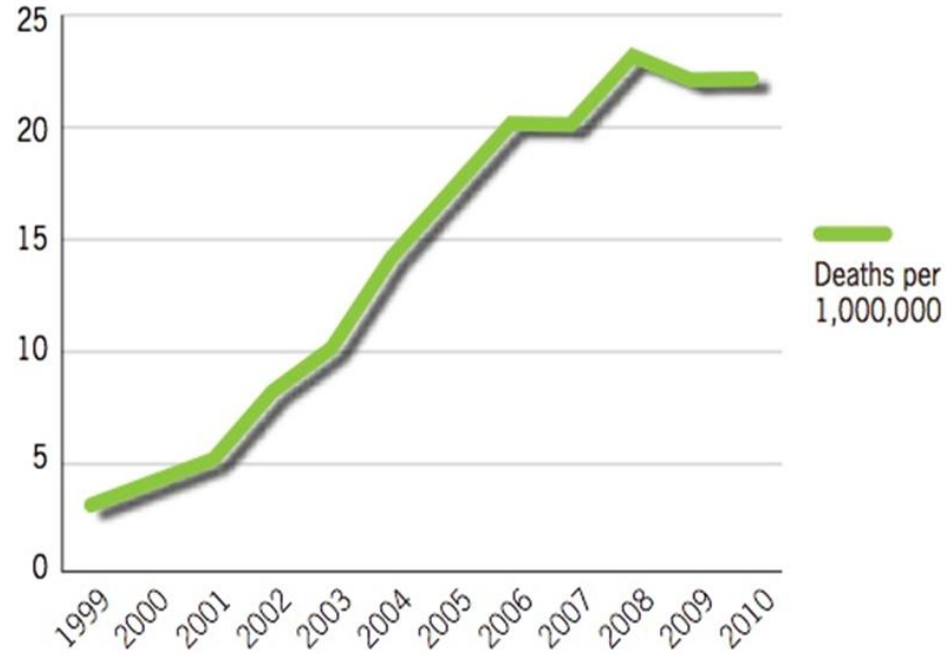
WHERE DO INFECTIONS HAPPEN?

Antibiotic-resistant infections can happen anywhere. Data show that most happen in the general community; however, most deaths related to antibiotic resistance happen in healthcare settings, such as hospitals and nursing homes.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

CS239559

Deaths caused by *C. difficile* infections*



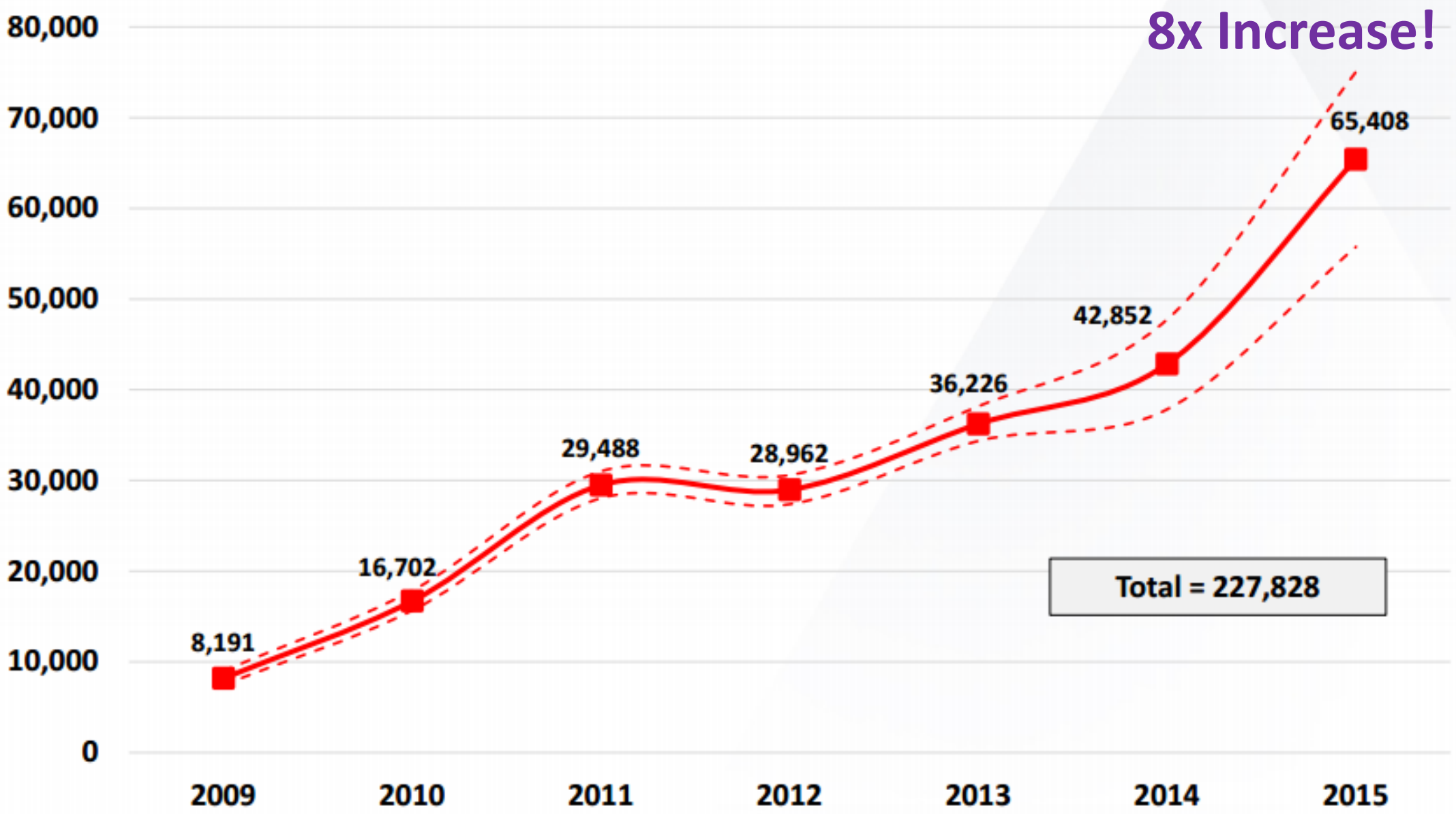
*Age-adjusted rate of *C. difficile* as the primary (underlying) cause of death.

SOURCE: CDC National Center for Health Statistics, 2012

CDC Hazard Level for Antibiotic Resistance Threats - 2013

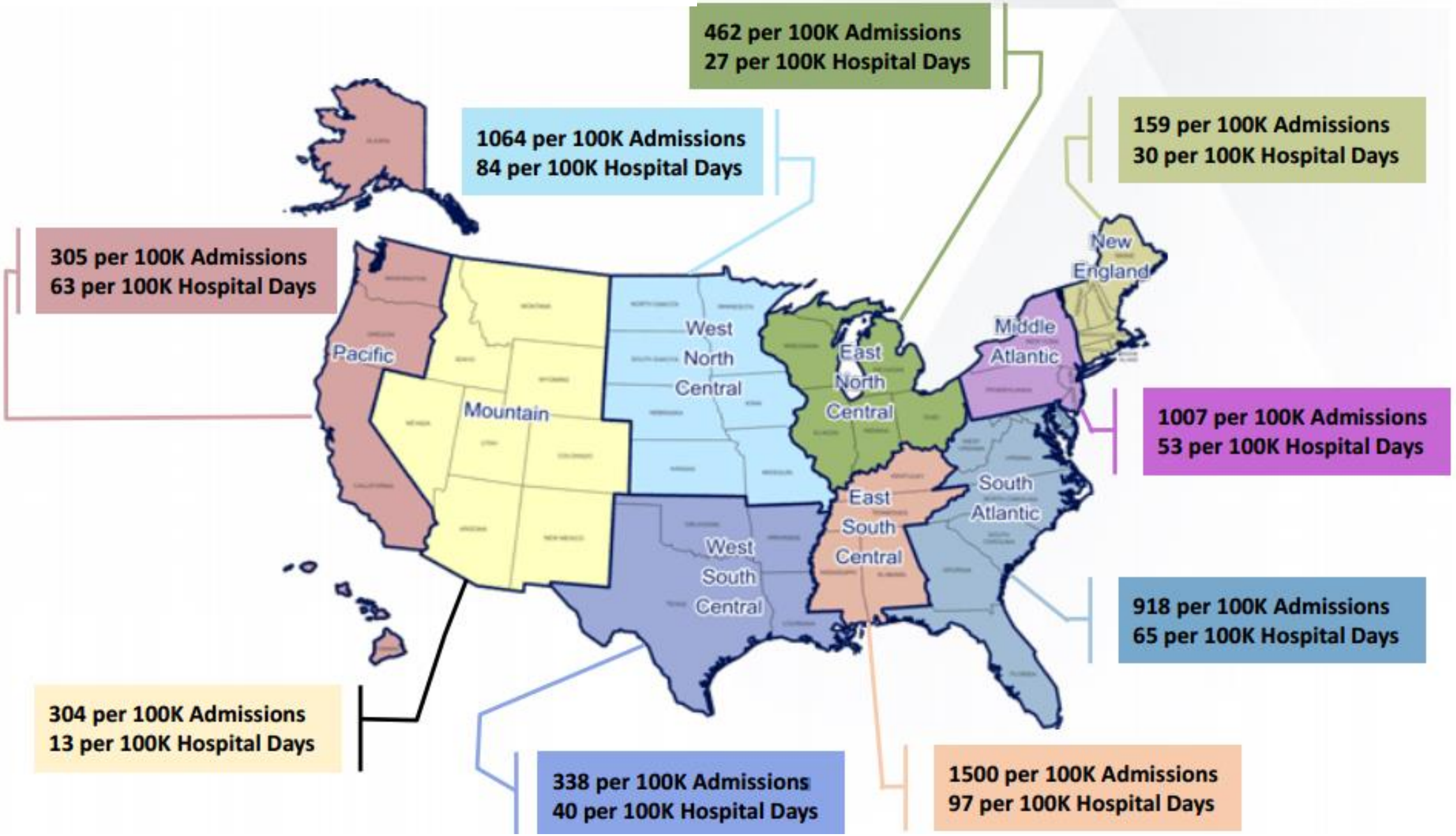
Concerning	Serious	Urgent
VRSA	MRSA	*Clostridium difficile* (C. diff)
Ery-R GABHS	VRE	Carbapenem-R Enterobacteriaceae
Clinda-R GBBHS	MDR-Pseudomonas	Drug-resistant *N. gonorrhoeae*
	ESBL-Enterobacteriaceae	
	DR-Campylobacter	
	DR-Salmonella	
	Fluconazole-R Candida sp	
	MDR-Acinetobacter	
	MDR/XDR TB	

Results - Projected CRE Encounters

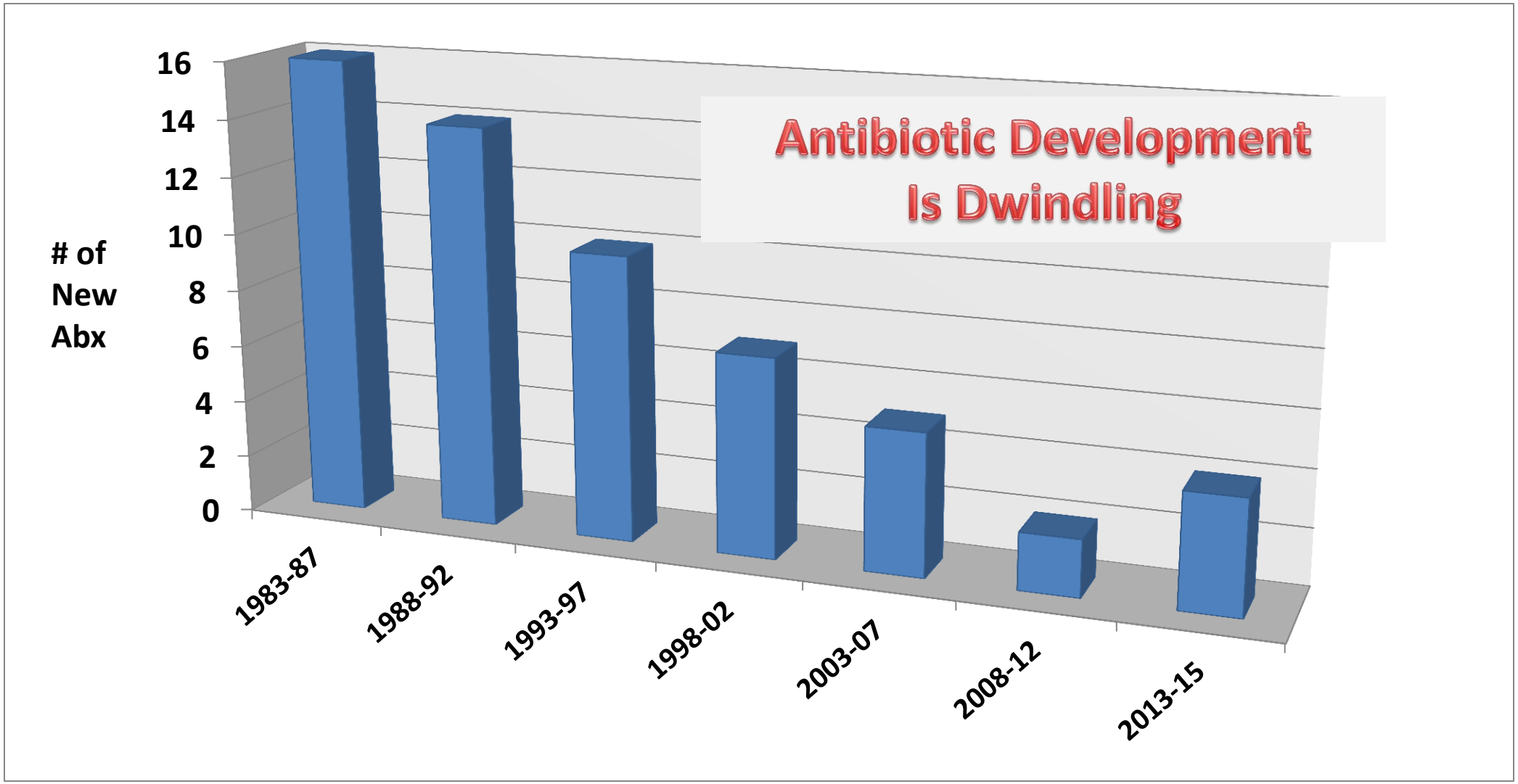


Schneider G. SHEA 2017.

CRE Incidence - Geographic Trends



Approved Antibiotics in U.S. 1983 - 2012



Frequency of ADEs due to Antibiotics in Outpatient Setting

- Up to 1:4 will experience some ADE with an antibiotic

- 142,505 estimated emergency department visits/year due to untoward effects of antibiotics (~ 1:1000 abx prescriptions)
  - Antibiotics account for 19.3% of drug related adverse events
    - 78.7% for allergic events
    - 19.2% for adverse events (e.g. diarrhea, vomiting)
  - Approximately 50% due to penicillin & cephalosporin classes
  - 6.1% required hospital admission

2004-2005 NEISS-CADES project
Bourgeois, et al. Pediatrics. 2009;124;e744-50
Linder. Clin Infect Dis. 2008 Sep 15;47(6):744-6
Vangay, et al. Cell host & Microbe 2015;17;553-64
Shehab N et al. Clin Infect Dis. 2008;47:735

Adjusted Risk of Miscarriage with Antibiotic Exposure

Drug	Adjusted Odds Ratio (95% CI)
Azithromycin	1.65 (1.34-2.02)
Doxycycline	2.81 (1.93-4.10)
Ciprofloxacin	2.45 (1.98 - 3.03)
Levofloxacin	3.28 (1.73-6.24)
Sulfonamides	2.01 (1.36-2.97)
Metronidazole	1.70 (1.27-2.26)

Vmuanda FT. CMAJ 2017

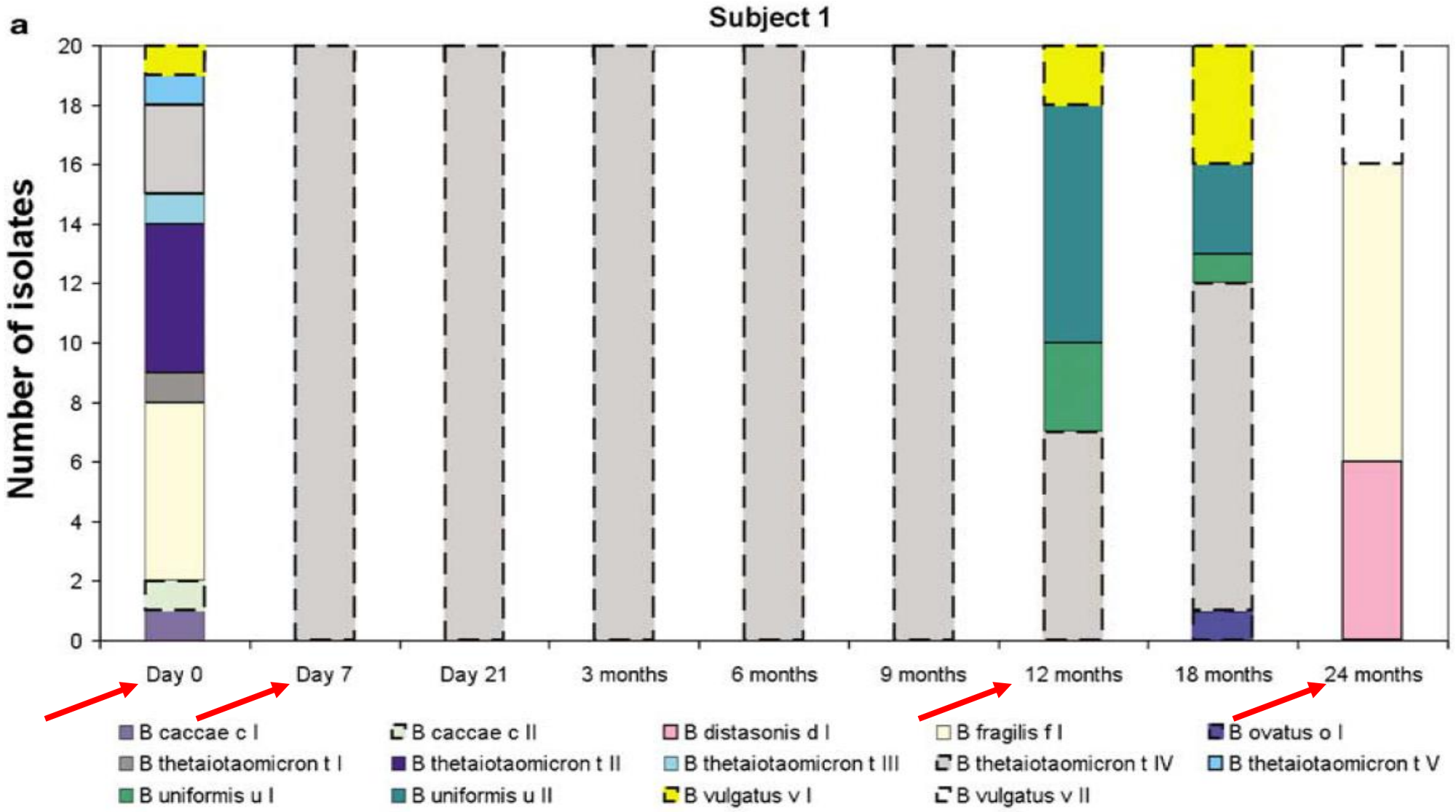
Risks with Use of the Quinolones

Condition	Relative Risk
Achilles tendon rupture Current exposure overall Age 60-79 Age > 80	 4.3 (95% CI, 2.4-7.8) 6.4 (95% CI, 3.0-13.7) 20.4 (95% CI, 4.6-90.1)
Serious arrhythmia	2.43, 95% (CI, 1.6–3.8)
Death 1-5 d after Levofloxacin	2.49 (95% CI, 1.7–3.6)
Aortic dissection	2.43 (95%CI, 1.8 - 3.2)
C. Diff infection	12.7 (95% CI, 2.6–61.6)
Risk of acquiring MRSA	3.0 (95% CI 2.5 to 3.5) (c/w 1.8 RR for other abx)

Van Der Linden. JAMA Int Med 2003
Gowtham. Ann Fam Med. Apr 2014
Chien-Chang. JAMA Int Med 2015
McCusker. Emerg Infect Dis 2003
Tacconelli. JAC 2008

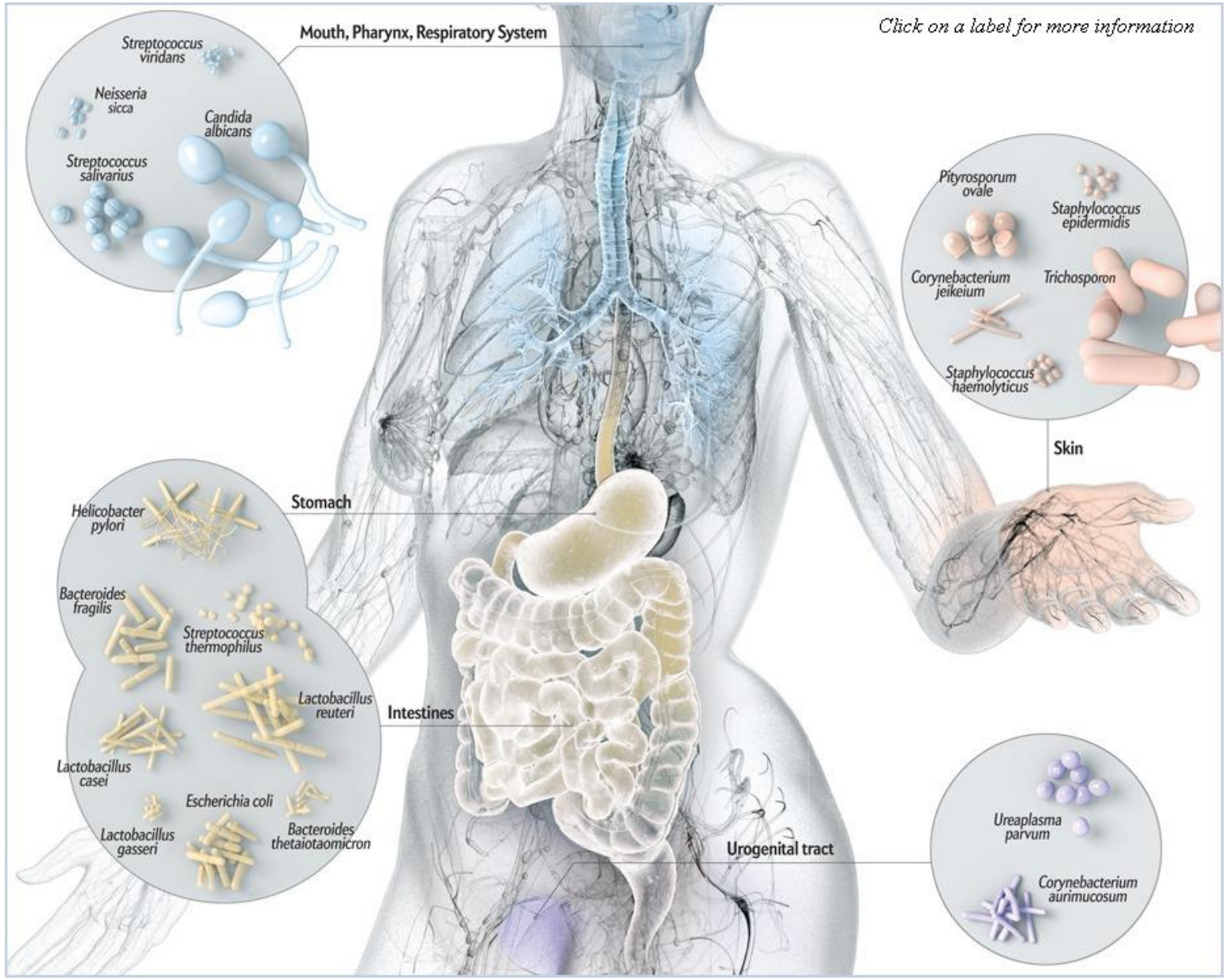
- **2nd line abx for pneumonia and UTIs with a black box warning**
- **Over 23 million prescriptions of quinolones / yr in U.S. (most commonly prescribed class)**
- **Over 2,000 lawsuits filed for injuries in 2011**

Diversity of Bacteroides Species in Gut After 7 day Course of Clindamycin



Microbiology (2010), 156, 3216–3223

Human Microbiome



10^{13} Human Cells
10^{14} Bacterial Cells

"**Dysbiosis**" Associations

- Asthma
- IBD
- Obesity
- Auto-immune dz
- Metabolic syndrome
- Diabetes
- Allergy
- Autism

Antibiotics and Risk of Acquiring Type 2 Diabetes Mellitus

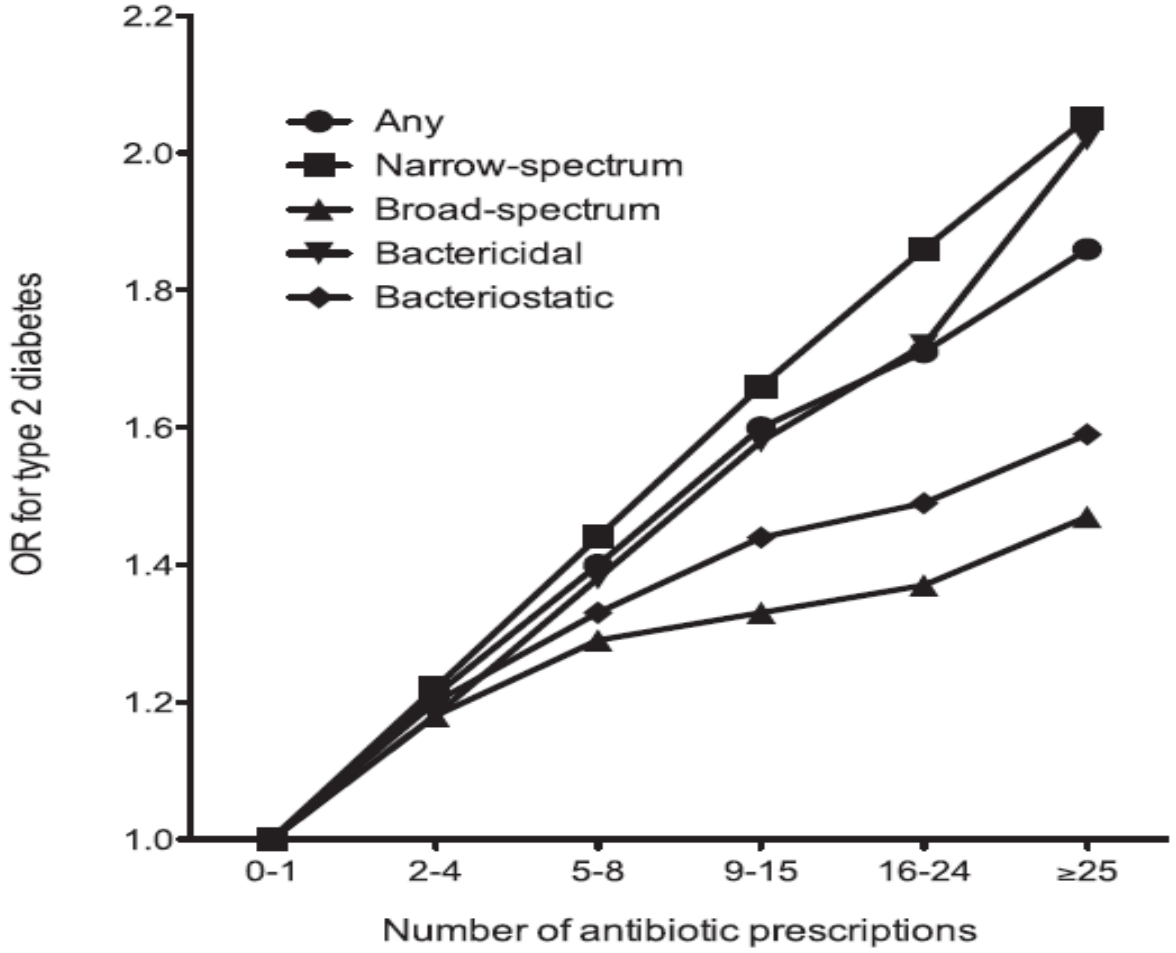
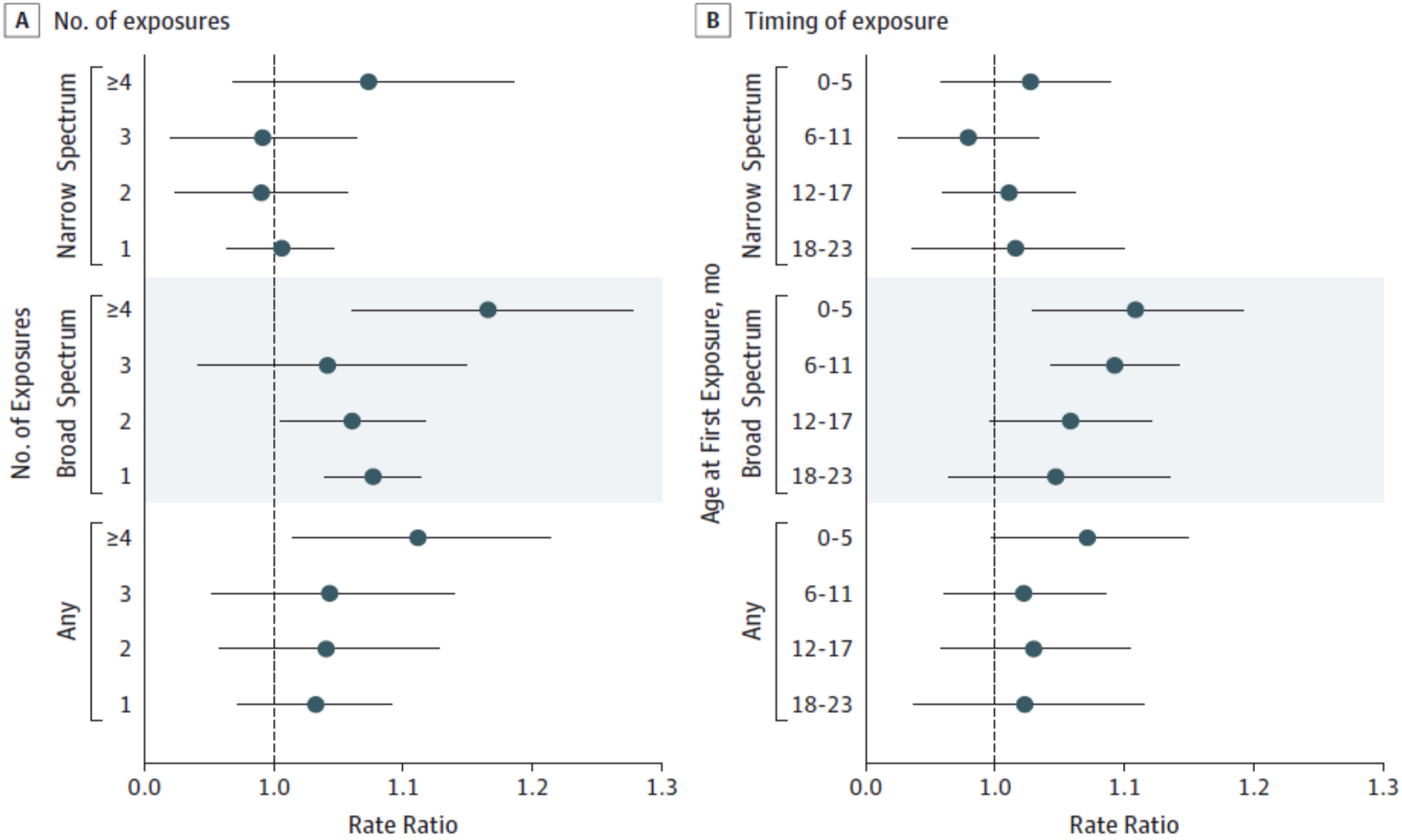


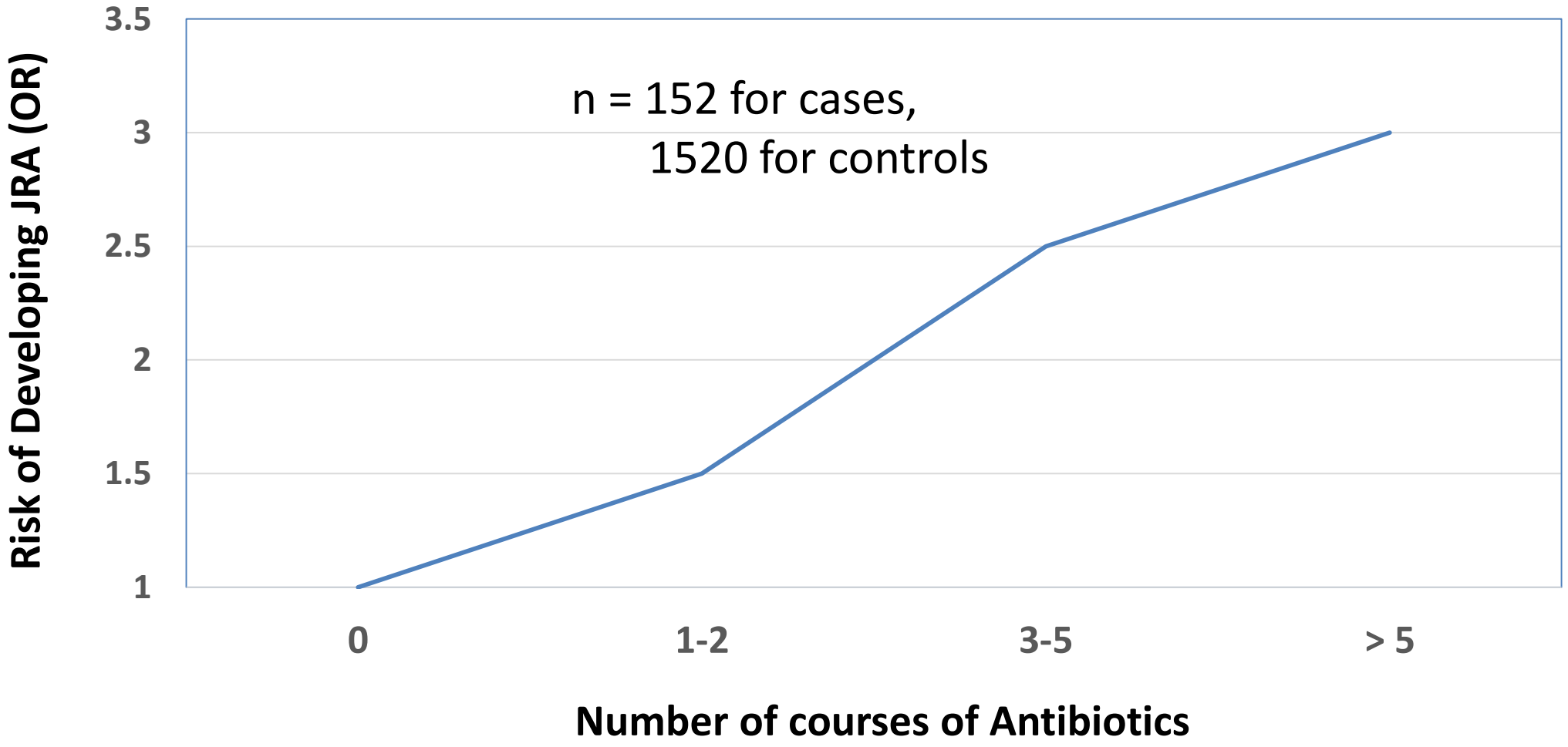
Figure 1. OR for type 2 diabetes according to the number of antibiotics prescriptions prior to the initiation of treatment for type 2 diabetes.

Figure 3. Impact of Antibiotic Class, Frequency, and Timing on the Risk for Obesity



JAMA Pediatr. 2014;168(11):1063-1069

Antibiotic Exposure and Development of Juvenile Rheumatoid Arthritis



Horton DB. Pediatrics 2015

BMJ Journals

Gut

Long-term use of antibiotics and risk of colorectal adenoma

Yin Cao[1, 2, 3], Kana Wu[3], Raaj Mehta[1, 2], David A Drew[1, 2], Mingyang Song[1, 2, 3], Paul Lochhead[1, 2], Long H Nguyen[1, 2], Jacques Izard[4], Charles S Fuchs[5, 6, 7], Wendy S Garrett[8, 9, 10], Curtis Huttenhower[9, 11], Shuji Ogino[8, 12, 13], Edward L Giovannucci[3, 12, 14], Andrew T

- Prevalence of colorectal adenomas on screening colonoscopy in the Nurses Health Study based on ≥ 2mos of antibiotic exposure at a younger age

- **36% increased risk** if received age 20-39
- **69% increased risk** if received age 40-59

Cao Y, *et al*. *Gut* 2017;**0**:1–7. doi:10.1136/gutjnl-2016-313413

Science News

from research organizations

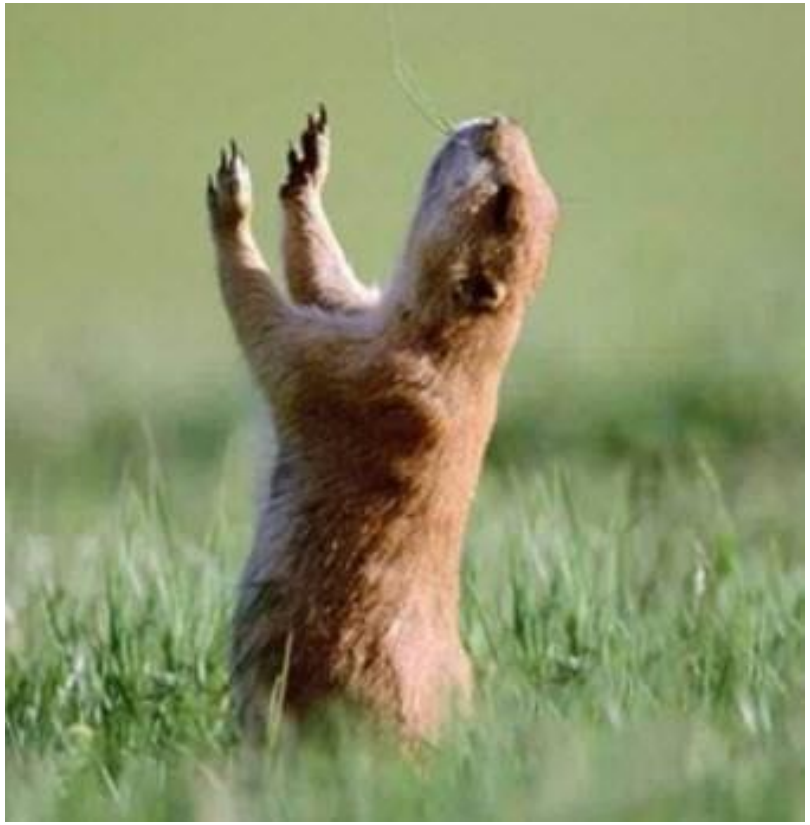
Gut bacteria associated with cancer immunotherapy response in melanoma

Date: February 21, 2017

Source: University of Texas M. D. Anderson Cancer Center

Summary: Melanoma patients' response to a major form of immunotherapy is associated with the diversity and makeup of trillions of potential allies and enemies found in the digestive tract.

Wargo J. Abstract #3008, ASCO 2017.



True Believer

We must come to the belief that casually writing for an antibiotic is not a benign act!

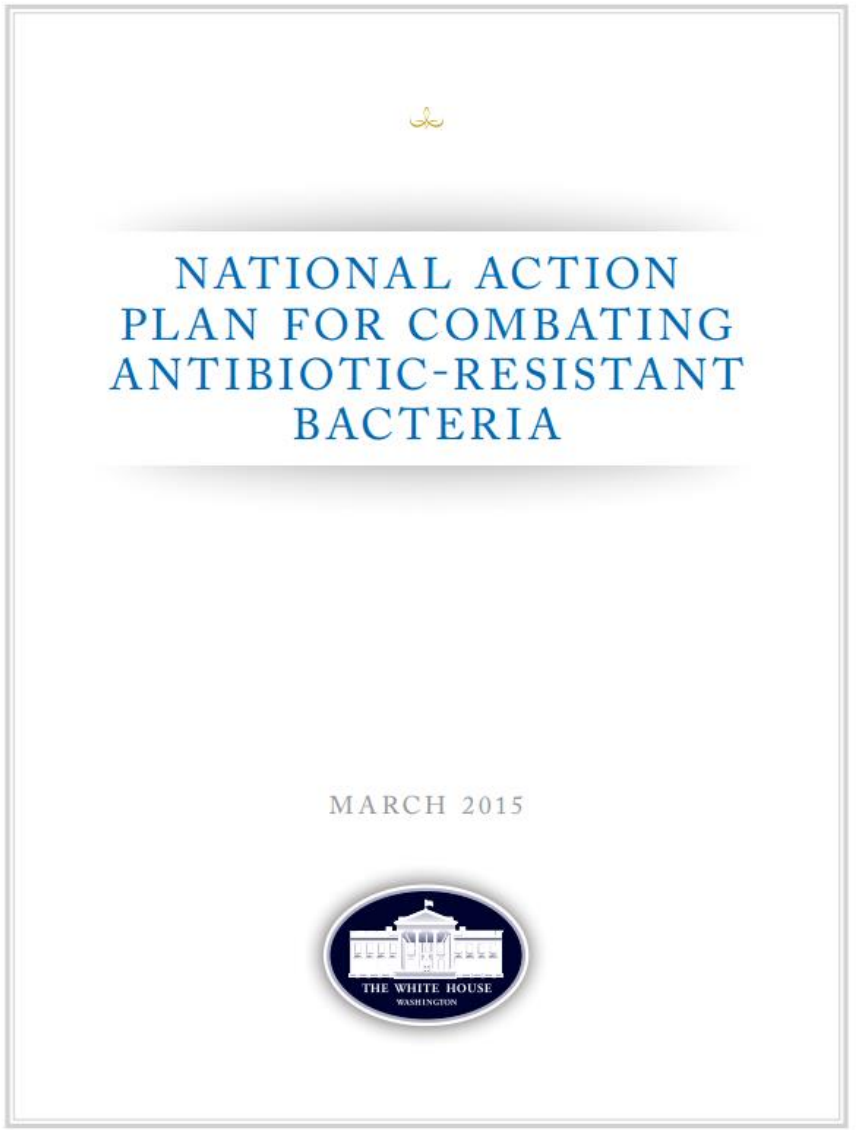
Call for Antimicrobial Stewardship - Preserve a Precious Resource

- American Academy of Pediatrics
- American Society of Health-System Pharmacists
- Infectious Diseases Society for Obstetrics and Gynecology
- Society for Hospital Medicine
- Society of Infectious Diseases Pharmacists
- Society for Healthcare Epidemiology of America
- Infectious Diseases Society of America
- Centers for Disease Control and Prevention

What Is Antimicrobial Stewardship?

Right Drug, Right Dose, Right Time, Every Time

Regulatory and Cost Imperatives for Antimicrobial Stewardship



Regulatory and Cost Imperatives for Antimicrobial Stewardship

Rules for CMS Participation for acute care hospitals, critical access hospitals, and LTCFs:

- Implementation of a hospital-wide ASP
- Evidence of coordinated efforts across hospital departments including infection prevention, quality, medical staff, nursing service, and pharmacy
- Identified leadership at all levels
- LTCFs - antibiotic use protocols and a system to monitor antibiotic use

Implementation dates:

Acute care and critical access hospitals	January 2017
Long-term care facilities	November 2017

Joint Commission Requirement

New Antimicrobial Stewardship Standard

8 Elements of Performance*

1. Leaders establish antimicrobial stewardship program as an organizational priority
2. Educates staff involved in abx ordering/dispensing/administration on resistance and stewardship practices. Upon hire and periodically thereafter.
3. Educates patients and families as needed re: appropriate use of abx (e.g. GetSmart)
4. Multi-disciplinary team including ID/IP/Ph/Practitioners
5. Program has 7 core CDC elements
6. ASP uses organization-approved multidisciplinary protocols (e.g. formulary restrictions, appropriateness assessments, C diff care, abx use guidelines, IV-PO conversion, preauth requirements
7. ASP collects/analyzes/reports data on a regular basis
8. Hospital takes action on improvement opportunities identified by its ASP

*Standard went into effect Jan 2017

CDC Guidelines 7 Core Elements

- **Leadership commitment** - dedicating necessary human, financial, and IT resources to the program
- **Accountability** - leader who is responsible for program outcomes
- **Drug expertise** - pharmacist in charge of working to improve abx use
- **Action** - implementing one or more CDC-recommended actions
- **Education** - teaching clinicians, relevant staff, and patients and families about abx resistance and optimal prescribing habits
- **Tracking** - monitoring patterns of prescribing and resistance
- **Reporting** - relaying information on abx use and resistance within institution on a regular basis

CMS Estimated Costs to Develop ASPs

CMS Rule 482.42b Estimates for ASP Staffing

Hospital Beds	PharmD CMS FTEs*	MD CMS FTEs*	IT CMS FTEs*
124 (average size)	0.25	0.1	0.05
300	0.6	0.25	0.1
600	1.2	0.5	0.2
800	1.6	0.65	0.3
1000	2	0.8	0.4

*CMS recommendations represent *a minimum* and do not account for patient complexity

- CMS estimates average hospital with no ASP will need to spend ~ $109,000
- Studies consistently show avg savings of $200,000 - $400,000

Attributable Hospital Cost Associated with Select HAIs (in 2012 $)

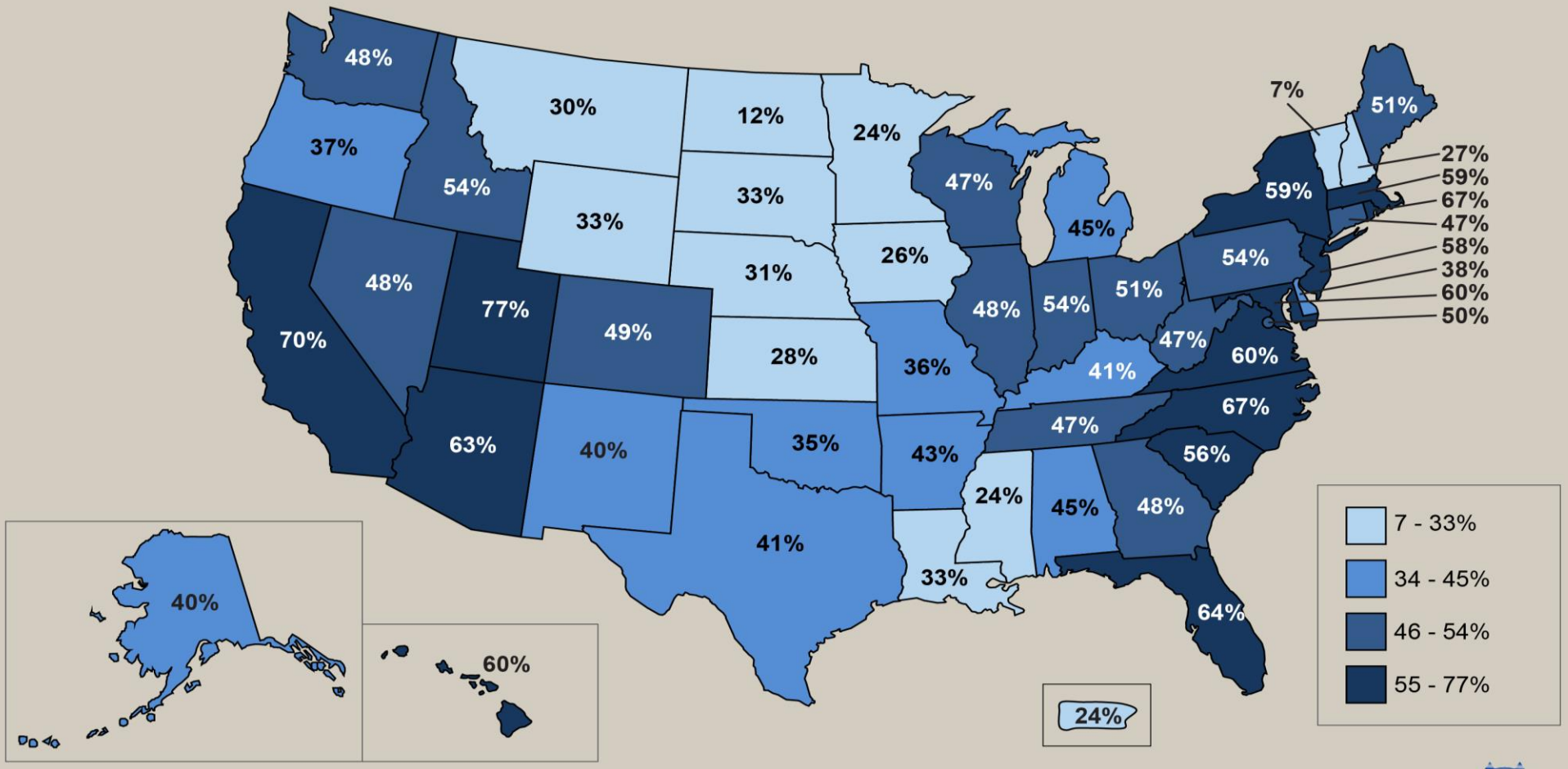
HAI	Attributable Cost
MRSA SSI	$42,300
MRSA CLABSI	$58,614
VAP	$40,144
C. Difficile infxn	$11,285
CAUTI	$896

JAMA *Intern Med*, Sept 2013

- Costs adjusted to 2012 dollars

Percent of Hospitals with Antibiotic Stewardship Programs by State, 2015*

Nationally, 48.1% of all hospitals have stewardship programs (2,199 of 4,549); the national goal is 100% of hospitals by 2020.



*A hospital stewardship program is defined as a program following all 7 of CDC's Core Elements of Hospital Antibiotic Stewardship Programs.

Source: CDC's National Healthcare Safety Network (NHSN) Survey

GET SMART
Know When Antibiotics Work

Where to Start? - Leadership

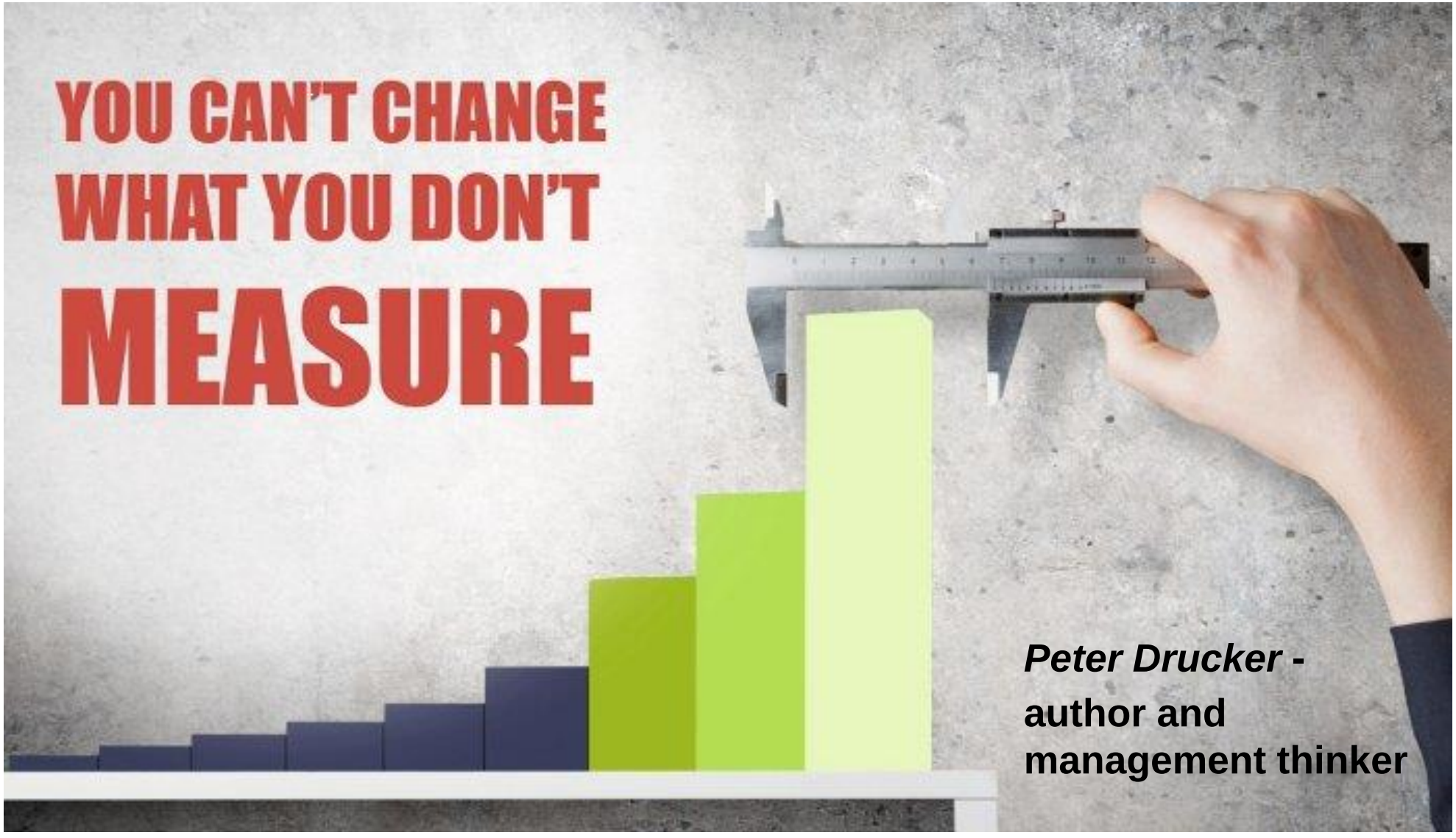
Peter Drucker -

“Management is doing things right, leadership is doing the right things”

Leadership must step up

- Recognize the need
- Make it an organizational priority
- Dedicate resources

Where to Start?



Measure Something*

Acute Care

- Days of Therapy (DOT)
- Defined Daily Doses
- Abx spending
- Specific abx DOTs
  - e.g. quinolones, carbapenems
- C diff HAIs
- Prevalence of abx resistance in lab isolates
  - %MRSA, %VRE, %CRE
- Utilization by provider

Outpatient

- Overall use in URIs
  - % of sinusitis w abx
  - % of otitis w abx
  - % of bronchitis w abx
- Abx appropriateness
- Overall use of 2nd line abx
  - esp quinolones
- Utilization and/or appropriateness by provider

* Most measures other than prevalence should be tied to a volume denominator (e.g. 1000 patient-days)

LTCFs

- DOTs
- Antibiotic starts
  - % facility initiated
  - % hospital initiated
- Specific abx DOTs
  - esp quinolones
- Abx durations > 7 days
- U/A & U/C ordered w/o specific indication
- Inappropriate abx starts for UTIs
- Utilization by provider

Do Something

- **Target an area for improvement and use a tool**

- Formulary restrictions and prior authorization
- Guidelines and clinical pathways
- IV to oral conversion program
- Pharmacy dose optimization review

- Provider and staff education

- Hardwired ordersets and forced antibiotic indications
- Retrospective audit and feedback to providers
- Prospective audit and feedback - gold standard

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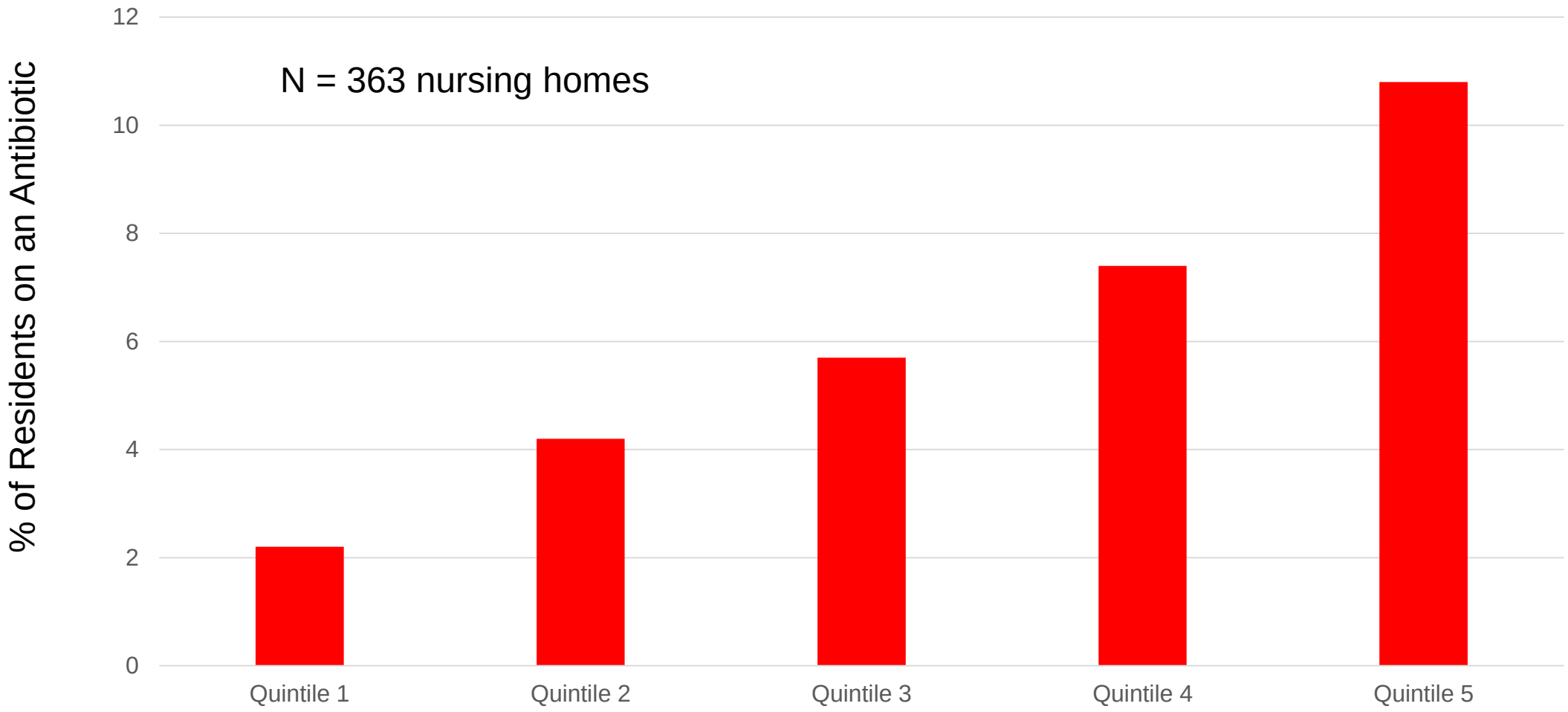
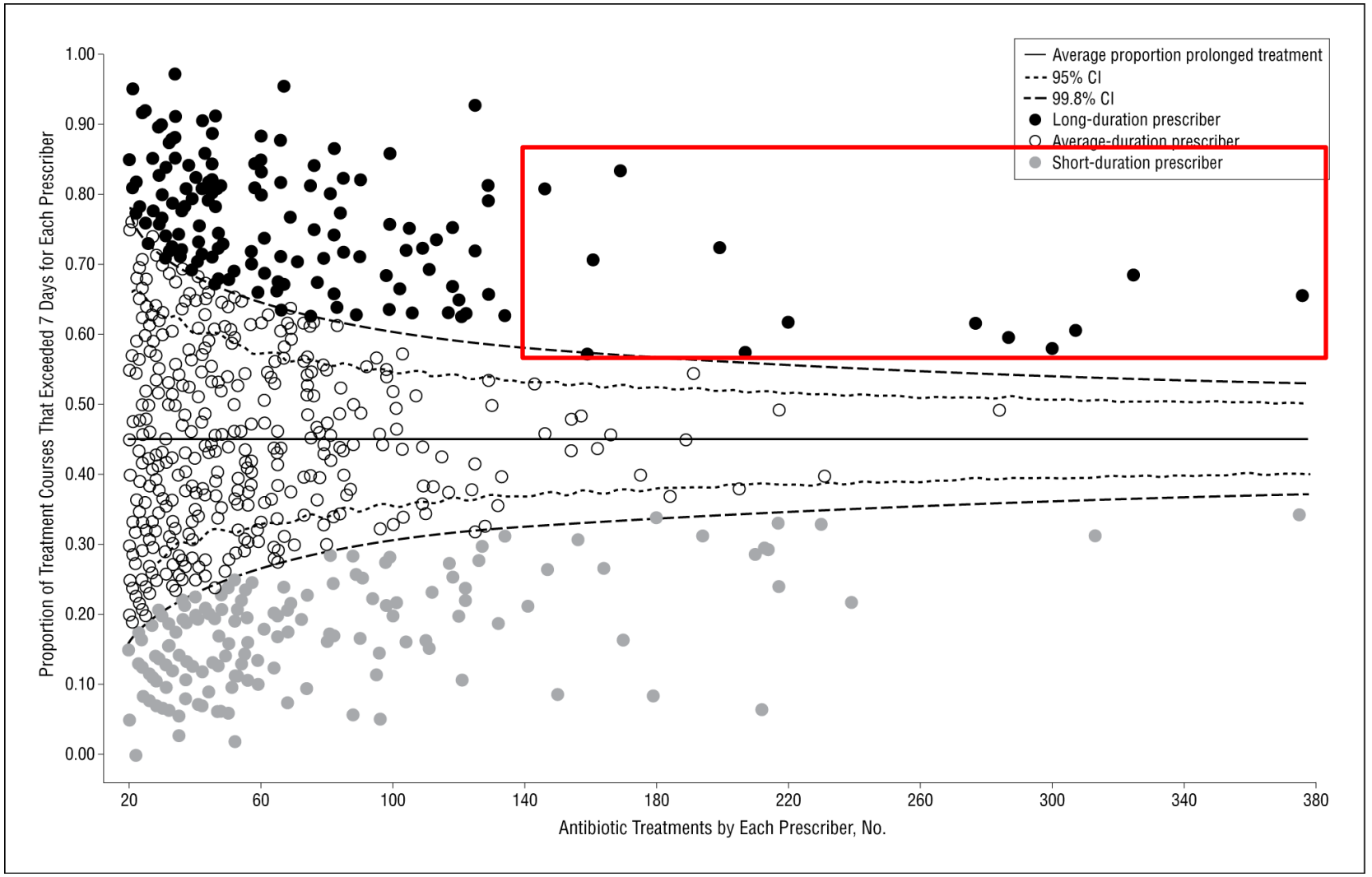
Variability of Antibiotic Use in LTCFs



Daneman N. *J Antimicrob Chemother*. 2011;66

Prescriber Practice in Ontario LTCFs Drives Large Proportion of Inappropriate Antibiotic Use



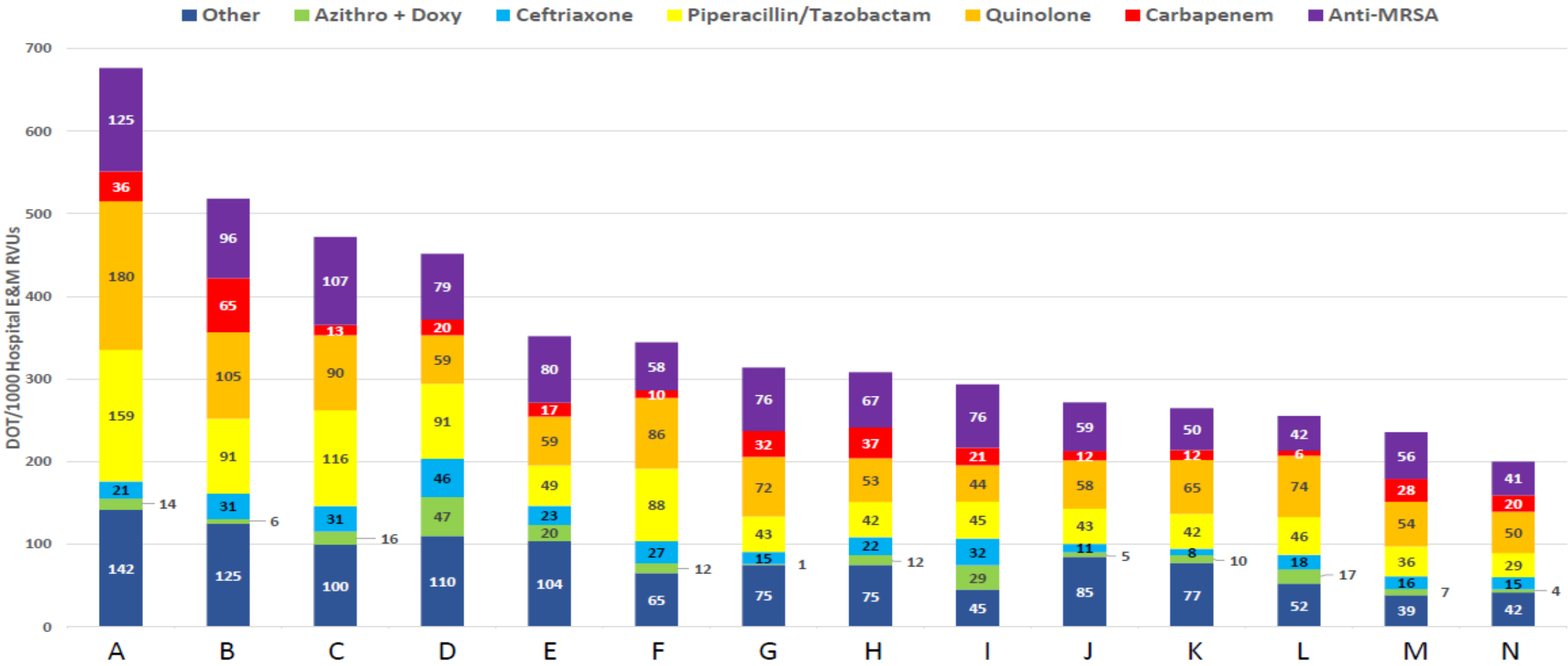
Targeting just these high prescribing, long duration prescribing providers could have significant impact on the whole province

Daneman N. *JAMA Intern Med*. 2013;173

Targeting Outlier Prescribers?

outlier

Hospitalists: Antimicrobial IP DOT Per 1000 Hospital E&M RVUs July 2015 - June 2016 (Year)



Anti-MRSA" includes vancomycin, linezolid, ceftaroline, and daptomycin
Other" includes all other antimicrobial DOT eg. antifungals, antivirals, metronidazole, cefazolin, TMP/SMX, aztreonam, amp/sulbactam, cephalexin, clindamycin, cefepime, ceftazidime, etc.

Provider and Hospital E&M RVUs

Attributed by Authorizing Provider on Drug Order

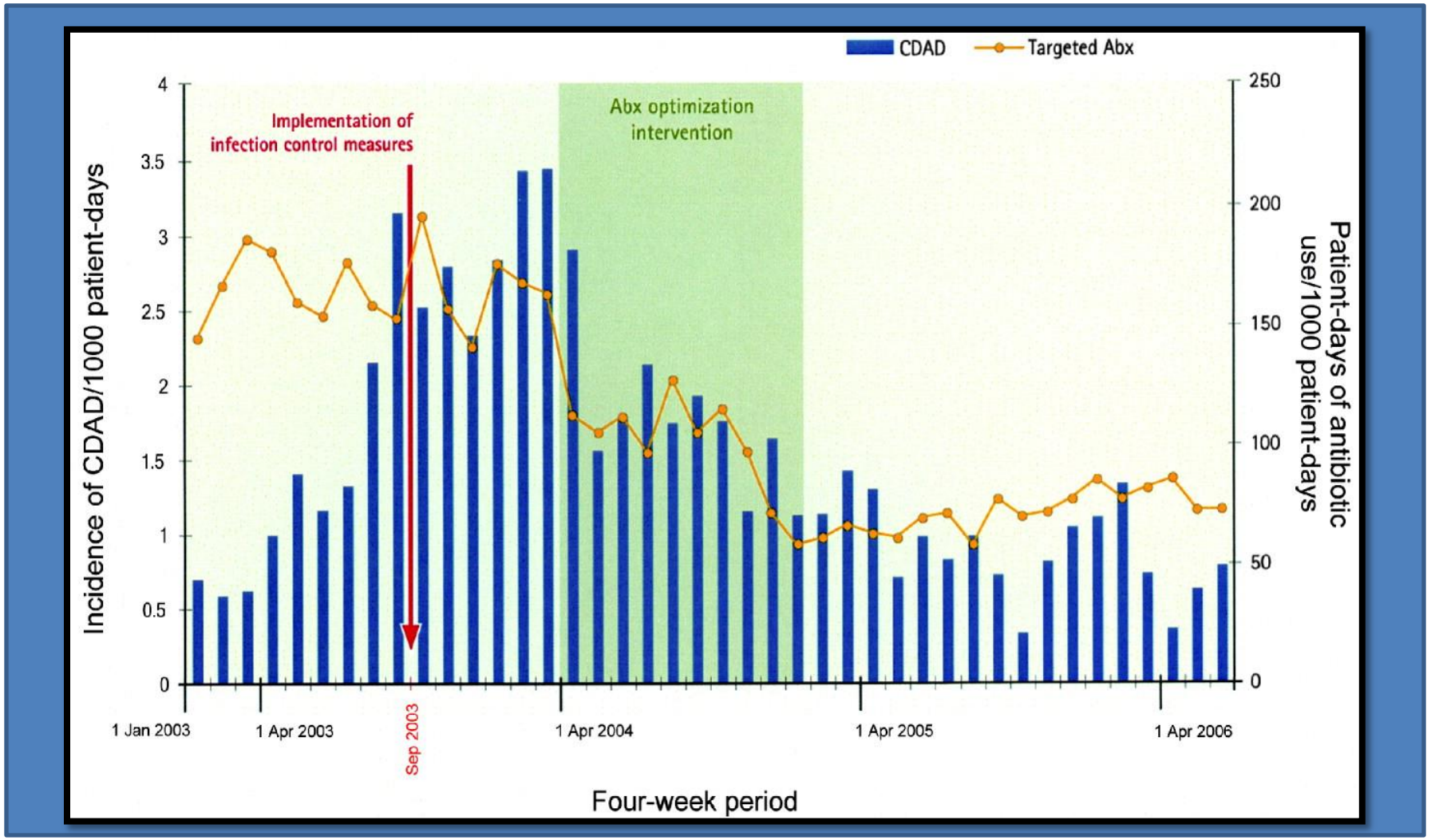
Targeting the Low Hanging Fruit

Target Area	Facility Type
No abx for Asx bacteriuria	Acute Care, LTCF, Outpt
Duration of abx	Acute Care, LTCF, Outpt
Appropriate empiric abx	Acute Care, LTCF, Outpt
De-escalation of abx	Acute Care, LTCF?
Appropriate use in URIs	Outpt, LTCF?
Decreased quinolone use	Acute Care, LTCF, Outpt
Decreased carbapenem use	Acute Care, LTCF?

ASP….. It Works!

Targeted antibiotic consumption and Nosocomial *C. difficile* disease

Tertiary care hospital; Quebec, 2003-2006

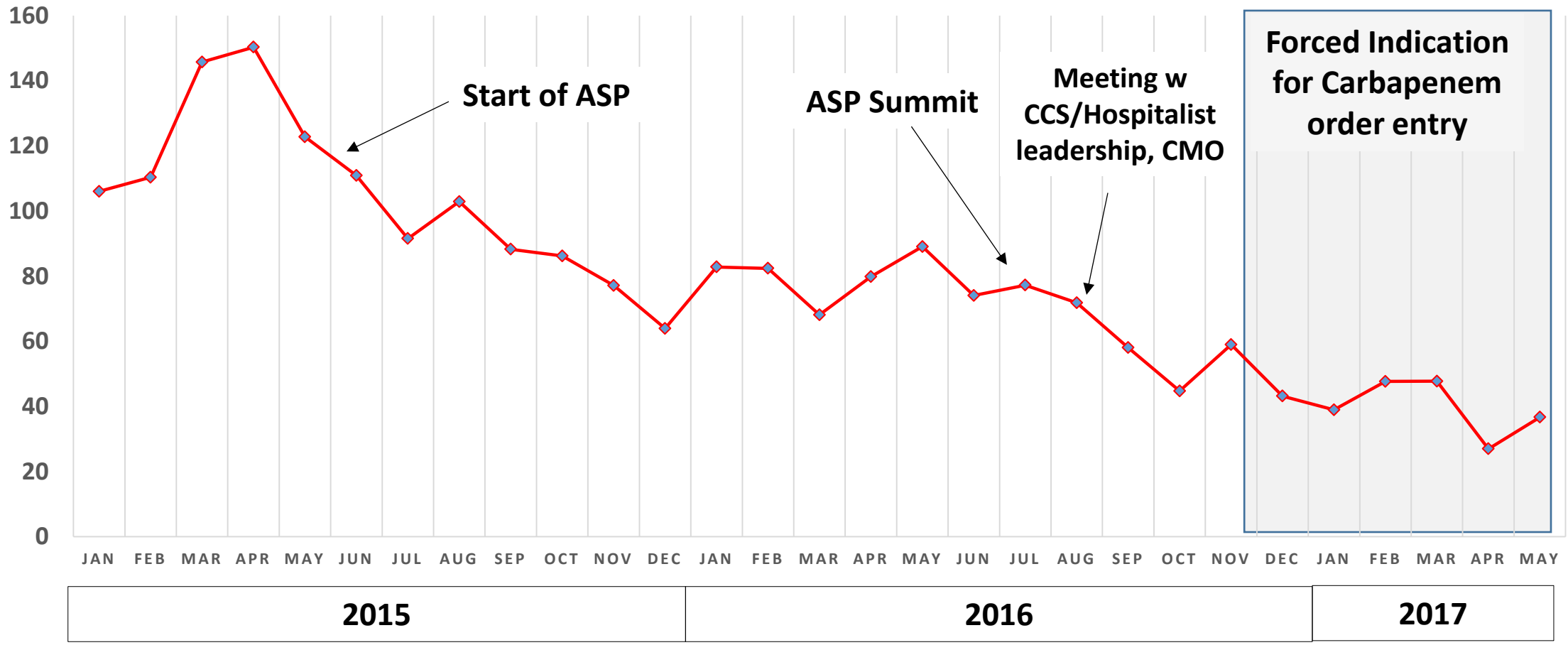


Valiquette, et al. *Clin Infect Dis* 2007;45:S112.

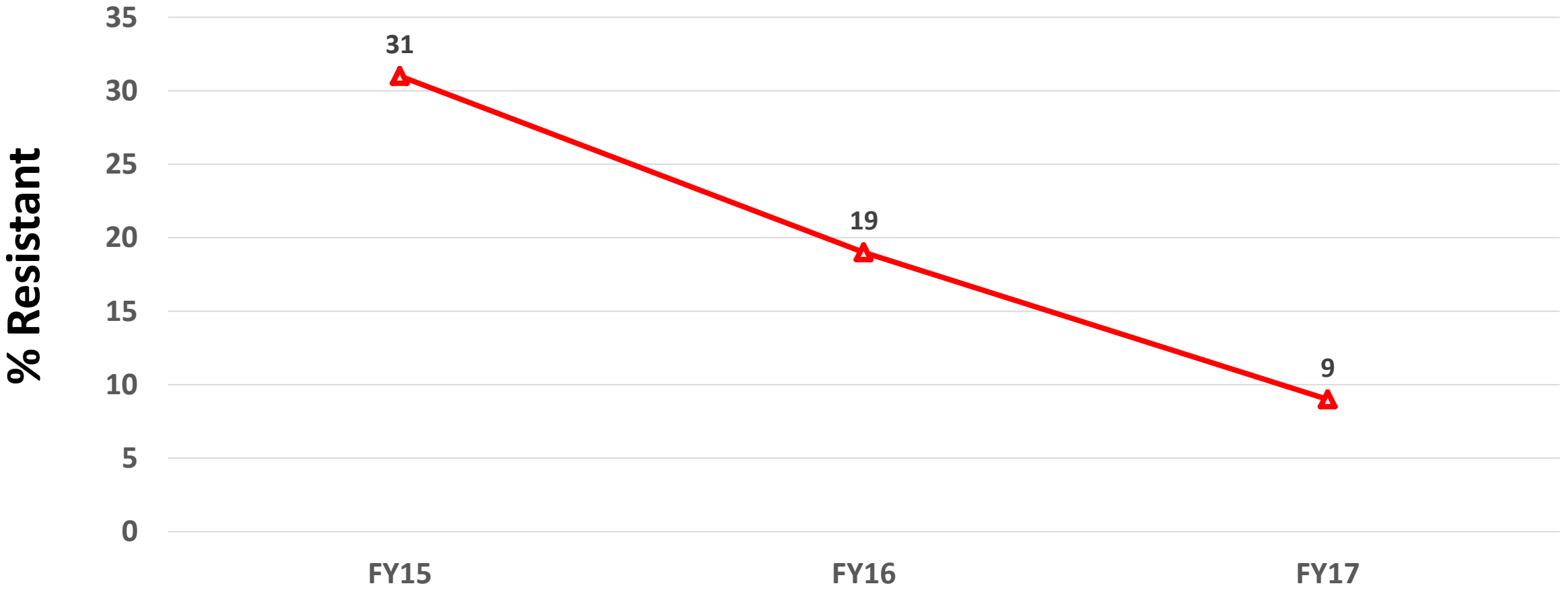
How About Us?

SANFORD HEALTH

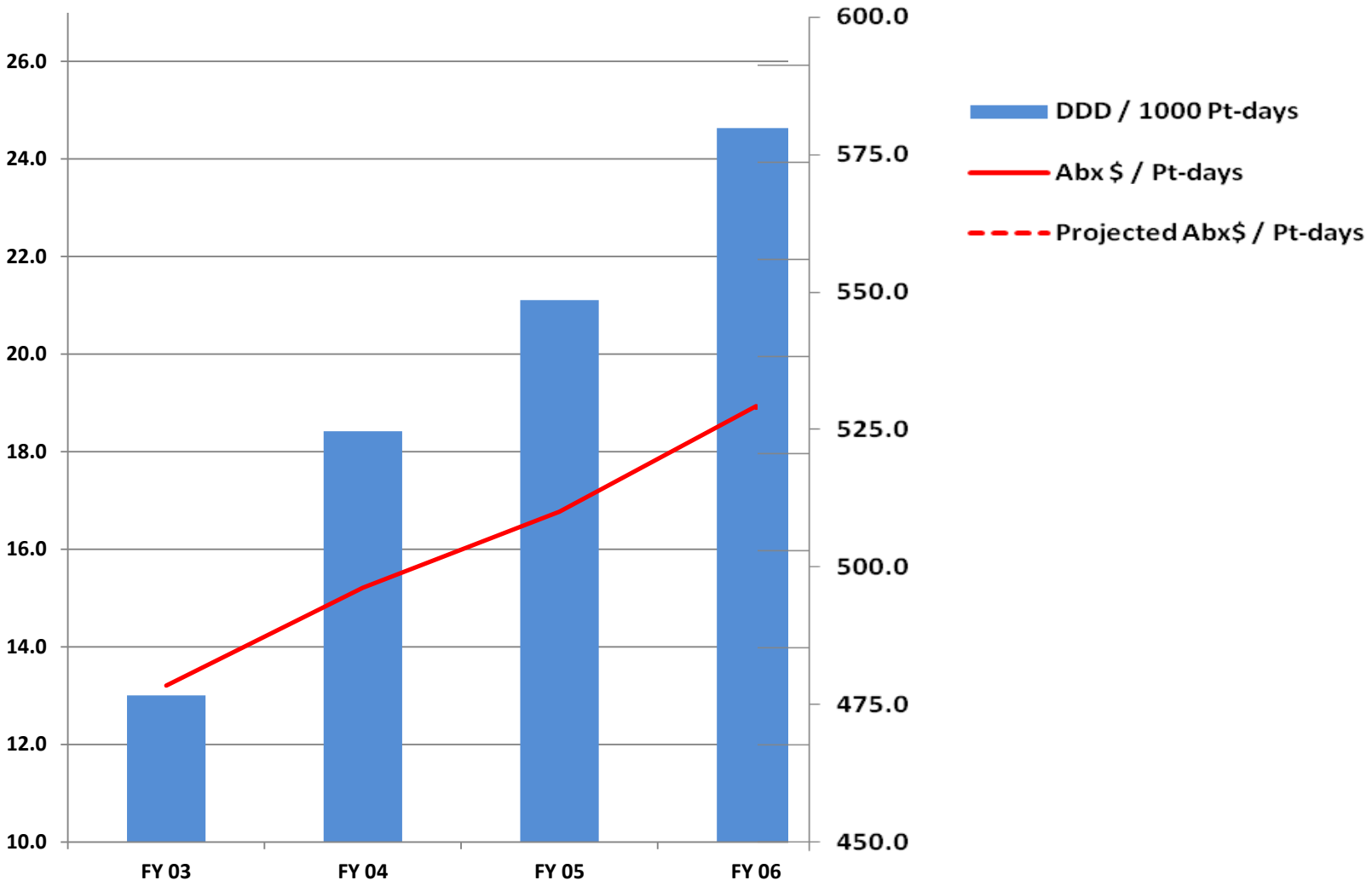
Sanford Region Carbapenem DOTs/1000 Pt-days



Pseudomonas aeruginosa
Resistance to Carbapenems



Antimicrobial Use and Costs Before and After ASP Inception



Antimicrobial Costs at MeritCare/Sanford and Inferred Savings in 1st Four Years After ASP Inception in 2007

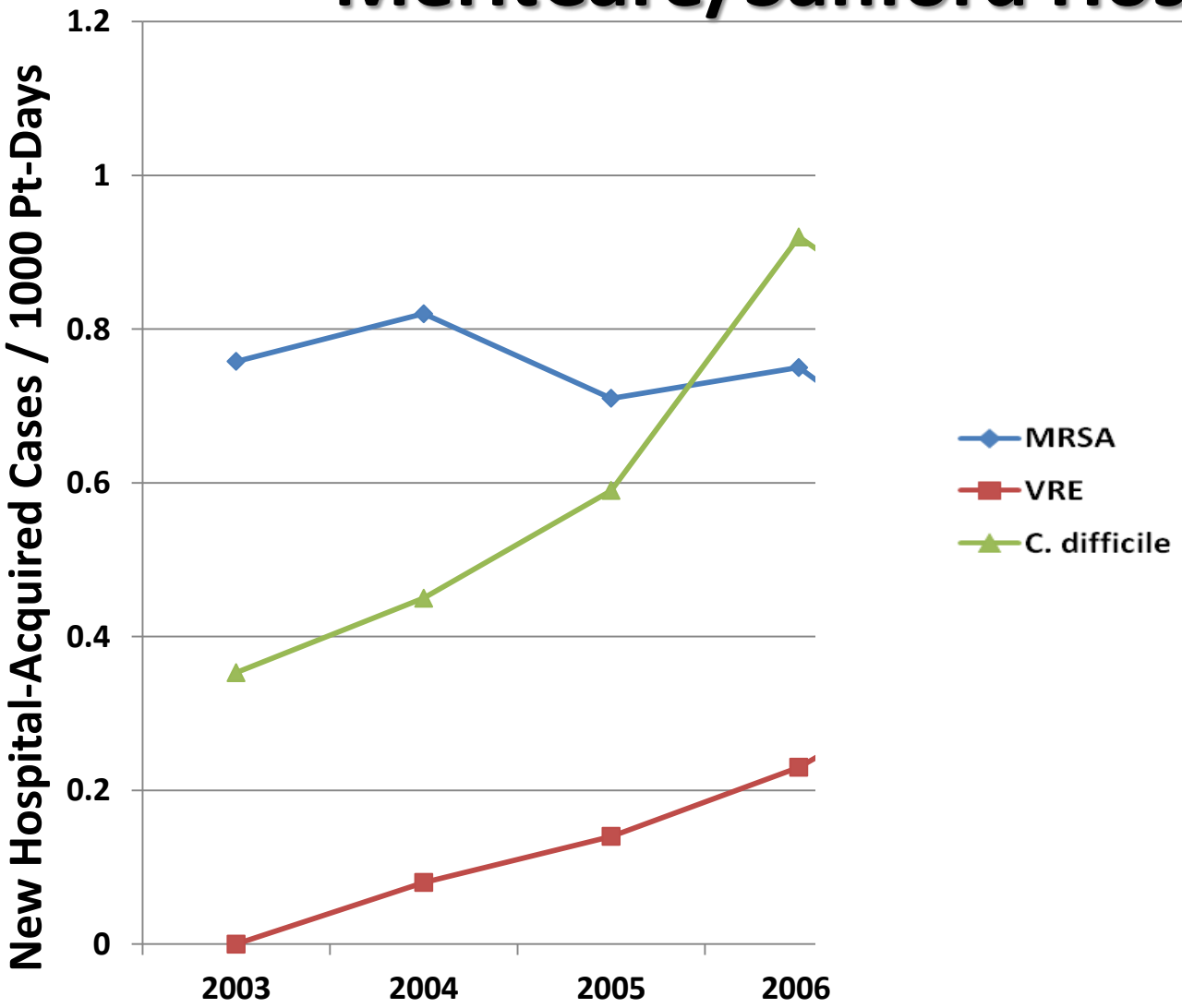
Year	Total Abx Expenditures	Patient Days	Abx $ / Pt-day	Actual Savings c/w FY 06[a]	Projected Abx $ / Pt-day[b]	Projected Cost Savings[c]
FY 06	$1,758,433	92,873	$18.93		**ref**	
FY 07	$1,657,295	96,990	$17.09	$174,582	$20.70	$350,134
FY 08	$1,729,034	100,667	$17.18	$171,133	$22.60	$545,615
FY 09	$1,579,291	91,798	$17.20	$156,056	$24.50	$670,125
FY 10	$1,707,946	91,494	$18.67	$29,278	$26.30	$698,099
Total Estimated Savings Since ASP Inception						**$2,263,973.00**

a (FY 06 Abx$/Pt-day - Current year Abx$/Pt-day) x Pt-days

b Based on projections by linear regression of trend rise in costs for 2003-2006

c (Projected Abx$/Pt-day – Current year Abx$/Pt-day) x Pt-days

Incidence of Hospital – Acquired Infections at MeritCare/Sanford Hospital 2003-2010



What Can We Target in a 2’ Mini-Consult?

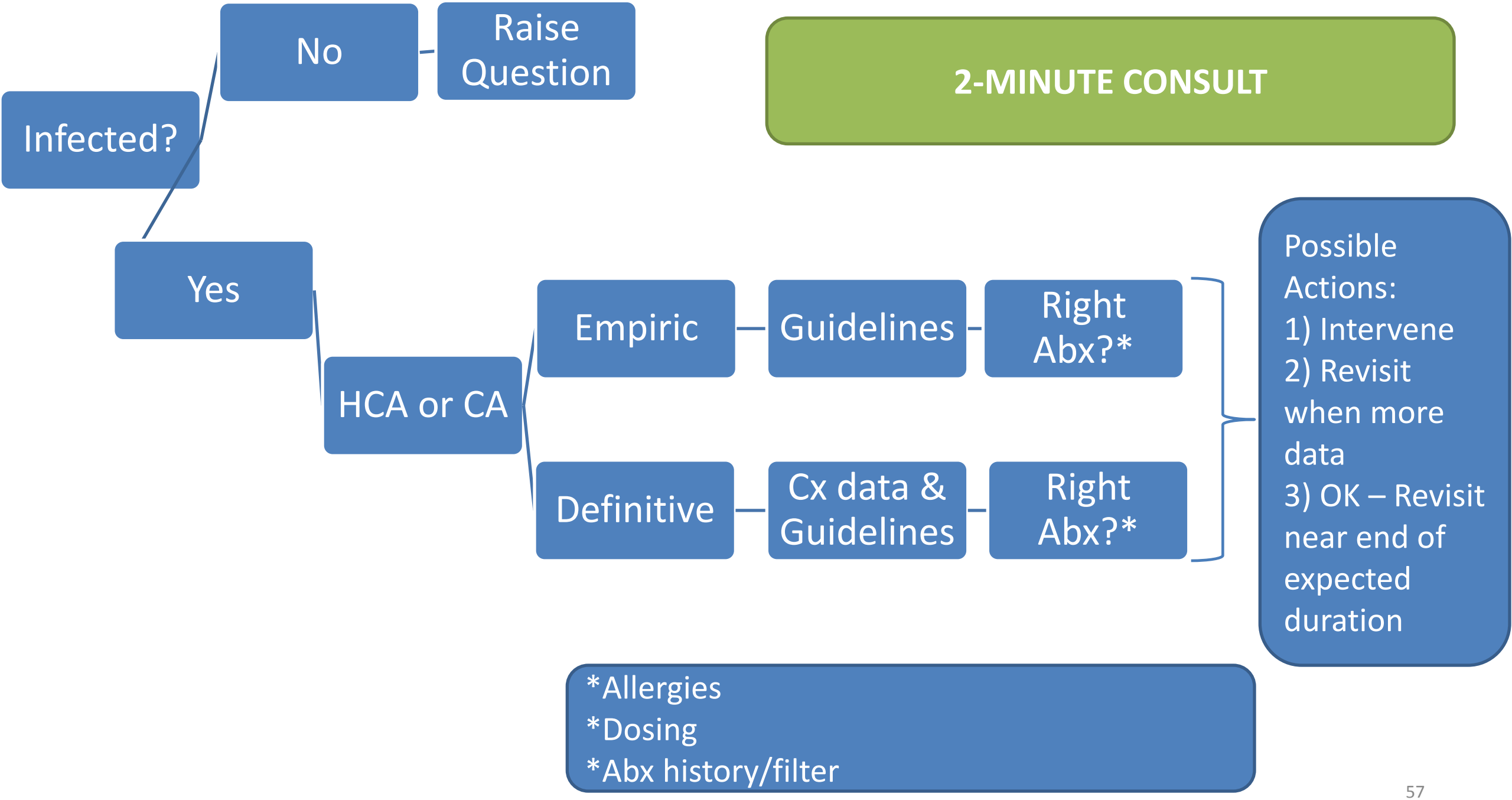
SANFORD HEALTH

Questions to Ask on Every Case

- Is it really an infection? Are abx warranted?
- Is the source healthcare-acquired or community-acquired?
- Are they giving empiric vs definitive Rx?
- What is the narrowest spectrum drug(s) they can give to accomplish the goal?
- Have they set the right duration?

Keep in Mind the Big Picture Goals

- Reducing broad spectrum agents, esp the carbapenems, quinolones, anti-pseudomonal drugs, unless definite indication
- Reducing very expensive antibiotics (Ceftaroline, Daptomycin, Lipo Ampho, Micafungin, carbapenems)
- What is data showing for particular target or focus areas in your region?
- Are there outlier departments or physicians that merit special attention


2-MINUTE CONSULT
Infected?
No
Raise Question
Yes
HCA or CA
Empiric
Guidelines
Right Abx?*
Definitive
Cx data & Guidelines
Right Abx?*
Possible Actions:
1) Intervene
2) Revisit when more data
3) OK – Revisit near end of expected duration
*Allergies
*Dosing
*Abx history/filter

Common Infectious Diseases and Areas for Potential Improvement

- UTI
- Pneumonia
- Cellulitis / SSTI / Wounds
- Intra-abdominal infection

Antibiotics…… How Long Is Enough?

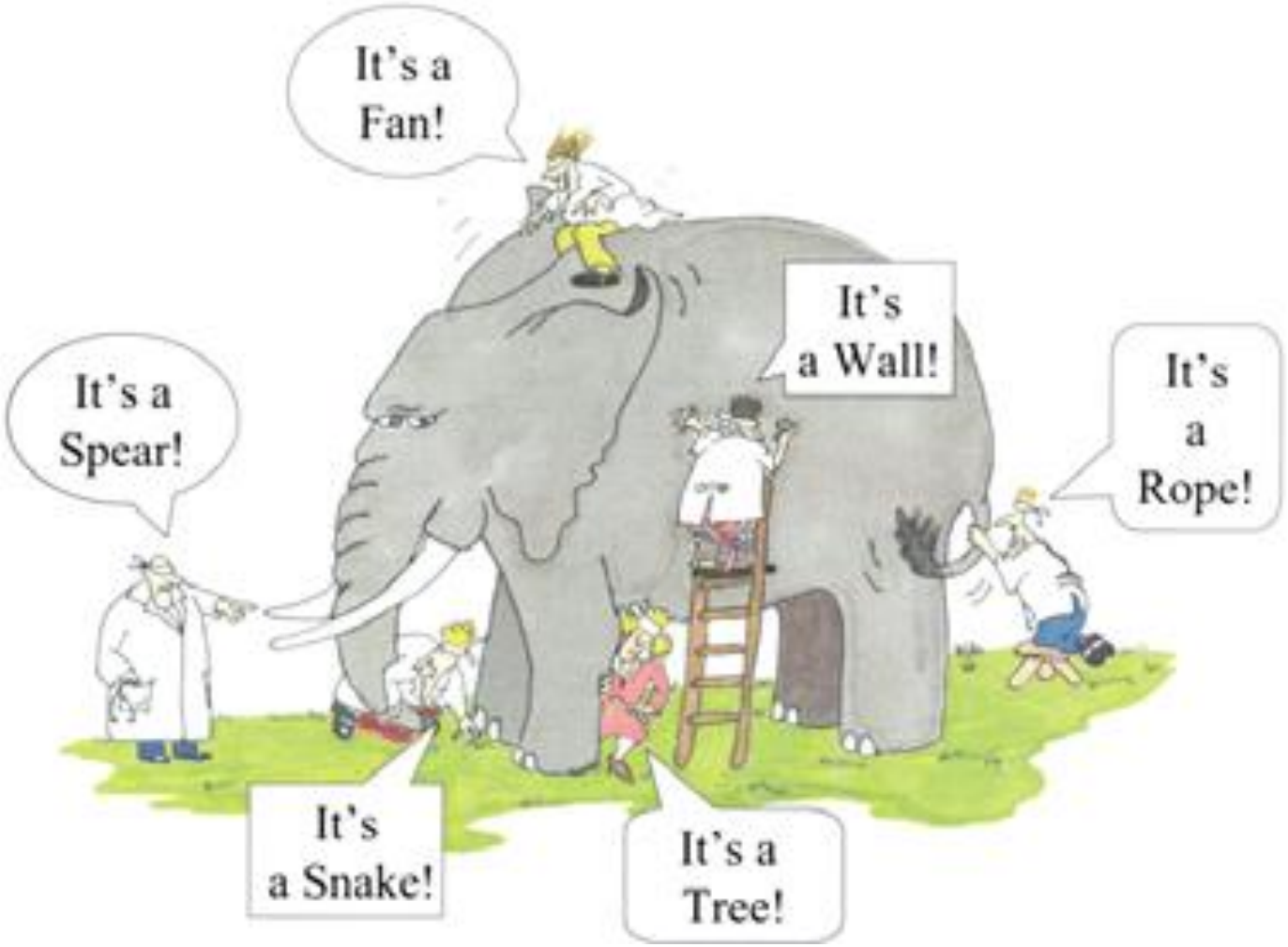
Duration of Therapy

It May Be Shorter Than You Think!

Disease	Duration of Treatment (days)	
	Short	Long
Pharyngitis	3-6	10
Acute Sinusitis	5	10
COPD exacerbation	≤ 5	≥ 7
CAP	3-5	7-10
HCAP, HAP	≤ 8	10-15
Cellulitis	5-6	10
UTI – Cystitis	5 days (macrodantin) 3 days (TMP-SMX, quinolones)	7
UTI – Pyelonephritis	5 days (quinolones)	14 days (TMP-SMX, or Beta lactam)
Peritonitis	4-7 days after source control	10

Altimimi S. Cochrane Database 2012
Spellberg B. JAMA Int Med 2016

Urinary Tract Infection – What is It?



UTI Definitions (IDSA)

- **Asymptomatic Bacteriuria**: $\geq 10^5$ cfu/mL voided specimen (? X2) or chronic foley, or $\geq 10^2$ cfu/mL from a new catheterized specimen

- **Acute uncomplicated cystitis** and **pyelonephritis**: typical symptoms in an otherwise healthy non-pregnant adult. Dx confirmed with + UA and/or $\geq 10^2$ cfu/mL on UC

- **Complicated cystitis or pyelonephritis**: lower or upper tract UTI in patient with underlying risk of treatment failure (diabetes, pregnancy, renal failure, obstruction or anatomic abnormality, indwelling device, recent instrumentation, transplant, immunosuppression, hospital-acquired)

- **Catheter-associated UTI**: presence of symptoms or signs of UTI with no other identifiable source with $\geq 10^3$ cfu/mL

Prevalence of Asymptomatic Bacteriuria and Pyuria

Population	Bacteriuria	Pyuria w Bacteriuria
Healthy Adult Women	2-5%	32%
Pregnant Women	2-11%	50%
Diabetic Women	8-14%	70%
Elderly: Nursing Home		
Female	25-53%	90%
Male	15-35%	90%
Spinal Cord Injury	50%	33-86%
Indwelling urinary catheter	100%	70%

Nicolle LE, *Int J of Antimicrob Agents*. Aug 2006.
Juthani-Mehta M. *Clin Geriatr Med* 2007; 23

Asymptomatic Bacteriuria ≠ UTI

- Common, esp. elderly women and compromised pts
- 20-50% of treated “UTI” is actually Asx Bacteriuria
- Ratio of asx bacteriuria to symptomatic UTI in LTC is > 100:1
- Good evidence that Rx gives no benefit and causes harm (ADEs, resistance, more UTI)

Nicolle et al. *NEJM* 1983
Nicolle et al. *Am J Med* 1987
Ouslander et al. *Annals Int Med* 1995

UTI is #1 reason for Abx in LTCFs

Problem: What constitutes symptoms in an elderly, incontinent, and demented patient with limited ability to communicate?

ASB is common as are atypical presentations for infection.

Do UTI's Do That?

- Unexplained falls
- Weakness

Evidence for this is overall poor quality

- Delirium
- Change in mental status
- Change in urine character

Kallin K, et al. J Family Practice 2004:53;41-52
Campbell AJ. BMJ2008;337:a2320
Juthani-Mehta M. J Am Geriatr Soc 2009;57:963-70
Nicolle, L. J Amer Geri Soc 2009;57:113-49
Rituparna, D. Infect Control and Hosp Epid 2011;32:84-6
Gupta K. JAMA 2014;311:844-54.
Sundvall PD.BMC Family Practice 2011, 12:36
Juthan-Mehta M. JAMA2014;312:1687-8

When to Order Testing and Treatment

Any of the Following:
1. Fever
2. Leukocytosis (WBC > 14,000)
3. P > 100, Syst BP < 100*

AND ONE or more of the following, **or 2 of the following alone:**

- CV angle pain/tender
- New or incr SP tenderness
- Gross hematuria
- New or marked increased incont
- New or marked increased urgency
- New or marked increased frequency
- Change in urine character and change in mental status

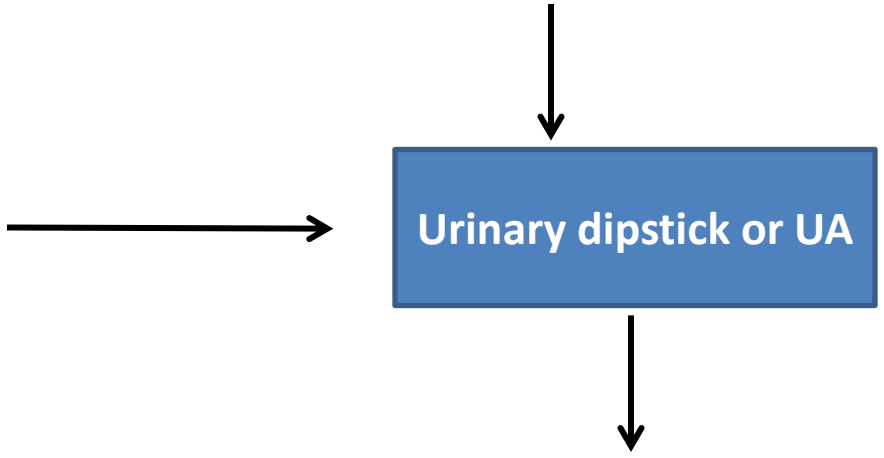
Or

1. Acute dysuria AND ONE or more of the following:

- Change in character of the urine
- Change in mental status
- Gross hematuria

OR

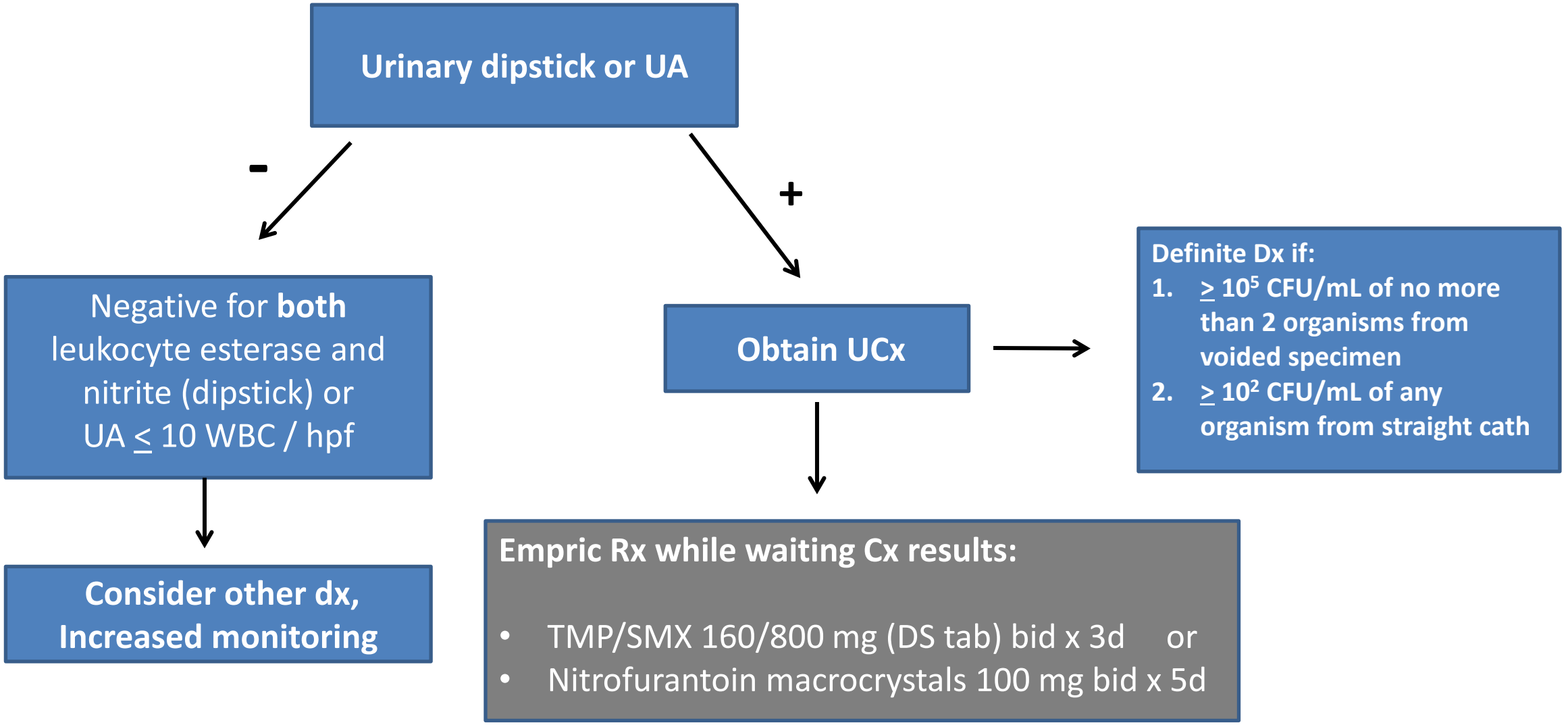
2. Acute pain, swelling, or tenderness of the testes, epididymis, or prostate



*Carson addition

Inf Dis Clin NA. March 2014

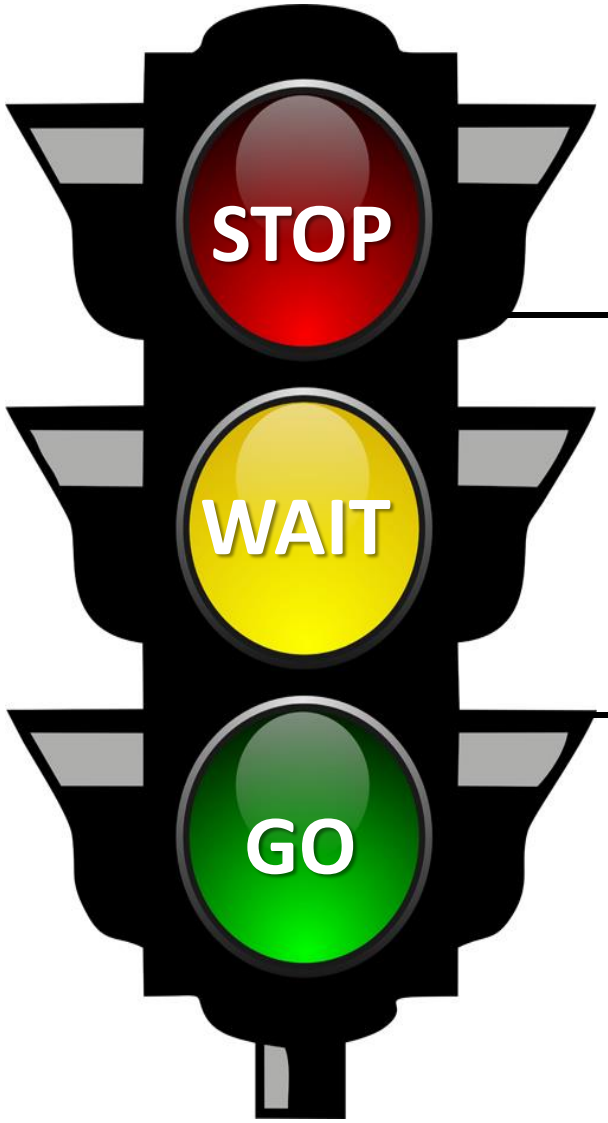
When to Order Testing and Treatment in the NH



Inf Dis Clin NA. March 2014

UTI Pathway to Assist with Antibiotic Use
for Sub-Acute Care, LTC & Nursing Home Facilities

START: Suspected UTI. What are the patient's symptoms?



Mental Status Changes (resident seems "off"), Foul Smelling Urine, OR Urine Color Changes (dark or cloudy)

Antibiotics and Urine Culture **NOT INDICATED**, further monitoring required

Seek alternative causes changes (e.g. dehydration, medications, environmental changes, metabolic problems, bleeding, cardiovascular, stroke, etc.)

PLACE RESIDENT ON CLOSE MONITORING PROTOCOL
Increased fluid intake (unless contraindicated)
Monitor & document I/Os and VS every shift for next 24h

Acute Dysuria (pain or discomfort when urinating) OR
FEVER (single temp > 100^{0}F, or repeated temp >99^{0}F or increase in single temp greater than 2^{0}F over baseline)
AND
At least ONE of the following symptoms to indicate urine is source:
Urgency, frequency, suprapubic pain, gross hematuria, CV angle tenderness, incontinence

THEN take a clean catch urine (per protocol) and send for UA and/or C&S

LaPlante KL, 2016

https://www.ahrq.gov/nhguide/index.html

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

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Home

Nursing Home Antimicrobial Stewardship Guide

Overview of the Guide

The Nursing Home Antimicrobial Stewardship Guide provides toolkits to help nursing homes optimize their use of antibiotics.

Browse Antimicrobial Stewardship Toolkits

Toolkits on four topic areas are available.

Implement, Monitor, and Sustain a Program

Two toolkits help nursing homes start and maintain antimicrobial stewardship programs.

Determine Whether To Treat >

Choose the Right Antibiotic >

Engage Residents and Family >

Suspected UTI **SBAR**

Complete this form before contacting the resident's physician.

Date/Time _____

Nursing Home Name _____

Resident Name _____ Date of Birth _____

Physician/NP/PA _____ Phone _____

Fax _____

Nurse _____ Facility Phone _____

Submitted by ☐ Phone ☐ Fax ☐ In Person ☐ Other _____

S Situation

I am contacting you about a suspected UTI for the above resident.

Vital Signs BP _____/_____ HR _____ Resp. rate _____ Temp. _____

B Background

Active diagnoses or other symptoms (especially, bladder, kidney/genitourinary conditions)

Specify _____

☐ No ☐ Yes The resident has an indwelling catheter

☐ No ☐ Yes Patient is on dialysis

☐ No ☐ Yes The resident is incontinent **If yes,** new/worsening? ☐ No ☐ Yes

☐ No ☐ Yes Advance directives for limiting treatment related to antibiotics and/or hospitalizations

Specify _____

☐ No ☐ Yes Medication Allergies

Specify _____

☐ No ☐ Yes The resident is on Warfarin (Coumadin®)

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care • www.ahrq.gov

www.ahrq.gov/NH-ASPGuide · June 2014
AHRQ Pub. No. 14-0010-2-EF

Empiric Antimicrobial Management of UTI

Syndrome	Antibiotic	Duration	Comments
Uncomplicated Cystitis	Nitrofurantoin 100 mg bid	5 days	First choice, low resistance, Avoid if GFR < 30
	TMP-SMX DS bid	3 days	Avoid if regional resistance > 20% or recent use
	Fosfomycin 3 gm	Single dose	Minimal resistance, avoid if any suspicion of pyelo
	Cipro or Levo 250 mg bid	3 days	**2nd line agents**, should be reserved if can't take above
Pyelonephritis - Outpatient - Inpatient	- Cipro 500 mg bid - IV FQ, **CP** or ES-PCN	7 days	Definitive therapy should be based on C&S data. Consider carbapenem if ESBL risk is high
Complicated Cystitis Pyelonephritis	- Cipro 500 mg bid - IV CP, ES-PCN, FQ	5-10 days 5-14 days	Need to empirically cover for pseudomonas and consider ESBL. Definitive rx based on C&S data

The art of medicine is to amuse the patient while nature cures the disease

Voltaire

Resources

- AHRQ: Nursing Home Antimicrobial Stewardship Guide
  http://nhguide.airprojects.org

- CDC: The Core Elements of Antibiotic Stewardship for Nursing Homes
  https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html

- CDC: Get Smart for Healthcare in Hospitals and Long-Term Care
  https://www.cdc.gov/getsmart/healthcare/index.html

- http://www.ndhealth.gov/disease/hai/Resources/ (Patient Education)


ANY
QUESTIONS
?

MAD-ID
MAKING A DIFFERENCE IN INFECTIOUS DISEASES

Antimicrobial Stewardship Programs

MAD-ID offers two Antimicrobial Stewardship Training Programs:

Basic Program: Designed to teach the basic skills and provide an overview of Antimicrobial Stewardship practice needed to develop an Antimicrobial Stewardship Program.

Advanced Program: Designed to meet the needs of pharmacists, physicians and other providers that have some antimicrobial stewardship experience and/or basic skills in this area. CPE and CME credit for didactic portion provided by MAD-ID and NFID, respectively

Potential Educational "One-Liners" for Patients Expecting an Antibiotic

- You should know, that by giving you an antibiotic, we may increase your chance of……..

- Altering the bacteria in your gut for months
  - This is starting to be linked with allergy problems, immune problems, nutrient metabolism changes, and maybe even obesity

- Having an adverse drug event - about 1:4 chance
  - sometimes quite serious, 2-16x increased risk for C diff

- Carrying a variety of resistant bacteria, and passing these onto your family
  - MRSA 2-3x increase risk
  - Drug resistant pneumococcus - 2-5x increase risk
  - 9x increased risk of drug resistant E coli in stool

Katsarolis. BMC Infect Dis 2009
Nasrin. BMJ 2002
Taconelli. J Antimicrob Chemother 2008
Hannah. Emerg Infect Dis 2005

Choosing Wisely®

An initiative of the ABIM Foundation

ConsumerReportsHealth

ABIM FOUNDATION

Antibiotics

When you need them—and when you don't

Antibiotics are strong medicines that can kill bacteria. But we have overused antibiotics for many years. As a result, we now have bacteria that resist antibiotics. Resistant bacteria cause infections that are harder to cure and more costly to treat.

Drug-resistant infections kill at least 23,000 children and adults in the U.S. every year.

Antibiotic-resistant infections can strike anyone. They can be passed on to others. For example, more and more healthy young people are getting skin infections from MRSA, a bacteria that resists many common antibiotics. MRSA is spreading in households, daycare, schools, camps, dorms, gyms, team sports, and the military.

Try to protect yourself and your loved ones. Here's what you need to know to help prevent resistance:

Taking antibiotics makes you more likely to get a resistant infection in the future.
Sometimes you need antibiotics to prevent or treat an infection. But half of antibiotics prescriptions are not needed.

It is normal to have bacteria on your skin and in your body. Many bacteria are harmless. They can even keep you healthy. When you use an antibiotic, it kills most bacteria, including the friendly ones. But a few bacteria survive. These resistant bacteria can multiply and take over.

Antibiotics have side effects.
Each year, 14,000 Americans die from severe diarrhea caused by antibiotics. Other side effects include vaginal infections, nausea and vomiting. Serious allergic reactions include blistering rashes, swelling of the face and throat, and breathing problems. Some antibiotics can cause permanent nerve damage and torn tendons.

Resistant infections cost a lot.
Resistant infections usually need more costly drugs, more medical care or longer hospital stays. It costs over $40,000 extra to treat a resistant bloodstream infection in one hospital patient. Resistant infections cost $20 billion each year.

Do You Need Antibiotics?

People use antibiotics incorrectly for many common conditions. Medical organizations are alarmed about this problem and have listed some of these conditions below.

RESPIRATORY INFECTIONS

Children's sore throat, cough, runny nose

American Academy of Pediatrics

The problem: Different conditions need different treatments:

- Colds, flu and most other respiratory infections are caused by a virus. Antibiotics don't kill viruses.
- Bronchitis is usually caused by a virus or an irritant in the air like cigarette smoke.
- Strep throat is caused by bacteria. Symptoms include fever, redness and trouble swallowing. But most children with those symptoms do not have strep throat. Your child should get a strep test before taking antibiotics.

Consider antibiotics if:

- A cough doesn't get better in 14 days.
- The doctor diagnoses a bacterial illness, like strep throat.

Sinus infections (sinusitis)

American Academy of Allergy, Asthma & Immunology

The problem: Sinusitis is almost always caused by a virus. Symptoms include a stuffed-up feeling, a runny nose and pain in the face. Even when bacteria are the cause, the infections usually clear up on their own in about a week.

Consider antibiotics only if:

- You don't get better after 10 days.
- You get better and then worse again.
- You have a high fever and thick, colored mucus for three or more days in a row.

EAR INFECTIONS

Children's ear infections

American Academy of Family Physicians

The problem: Most ear infections improve on their own in two or three days, especially in children age two or older. Give your child over-the-counter pain relievers for a few days, and avoid antibiotics. Take your child to a doctor if symptoms aren't better in two to three days or they get worse at any time.

Get antibiotics right away for:

- Babies age six months or younger.
- Children from six months to two years old with moderate to severe ear pain.
- Children age two or older with severe symptoms.

Children with ear tubes

American Academy of Otolaryngology-Head & Neck Surgery

The problem: For children with ear tubes, antibiotic eardrops work better than oral antibiotics. Drops go straight through the ear tube into the middle ear—where most children's ear infections are. Drops are also less likely to cause resistant bacteria.

Consider oral antibiotics if the child:

- Is very ill.
- Needs antibiotics for another reason.
- Doesn't get better with eardrops.

Swimmer's Ear

American Academy of Otolaryngology-Head & Neck Surgery

The problem: Swimmer's ear is caused by water trapped in the ear canal. Usually, over-the-counter eardrops help as much as antibiotics, and they don't cause resistance. But if you have a hole or tube in your eardrum, check with your doctor first. Non-prescription eardrops could damage your hearing.

If you do need antibiotics:

- Antibiotic eardrops work better than oral antibiotics against swimmer's ear.
- Consider oral antibiotics if the infection spreads beyond the ear or you have other conditions, such as diabetes, that increase the risk of complications.