WELCOME TO THE 2022 NEW JERSEY ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

MEET THE LOCAL STEWARDSHIP LEADERS

#NJ ANTIBIOTICS AWARE
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NJ Health
New Jersey Department of Health

NJCDS

OVERVIEW OF THE PROGRAM

- Jason Mehr, MPH, CIC, Healthcare-associated Infections/Antimicrobial Resistance Unit Lead
- Edward Lifshitz, MD, FACP, Medical Director of Infectious and Zoonotic Disease Program
  - Introduction to Antimicrobial Stewardship in New Jersey
- Keith S. Kaye, MD, MPH, Rutgers Robert Wood Johnson Medical School
  - Antimicrobial Stewardship During Transitions of Care and in Post-Acute Care Settings
- Acute Care Facility Panel and Awardees
- Post-Acute Care Facility Speakers and Awardees
- Outpatient Care Facility Awardees
- The Next Steps
  - Paul W. Fotiou, Pharm D, Antimicrobial Stewardship Coordinator
  - Gargi Patel, Pharm D, Infectious Disease Pharmacist

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NJDOH ASRP Team

Jason Mehr, MPH, CIC- Healthcare-associated Infections/Antimicrobial Resistance Unit Lead

Paul Fotiou, Pharm D- Antimicrobial Stewardship Coordinator

Gargi Patel, Pharm D- Infectious Disease Pharmacist

Kelly McLaughlin, MPH, MCHES- Project Firstline Team Lead, Health Educator

Suzanne Miro, MPH, MCHES- Health Educator

Krista Reale, MA, CHES- Health Educator

Miriam Gonzales, CHES- Project Firstline Health Educator

Jasmine Davis, MPH, CHES- Project Firstline Health Educator

Celina Koh- Health Data Specialist

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Housekeeping

Please stay muted if you are not speaking

The webinar is being recorded

Continuing education credits (1.0 hour) awarded by New Jersey Hospital Association

- Continuing Medical Education (CME)
- Continuing Nursing Education (CNE)
- Licensed Nursing Home Administrator (LNHA)
- Certified Assisted Living Administrator (CALA)

Don’t forget to fill out evaluation survey at the end of the program!

Awardees- be on the lookout for digital toolkit, certificates, pins, badges

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Antimicrobial Stewardship

Set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antimicrobial use.

“One can think of the middle of the twentieth century as the end of one of the most important social revolutions in history, the **VIRTUAL ELIMINATION OF INFECTIOUS DISEASES** as a significant factor in social life”

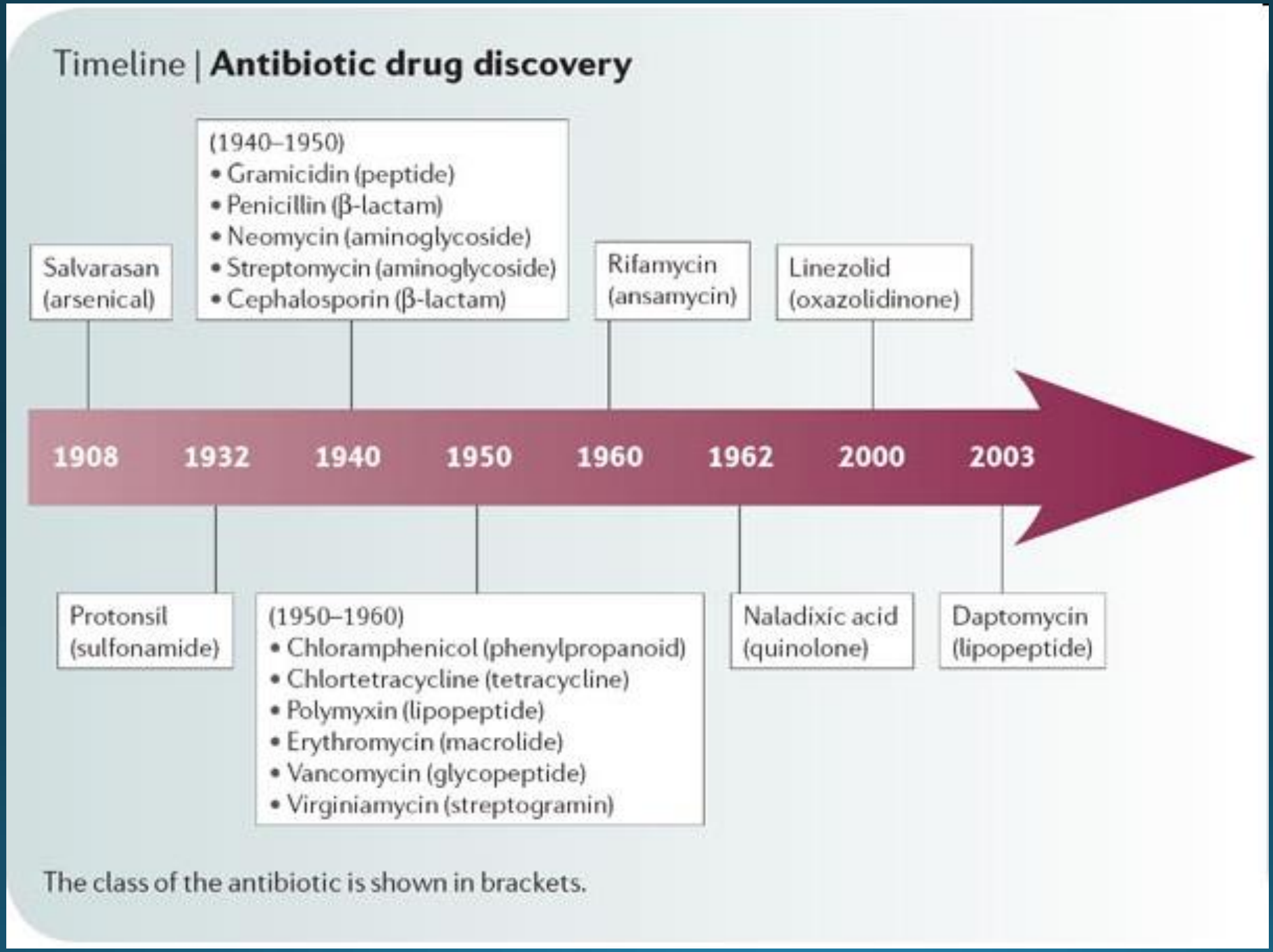
1962

Sir Frank MacFarlane Burnet
Director of the Walter and Eliza Hall Institute of Medical Research
1960 Nobel Prize co-winner in Physiology or Medicine

“…we are potentially headed for a **POST-ANTIBIOTIC WORLD** in which we will have few or no clinical interventions for some infections.”

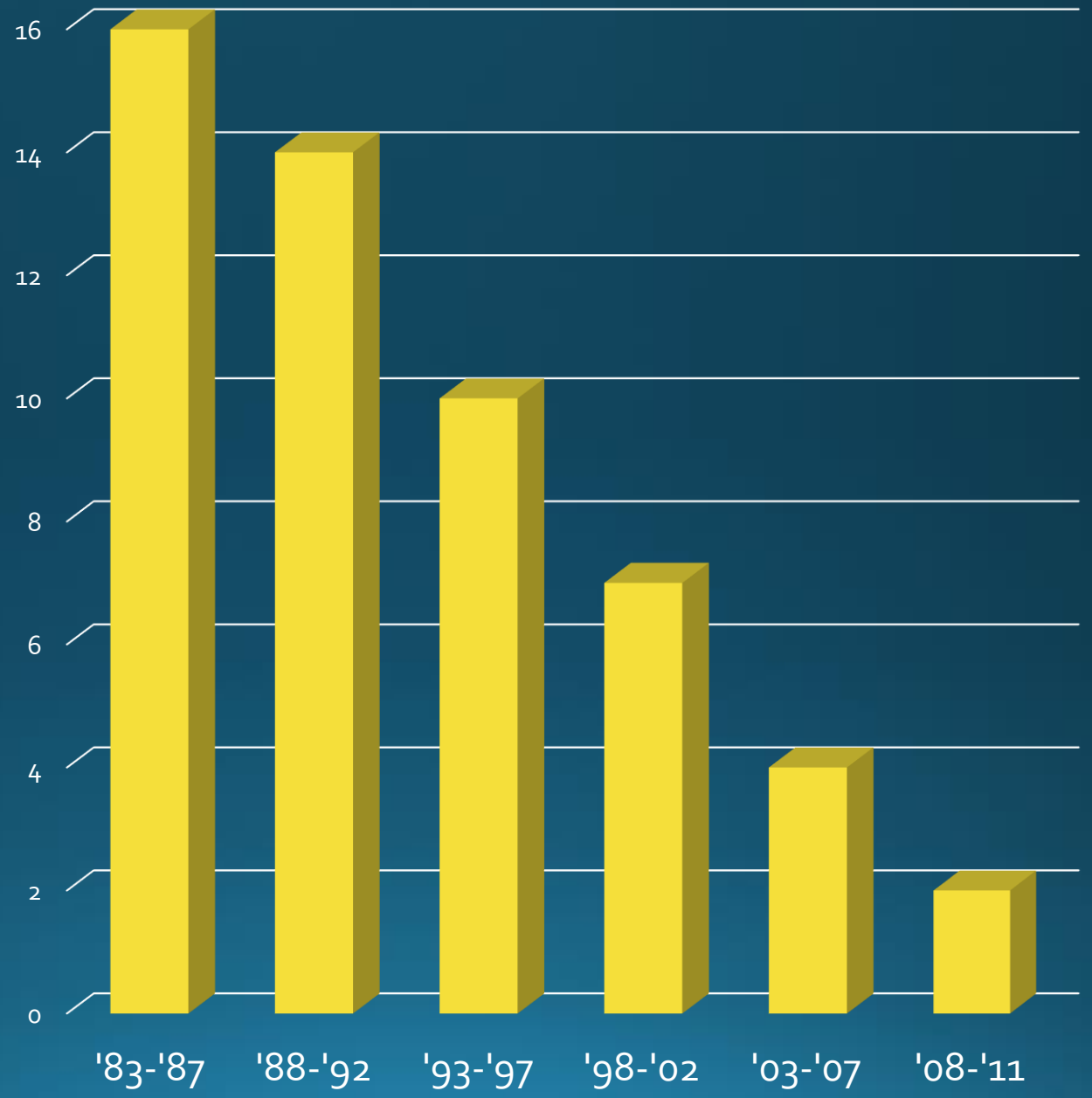
2010

Thomas Frieden
Director - CDC



Nature Reviews Microbiology 5, 175-186 (March 2007)

New Antibiotics

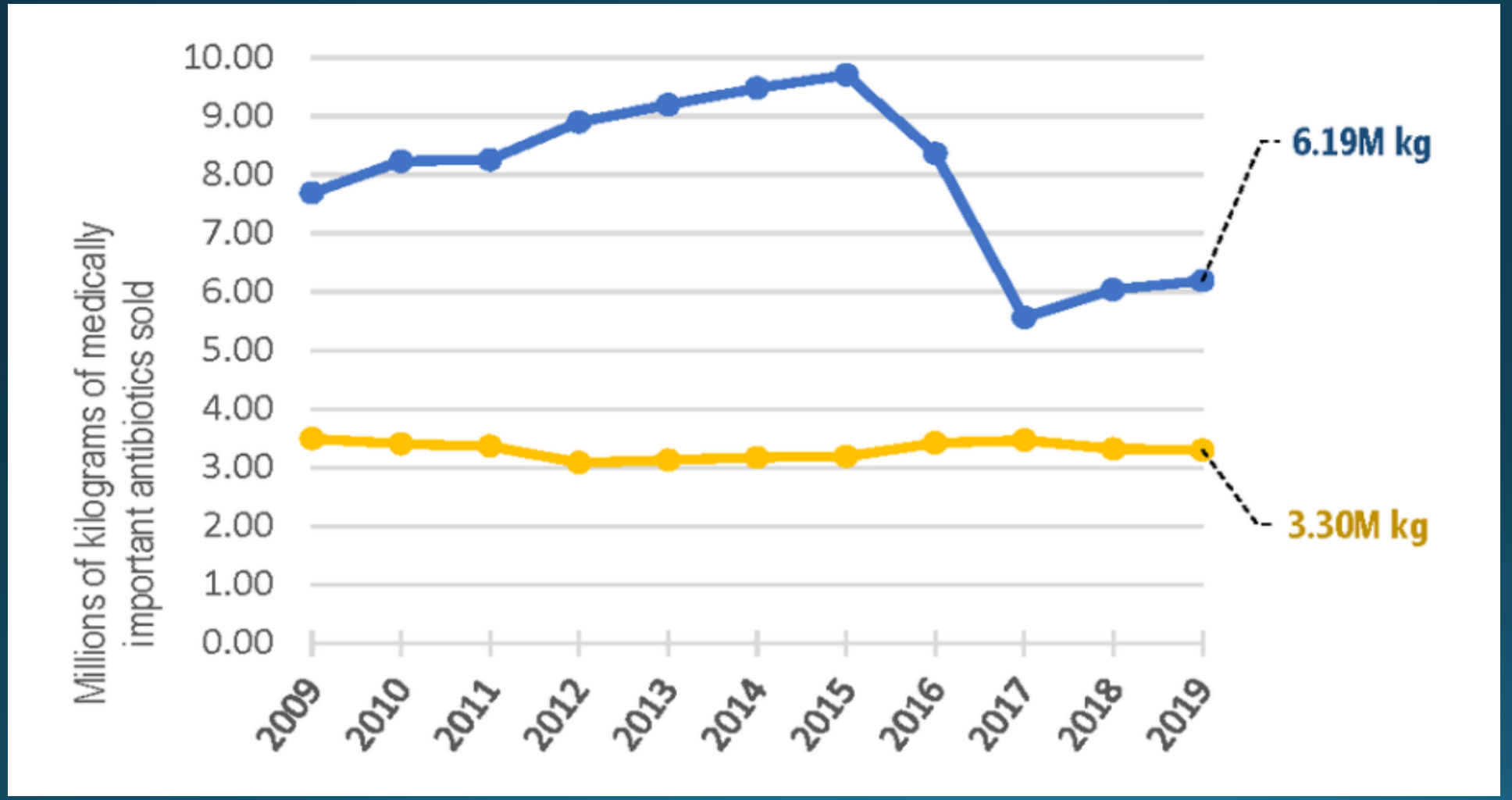


Usage and Harm

US Antibiotic Usage

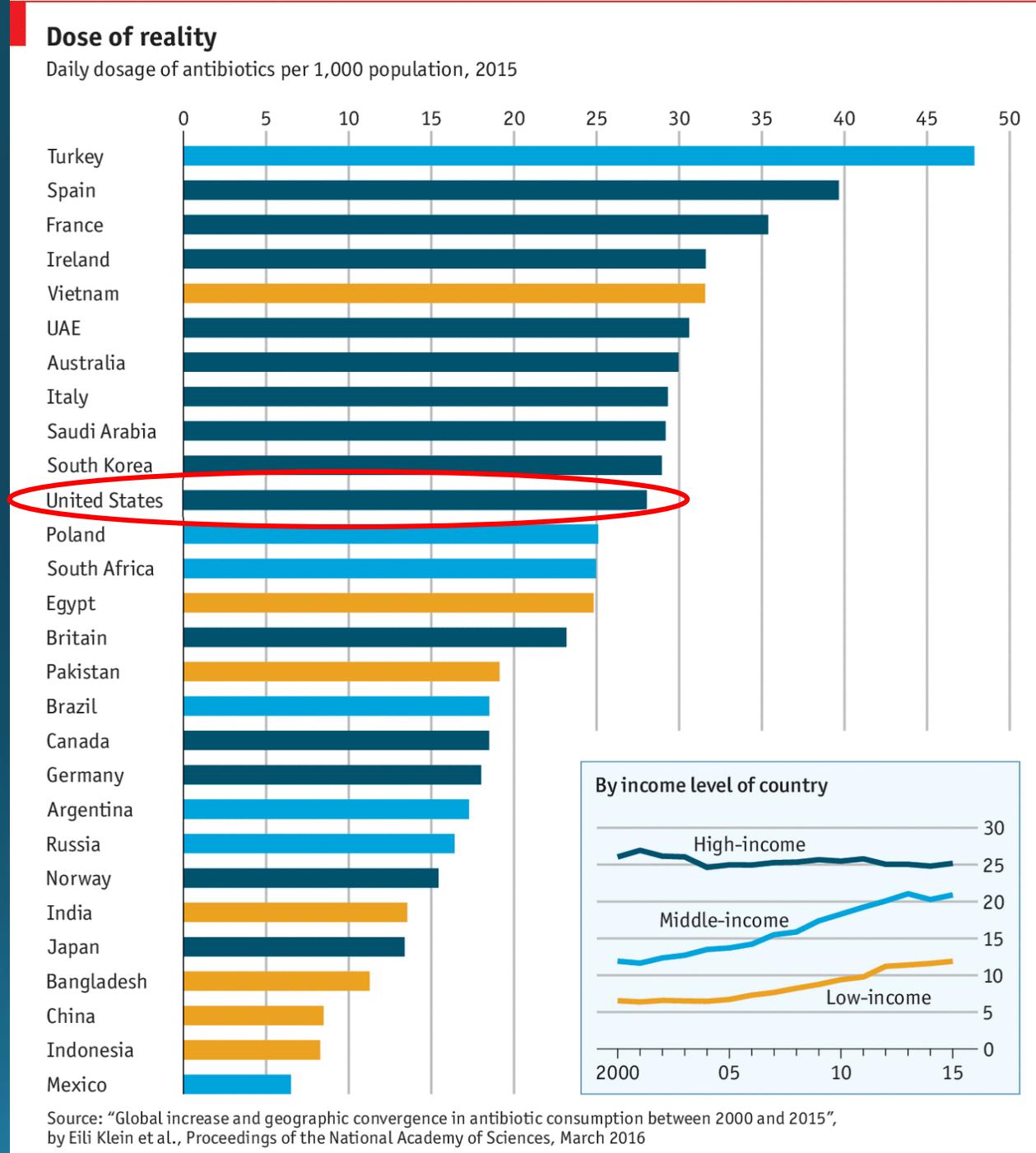
- Much is unknown
- Humans
  - ~ 3.3 million kgs/y
- Animal agriculture
  - ~ 6.2 million kgs/y

Medically Important Abs – US 2009-2019

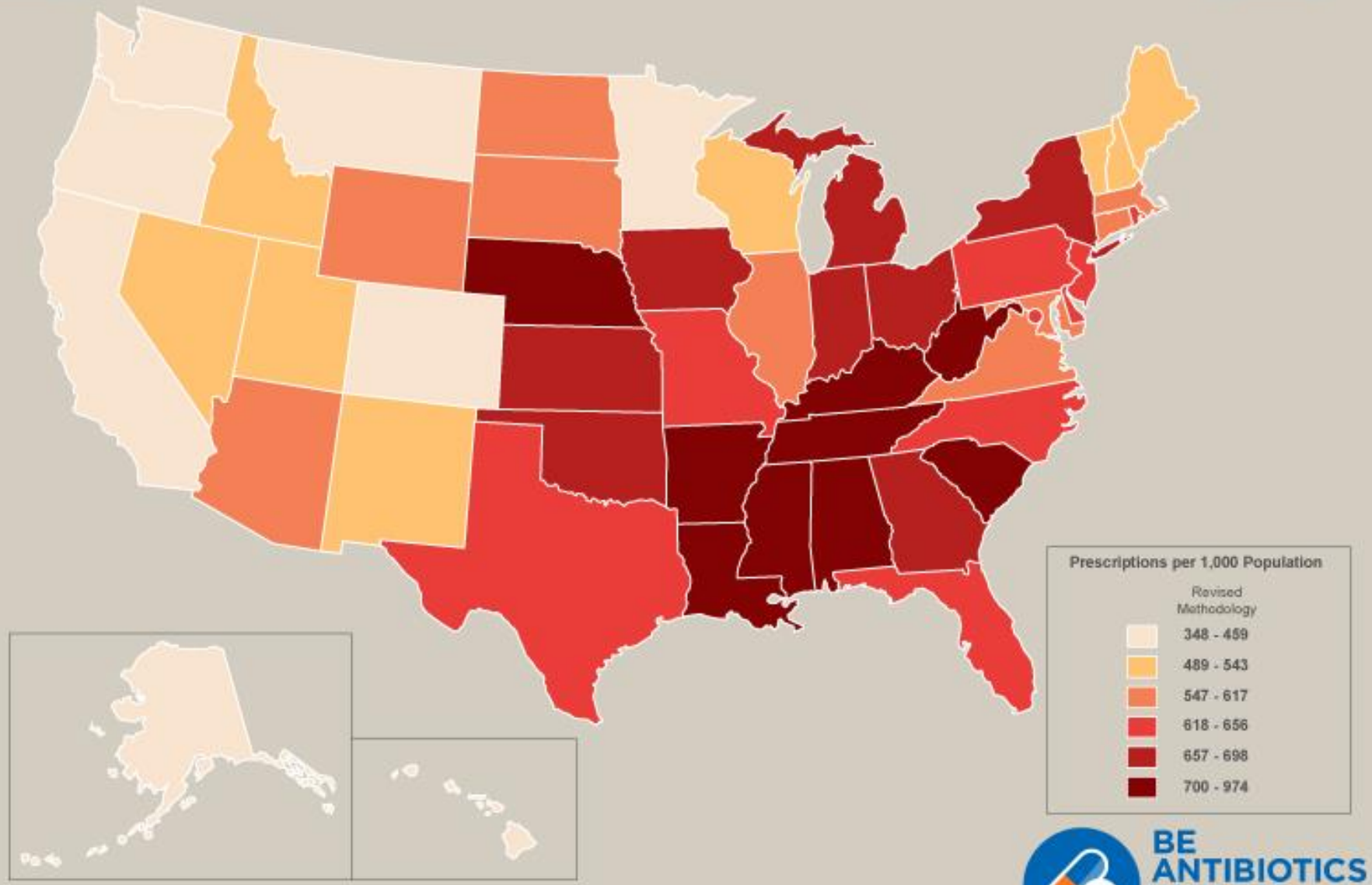


https://www.nrdc.org/experts/david-wallinga-md/us-livestock-antibiotic-use-rising-medical-use-falls-0

Daily Dosage of Abs 2015



Community Antibiotic Prescriptions per 1,000 Population by State - 2020



Data source: IQVIA Xponent 2020

CS327219-A

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

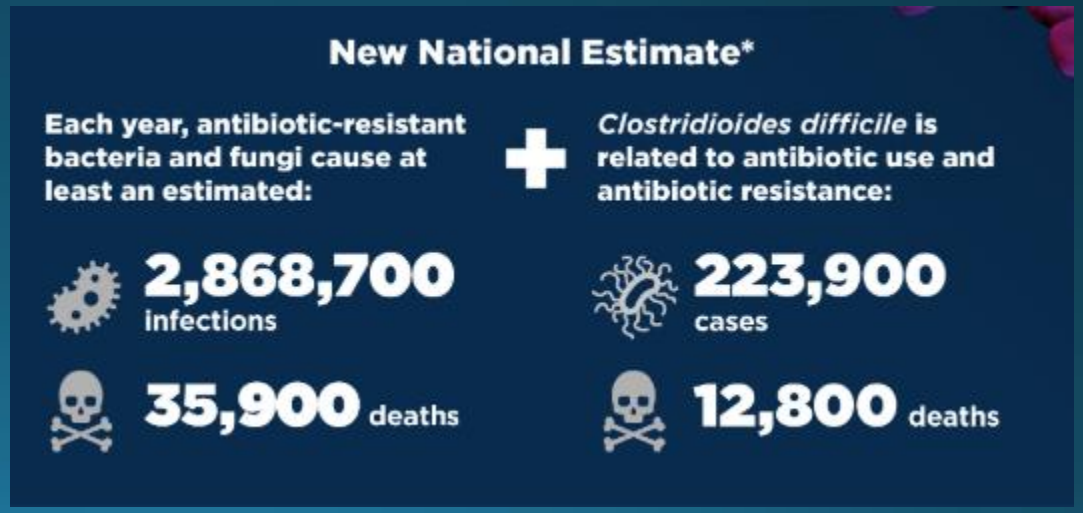
State	Rx/1000
West Virginia	974
New Jersey	656
National Average	613
Alaska	348

What's the Harm?
The Individual

1. Cost
2. Side effects
3. *C. difficile* infection
4. Resistant organisms

What's the Harm?
The Collective

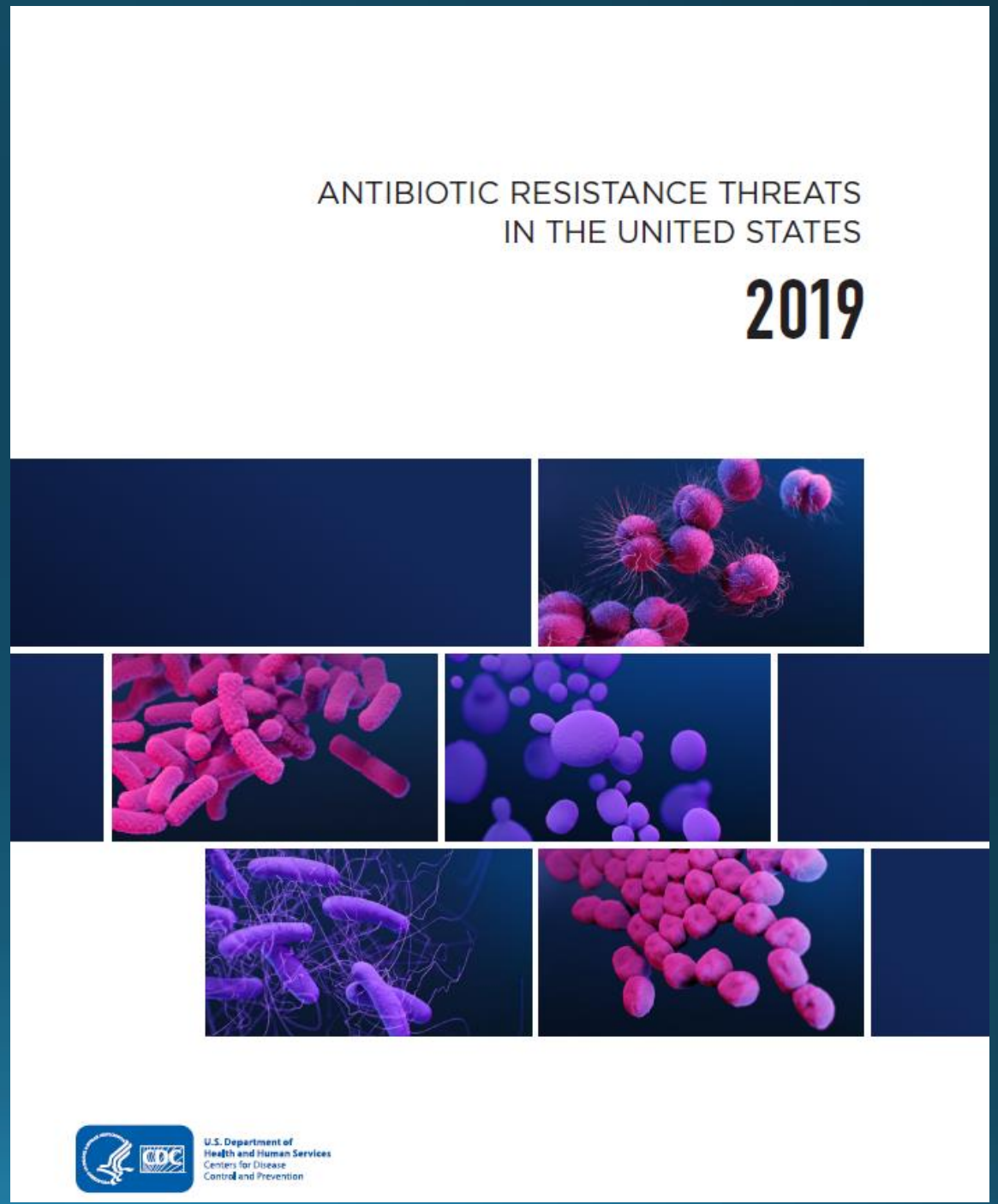
- ↑ morbidity & mortality
  - 2,800,000 infected/y
    - 35,000 deaths/y



https://www.cdc.gov/drugresistance/biggest-threats.html

What's the Harm? The Collective

- ↑ resistance



Candida auris

New York, New Jersey Are Flashpoint For New 'Superbug' Fungus In Hospitals

April 25, 2017 8:31 PM

'Superbug' Strikes New Jersey; 17 Infected And Growing

N.J. has the second-highest infection rate from a "superbug," a potentially deadly fungus that has increased 800 percent since the fall.

By Tom Davis (Patch Staff) - Updated May 1, 2017 11:52 am ET

Number of dangerous fungal disease on rise in N.J., according to CDC

Updated May 4, 2017; Posted May 4, 2017

What's the Harm?
The Collective

- Cost for Rx /Tx
  - 20-50% unnecessary/inappropriate
  - ↑ costs treating these infections
    - $20 billion/y

https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf

What's the Harm?
The Collective

We all may need an antibiotic one day…

Inpatient Prevalence

- 55% receive Abs
- 4 parenteral Abs make up 45%
  - Vancomycin
  - Piperacillin-tazobactam
  - Ceftriaxone
  - Levofloxacin
- No difference in community vs hospital acquired Rx

JAMA .2014;312(14):1438-1446. doi:10.1001/jama.2014.12923
MMWR / March 7, 2014 / Vol. 63 / No. 9

Up to 50% Unnecessary/Inappropriate

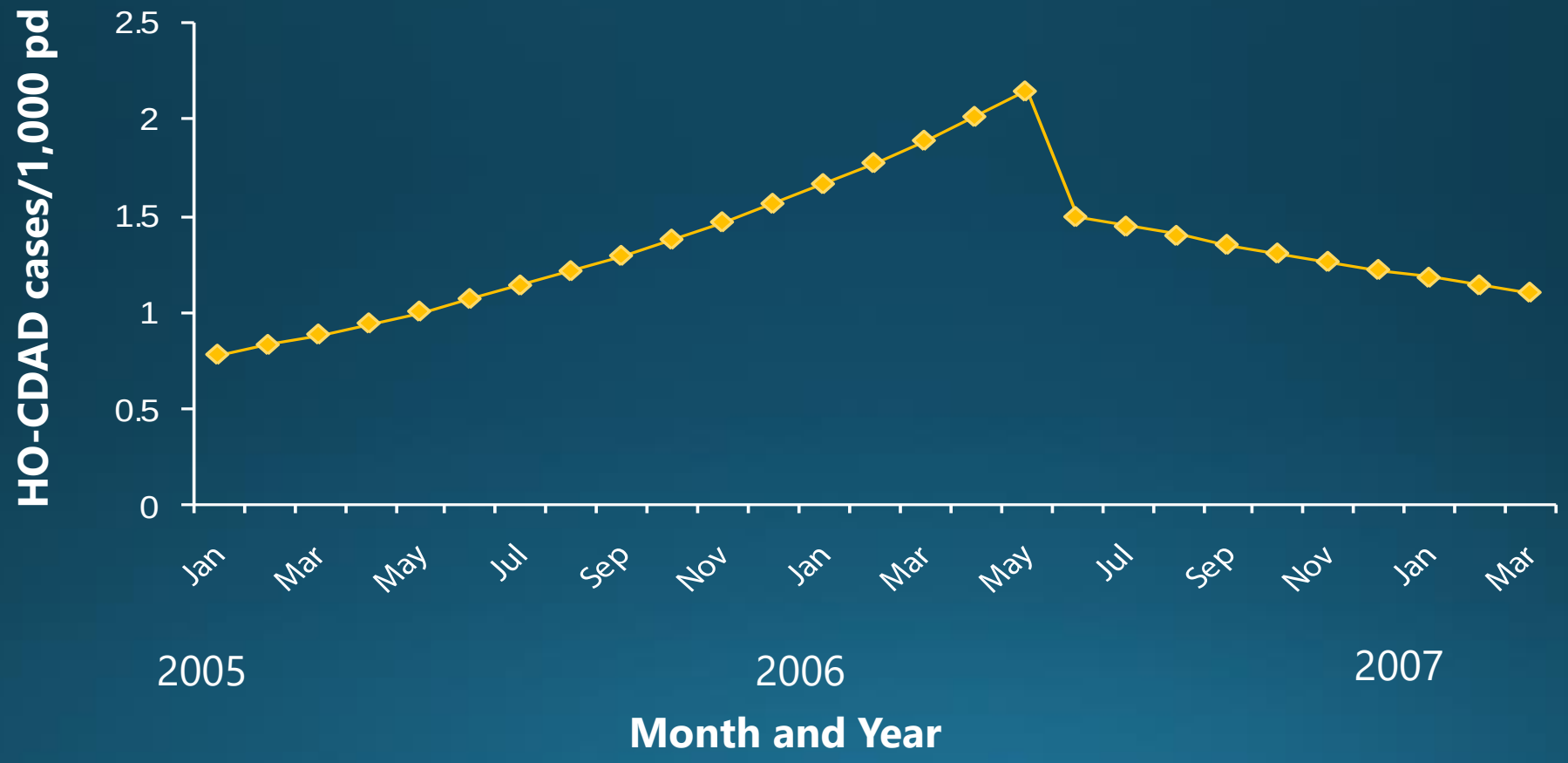
- Pt may appear to have infection treatable by antibiotics
  - Colonization, scarring
- Lack of knowledge:
  - Unnecessary duplication of therapy
  - Overly broad spectrum
  - Wrong Ab prescribed
  - Wrong dose
  - Wrong time – too long

Antimicrobial Stewardship Program Goals

- Appropriate use of Abs leading to:
  - ↑ patient safety
    - ↓ adverse effects including *C. difficile*
  - ↓ emergence of resistance
  - Save money

ASP has been shown to decrease *C. difficile* infections…

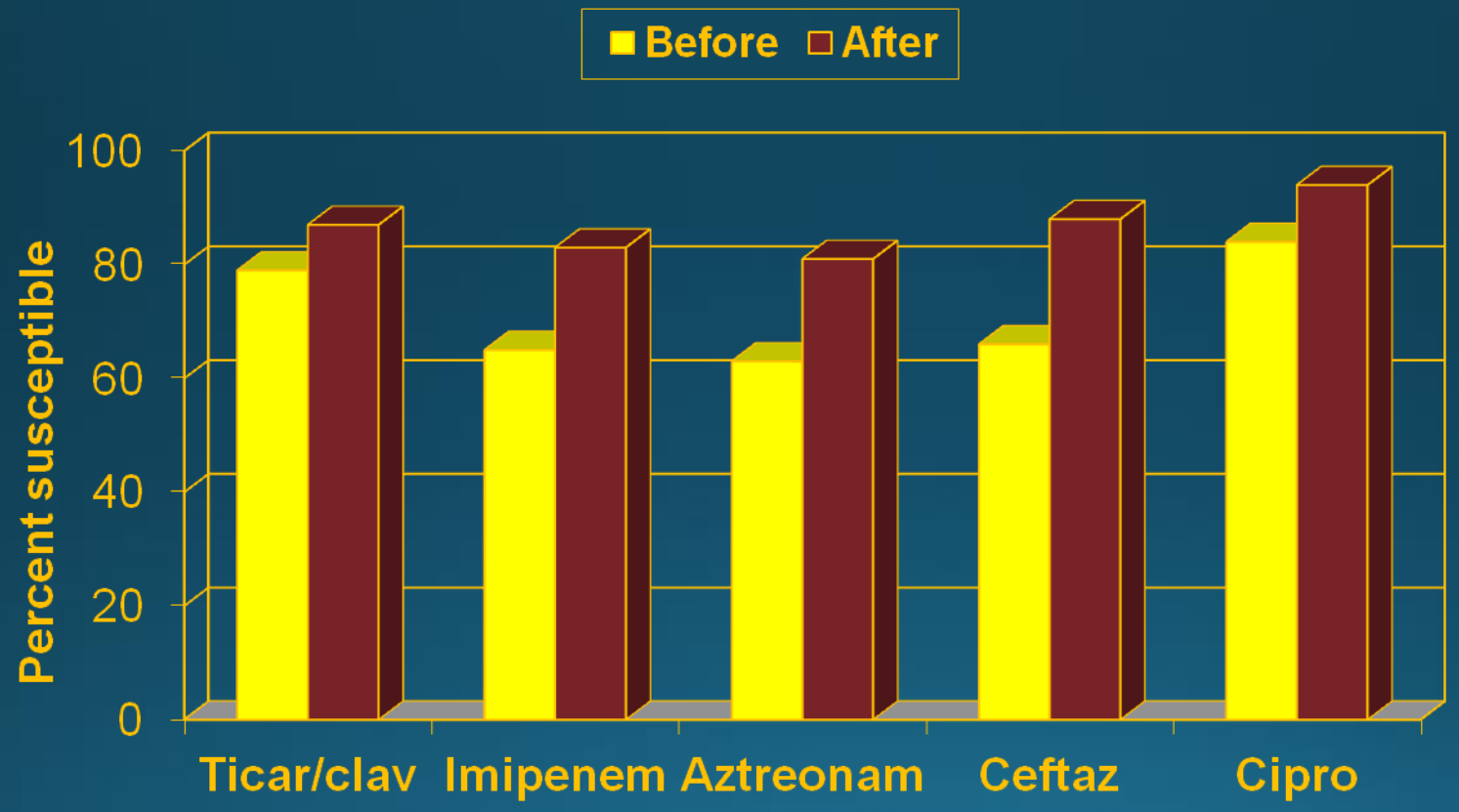
Impact of fluoroquinolone restriction on rates of *C. difficile* infection



Infect Control Hosp Epidemiol. 2009 Mar;30(3):264-72.

Reduce resistance…

P. aeruginosa susceptibilities before and after implementation of antibiotic restrictions

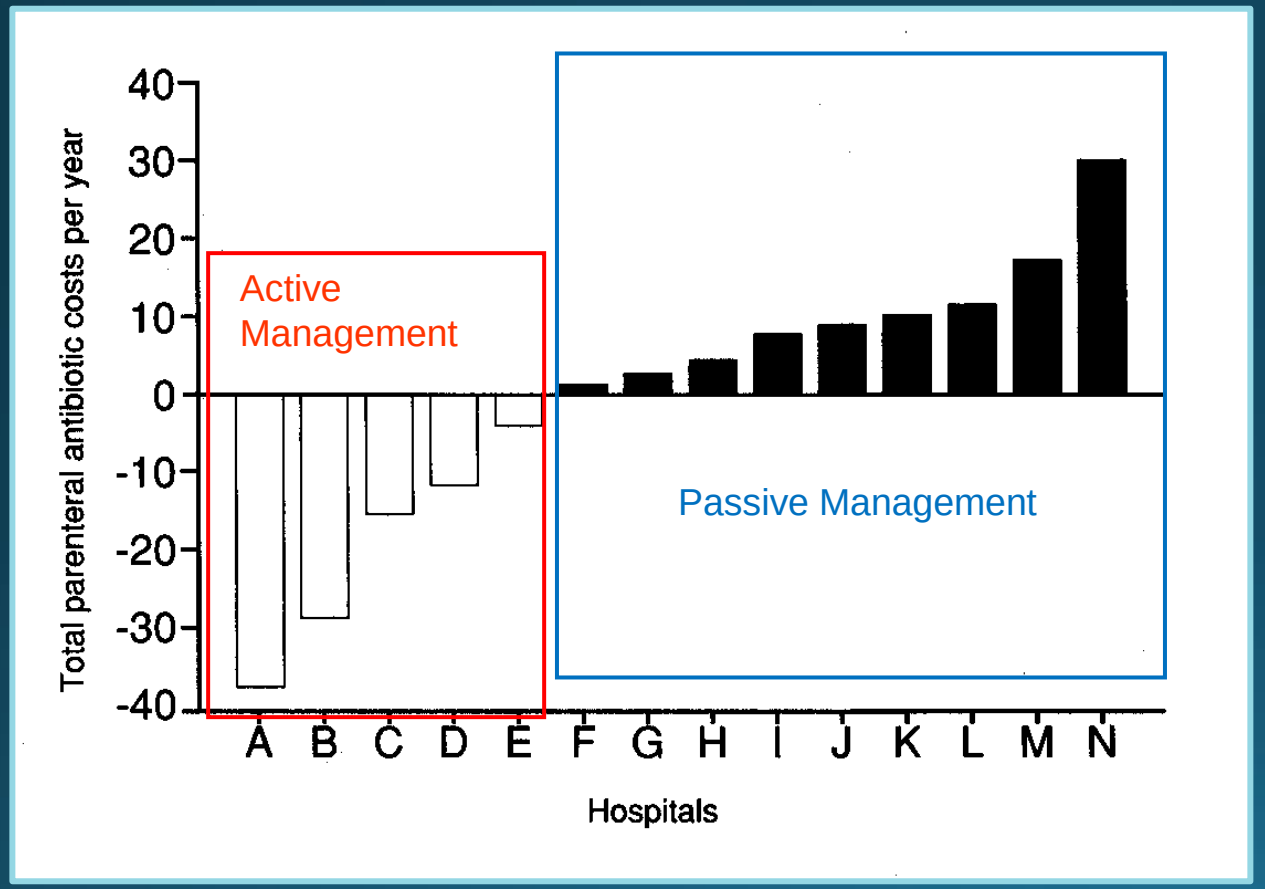


P<0.01 for all increases

CID 1997;25:230

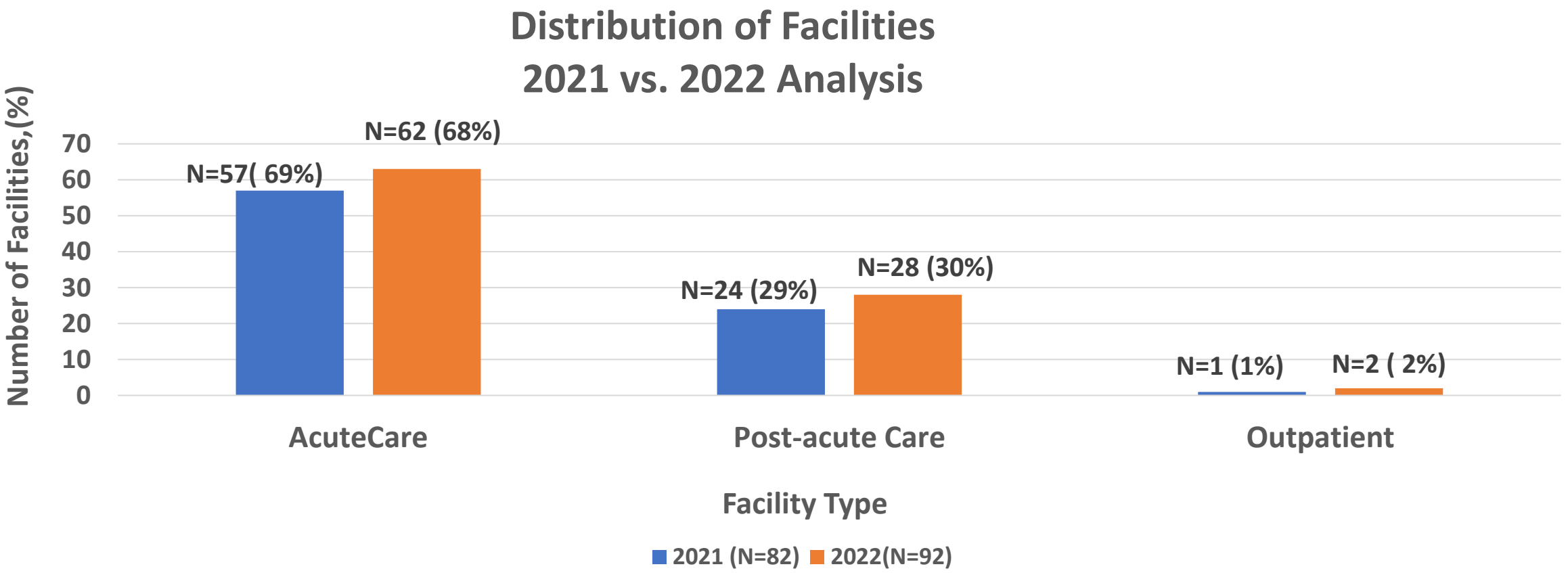
And save money…

Savings of $200,000-$900,000/year



Carling et. al. CID,1999;29;1189.

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM
2021 VS 2022 ANALYSIS



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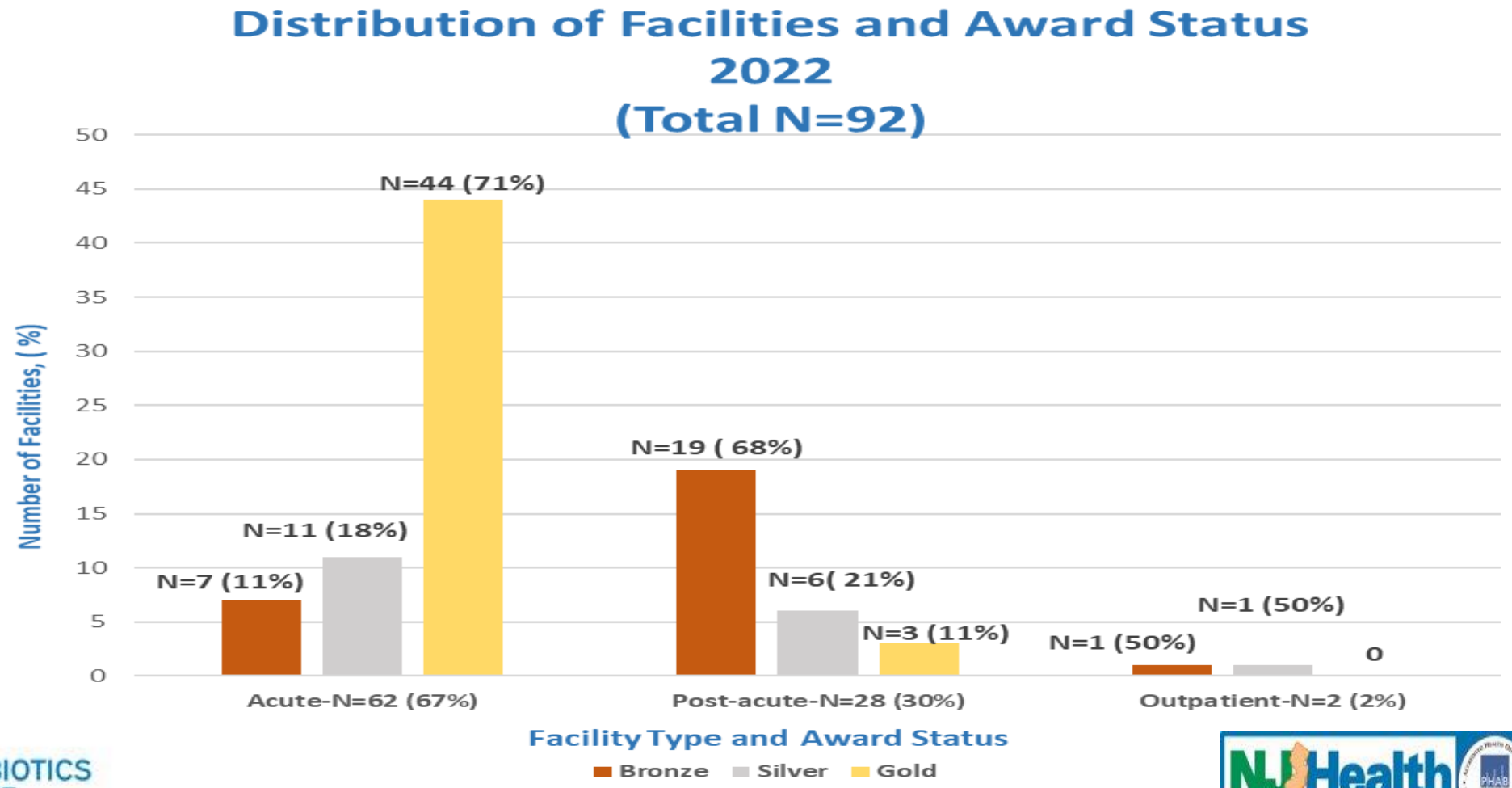
ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM
2022 ANALYSIS



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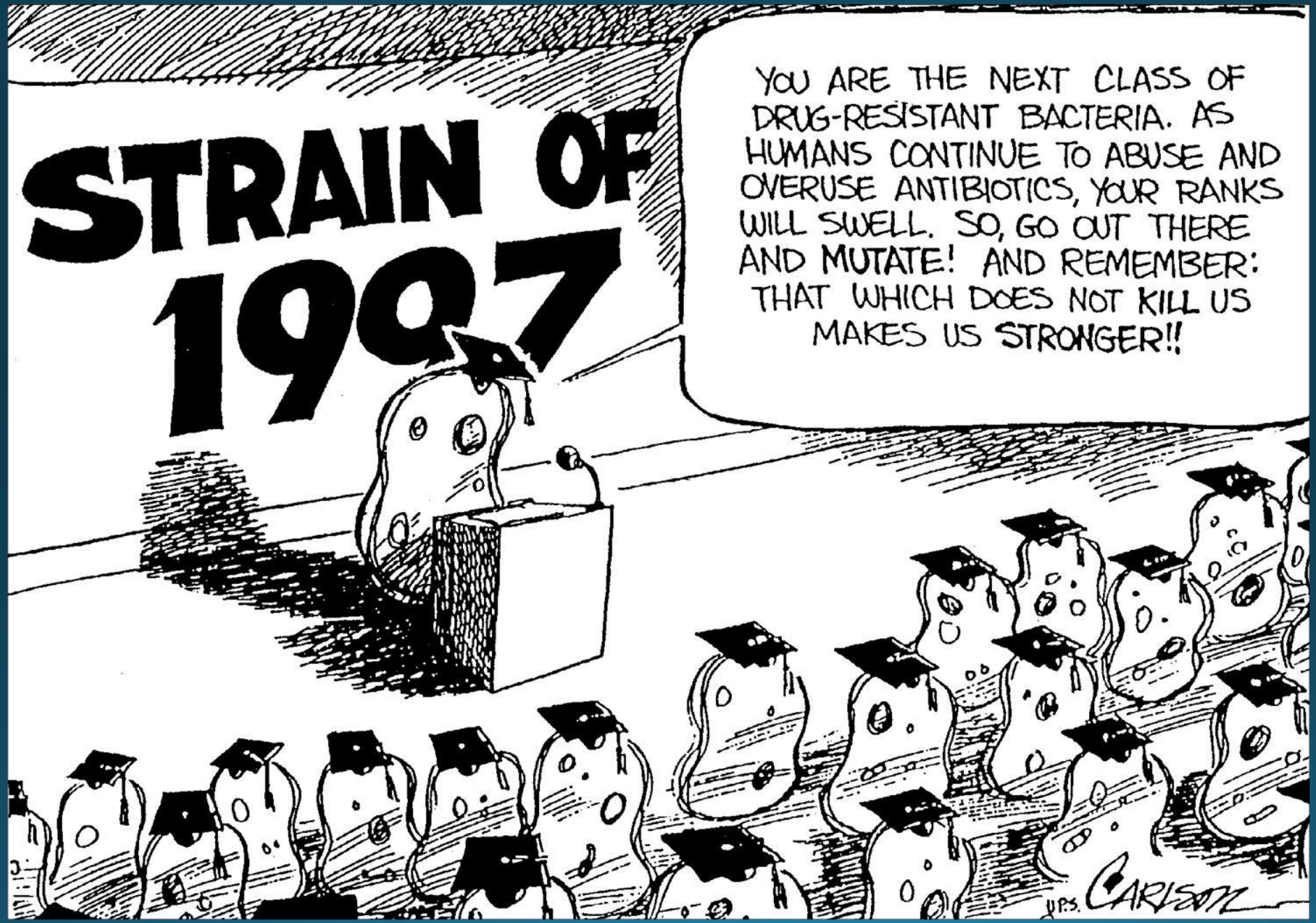
“…the microbes are educated to resist penicillin and a host of penicillin-fast organisms is bred out…In such cases the thoughtless person playing with penicillin is morally **RESPONSIBLE FOR THE DEATH** of the man who finally succumbs to infection with the penicillin-resistant organism. I hope this evil can be averted.”

1945

Sir Alexander Fleming


STRAIN OF 1997
YOU ARE THE NEXT CLASS OF DRUG-RESISTANT BACTERIA. AS HUMANS CONTINUE TO ABUSE AND OVERUSE ANTIBIOTICS, YOUR RANKS WILL SWELL. SO, GO OUT THERE AND MUTATE! AND REMEMBER: THAT WHICH DOES NOT KILL US MAKES US STRONGER!!
J.P.S. CARLSON

Questions?

- Dr. Edward Lifshitz, MD, FACP, Medical Director of Infectious and Zoonotic Disease Program
- Edward.Lifshitz@doh.nj.gov

Keynote Speaker

KEITH KAYE, MD, MPH
CHIEF- DIVISION OF ALLERGY, IMMUNOLOGY AND INFECTIOUS DISEASES
PROFESSOR OF MEDICINE
ROBERT WOOD JOHNSON MEDICAL SCHOOL

Antimicrobial Stewardship During Transitions of Care and in Post-Acute Care Settings

Keith S. Kaye, MD, MPH
Chief, Division of Allergy, Immunology and Infectious Diseases
Professor of Medicine
Rutgers, Robert Wood Johnson Medical School
New Brunswick, NJ

Disclosures

- Consultant: Shinogoi, Merck, Qpex, Allecra, Venatorx, AbbVie
- Grant Support: NIH, AHRQ

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Objectives

- Antibiotic resistance in the community
- Review the need for stewardship in transitions of care (TOC)
- Evaluate opportunities and challenges for stewardship in TOC
- Understand the need for stewardship in post-acute care settings
- Evaluate the current state of stewardship in post-acute care settings and opportunities in these settings

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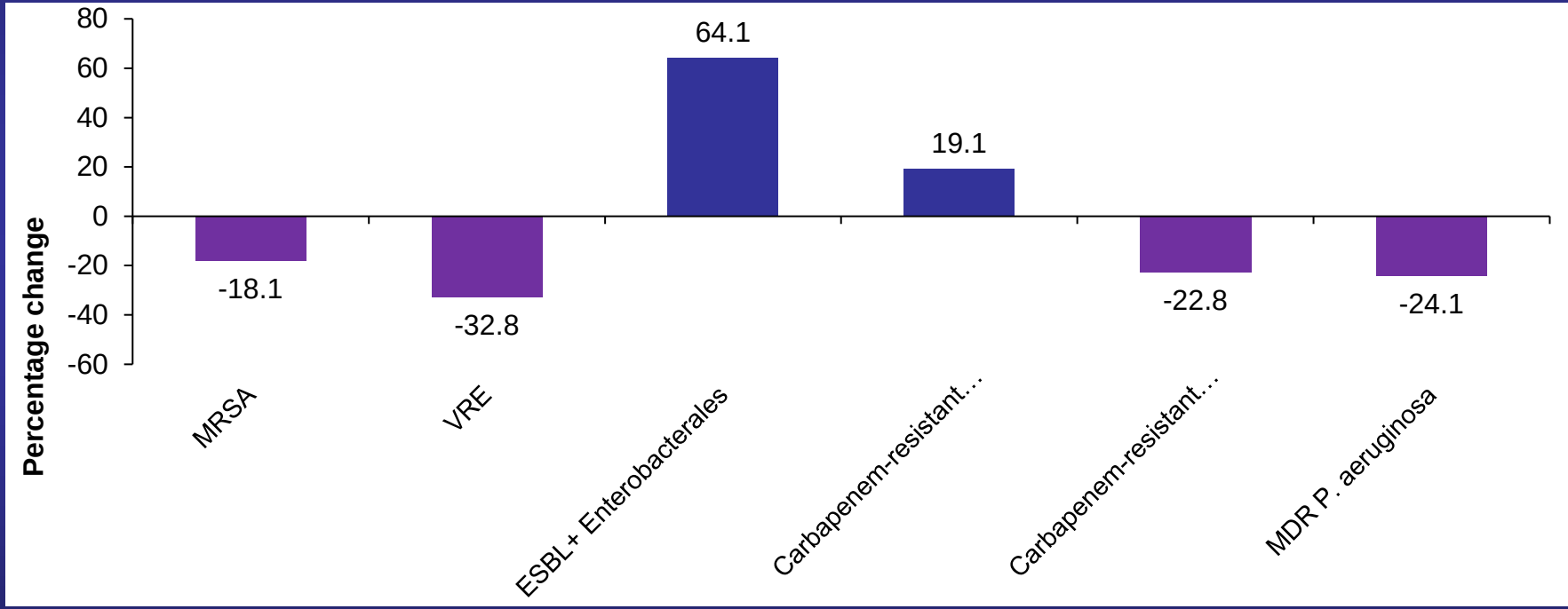
ESBL-producing *Enterobacterales* are a Major Threat in the Community

Percentage change in infections in hospitalized patients caused by selected community-acquired pathogens between 2012 and 2017 in the United States

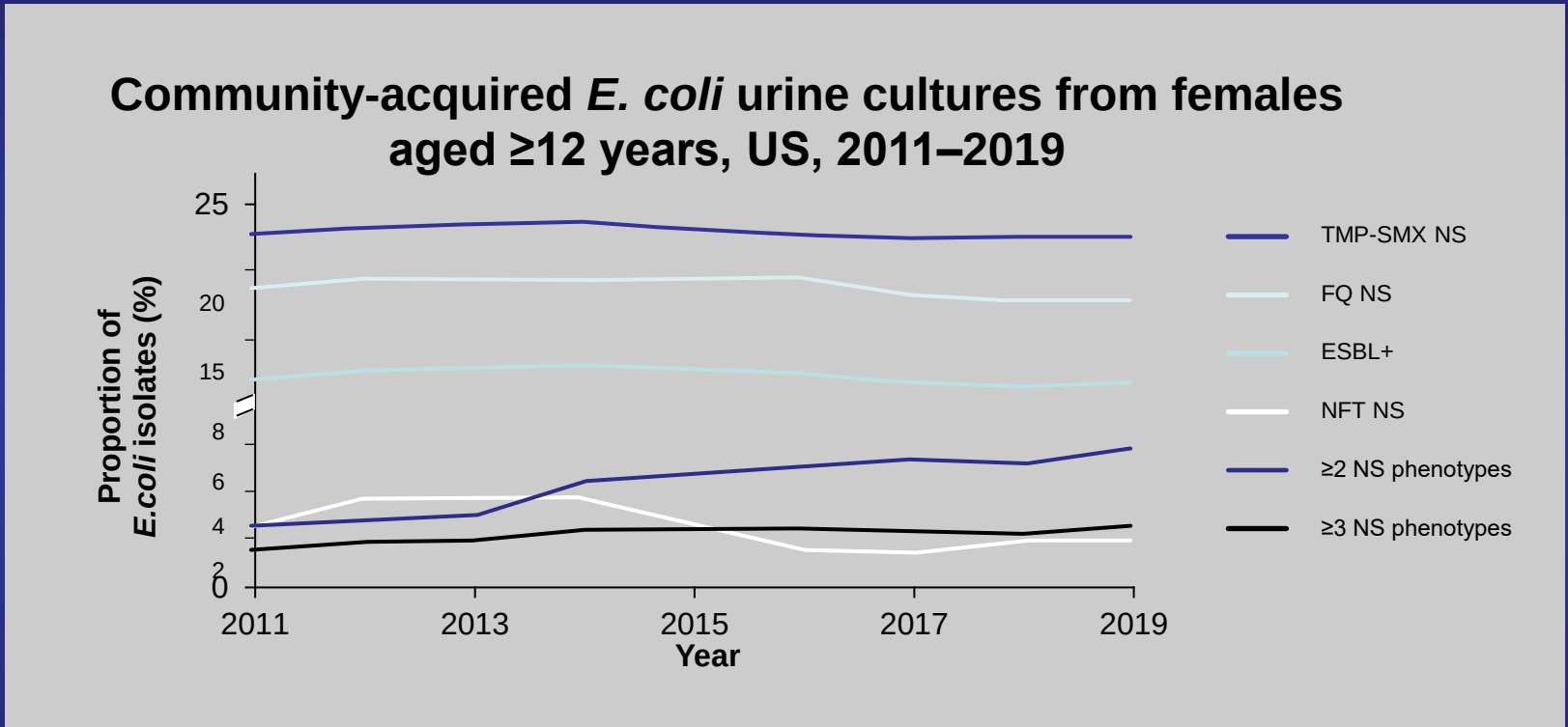


ESBL, extended-spectrum beta-lactamase; MDR, multidrug resistant; MRSA, methicillin-resistant *Staphylococcus aureus*; *P. aeruginosa*, *Pseudomonas aeruginosa*; VRE, vancomycin-resistant *Enterococci*

Jernigan JA, *et al. N Engl J Med* 2020;382(14):1309–1319.

Kaye KS, *et al. Clin Infect Dis* 2021;73(11):1992–1999.

AMR in Community-acquired Urinary *E. coli* Remains High for TMP-SMX, FQ and ESBL+ in the US and is Increasing for Isolates Non-susceptible to ≥2 classes of Antimicrobials



Kaye et al, *Clin Infect Dis* 2021;73(11):1992–1999 AMR, antimicrobial resistance; ESBL+, extended-spectrum beta-lactamase producing; FQ, fluoroquinolone; NFT, nitrofurantoin; NS, non-susceptible; TMP-SMX, trimethoprim-sulfamethoxazole; UTI, urinary tract infection

Co-resistance of Urinary *E. coli* is Common

Community-acquired *E. coli* urine cultures from females aged ≥12 years, US, 2011–2019

Resistance phenotype	No. isolates	ESBL+ (% NS)	FQ (%NS)	TMP-SMX (%NS)	NFT (%NS)	All 4 classes (%NS)
ESBL+	96,306		72.4	56.7	11.9	6.8
FQ	319,354	21.8		51.6	8.0	2.0
TMP-SMX	384,304	14.2	42.9		6.8	1.7
NFT	56,954	20.1	44.7	46.0		11.5

- Co-resistance was defined as the presence of 2 or more of the 4 resistance phenotypes assessed
- Among *E. coli* with ESBL+, co-resistance was observed as follows: 72.4% to FQ, 56.7% to TMP-SMX, 11.9% NFT
- Among *E. coli* isolates with FQ resistance, resistance to all 3 other phenotypes was observed in 2.0% of isolates

Kaye KS, *et al*. Poster #2225 presented at IDWeek 2022, October 19–23 2022, Washington, DC.

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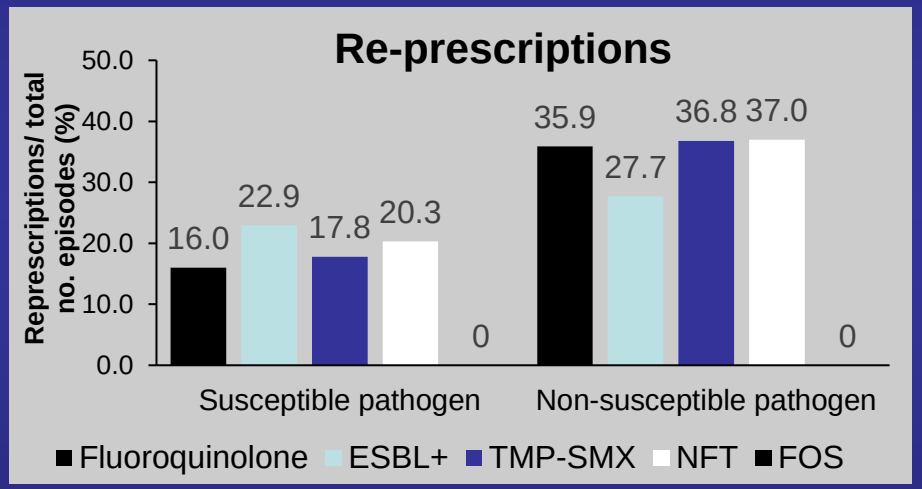
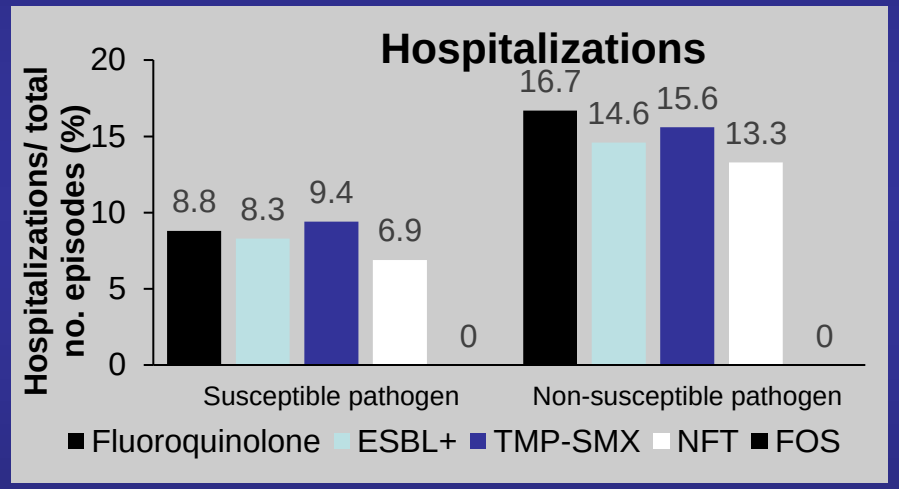
AMR Increases Treatment Failure in Community-acquired UTIs

- 5395 community-acquired UTI episodes[a] caused by *Enterobacterales*
- Treatment failure[b]: 34.3% in patients treated empirically with an antibiotic to which the pathogen was non-susceptible vs 18.9% of patients treated with an antibiotic to which the pathogen was susceptible





[a]Both uncomplicated and complicated UTIs. [b]Treatment failure defined as receipt of a subsequent antibiotic prescription within 28 days of the initial prescription or a UTI-related hospitalization within 28 days of the initial prescription.
AMR, antimicrobial resistance; ESBL+, extended-spectrum beta-lactamase producing; FOS, fosfomycin; NFT, nitrofurantoin; UTI, urinary tract infection

Dunne MW, *et al*. *Microbiol Spectr* 2022;10(1):e02359-21.

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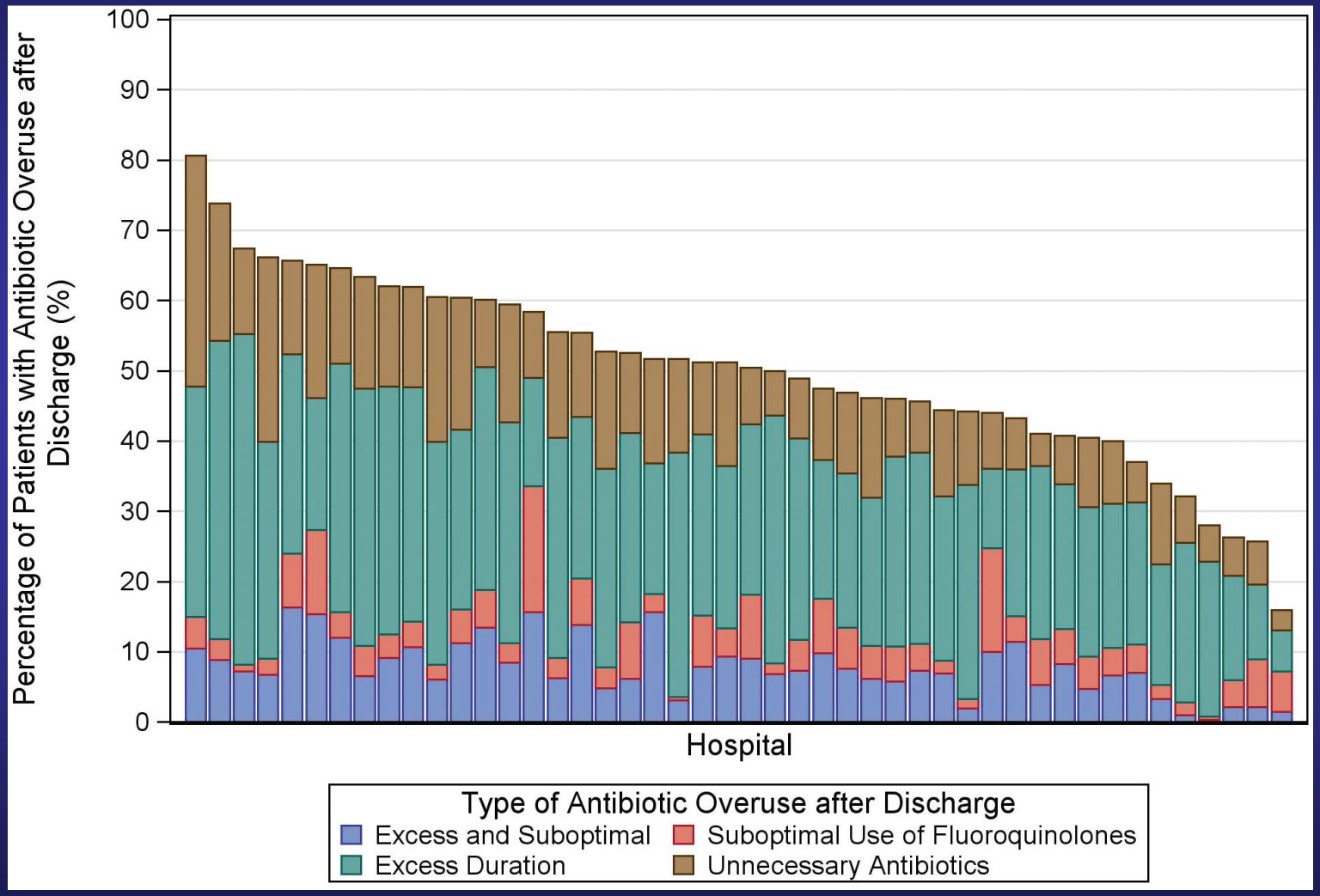
Antibiotic Overuse in the Post-Discharge Setting

- VA experience: 20% of patients discharged are prescribed an oral antimicrobial, and 40% of the therapy is administered in the post acute setting
- Chavada et al: > 70% of inappropriate prescribing driving by prolonged durations of therapy
- Post-discharge antibiotic therapy often discordant with national, institutional guidelines

Feller et al, CMI, 2020, 327-332; Chavada et al, BMC Infect Dis, 2018; Patel et al, J of Amer College of Clin Pharm, 632-43

Antibiotic Overuse at Discharge

- Multi-center study: among patients treated for UTI or pneumonia, 49.1 % had inappropriate post-discharge antibiotics



Vaughn et al, Clin Infect Dis, 2021, e4499-e4506

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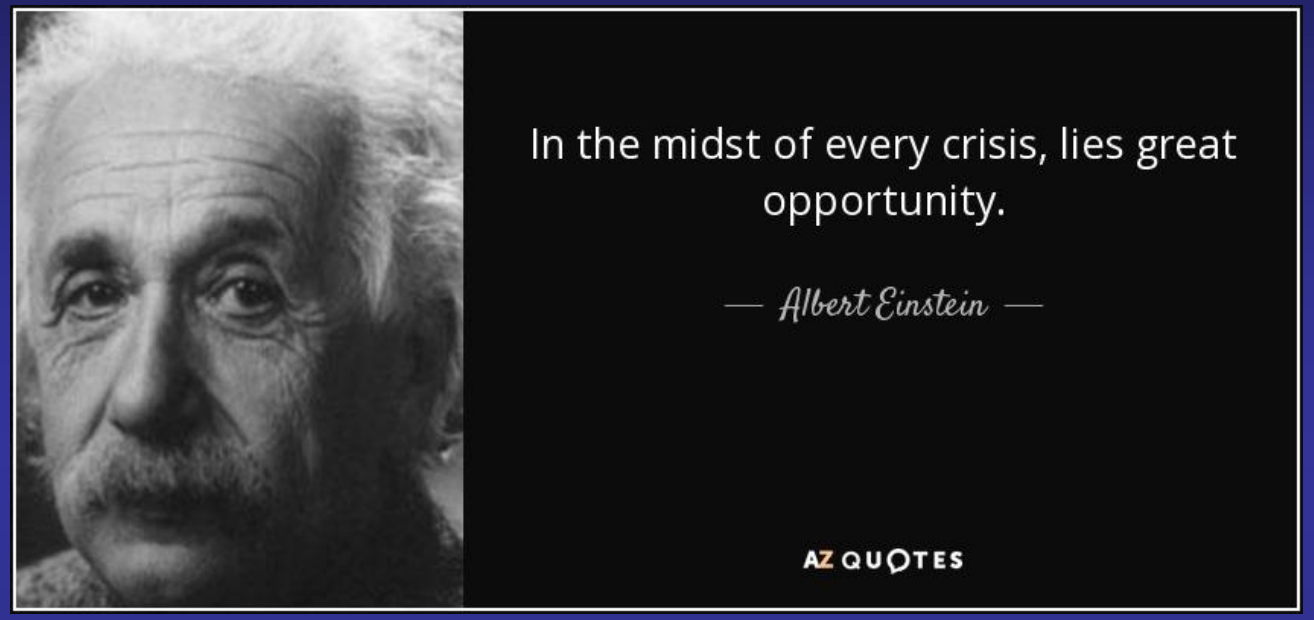
Crisis of Resistance in Community + Inappropriate Antibiotic Use at Discharge = Opportunity



- TOC represents opportune moment to antimicrobial utilization prior to discharge
- Pharmacists, stewardship personnel well-positioned to address TOC antimicrobial optimization
- There are opportunities other than OPAT!

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Shorter Is Better

Diagnosis	Short (d)	Long (d)	Result	#RCT
CAP	3-5	5-14	Equal	14
Atypical CAP	1	3	Equal	1
Possible PNA in ICU	3	14-21	Equal	1*
VAP	8	15	Equal	2
cUTI/Pyelonephritis	5 or 7	10 or 14	Equal	9**
Intra-abdominal Infection	4	10	Equal	2
GNB Bacteremia	7	14	Equal	3†
Cellulitis/Wound/Abscess	5-6	10	Equal	4‡
Osteomyelitis	42	84	Equal	2
Osteo with Removed Implant	28	42	Equal	1
Debrided Diabetic Osteo	10-21	42-90	Equal	2φ
Septic Arthritis	14	28	Equal	1
AECB & Sinusitis	≤5	≥7	Equal	>25
Neutropenic Fever	AFx72 h	+ANC>500	Equal	1
Post Op Prophylaxis	0-1	1-5	Equal	55Ψ
P. vivax Malaria	7	14	Equal	1

Total: 16 Conditions **>120 RCTs**

*Infiltrate on CXR but low CPIS score (≤6), both ventilated and non ventilated, likely CAP, HAP, and VAP combined; **2 RCT included males, the smaller one found lower 10-18 d f/up cure in males with 7 days of therapy but no difference at longer follow-up, larger exclusive male study found no diff in cure; †GNB bacteremia also in UTI/cIAI RCTs; ‡3 RCTs equal, 1 (low dose oral flucox) ↑relapses 2° endpoint; φall patients debrided, in 1 study total bone resection (clean margins); ΨIncludes meta-analysis of 52 RCTs; refs at https://www.bradspellberg.com/shorter-is-better

Shorter Is Better | mysite (bradspellberg.com)

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Where to Start: Gap Analysis, Education

- https://www.henryford.com/-/media/files/henry-ford/hcp/antimicrobial-stewardship-transitions-of-care/amstoc-gapanalysis.pdf

- Centers for Disease Control and Prevention. Implementation resources for hospitals: Available from https://www.cdc.gov/antibiotic-use/core-elements/hospital/implementation.html

Keys to Successful Implementation of TOC Stewardship Program

- Initially target collaborative units with strong leadership
- Identify good disease/duration targets (e.g. CAP, UTI), populations at high readmission risk, antibiotics with safety concerns
- Prescribing targets for optimization include duration, inappropriate use, dosage, antibiotic choice
- Can utilize a variety of different types of pharmacists, stewardship personnel, pharmacist extenders
- Getting support from C-suite: focus on patient safety, readmission risk, positive press and reputation

Patel et al, J of Amer College of Clin Pharm, 2022, 632-43

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Barriers (and Approaches) to Successful TOC Stewardship Implementation

- Extra time and resources (buy in from C-suite, clinical champions; start small/pilot programs; leverage IT)
- Coverage during weekends and off-hours time (plan ahead of time; documentation; delegate TOC responsibilities)
- Communication with physicians/providers - needs to be timely (collaborative rounding; utilize secure messaging and protocols)
- Acceptance and participation –i.e. buy-in from providers (multi-disciplinary teams; share success stories; physician champions)

Patel et al, J of Amer College of Clin Pharm, 2022, 632-43

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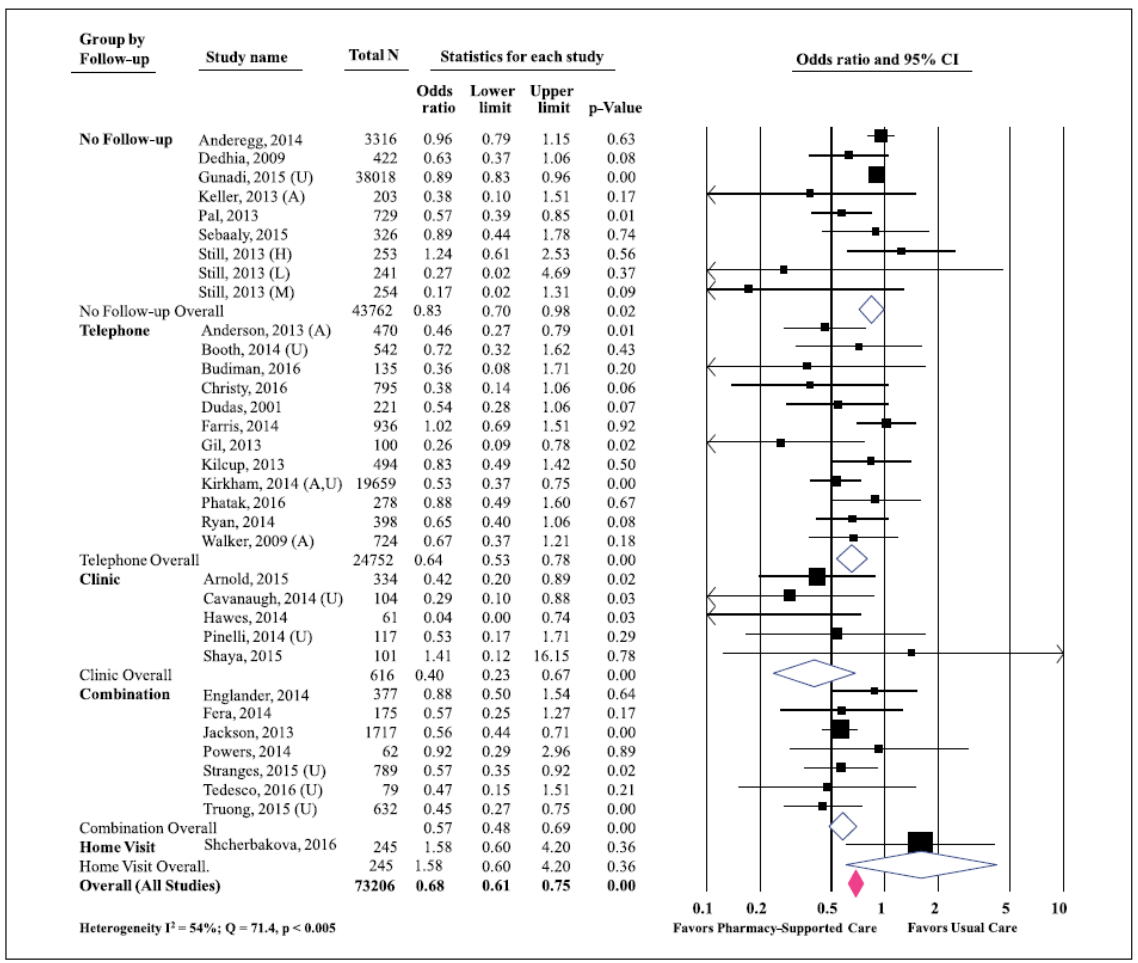
TOC Stewardship Interventions Can ↓ Readmissions!



Group by Follow-up	Study name	Total N	Odds ratio	Lower limit	Upper limit	p-Value
No Follow-up	Anderegg, 2014	3316	0.96	0.79	1.15	0.63
	Dedhia, 2009	422	0.63	0.37	1.06	0.08
	Gunadi, 2015 (U)	38018	0.89	0.83	0.96	0.00
	Keller, 2013 (A)	203	0.38	0.10	1.51	0.17
	Pal, 2013	729	0.57	0.39	0.85	0.01
	Sebaaly, 2015	326	0.89	0.44	1.78	0.74
	Still, 2013 (H)	253	1.24	0.61	2.53	0.56
	Still, 2013 (L)	241	0.27	0.02	4.69	0.37
	Still, 2013 (M)	254	0.17	0.02	1.31	0.09
No Follow-up Overall		43762	0.83	0.70	0.98	0.02
Telephone	Anderson, 2013 (A)	470	0.46	0.27	0.79	0.01
	Booth, 2014 (U)	542	0.72	0.32	1.62	0.43
	Budiman, 2016	135	0.36	0.08	1.71	0.20
	Christy, 2016	795	0.38	0.14	1.06	0.06
	Dudas, 2001	221	0.54	0.28	1.06	0.07
	Farris, 2014	936	1.02	0.69	1.51	0.92
	Gil, 2013	100	0.26	0.09	0.78	0.02
	Kilcup, 2013	494	0.83	0.49	1.42	0.50
	Kirkham, 2014 (A,U)	19659	0.53	0.37	0.75	0.00
	Phatak, 2016	278	0.88	0.49	1.60	0.67
	Ryan, 2014	398	0.65	0.40	1.06	0.08
	Walker, 2009 (A)	724	0.67	0.37	1.21	0.18
Telephone Overall		24752	0.64	0.53	0.78	0.00
Clinic	Arnold, 2015	334	0.42	0.20	0.89	0.02
	Cavanaugh, 2014 (U)	104	0.29	0.10	0.88	0.03
	Hawes, 2014	61	0.04	0.00	0.74	0.03
	Pinelli, 2014 (U)	117	0.53	0.17	1.71	0.29
	Shaya, 2015	101	1.41	0.12	16.15	0.78
Clinic Overall		616	0.40	0.23	0.67	0.00
Combination	Englander, 2014	377	0.88	0.50	1.54	0.64
	Fera, 2014	175	0.57	0.25	1.27	0.17
	Jackson, 2013	1717	0.56	0.44	0.71	0.00
	Powers, 2014	62	0.92	0.29	2.96	0.89
	Stranges, 2015 (U)	789	0.57	0.35	0.92	0.02
	Tedesco, 2016 (U)	79	0.47	0.15	1.51	0.21
	Truong, 2015 (U)	632	0.45	0.27	0.75	0.00
Combination Overall			0.57	0.48	0.69	0.00
Home Visit	Shcherbakova, 2016	245	1.58	0.60	4.20	0.36
Home Visit Overall.		245	1.58	0.60	4.20	0.36
Overall (All Studies)		**73206**	**0.68**	**0.61**	**0.75**	**0.00**

Figure 2. Effect of pharmacy-supported care with patient-centered follow-up (telephonic, clinic, combination, home visit, or no follow-up) compared with usual care on 30-day readmissions. No follow-up = pharmacy-supported care without patient-centered follow-up. Combination = 2 or more types of follow-up provided. Home visit = in-home visit by pharmacist. Citations marked with (A) are studies that used multivariate analysis to control for confounders; citations marked with (U) are studies that used admissions, not patients, as the unit of analysis; citations marked with H = high risk patients, M = moderate risk, and L = low risk. Compared with those without a patient-centered follow-up component, clinic visits and combination care showed significant reductions in the odds of readmission ($P = 0.009$ and $P = 0.003$, respectively); however, telephonic interventions were statistically similar ($P = 0.052$). Differences between telephonic, clinic, and combination care were not significant, $P > 0.07$.

Pharmacy-supported TOC interventions resulted in significant reduction in the odds of all-cause 30-day readmission by about 32% (OR = 0.68; 95% CI = 0.61, 0.75)

Rodrigues et al, Annals of Pharmacotherapy2017 Vol. 51(10) 866–889

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Several Examples of Successful TOC Stewardship Programs, Interventions

- Many utilized chart review, local guidelines, stewardship protocols and direct communication with providers
- Utilize audit/feedback in real-time, at time of order prescription
- Working closely with the outpatient pharmacy, case management, and the primary team can improve the accuracy of an anticipated discharge
- Document TOC stewardship recommendations and acceptance

Patel et al, J of Amer College of Clin Pharm, 2022, 632-43

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Original Investigation | Pharmacy and Clinical Pharmacology

Pharmacist-Driven Transitions of Care Practice Model for Prescribing Oral Antimicrobials at Hospital Discharge

Nicholas J. Mercuro, PharmD; Corey J. Medler, PharmD; Rachel M. Kenney, PharmD; Nancy C. MacDonald, PharmD; Melinda M. Neuhauser, PharmD, MPH; Lauri A. Hicks, DO; Arjun Srinivasan, MD; George Divine, PhD; Amy Beaulac, PharmD; Erin Eriksson, PharmD; Ronald Kendall, PharmD; Marilen Martinez, PharmD; Allison Weinmann, MD; Marcus Zervos, MD; Susan L. Davis, PharmD

- Nonrandomized, stepped-wedge design
- Seventeen distinct medicine, surgery, and specialty units from a health system in Southeast
  - One academic tertiary hospital and four community hospitals.
  - Hospitalized adults who had urinary, respiratory, skin and/or soft tissue, and intra-abdominal infections and were prescribed antimicrobials at discharge were included
- Clinical pharmacists identified patients to be discharged with a prescription for oral antimicrobials
  - Collaborated with primary teams to prescribe optimal therapy
  - Academic and community hospitals used stewardship and clinical pharmacists in multidisciplinary rounding model to discuss [illegible] facilitate order entry of the antimicrobials at discharge

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Table 3. Patients Receiving Optimal Prescription at Discharge

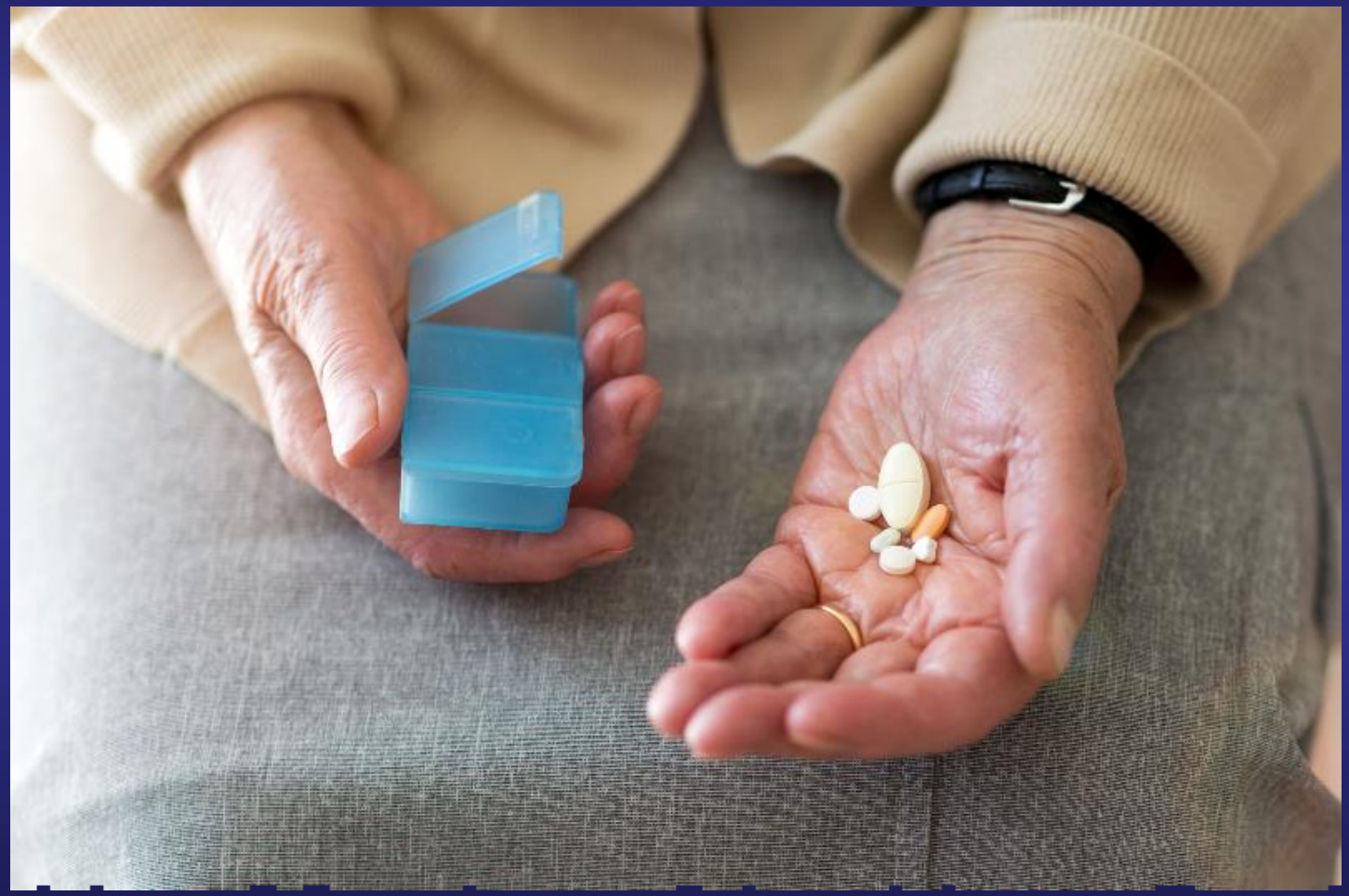
Prescription component	Patient group, No./total No. (%)		Absolute difference, % (95% CI)	Time-adjusted GEE OR (95% CI)
	Preintervention	Postintervention		
Overall	144/400 (36.0)	326/400 (81.5)	45.5 (39.2 to51.3)	5.63 (3.69 to 8.60)
Group 1	14/25 (56.0)	185/225 (82.2)	26.2 (7.0 to 45.8)	1.09 (0.59 to 2.01)
Group 2	59/150 (39.3)	103/125 (82.4)	43.1 (32.2 to 52.7)	3.93 (1.72 to 8.99)
Group 3	71/225 (31.6)	38/50 (76.0)	44.4 (30.0 to 56.5)	5.53 (1.59 to 19.23)
Community hospitals	86/275 (31.3)	73/98 (74.5)	43.2 (32.4 to 52.8)	4.28 (2.10 to 8.69)
Academic hospital	58/125 (46.4)	253/302 (83.8)	37.4 (27.5 to 46.7)	3.27 (1.87 to 5.72)
Components of nonoptimal prescribing throughout antimicrobial therapy course				
Prolonged duration[a]	177/400 (44.2)	37/400 (9.2)	−35.0 (−40.2 to −29.2)	0.17 (0.11 to 0.26)
Treatment for asymptomatic bacteriuria[a]	37/400 (9.2)	10/400 (2.5)	−6.8 (−10.0 to −3.4)	0.31 (0.11 to 0.86)
Nonbacterial upper respiratory tract infection[a]	7/400 (1.7)	1/400 (0.3)	−1.5 (−3.0 to 0)	0.15 (0.03 to 0.86)
Non-guideline-concordant selection[b]	81/400 (20.2)	24/400 (6.0)	−14.3 (−18.8 to −9.6)	0.28 (0.10 to 0.78)
Suboptimal dose[c]	23/400 (5.7)	4/400 (1.0)	−4.8 (−7.3 to −2.2)	0.11 (0.03 to 0.43)
Organism resistant to antimicrobial agent[b]	8/400 (2.0)	2/400 (0.5)	−1.5 (−3.2 to 0.2)	0.37 (0.07 to 2.09)
Duration too short[c]	6/400 (1.5)	6/400 (1.5)	0 (−1.8 to 1.8)	0.63 (0.10 to 4.11)

Table 4. Patient Outcomes

Outcome	Patient group, No. (%)		Absolute difference, % (95% CI)	Time-adjusted GEE OR (95% CI)
	Preintervention (n = 400)	Postintervention (n = 400)		
30-d Mortality	3 (0.7)	6 (1.5)	0.8 (−0.9 to 2.4)	0.80 (0.09 to 7.18)
90-d Mortality	12 (3.0)	11 (2.7)	−0.2 (−2.7 to 2.2)	0.78 (0.36 to 1.71)
30-d Readmission	77 (19.3)	81 (20.3)	1.0 (−4.5 to 6.5)	0.77 (0.60 to 0.98)
Infection related	33 (8.3)	21 (5.3)	−3.0 (−6.5 to 0.5)	0.48 (0.28 to 0.81)
30-d Unplanned office or emergency department visit	105 (26.3)	109 (27.3)	1.0 (−5.1 to 7.1)	0.59 (0.37 to 0.94)
No clinical resolution[a]	50 (16.5)	34 (12.4)	−4.1 (−9.8 to 1.6)	0.91 (0.63 to 1.30)
Any adverse drug event	78 (19.5)	53 (13.3)	−6.3 (−11.4 to −1.0)	1.09 (0.57 to 2.06)
Severe adverse drug event	36 (9.0)	13 (3.2)	−5.7 (−9.1 to −2.4)	0.40 (0.18 to 0.88)
Clostridioides difficile infection	7 (1.7)	2 (0.5)	−1.2 (−2.8 to 0.4)	0.64 (0.11 to 3.64)
MDRO at 90 d	28 (7.0)	10 (2.5)	−4.5 (−7.6 to −1.6)	0.32 (0.15 to 0.71)

Mercuro et al, JAMA Network Open, 2022

Approaches to Stewardship in Long Term Care



DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Parts 405, 431, 447, 482, 483, 485, 488, and 489

[CMS–3260–F]

RIN 0938–AR61

Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities

AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Final rule.

SUMMARY: This final rule will revise the requirements that Long-Term Care facilities must meet to participate in the Medicare and Medicaid programs. These changes are necessary to reflect the substantial advances that have been made over the past several years in the theory and practice of service delivery and safety. These revisions are also an integral part of our efforts to achieve broad-based improvements both in the quality of health care furnished through federal programs, and in patient safety, while at the same time reducing procedural burdens on providers.

DATES: *Effective date:* These regulations are effective on November 28, 2016.

Summary of Core Elements for Antibiotic Stewardship in Nursing Homes

Leadership commitment
Demonstrate support and commitment to safe and appropriate antibiotic use in your facility

Accountability
Identify physician, nursing and pharmacy leads responsible for promoting and overseeing antibiotic stewardship activities in your facility

Drug expertise
Establish access to consultant pharmacists or other individuals with experience or training in antibiotic stewardship for your facility

Action
Implement **at least one** policy or practice to improve antibiotic use

Tracking
Monitor **at least one process** measure of antibiotic use and **at least one outcome** from antibiotic use in your facility

Reporting
Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant staff

Education
Provide resources to clinicians, nursing staff, residents and families about antibiotic resistance and opportunities for improving antibiotic use

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Original Investigation | Infectious Diseases

Implementation of an Antibiotic Stewardship Program in Long-term Care Facilities Across the US

Morgan J. Katz, MD, MHS; Pranita D. Tamma, MD, MHS; Sara E. Cosgrove, MD, MS; Melissa A. Miller, MD, MS; Prashila Dullabh, MD; Therese A. Rowe, DO; Roy Ahn, MPH, ScD; Kathleen Speck, MPH; Yue Gao, MPH; Savyasachi Shah, BDS, MPH; Robin L. P. Jump, MD, PhD

- Leveraged “AHRQ Acute Care Hospital Toolkit to Improve Antibiotic Use” to create a 12-month education-based intervention
- Emphasized importance of teamwork, clinical best practices, and the science of safety to encourage nursing facilities to expand stewardship activities, impact
- Educational bundle delivered through webinars, posters,
- Pocket cards, and virtual office hours with experts
  - Rebranded the “Four Moments of Antibiotic Decision Making” framework for long-term care

Katz et al, JAMA Open Network, 2022; Taylor et al, JAMA Open Network, 2022

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Table 2. Characteristics of Antibiotic Stewardship Programs (ASPs) at Participating Long-term Care Sites at Baseline and End of Safety Program[a]

Assessed domains	Assessed items	Sites, No. (%)		
		Baseline (n = 439)	End of program (n = 367)	*P* value
Accountability	Infection prevention and control nurse involved with ASP	363 (82.7)	341 (92.9)	<.001
	Medical director involved with the ASP	273 (62.2)	257 (70.0)	.02
	Consultant pharmacist working at the facility	420 (95.7)	353 (96.2)	.71
Actions to improve antibiotic use	In-service training to nurses on topics related to antibiotic use	328 (74.7)	331 (90.2)	<.001
	Protocols for diagnosis and treatment of common infection syndromes	287 (65.4)	279 (76.0)	.001
	Antibiotic prescribing recommendations for facility	213 (48.5)	205 (55.9)	.04
	Working with the contracted laboratory to develop antibiogram	194 (44.2)	191 (52.0)	.03
	Postprescription review with feedback of select antibiotics	166 (37.8)	223 (60.8)	<.001
	Formulary restriction of some antibiotics	66 (15.0)	77 (21.0)	.03
	At least one of the above	402 (91.6)	362 (98.6)	<.001
	All activities above	28 (6.4)	41 (11.2)	.02
Antibiotic use tracking	Antibiotic starts	296 (67.4)	327 (89.1)	<.001
	Antibiotic DOT per 1000 resident-days	176 (40.1)	269 (73.3)	<.001
	Defined daily doses per 1000 resident-days	40 (9.1)	89 (24.3)	<.001
	At least one of the above tracking methods	384 (87.5)	358 (97.5)	<.001

Table 3. Changes in Antibiotic Use, Urine Cultures Collected, and *Clostridioides difficile* LabID Events

Outcomes	Rate per 1000 resident-days		Difference (95% CI)	*P* value
	Baseline (n = 410)	End of program (n = 410)		
Antibiotic starts				
All antibiotics	7.89	7.48	-0.41 (-0.76 to -0.07)	.02[a]
Fluoroquinolones	1.49	1.28	-0.21 (-0.35 to -0.08)	.002[a]
Piperacillin-tazobactam	0.09	0.11	0.02 (-0.01 to 0.04)	.13
Third-generation cephalosporins	0.80	0.74	-0.06 (-0.14 to 0.02)	.15
Ceftazidime/cefepime	0.09	0.13	0.04 (-0.004 to 0.08)	.08
Antibiotic days of therapy				
All antibiotics	64.10	61.05	-3.05 (-6.34 to 0.23)	.07
Fluoroquinolones	10.6	9.41	-1.20 (-2.15 to -0.24)	.01[a]
Piperacillin-tazobactam	2.18	3.01	0.83 (-0.17 to 1.84)	.10
Third-generation cephalosporins	5.48	4.72	-0.76 (-1.44 to -0.88)	.03[a]
Ceftazidime/cefepime	1.41	2.19	0.78 (0.07 to 1.49)	.03[a]
Urine cultures collected	3.01	2.63	-0.38 (-0.61 to -0.15)	.001[a]
Clostridioides difficile LabID events/10 000 resident-days	1.66	1.50	-0.16 (-0.64 to 0.33)	.52

Table 4. Differences in Antibiotic Use Stratified by Facility Engagement

Engagement measure	Nursing homes, No. (%) (n = 439)	Difference per 1000 resident-days (95% CI)	
		Antibiotic starts	Antibiotic days of therapy
Webinars attended[a]			
None	82 (18.7)	0.40 (-0.55 to 1.35)	3.51 (-6.73 to 13.75)
Low (1-7)	254 (57.9)	-0.29 (-0.74 to 0.17)	-1.85 (-6.07 to 2.37)
High (≥8)	103 (23.5)	-1.12 (-1.75 to -0.49)[b]	-9.97 (-15.37 to -4.56)[b]
Webinars attended with educational credit claimed[a]			
None	295 (67.2)	-0.35 (-0.78 to 0.08)	-1.99 (-6.18 to 2.21)
Low (1-7)	83 (18.9)	-0.31 (-1.12 to 0.49)	-2.5 (-9.79 to 4.8)
High (≥8)	61 (13.9)	-0.77 (-1.62 to 0.07)	-7.92 (-14.93 to -0.92)[b]

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Box. The 4 Moments of Antibiotic Decision Making

1. Make the Diagnosis

Does the resident have symptoms that suggest an infection?

2. Cultures and Empiric Therapy

What type of infection is it? Have we collected appropriate cultures before starting antibiotics? What empiric therapy should be initiated?

3. Duration of Therapy

What duration of antibiotic therapy is needed for the resident's diagnosis?

4. Stop, Narrow, Change to Oral

It's been 2-3 days since we started antibiotics. Reevaluate the resident and review results of diagnostic tests. Can we stop antibiotics? Can we narrow therapy? Can we change to oral antibiotics?

Katz et al, JAMA Open Network, 2022

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https://www.ahrq.gov/antibiotic-use/long-term-care/index.htmlhttps://www.ahrq.gov/antibiotic-use/long-term-care/index.html

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Summary and Conclusions

- Antimicrobial resistance and antibiotic overuse are major problems and threats in the outpatient setting
- Implementing TOC stewardship can have positive impact on post-discharge antibiotic prescribing and outcomes
- Stewardship in long-term care remains a challenge, but educational initiatives can be implemented and effective

Questions?

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ACUTE CARE FACILITY PANEL

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Navaneeth Narayanan, Pharm D, MPH, BCIDP

Robert Wood Johnson University Hospital, New Brunswick, NJ

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Over 10 years and counting… Evolution of Antimicrobial Stewardship at RWJ University Hospital–New Brunswick

Navaneeth Narayanan, PharmD, MPH, BCIDP
Infectious Diseases Clinical Pharmacist | Clinical Associate Professor
Robert Wood Johnson University Hospital | Rutgers University

Core Members of RWJUH-NB ASP:
Tanaya Bhowmick, MD | Ahmed Abdul Azim, MD | Arsheena Yassin, PharmD, BCIDP

Robert Wood Johnson University Hospital

- >600-bed tertiary care, academic medical center
- Flagship hospital of RWJBarnabas Health System
  - MICU, CCU, SICU, Neuro ICU, CVICU
  - Level 1 trauma center
  - Medical/surgical oncology and BMT
  - Solid organ transplant
  - Advanced GI services
- Bristol-Myers Squibb Children's Hospital
  - PICU, NICU
  - Hematology/oncology
  - Trauma center

At the start *(2011)*	**Early progress** *(2011-2020)*	**Recent progress** *(2022)*	**Future goals** *(2023-beyond)*
New adult ID MD personnel support	Hospital website	Hospital ID PharmD position (Arsheena Yassin)	Outpatient ASP + OPAT
Evolve current faculty ID PharmD role	Policies/protocols	Core guidelines + updates	↑ Core guidelines
Antimicrobial Stewardship Advisory Committee	Formulary management + susceptibility testing	Prospective audit and feedback	Advanced ID guidelines
Program goals	EMR timeouts + indications	Pharmacist-driven PK optimization	EMR-based clinical decision support
	Metrics + QI	Integration with health system-level work	↑ Medical/hospital staff + patient education
	Guidelines PRN	↑ ID physician faculty	Expansion of dose optimization protocols
	Rapid microbiology diagnostics		Data analyst + metrics dashboards
	Education		Antibiotic allergies
	Pediatric ASP (Peds ID MD)		

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	Education		Antibiotic allergies
	Pediatric ASP (Peds ID MD)		

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AtlantiCare's Antimicrobial Stewardship Program: The Journey Towards Gold Status

AtlantiCare Regional Medical Center (ARMC) Overview

- 567 bed teaching hospital
- Campuses in Pomona (Mainland Campus) and Atlantic City (Atlantic City Campus)

- Mainland Campus
  - Primary Stroke Center
  - Patient Population = Geriatrics and Maternity

- Atlantic City Campus
  - Level II Trauma Center
  - 128th comprehensive stroke center in the United States

- Three PGY-1 Pharmacy residents and student rotations from over 7 colleges of pharmacy.

Antimicrobial Stewardship Program (ASP)

- The Antimicrobial Management Team (AMT) at ARMC is a subcommittee of the Pharmacy and Therapeutics Committee, which includes the ASP. Members include Infectious Disease physicians, Medical staff, Pharmacy, Infection Control / Prevention, Nursing, Laboratory personnel and Corporate administration. The ASP will report findings at AMT and to the System Patient Safety Committee as well as monitoring functions via a scorecard.

- Components of the Antimicrobial Stewardship Program:

1. Antibiotic Sensitivity Surveillance
2. Evidence-based order sets & treatment guidelines
3. Restricted Antibiotic Policies
4. Dose optimization
5. IV to oral antibiotic conversion
6. De-escalation of Antibiotic treatment
7. Required education
8. Monitoring

Antimicrobial Stewardship Program (ASP) at ARMC

- NJDOH Antimicrobial Steward Awards: **2020 Bronze Award, 2021 Silver Award**.
- The ASP has evolved into a centerpiece of clinical activity. Since 2018,18 posters related to antimicrobials and ID were presented at national and local pharmacy and medical conferences.
- In addition to ASP guidance provided by the CDC, IDSA, and The Joint Commission, the NJDOH Antimicrobial Steward Awards application has provided practical direction and ideas for focus for the ARMC stewardship program.
- Our ASP is key initiative of the highest priority as an interdisciplinary team to implement and oversee our Stewardship Program. Activities and functions of the ASP are incorporated into the daily workflow of pharmacists that extend to all areas of the medical center. Pharmacy Residents, students, and technicians all contribute to the ASP at ARMC.

Antimicrobial Stewardship Program (ASP) at ARMC

THANK YOU!

DONALD ALLEGRA, MD

JULIANA QUAD, PHARM D, RPH

#NJ ANTIBIOTICS AWARE
LOCAL STEWARDSHIP LEADERS

St. Clare's Health, Denville and Dover Campus, NJ

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New Jersey Department of Health

CDS

Saint Clare's Health

Denville | Dover | Boonton

Our Journey of Antimicrobial Stewardship

Around the corner. Ahead of the curve.

One step at a time…..

- 1990s- Formulary streamlining of antibiotics
- 2010- First clinical pharmacist hired (1.0 FTE)
  - Saint Clare's Hospital Denville
  - ICU rounding, med/surg chart reviews
- 2011- Started 4-hour piperacillin/tazobactam infusions
- 2012- Second clinical pharmacist hired (1.0 FTE)
  - Saint Clare's Hospital Dover
- 2012- First Antimicrobial Stewardship meeting
  - Quarterly meetings
- 2020- Internal medicine residency established
  - ICU and Med/Surg teaching teams

Case Study #1: Ertapenem

- 2016- Added ertapenem to the outpatient Formulary
  - Single inpatient dose allowed on day of discharge
  - Inpatient orders are automatically converted to meropenem (cost)
- 2019- Implemented extended 3-hour infusion of meropenem
- 2021- Meropenem and ertapenem DUE
  - Cost of ertapenem (generic) decreased
  - *Pseudomonas* sensitivity to meropenem has decreased from 89% to 81%.
  - Ertapenem advantages
    - Once-daily dosing (not extended, fewer pump hours/day)
    - Less pharmacy time to dispense
    - Less nursing time to administer multiple doses per day
    - Narrower coverage (- pseudomonas)

Case Study # 2: Vancomycin

- First identified in 1953
- 2020 revision of therapeutic monitoring guidelines for vanco
- 2022 drug use evaluation of local practice
  - Conclusions
    - 99/100 cases- continuation or d/c at 72 hours based on national guidelines
    - Serum levels were drawn in timely manner and adjusted without significant delay
    - 1/3 patients had a trough target > 15 mg/L
    - Pharmacokinetic modeling was done to demonstrate that a target trough of 10 to 15 mg/L would achieve a desired AUC target of 400 to 600 in 95% of our patients

Rybak MJ, Le J, Lodise TP, Levine DP, Bradley JS, Liu C, Mueller BA, Pai MP, Wong-Beringer A, Rotschafer JC, Rodvold KA, Maples HD, Lomaestro BM. Therapeutic monitoring of vancomycin for serious methicillin-resistant Staphylococcus aureus infections: A revised consensus guideline and review by the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, the Pediatric Infectious Diseases Society, and the Society of Infectious Diseases Pharmacists. Am J Health Syst Pharm. 2020 May 19;77(11):835-864. doi: 10.1093/ajhp/zxaa036. PMID: 32191793.

ACUTE CARE FACILITIES PANEL
QUESTION #1

- **Which stewardship practices would be most beneficial to preventing healthcare associated infections?**

#NJ ANTIBIOTICS AWARE
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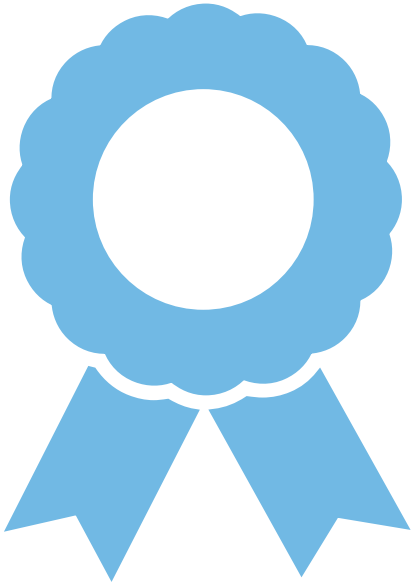
ACUTE CARE FACILITIES PANEL
QUESTION #3

- **Which stewardship protocols are most effective in targeting high-risk MDRO patients and leading to successful outcomes?**



ACUTE CARE FACILITY AWARDEES

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

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ACUTE CARE FACILITY AWARDEES BRONZE

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- Christian Health, Ramapo Ridge Behavioral Health
- Encompass Health Rehabilitation Hospital of Tinton Falls
- Kessler Institute for Rehabilitation Chester
- Kessler Institute for Rehabilitation Saddle Brook
- Kessler Institute West Orange
- Raritan Bay Medical Center
- RWJ Barnabas Health – Hamilton

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ACUTE CARE FACILITY AWARDEES SILVER

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- Bergen New Bridge Medical Center - Acute Care Facility
- Cape Regional Medical Center
- CareWell Health Medical Center
- Deborah Heart and Lung Cancer
- Hackensack Meridian Mountainside Medical Center
- Holy Name Medical Center

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- Rutgers Robert Wood Johnson Medical School
- RWJBH University Hospital Rahway
- Salem Medical Center
- Shore Medical Center
- Trinitas Regional Medical Center

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ACUTE CARE FACILITY AWARDEES GOLD

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- Atlanticare Regional Medical Center
- Bayonne Medical Center
- Bayshore Medical Center
- CentraState Healthcare System
- Chilton Medical Center, Atlantic Health System
- Clara Maass Medical Center
- Cooper University Hospital

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ACUTE CARE FACILITY AWARDEES GOLD

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- Cooperman Barnabas Medical Center
- Hackensack Meridian Health Pascack Valley Medical Center
- Hackensack University Medical Center
- Hackettstown Medical Center
- HMH Riverview Medical Center
- Hunterdon Medical Center
- Inspira Medical Center Elmer

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ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- Inspira Medical Center Mullica Hill
- Inspira Medical Center Vineland
- Jefferson - Cherry Hill Hospital
- Jefferson - Stratford Hospital
- Jefferson - Washington Township Hospital
- Jersey City Medical Center
- Jersey Shore University Medical Center

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ACUTE CARE FACILITY AWARDEES- GOLD

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- JFK Medical Center
- Monmouth Medical Center
- Monmouth Medical Center Southern Campus
- Morristown Medical Center
- Newark Beth Israel Medical Center
- Newton Medical Center
- Ocean University Medical Center

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LOCAL STEWARDSHIP LEADERS

- Overlook Medical Center
- Penn Medicine Princeton Medical Center
- RWJ University Hospital Somerset
- RWJ Barnabas Health - Community Medical Center
- Saint Clare's Health Denville
- Saint Clare's Health Dover
- Southern Ocean Medical Center

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ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

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LOCAL STEWARDSHIP LEADERS

- St. Joseph's University Medical Center
- St. Joseph's Wayne Medical Center
- St. Mary's General Hospital
- University Hospital
- Virtua Marlton Hospital
- Virtua Mount Holly Hospital
- Virtua Our Lady of Lourdes Hospital

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Virtua Voorhees Hospital

Virtua Willingboro Hospital

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POST-ACUTE CARE FACILITY SPEAKERS

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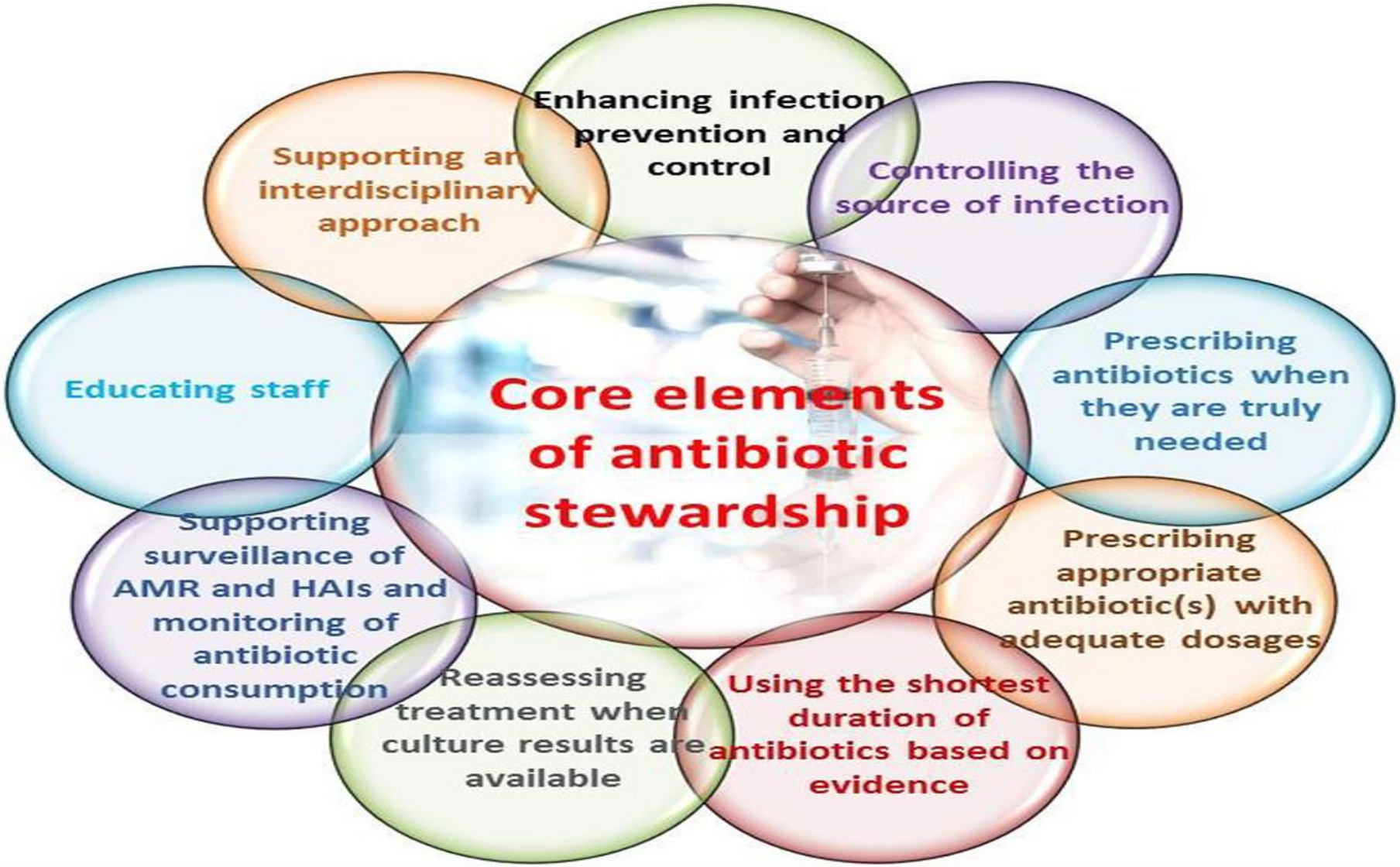
Antibiotic Stewardship Program
Actors Fund Home

Presented by Maria Box, RN, DON

Helen H. Crimmins, RN, ADON/IPN

Actors Fund Home
A residence of the
Entertainment Community Fund



Actors Fund Home
A residence of the
Entertainment Community Fund

- ***INTRODUCTION***
- ***WHAT IS THE MAIN PURPOSE OF STARTING AN ANTIMICROBIAL STEWARDSHIP PROGRAM?***
- ***WHAT DOES ANTIBIOTIC STEWARDSHIP MEAN?***
- ***CORE ELEMENTS OF ASP***
- ***THE ANTIBIOTIC STEWARDSHIP PROGRAM BENEFITS***
- ***WHY IS IT IMPORTANT?***

Actors Fund Home
A residence of the
Entertainment Community Fund

- ***THE KEY TO A SUCCESSFUL ANTIBIOTIC STEWARDSHIP PROGRAM IS:***

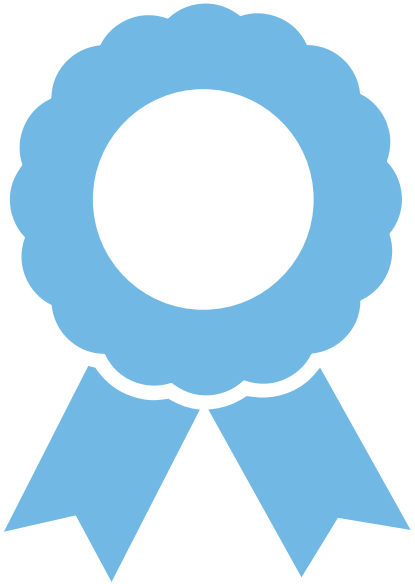
COMMUNICATION, TEAMWORK AND SUPPORT.

References:

https://www.who.int/

https://www.cdc.gov/antibiotic-us

https://www.hopkinsmedicine.org/antimicrobial-stewardship



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POST- ACUTE CARE FACILITY AWARDEES BRONZE

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- Actors Fund Home
- Bridgeway Care and Rehabilitation Center - Bridgewater
- CareOne at Cresskill
- CareOne at Madison
- CareOne at Teaneck
- CareOne at Valley
- Complete Care Woodlands

POST- ACUTE CARE FACILITY AWARDEES BRONZE

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

#NJ ANTIBIOTICS AWARE
LOCAL STEWARDSHIP LEADERS

- Essex County Hospital Center
- Heath Village
- Inglemoor Rehabilitation and Care Center
- Kindred Hospital East New Jersey
- Kindred Hospital Rahway
- Parker at Landing Lane
- Parker at Monroe

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NJCDS New Jersey Communicable Disease Service

POST- ACUTE CARE FACILITY AWARDEES BRONZE

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

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LOCAL STEWARDSHIP LEADERS

- RWJ Barnabas Health Children's Specialized Center
- Springpoint Senior Living at Meadow Lakes
- Tallwoods Care Center
- The Dwelling Place at St. Clare's
- The Manor Health and Rehabilitation Center

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POST- ACUTE CARE FACILITY AWARDEES SILVER

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

- Aristacare at Delaire
- CareOne at Wayne
- Elmora Hills Healthcare and Rehabilitation Center
- Parker at Somerset
- Roosevelt Care Center Edison
- Spring Hills Post-Acute Wayne

POST- ACUTE CARE FACILITY AWARDEES GOLD

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

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Bergen New Bridge Medical Center

Christian Health Care Center

Preakness Healthcare Center

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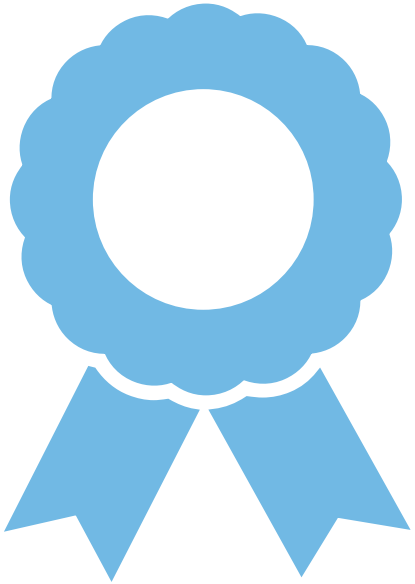

OUTPATIENT FACILITY AWARDEES

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OUTPATIENT FACILITY AWARDEES BRONZE

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

Hunterdon Health

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OUTPATIENT FACILITY AWARDEES SILVER

ANTIMICROBIAL STEWARDSHIP RECOGNITION PROGRAM

Complete Care Health Network

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ANTIMICROBIAL STEWARDSHIP ENHANCEMENTS IN 2023

- Technical assistance calls and webinars
- Virtual, one-on-one meetings
- On-site collaborative efforts
- Attention to entities that may be lacking in resources
- Growth of Antimicrobial Stewardship activities in outpatient settings
- Improved resources in 2023, surpassing all previous levels

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FUTURE DIRECTION OF ANTIMICROBIAL STEWARDSHIP

- Redesign and improvise ASRP application
- Updates from CDC as follows...
  - Hospital Core Elements – Priorities for Hospital Core Element Implementation
  - https://www.cdc.gov/antibiotic-use/core-elements/hospital/priorities.html
- Promote stewardship aspects throughout all healthcare facilities:
  - Collaborative stewardship initiatives with acute and post-acute care facilities
  - Transitions of Care (ToC) stewardship model to enhance facilities to higher levels of care
- Post-ceremony follow-up
  - https://forms.office.com/g/TrdYspZfbj

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THANK YOU

- Please use the following link to obtain your 1 hr of CME/CNE/LNHA/CALA, credits provided by NJHA
  - https://education.njha.com/courses/48817
- Antimicrobial Stewardship Recognition Program- NJDOH Website
  - https://www.nj.gov/health/cd/edu_training/ASP/asp_recognition.shtml
- Contact us at email: abxaware@doh.nj.gov

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