Antimicrobial Stewardship Metrics What to do?

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Disclosure

- I have no actual or potential conflict of interest in relation to this program or presentation

- Commercial Interests:
  - none

There are no standard, universally accepted metrics,

……for assessing the effectiveness of antimicrobial stewardship programs (ASPs)

Akpan. *Antibiotics* 2016;5:5. Dodds Ashley. *Clin Infect Dis* 2014 59(s3:112). Nagel. *Clin Infect Dis* 2014;59(S3):S146.

Goals of ASPs

…….optimal clinical outcomes

……appropriate use

…..limit the selection of antimicrobial resistant strains

ASPs are struggling to identify appropriate measures of success;

Nevertheless……

Accurate measurement is required before any improvement can take place

Morris. *Current Treatment Options in Infectious Diseases* 2014; 6:101.
Reddy. *Expert Rev Anti Infect Ther*; 2015; 13:843

Step-back….

Can we learn from other programs that have demonstrated the value of their efforts?[1]

Infection Control, in 2016….

…interventions that prevent bloodstream infections can be of high value…specifically;

- 57% fewer bloodstream infections
- Net savings: $1.85 million/hospital over 3 years[2]

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[1]Schwartz. *Clin Infect Dis* 2016; 63:450. [2]Nuckols. Economic evaluation of quality improvement interventions for bloodstream infections related to central catheters. A systematic review. *JAMA Intern Med*. 2016;176(12):1843.

Objectives

1. Review milestones in the emergence of Infection Control Programs (ICPs); focusing on the development of metrics for ICPs.

2. Review Joint Commission's expectations for ASPs with respect to metrics.

3. Review for ASPs:
   - Commonly recommended process and outcome metrics
   - Selecting process measures and performance metrics to measure the performance of ASP's interventions.

4. Review knowledge gaps in the area of ASP metrics.

Infection Surveillance and Control Programs (ISCPs)

50+ years*… and *<u>still</u> evolving….

Infection Surveillance and Control Programs (ISCPs)

- 1950s – 60s
  - *Staphylococcal* pandemic (pcn- resistant *S. aureus)*

    "Antibiotic resistance became a serious problem."

  - Voluntary formation of Infection Control Programs
- 1960s
  - CDC recommends regular surveillance
  - Data collection to *inform* rational infection control measures

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Wise. *Rev Infect Dis* 1989; 11:1005. Haley. *Am J Epidemiol* 1985; 121:182. Dixon. *MMWR* 2011; 60:58.

1960s-70s
Who will fund these programs?

Inadequate evidence to mandate infection control programs

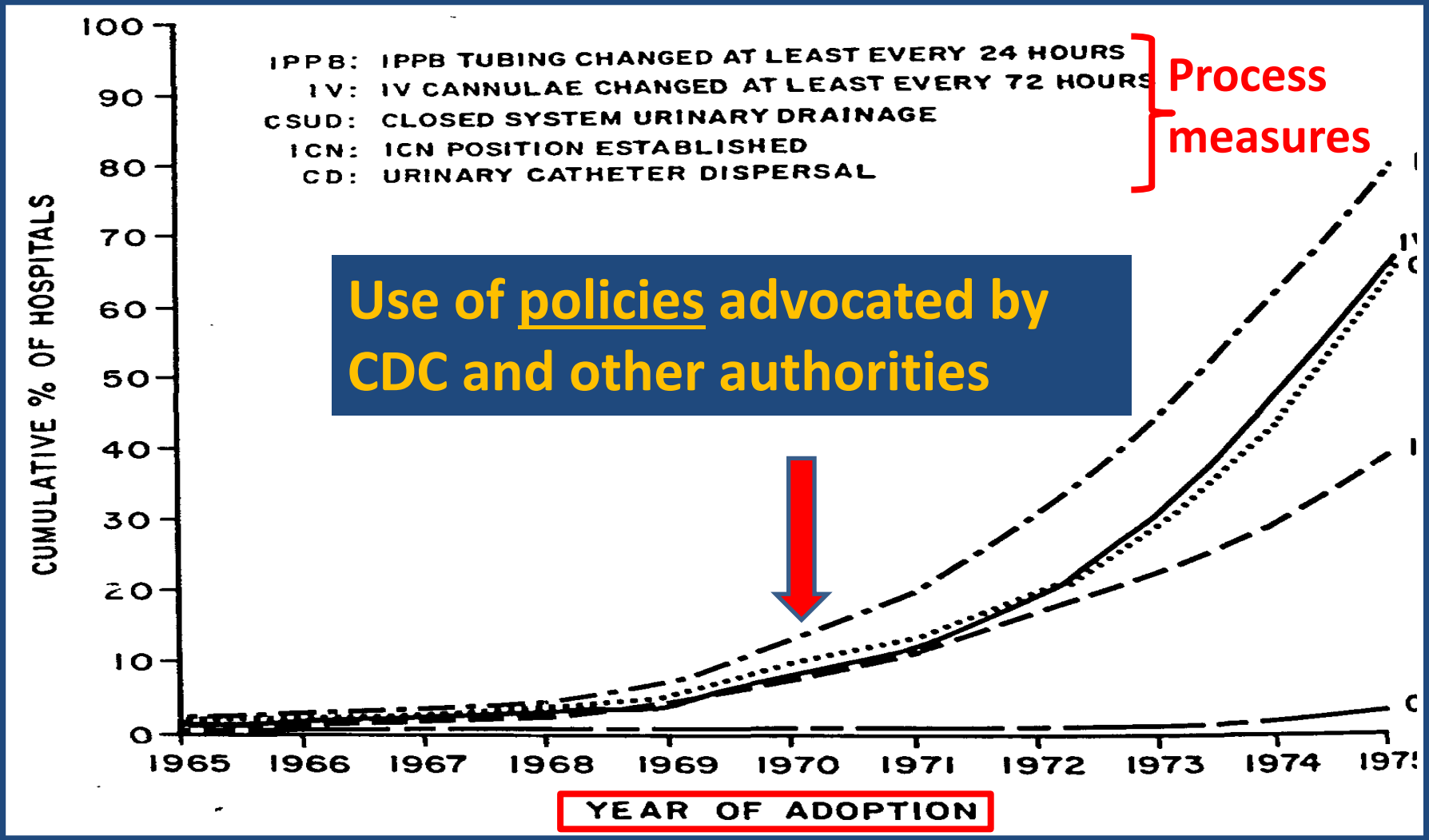
Haley. *Am J Epidemiol* 1985; 121:182. Dixon. *MMWR* 2011; 60:58.

Study on the Effectiveness of Nosocomial Infection Control **(SENIC)** Project[1,2] (CDC 1970-76)

Infection control program	Outcome Hospital infection rate
Effective[3]	**32% reduction**
Not effective	**18% increase**

[1]Haley. *Am J Epidemiol* 1985; 121:182. [2] Dixon. *MMWR* 2011; 60:58. [3]**"Control index" measures the intensity of efforts to intervene to reduce infection risk.** Effective program elements: trained personnel, surveillance, active preventive interventions, regular reporting surgical wound infection rates to surgeons.

THE EMERGENCE OF INFECTION SURVEILLANCE AND CONTROL PROGRAMS IN US HOSPITALS: AN ASSESSMENT, 1976



Haley. *Am J Epidemiol* 1980; 111:574.

1976

Joint Commission Standard for Infection Surveillance & Control Programs

2017

Joint Commission Standard for

Antimicrobial Stewardship Programs

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Joint Commission 2017

What type of antimicrobial stewardship data should organizations collect, analyze, and report?

….<u>not</u> requiring any specific antimicrobial stewardship data

…….the <u>organization</u> must determine the antimicrobial stewardship data it will collect, analyze, and report

*Where to start……**<u>performance metrics</u>***

https://www.jointcommission.org/assets/1/6/New_Antimicrobial_Stewardship_Standard.pdf

Good faith effort to foster ***real quality*** improvement

Efforts should not…..

……create incentives for providers to improve *measured* performance,

…without truly improving *quality* of care

”Not just a “checkbox”

Nathwani. *J Hosp Infect* 2003; 50:165. https://www.ncbi.nlm.nih.gov/books/NBK43831/

Performance metrics - *Imperatives for ASPs*

Focus on an area of an ASP that is:

- *Important/problematic* to the organization
- Marked *variation* in practice
- Good evidence to support a practice which can be *simply* measured

Nathwani. *J Hosp Infect* 2003; 50:165.

Performance metrics – case study

- Piperacillin/tazobactam plus vancomycin
  - associated with a higher risk for nephrotoxicity
  - compared to alternative beta-lactams plus vancomycin[1,2]
- Commonly used antibiotic regimen

[1]Navalkele. *Clin Infect Dis* 2017; 64:116. [2]Hammond. *Clin Infect Dis* 2017; 64:666.

Steps to Quality Improvement[1,2,3]

WHAT are we trying to accomplish?

Avoid PT-V, promote Cef-V, +/- metro[4]

WHY is it important?

Nephrotoxicity risk

WHO is the specific target population?

Adult ED and hospitalized patients

WHEN will this be carried out?

HOW will this be carried out?

WHAT is the data source?

[1]McGowan. *J Antimicrob Chemother* 2016; 71:2370. [2]Rubin. *Int J Quality in Health Care* 2001; 6:489. [3]McGlynn. *Am J Prev Med* 1998; 14(3S):14. [4]PT-V (piperacillin/tazobactam plus vancomycin; Cef-V, +/- metro (cefepime plus vancomycin, +/- metronidazole)

Steps to Quality Improvement (cont)

- WHAT are our measureable goals?

	Pre-intervention	Post-intervention
% cases on PT-V		
% cases on Cefepime-V, +/- metronidazole		

- HOW will we know our changes are working?
  - Less nephrotoxicity
  - Requires risk-adjustment for nephrotoxicity

Steps to Quality Improvement (cont)

- HOW do we know if the intervention is harmful?

  (Measure unintended consequences)

  - Omitting metronidazole when indicated e.g., intra-abdominal infections (cefepime-based)
  - Change in *C. difficile* incidence
  - Rates of super-infection due to *Enterococcus*, ESBL-producing gram-negatives

Unintended consequences (cont)

Intervention	Unintended consequences
Targeting specific agents e.g., reduce piperacillin/tazobactam	Increase in use of other agents, especially agents with a similar spectrum Increase use of other anti-pseudomonal agents (e.g., cabapenems)
Surgical prophylaxis[1] Replace cephalosporins with gentamicin	Increased gentamicin nephrotoxicity

[1]Weeraporn. Ann Transl Med 2017; 5:100.

Steps to Quality Improvement (cont)

HOW completely was the intervention implemented?

$$\% \text{ implemented} = \frac{\text{\# cases assessed}}{\text{Total \# of cases}} \times 100$$

Steps to Quality Improvement (cont)

Validity of data - **alternate reasons for results**

Example: Intervention reduces specific antibiotic usage

- Intervention
- Shorter length of stay
- Fewer admissions
- Switch to other antibiotics
  - Assessing overall antibiotic use can help sort this out

Reason for reduction in usage?

Your experience with a Joint Commission survey of your ASP?

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Quality Improvement

Defining key processes for improvement and metrics to monitor performance

Processes

- Interventions
- Quality indicators

Demonstrated *linkage* to improve outcome

Outcomes

Dodds Ashley. *Clin Infect Dis* 2014;59(S3):S112. Porter. *JAMA* 2016; 316:1047.

Resources: Process and Outcome Metrics

Hospitals

- Core Elements[1]
- National Quality Partners Playbook on Antibiotic Stewardship[2]
- Systematic review of Quality Indicators[3]

Nursing Homes

- Core Elements[4]

Outpatient

- Core Elements[5]

[1] https://www.cdc.gov/getsmart/healthcare/pdfs/core-elements.pdf.
[2] http://www.qualityforum.org/Publications/2016/05/National Quality_Partners_Playbook__Antibiotic_Stewardship_in_Acute_Care.aspx.
[3]https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html. [4]WP1A quality indicators and quantity metrics of antibiotic use. 2016. Available from: http://driveab. eu/wp-content/uploads/2014/09/WP1A_Final-QMs-QIs_final.pdf. [5]https://www.cdc.gov/mmwr/volumes/65/rr/rr6506a1.htm

Infection-specific quality indicators

- Pneumonia[1,2]
- Sepsis[3]
- Urinary tract[4]
- Appropriate antibiotic use in hospitalized adults[5]

Expert consensus

- Guideline adherence
- Obtain cultures
- Targeted therapy
- Others

[1]Nathwani. *Clin Infect Dis* 2002; 34:318. [2]Schouten. *Clin Infect Dis 2005;* 41:450. [3]van den Bosch. *BMC Infect Dis* 2014; 14:345. [4]Spoorenberg. *Clin Infect Dis* 2014;58:164 . [5]van den Bosch. *Clin Infect Dis* 2015;60(2):281.

Quality of Antimicrobial Prescribing[1,2]

- Diagnostic criteria
- Empiric therapy
- Obtain cultures
- Culture-directed therapy
- Redundant regimen[2]
- IV/PO
- Document indication
- Duration of therapy

*

No consensus on what combination of these metrics constitutes "quality prescribing"

[1]van den Bosch. *Clin Microbiol Infect* 2016; 888e1. [2] Schultz. *Infect Control Hosp Epidemiol* 2014; 35:1229.

Test the utility of the quality indicator *before* widespread adoption[1,2]

Applicability of generic quality indicators for appropriate antibiotic use in daily hospital practice: a cross-sectional point-prevalence multicenter study

C.M.A. van den Bosch [1,*], M.E.J.L. Hulscher [2], S. Natsch [3], J. Wille [4], J.M. Prins [1], S.E. Geerlings [1]

4 /11 previously selected quality indicators were not clinically useful metrics

- Low applicability
- Low improvement potential
- Feasibility[3]

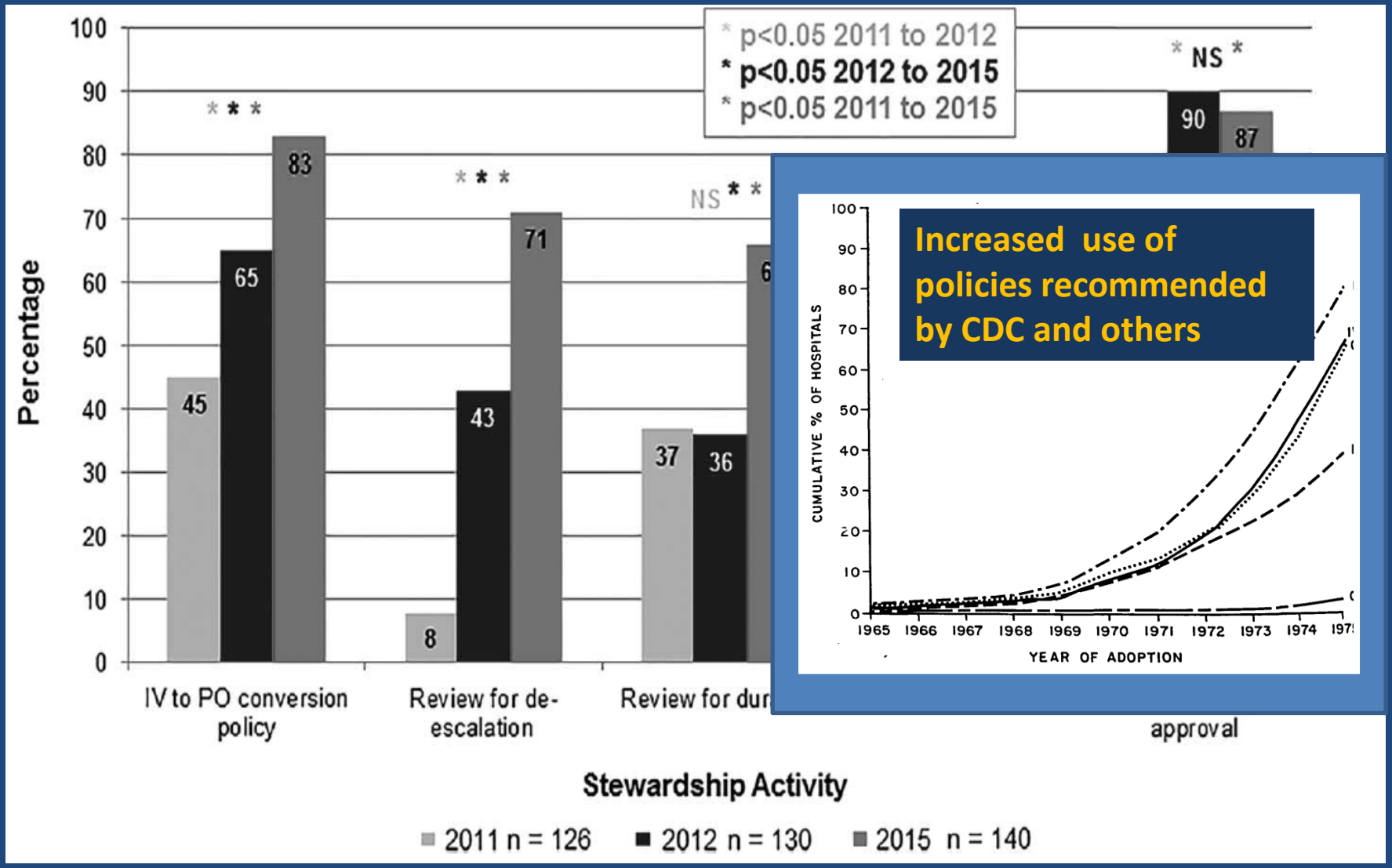
[1]van den Bosch. *Clin Microbiol Infect* 2016; 22:888.e1. [2]van den Bosch. *Clin Infect Dis* 2015;60(2):281. [3]Moehring. *Clin Infect Dis* 2017; 64:377.

Which intervention (process measure) should be selected?

<u>Tailor</u> interventions to the most important issues at your site

Benchmarking Process Measures
Are there data?

Benchmarking Process Measures
Veterans Health Administration (VHA)



Kelly. *Infect Cont Hosp Epidemiol* 2017,38:513.

"VHA is blazing a trail to improve patient safety through better antibiotic use"

… and working with the CDC to advance the science of using antibiotic use data to ***guide action***

Srinivasan. *Infect Control Hosp Epidemiol* 2017,38:522.

Quality Improvement

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Processes

- Interventions
- Quality indicators

Demonstrated *linkage* to improve outcome

Outcomes

Dodds Ashley. *Clin Infect Dis* 2014;59(S3):S112. Porter. *JAMA* 2016; 316:1047.

Outcomes[1,2]

- **Antibiotic use measures**
- **Patient outcomes**
  - Mortality, LOS
  - Infection-related mortality
  - Unintended consequences (eg: *C. difficile*)
  - Not showing harm[3]
  - Conservable antibiotic days[4]
  - Unplanned readmission[5]
  - Unnecessary FQ days[5]
- **Resistance**
- **Cost (value of healthcare)**

[1]Dodds Ashley. *Clin Infect Dis* 2014; (suppl 3):S112. [2]Schuts. *Lancet Infect Dis* 2016; 16:847. [3]Moehring. *Clin Infect Dis* 2017; 64:377. [4]Morris. *Infect Control Hosp Epidemiol* 2012; 33:500. [5]Werner. *BMC Infect Dis* 2011; 11:187.

Antibiotic use measures

National Healthcare Safety Network (NHSN)

- Antibiotic use (AU)

- Standardized Antimicrobial Administration Ratio (SAAR)

Application of NHSN data
Aggregate data

Helps an organization *focus resources*:

- an antibiotic or class of antibiotics
- that appear to be an outlier
- when compared with other facilities

* ***Your experiences with NHSN data?***

Reddy. *Expert Rev Anti Infect Ther 2015;* 13: 843.

Antibiotic Use (AU) calculation

$$AU = \frac{\text{Days of therapy (DOT)}}{\text{Days present}^{1} \ \underline{\textit{or}} \ \text{Admissions}^{2}}$$

[1]Number of days patient spent any time in a specific unit or facility
[2]Number of patients admitted to an inpatient location in the facility

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

Standardized Antimicrobial Administration Ratio[1]

Risk-adjusted

- Patient mix
- Hospital characteristics

SAAR Value =

$$\frac{\text{Observed number of abx days}}{\text{Predicted}^{2}\text{ number of abx days}}$$

[1] Each SAAR is an observed to predicted ratio for a combination of antibiotics and patient care locations. SAAR (>1.0) indicates more AU than predicted; i.e., achieves statistical significance (different than 1.0). [2]Statistically estimated from nationally aggregated data.

Application of SAARs

A Novel Metric to Monitor the Influence of Antimicrobial Stewardship Activities (SAAR)

Daniel J. Livorsi, MD, MSc;[1,2] Erin O'Leary, MPH;[3] Tamra Pierce, PharmD;[4] Lindsey Reese, MD;[4] Katharina L. van Santen, MSPH;[3] Daniel A. Pollock, MD;[3] Jonathan R. Edwards, MStat;[3] Arjun Srinivasan, MD[3]

Prospective audit and feedback program:

- implementation of processes to ***reduce broad-spectrum agents***
- greater involvement of an ID physician

……associated with reduction in SAAR values across multiple antimicrobial categories

Livorsi. *Infect Control Hosp Epidemiol* 2017; 38:721.

Application of SAARs
(Declines in broad-spectrum use, p <.001)

Findings consistent with efforts to:

- Encourage the prescription of more narrow-spectrum agents
- Not associated with increased LOS or mortality

Livorsi. *Infect Control Hosp Epidemiol* 2017; 38:721. Non-significant change between 2015-2014 of broad-spectrum antibiotics (BSA) for community infections, and all antibiotics.

Application of NHSN data (Aggregate data) (cont)

Does not:

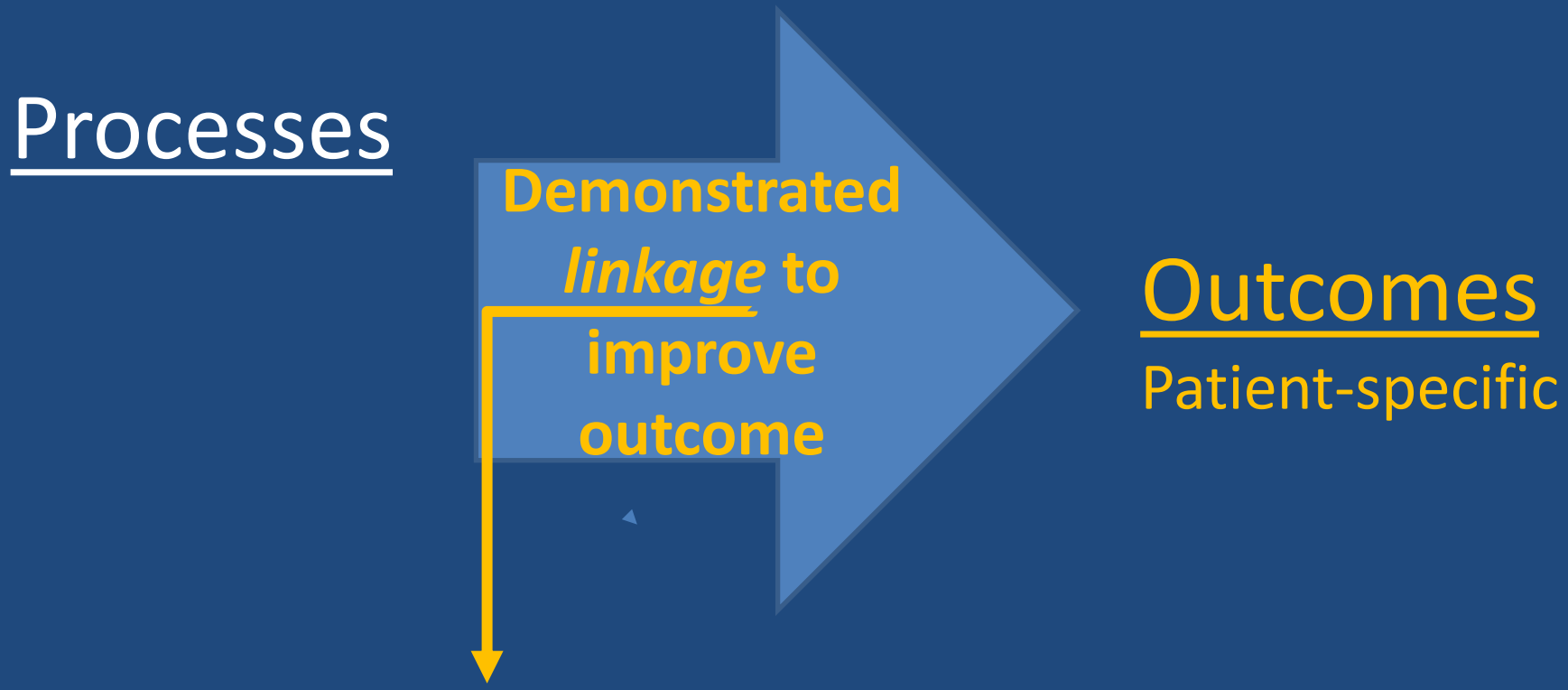
- Inform about the appropriateness (quality) of antimicrobial prescribing

Reddy. *Expert Rev Anti Infect Ther 2015;* 13: 843.

Outcomes

Patient-specific outcomes

Metrics and quality improvement



Mainz. *Int J for Quality in Health Care* 2003; 15:523.

Current evidence on hospital antimicrobial stewardship objectives: a systematic review and meta-analysis

Schuts. *Lancet Infect Dis* 2016; 16:847.

- Clinical outcomes (mortality, LOS)
- Adverse events
- Bacterial resistance rates
- Costs

Literature search

Quality indicators for appropriateness of antibiotic use

Is there a link?

Pre-determined outcomes:

- Clinical outcomes (mortality, LOS)
- Adverse events
- Bacterial resistance rates
- Costs

Schuts. *Lancet Infect Dis* 2016; 16:847.

Literature search identified 14 quality indicators

Source	Comments	Number of Quality Indicators
Expert consensus – RAND-modified Delphi procedure[1]	Serial review of the literature & discussion, amongst experts	Examples • Empirical antibiotic therapy per local guide • De-escalation • ID Consultation • Others
Expert consensus – Antimicrobial stewardship consensus meetings [2]		
Total		

[1] RAND: research and development corporation. van den Bosch. *Clin Infect Dis* 2015;60(2):281. [2] Dellit. *Clin Infect Dis* 2007; 44:159 or stewardship guideline development group.

Next…Reviewed studies reporting the impact of the 14 quality indicators, on pre-defined outcomes*

Mortality, LOS
Adverse events
Bacterial resistance rates
Costs

Inclusion

- Hospital or long-term facilities, adults
- Randomized or non-RCTs controlled trials, until April 2014
- Interrupted time series
- Observational studies

Methods

- Pooled outcome data irrespective of study design or type of disorder
- Analyses to assess the risk for bias

Schuts. *Lancet Infect Dis* 2016; 16:847.

Results

No published data identified of the impact of ASPs for the following……*future study?*

Specific quality indicators (n=5)

1. Documented antibiotic plan
2. Blood cultures
3. Cultures from the site of infection
4. Local guide in agreement with national guidelines
5. Assessment of patients' adherence

Facility type

Stewardship objectives for long-term care facilities

Schuts. *Lancet Infect Dis* 2016; 16:847.

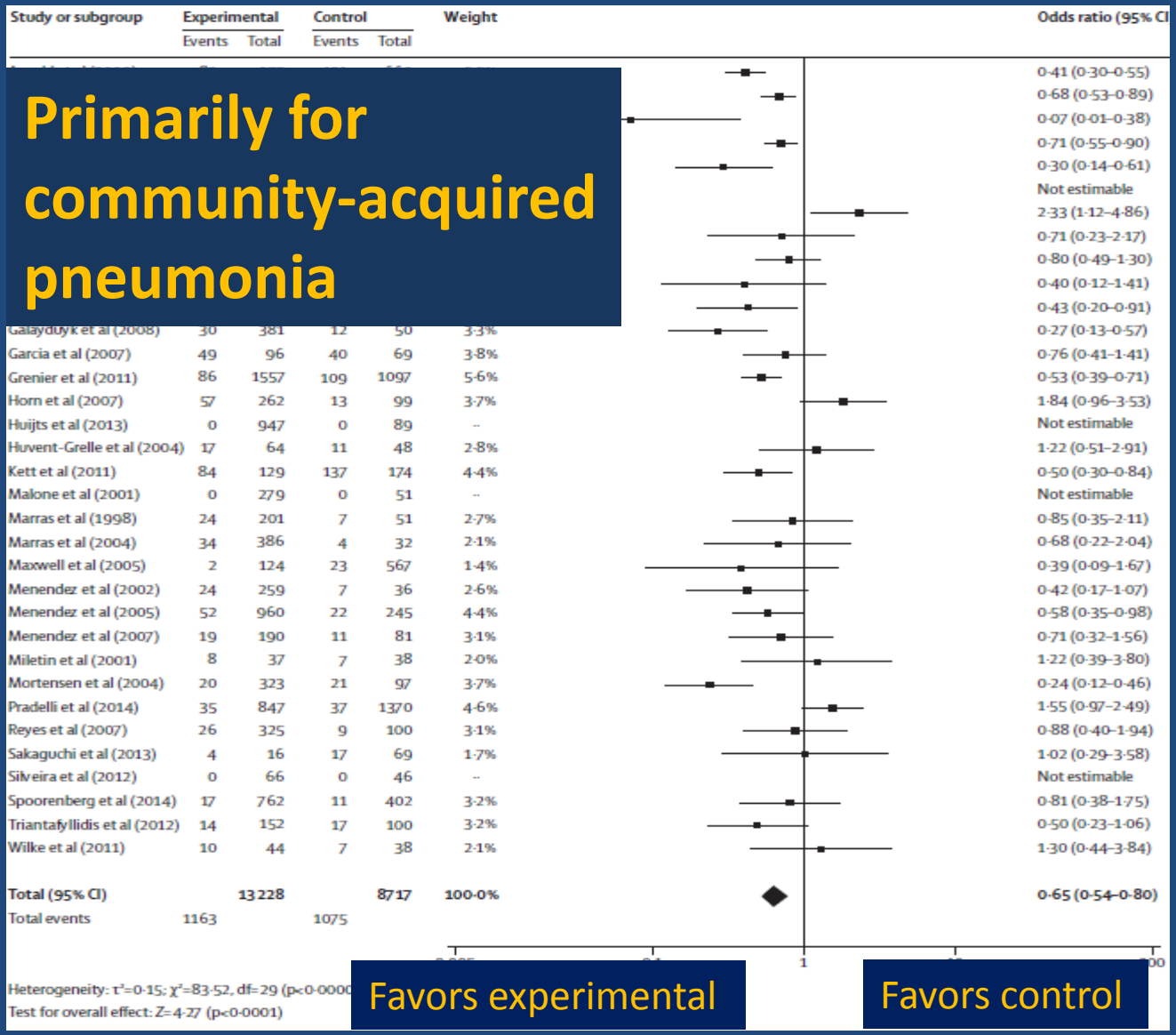
Remaining quality indicators: (n=9) with data evaluating the impact of ASPs

1. Empirical therapy according to the guidelines*
2. De-escalation of therapy*
3. Formal Bedside consultation by an ID specialist*

*Significant benefit demonstrated in >1 of 4 pre-defined outcomes; for ID bedside consultation, for *S. aureus bacteremia*. Schuts. *Lancet Infect Dis* 2016; 16:847.

Prescribing empirical antibiotic therapy according to guidelines (35% relative risk reduction for mortality [1])

Primarily for community-acquired pneumonia



Study or subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds ratio (95% CI
Galaydyuk et al (2008)	30	381	12	50	3·3%	0·41 (0·30–0·55)
Garcia et al (2007)	49	96	40	69	3·8%	0·68 (0·53–0·89)
Grenier et al (2011)	86	1557	109	1097	5·6%	0·07 (0·01–0·38)
Horn et al (2007)	57	262	13	99	3·7%	0·71 (0·55–0·90)
Huijts et al (2013)	0	947	0	89	..	0·30 (0·14–0·61)
Huvent-Grelle et al (2004)	17	64	11	48	2·8%	Not estimable
Kett et al (2011)	84	129	137	174	4·4%	2·33 (1·12–4·86)
Malone et al (2001)	0	279	0	51	..	0·71 (0·23–2·17)
Marras et al (1998)	24	201	7	51	2·7%	0·80 (0·49–1·30)
Marras et al (2004)	34	386	4	32	2·1%	0·40 (0·12–1·41)
Maxwell et al (2005)	2	124	23	567	1·4%	0·43 (0·20–0·91)
Menendez et al (2002)	24	259	7	36	2·6%	0·27 (0·13–0·57)
Menendez et al (2005)	52	960	22	245	4·4%	0·76 (0·41–1·41)
Menendez et al (2007)	19	190	11	81	3·1%	0·53 (0·39–0·71)
Miletin et al (2001)	8	37	7	38	2·0%	1·84 (0·96–3·53)
Mortensen et al (2004)	20	323	21	97	3·7%	Not estimable
Pradelli et al (2014)	35	847	37	1370	4·6%	1·22 (0·51–2·91)
Reyes et al (2007)	26	325	9	100	3·1%	0·50 (0·30–0·84)
Sakaguchi et al (2013)	4	16	17	69	1·7%	Not estimable
Silveira et al (2012)	0	66	0	46	..	0·85 (0·35–2·11)
Spoorenberg et al (2014)	17	762	11	402	3·2%	0·68 (0·22–2·04)
Triantafyllidis et al (2012)	14	152	17	100	3·2%	0·39 (0·09–1·67)
Wilke et al (2011)	10	44	7	38	2·1%	0·42 (0·17–1·07)
Total (95% CI)		**13228**		**8717**	**100·0%**	**0·65 (0·54–0·80)**
Total events	1163		1075			

Heterogeneity: τ^2=0·15; χ^2=83·52, df=29 (p<0·0000
Test for overall effect: Z=4·27 (p<0·0001)

Favors experimental

Favors control

[1] **relative risk 0·65, 95% CI 0·54–0·80, p<0·0001.** Schuts. *Lancet Infect Dis* 2016; 16:847.

De-escalation of therapy (**56%** relative risk reduction for mortality[1])

Study definition

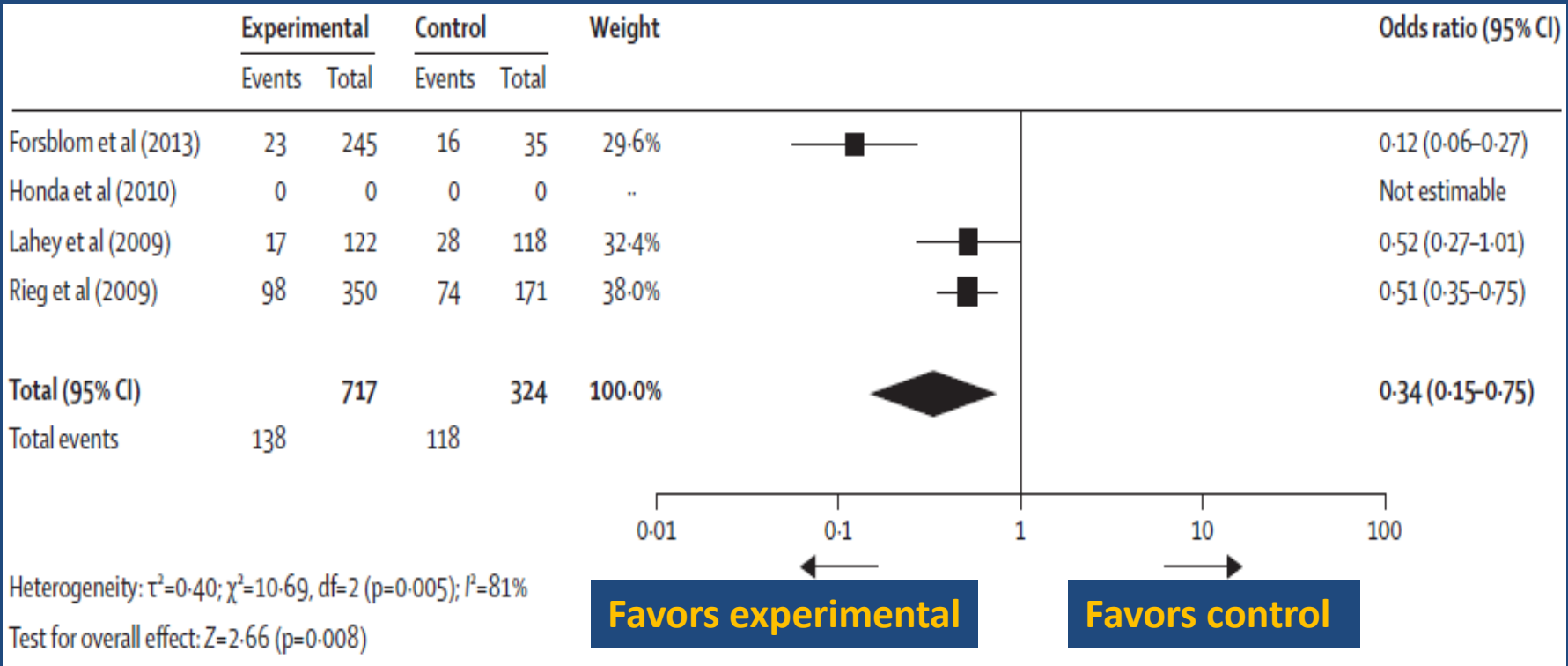
- Change to narrow-spectrum antibiotic or stop antibiotics as soon as culture results are available

Study design

- Mostly observational data

[1] RR (risk reduction) 0·44, 95% CI 0·30–0·66, p<0·0001. Schuts. *Lancet Infect Dis* 2016; 16:847.

Bedside ID consultation
(66% mortality reduction in *S. aureus* bacteremia)



Significant RRR of 66% (RR 0·34, 95% CI 0·15–0·75, p=0·008. Schuts. *Lancet Infect Dis* 2016; 16:847.

Overall, limited, low quality data

ASP's impact was positive for in >1 outcome

- Therapeutic drug monitoring
- Switch from IV to oral therapy
- Use of a list of restricted antibiotics

ASP's impact was less clear

- Adjusted of therapy per renal function
- Discontinuation of antibiotic therapy if infection is not confirmed
- Presence of a local guide

Schuts. *Lancet Infect Dis* 2016; 16:847.

Limitations

- Interventions assessed separately
  - Interventions are generally bundled (in practice)
  - Combined effect of meeting several interventions could be greater than that of meeting one

Randomized multi-hospital trials needed:

Test the effectiveness of interventions on achieving meaningful stewardship outcomes

Schuts. *Lancet Infect Dis* 2016; 16:847.

Comprehensive summary

- Interventions likely to be good starting points for any healthcare system:
  - ***adherence to guidelines***
  - ***de-escalation of therapy***

- Identified gaps in data linking interventions to practical outcomes

Graber. *Lancet Infect Dis* 2016; 16:764. Schuts. *Lancet Infect Dis* 2016; 16:847.

C. difficile infection

(*Lancet Infect Dis*; 2017)

Process

Outcomes

Effects of control interventions on *Clostridium difficile* infection in England: an observational study

Lancet Infect Dis 2017; 17: 411–21

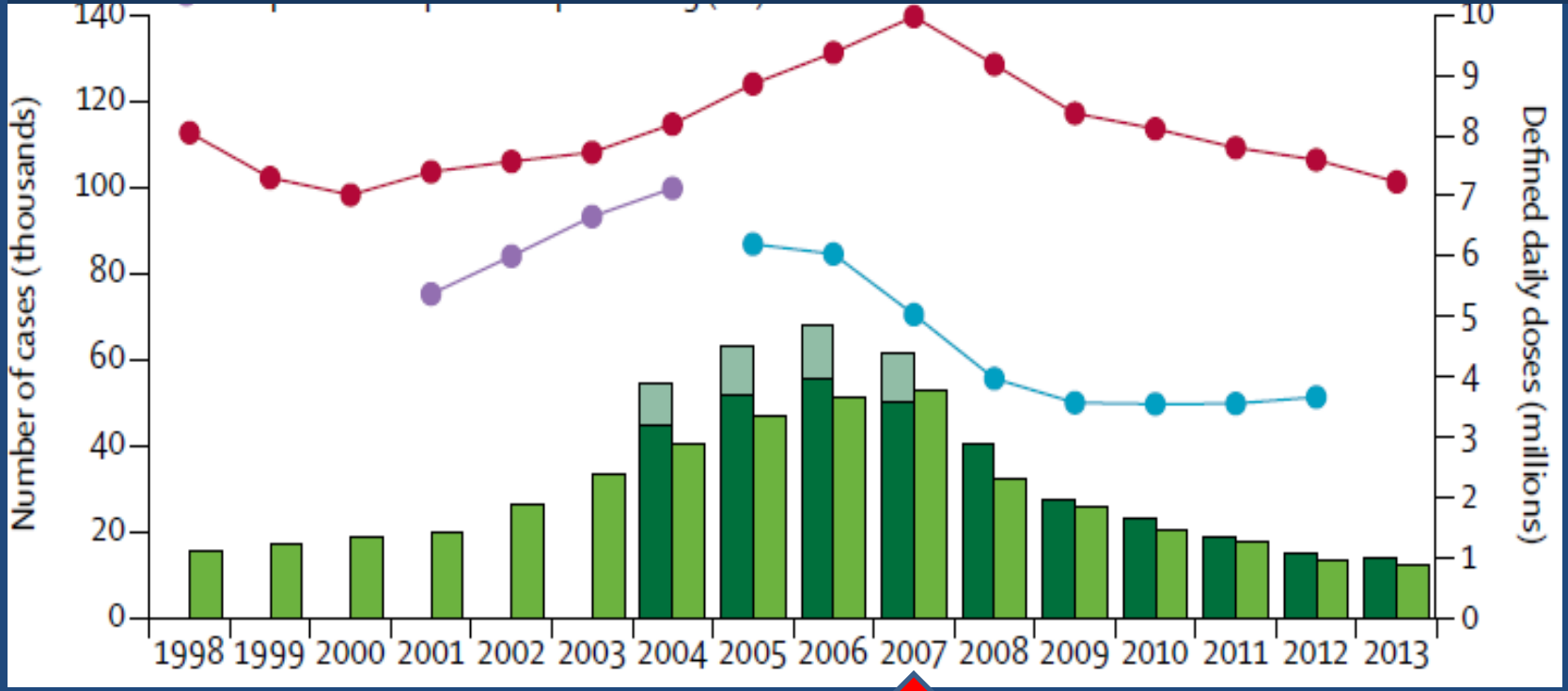
Conclusion:

….restriction of fluoroquinolone prescribing, above other interventions

…..appears to explain the decline in incidence of C. difficile infections

National recommendation (2007)

- Avoid clindamycin and cephalosporins
- Minimize use of fluoroquinolone, carbapenem and aminopenicillin
- Improved infection prevention and control activities



Dingle. *Lancet Infect Dis* 2017; 17: 411

Why did *C. difficile* infection decrease? (Two hypotheses)

1. If declines were driven by reductions in use of particular antibiotics then:

   then the incidence of *C difficile* infection caused by resistant isolates should decline faster than that caused by susceptible isolates across several genotypes.

2. If declines were driven by improvements in hospital infection control then:

   transmitted (secondary) cases should decline regardless of susceptibility.

Dingle. *Lancet Infect Dis* 2017; 17: 411

Methods /definitions

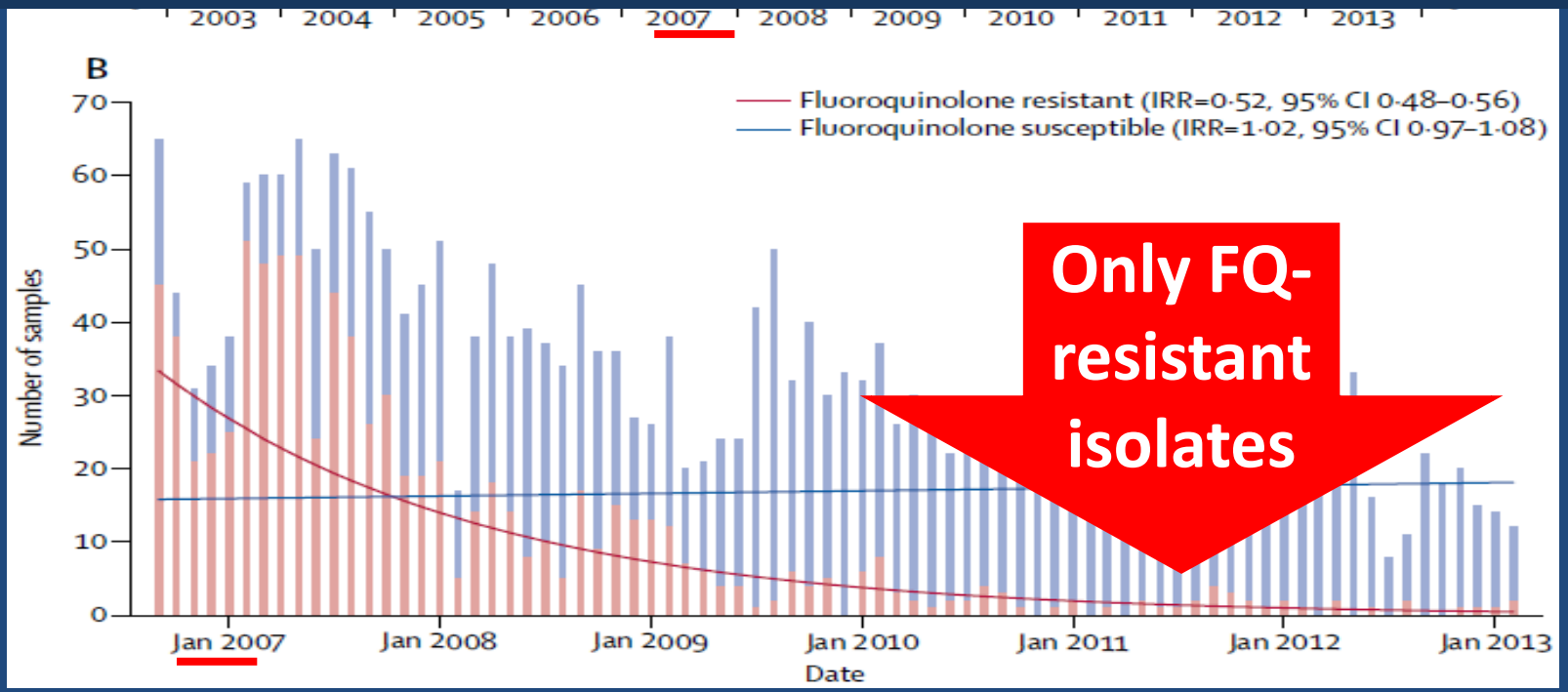
- Whole genome sequences:
  - clinical *C. difficile* isolates from symptomatic, unique patients during 2006-2013, (n=2021)
  - only sequence type, (n=261 isolates)

- Nosocomial transmission = subsequent infections from closely genetically related isolates

Dingle. *Lancet Infect Dis* 2017; 17: 411

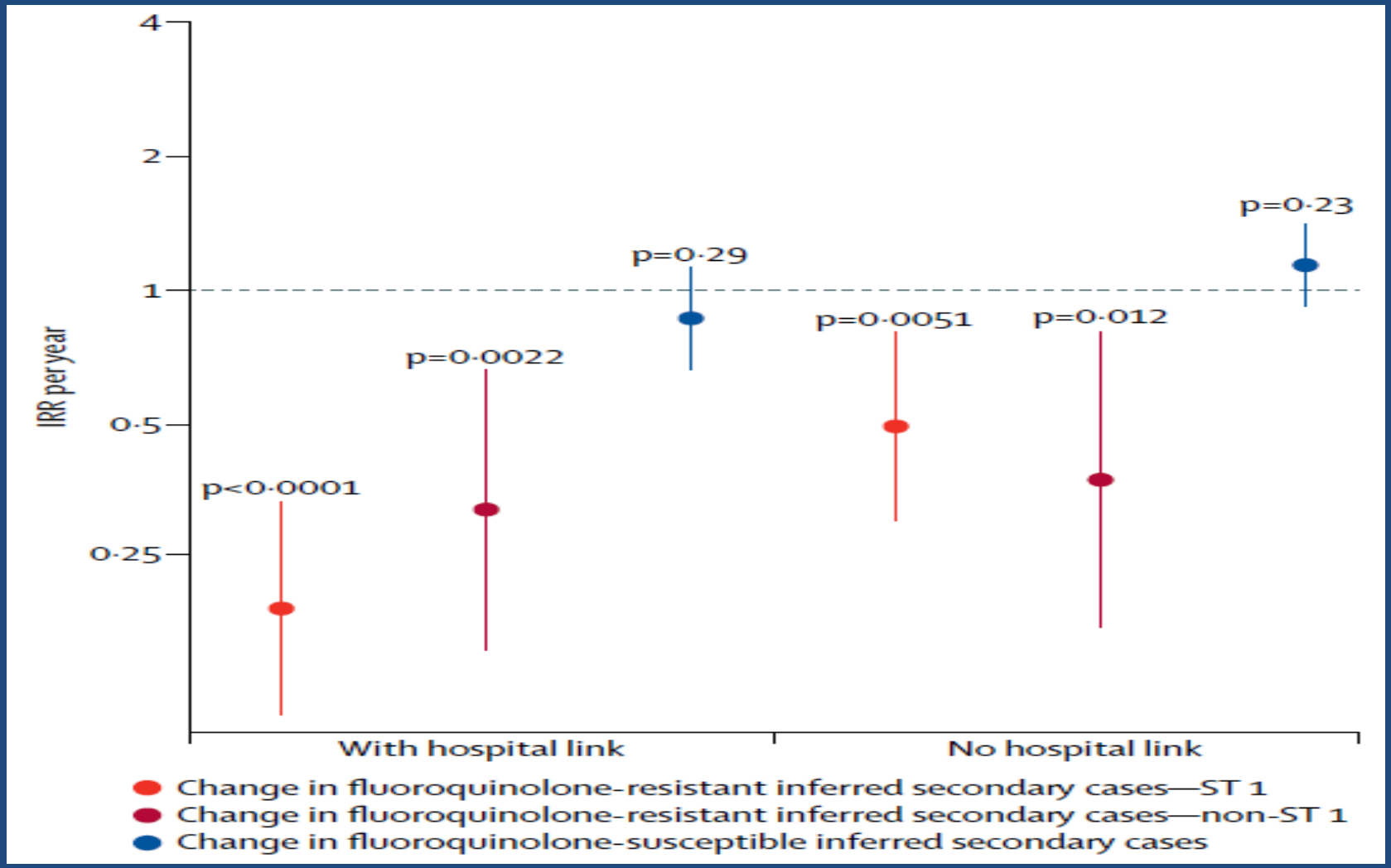
Whole genome sequence data suggests:

- **FQ restriction plausibly played the most important part in the decline of *C. difficile* infection**



Dingle. *Lancet Infect Dis* 2017; 17: 411

Incidence of *C. difficile* infection only fell for secondary cases caused by FQ-resistant isolates



Dingle. *Lancet Infect Dis* 2017; 17: 411

Limitations

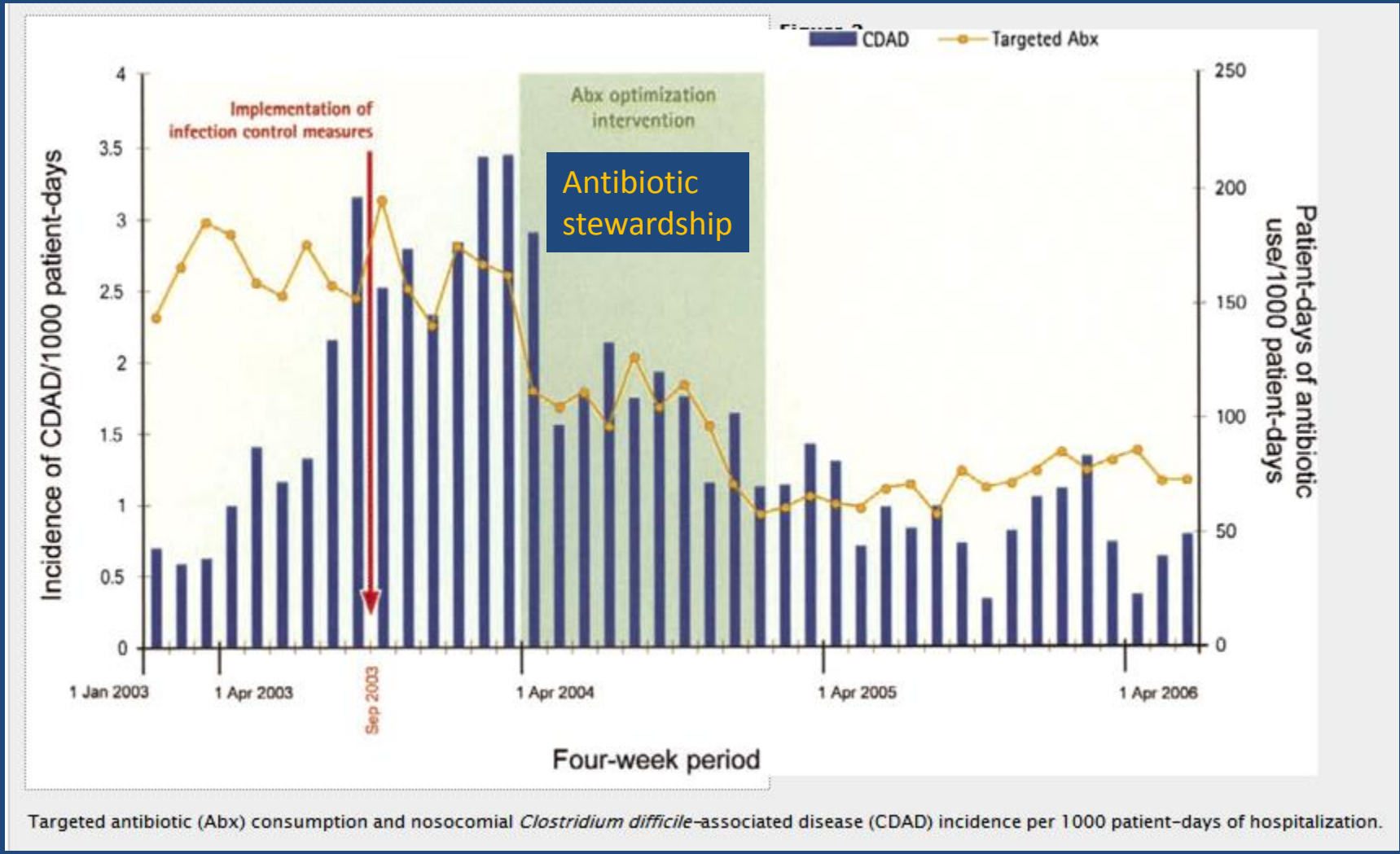
- Retrospective, quasi-experimental study

Nevertheless,

these findings are compelling, and consistent with other data….

[1]Donskey. *Lancet Infect Dis* 2017; 17:343. [2] van Kleef. *Lancet Infect Dis* 2017; 17:478.

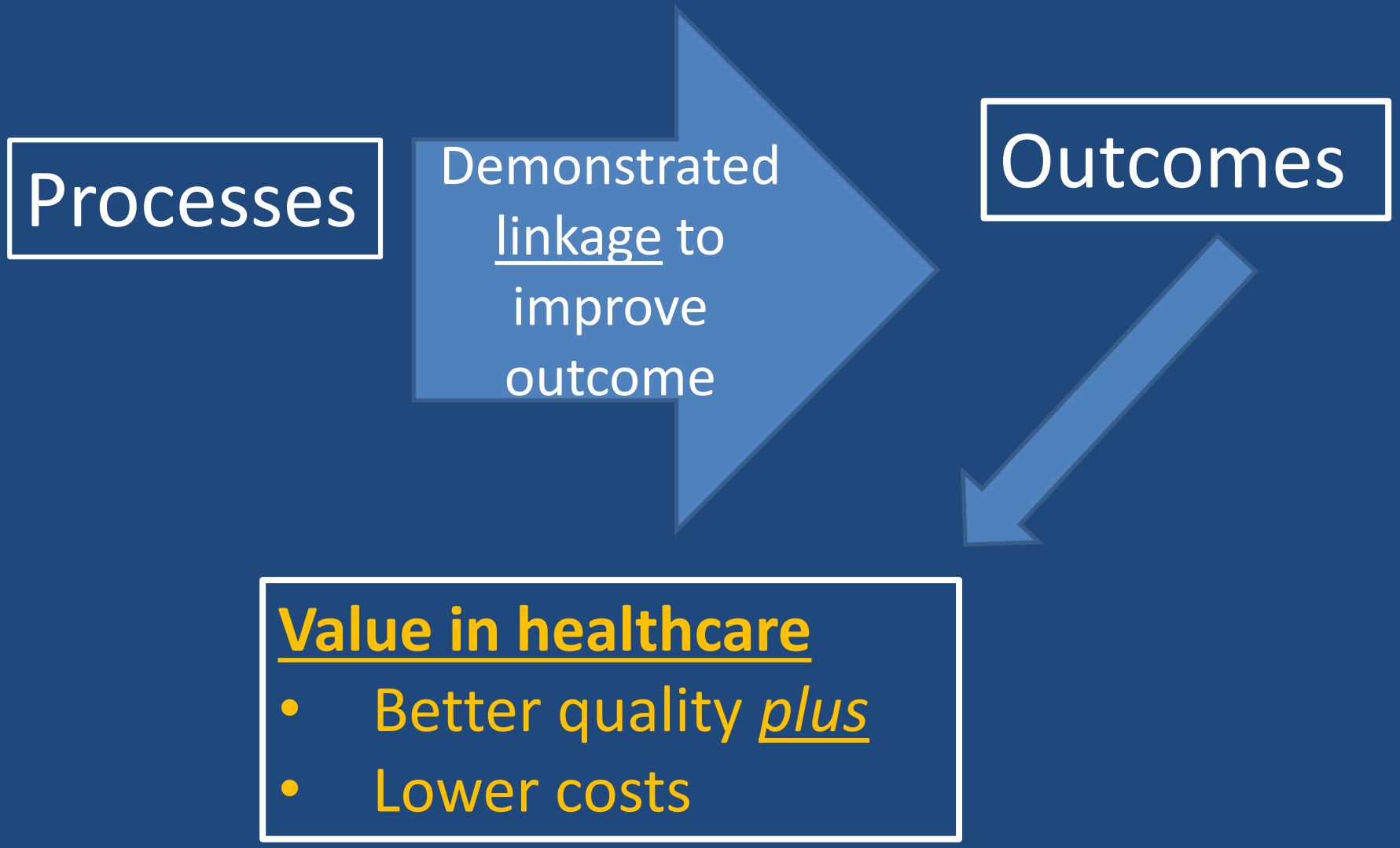
Antimicrobial Optimization Reduces *C. difficile* infection



Targeted antibiotic (Abx) consumption and nosocomial *Clostridium difficile*–associated disease (CDAD) incidence per 1000 patient-days of hospitalization.

Valiquette L, et al. *Clin Infect Dis* 2007;45:S112-S121

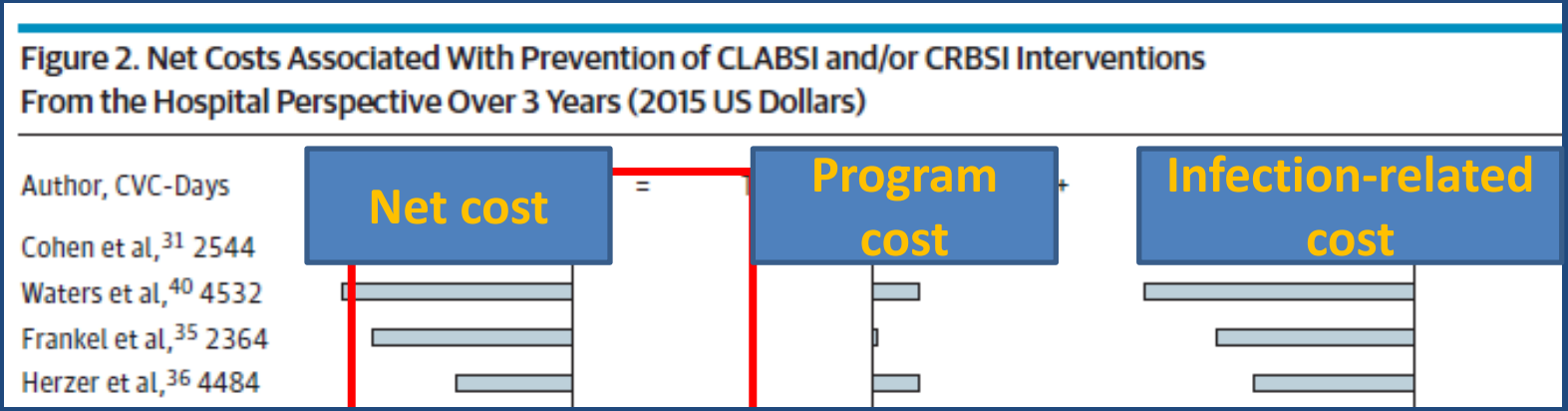
Quality Improvement



Dodds Ashley. *Clin Infect Dis* 2014;59(S3):S112. Porter. *JAMA* 2016; 316:1047.

JAMA Internal Medicine | Review

Economic Evaluation of Quality Improvement Interventions for Bloodstream Infections Related to Central Catheters
A Systematic Review



- 57% fewer bloodstream infections
- Net savings in the millions….

…can be of high value

Nuckols. *JAMA Intern Med* 2016; 176:1843.

Demonstrating the Value of Antimicrobial Stewardship Programs to Hospital Administrators

- Reimbursement based on *quality* of care

- ASPs must:
  - expand beyond measures linked to cost and utilization

Nagel. *Clin Infect Dis* 2014;59(S3):S146. Okumura. *Lancet Infect Dis* 2016; 16:999.

(excerpt)

Regulatory of Quality Improvement Organizations

ASPs can demonstrate <u>value to administrators by:</u>

Optimizing their hospital's compliance with relevant national quality indicators

*NHSN: National Healthcare Safety Network; CDC: Centers for Disease Control and Prevention. CMS: Centers for Medicare & Medicaid Services. AMA: Ameridan Medical Association; PCPI: Physician Consortium for Performance Improvement; ASC: Ambulatory Surgery Center. Nagel. *Clin Infect Dis* 2014;59(S3):S146.

Nagel. *Clin Infect Dis* 2014;59(S3):S146.

Summary….*for now*….

- Aggregate NHSN antibiotic measures can be used by hospitals to:
  - identify antibiotics (or classes) that are outliers (compared to similar organizations)
  - does not inform on the quality of antibiotic use

Summary….*for now*….

Performance metrics

Identify important/problematic areas…

- WHAT are we trying to accomplish?
- WHY is it important?
- WHO is the specific target population?
- WHAT are our measureable goals?
- HOW will we know our changes are working?
- HOW do we know if the intervention is harmful?

- HOW completely was intervention implemented?
- VALIDITY of data - alternate reasons for results

Finally, more studies….

- Link between ASP interventions (processes) and improved patient outcomes

- Value of ASPs
  - Health outcomes achieved per dollar spent

Porter. *N Engl J Med* 2010; 363:2477.

11 years after infection control programs were mandated by the Joint Commission…..

Editorial

INFECTION CONTROL 1987/Vol. 8, No. 6

Peter C. Fuchs, MD, PhD

Will the Real Infection Rate Please Stand?

Acknowledgements

- Onofre Donceras, RN (Infection Control) [1]
- David Schwartz, MD (Infectious Diseases) [1]

[1] John H. Stroger Jr. Hospital of Cook County

Questions / comments?

Your experiences with:

Joint Commission Survey?

NHSN usage measures?