

Antimicrobial Stewardship 2014

National and Regional Trends

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Penn Medicine

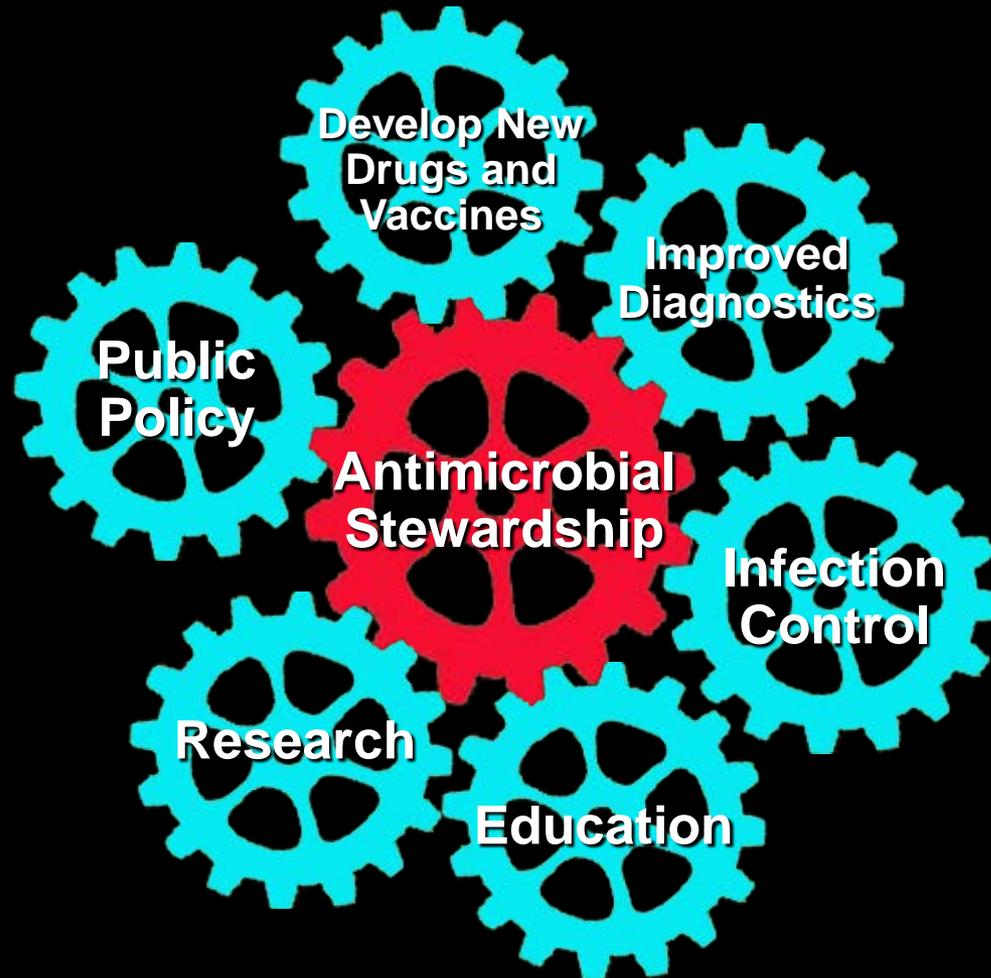
Disclosures

- ◆ **I have no disclosures or conflicts related to this lecture**

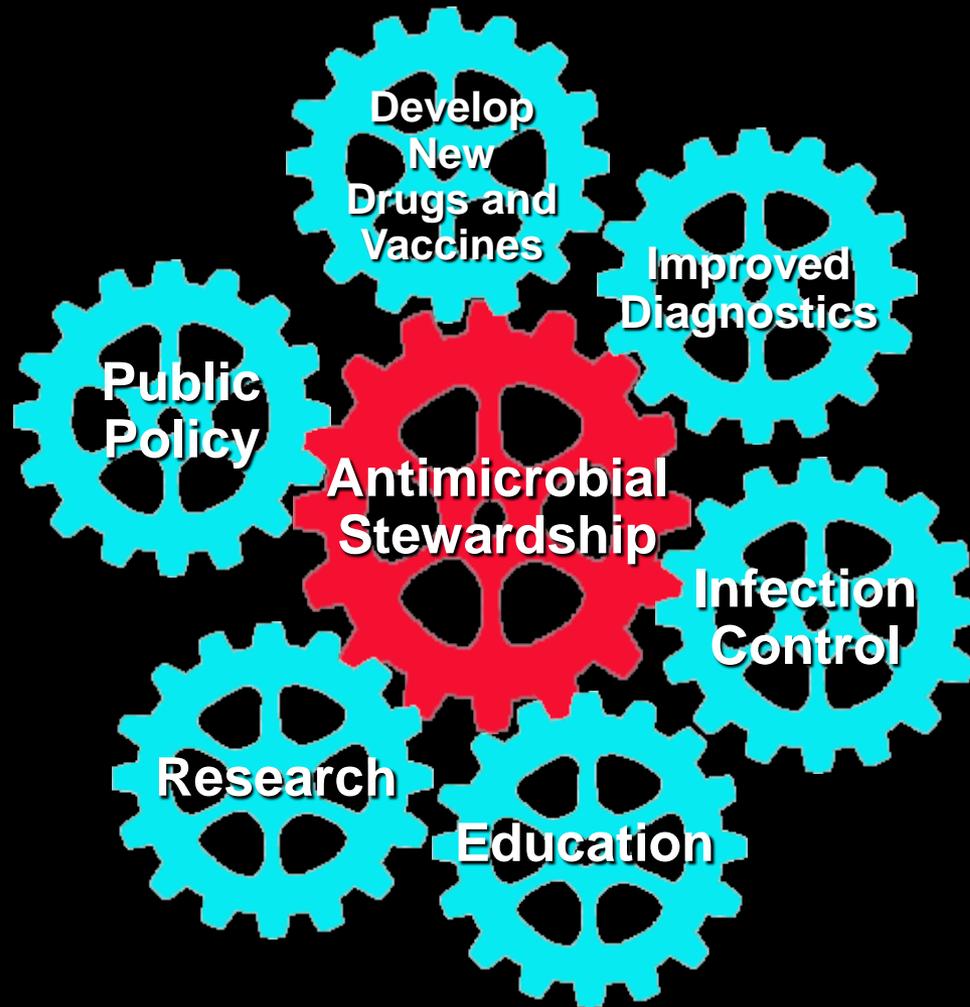
National and Regional Trends in Antimicrobial Stewardship

- ◆ **PCAST Report on Combating Antibiotic Resistance**
 - Federal response
 - Regulatory response
- ◆ **State initiatives in Antimicrobial Stewardship**
 - California Senate Bills 739 and 1311
- ◆ **Making the case for Antimicrobial Stewardship**
 - Measuring success

Efforts to Control Resistance



Efforts to Control Resistance



FREE Antibiotics

Up to a 14-day supply of the most commonly prescribed generic antibiotics with a valid prescription*



*With valid prescription. See pharmacist for details.

LIMITED
TIME ONLY!

Earn
5x **GAS**
EXTRA REWARDS

ON PARTICIPATING PRODUCTS

September 18, 2014



REPORT TO THE PRESIDENT ON COMBATING ANTIBIOTIC RESISTANCE

Executive Office of the President
President's Council of Advisors on
Science and Technology

September 2014



PCAST Report on Antibiotic Resistance

- ◆ **Improve surveillance of the rise of antibiotic-resistant bacteria**
 - Enable effective responses
 - Stop outbreaks
 - Limit transmission
- ◆ **Increase the longevity of current antibiotics**
 - Prevent spread of multidrug-resistant organisms
 - Limit emergence of antibiotic resistance
- ◆ **Increase the rate of discovery of new antibiotics and the development of innovative interventions**
- ◆ **Federal investment**
 - Double current investment in surveillance, stewardship, research and clinical development
 - \$450 to \$900 million annually
 - Incentivize commercial development
 - Additional \$800 million annually

1. Ensure Strong Federal Leadership

- ◆ **Task the National Security Council with oversight and coordination of Federal efforts to combat resistance**
- ◆ **Appoint a White House Director for National Antibiotic Resistance Policy**
 - Develop an integrated National Action Plan
- ◆ **Establish Interagency Task Force on Combating Antibiotic-Resistant Bacteria**
- ◆ **Establish a Joint Scientific Working Group on Human Antibiotic Resistance**
- ◆ **Establish a President's Advisory Council on Combating Antibiotic-Resistant Bacteria**

2. Effective Surveillance and Response

- ◆ **Strengthen state and local public health infrastructure for surveillance and response**
 - \$90 million in new funding for CDC annually
 - \$60 million for state grants
 - \$30 million to address community antibiotic resistance threats
- ◆ **Establish national capability for surveillance based on genomic analysis**
 - National laboratory network
 - Reference collection of genome sequences
 - Develop new computational methods and tools
 - Publicly accessible database with analytical tools
 - Surveillance efforts in diverse settings
 - Develop surveillance and testing standards
 - \$190 million annually

3. Fundamental Research

- ◆ **Develop new antibiotics and alternatives for treating bacterial infections**
- ◆ **Develop alternatives to antibiotics in agriculture**

4. Clinical Trials with New Antibiotics

- ◆ **Establish a robust national infrastructure to support clinical trials of new antibiotics**
- ◆ **Develop new regulatory pathways to evaluate urgently needed antibiotics**

5. Increase Economic Incentives for Developing Antibiotics

- ◆ **Direct Federal funding**
- ◆ **Economic rewards for drug development**
 - Higher reimbursement (CMS)
 - Delinking antibiotic use from revenues (antibiotic incentive fund)
 - Extend patent life or market exclusivity of another drug
 - Antibiotic usage fee (gasoline or cigarette tax)

6. Improve Antimicrobial Stewardship

◆ Definition

- Systematic efforts to optimize the use of antibiotics to maximize benefits, minimize resistance and decrease adverse events

◆ Only 50% of hospitals have implemented antimicrobial stewardship programs

- Barriers: Other priorities, staffing constraints and insufficient funding

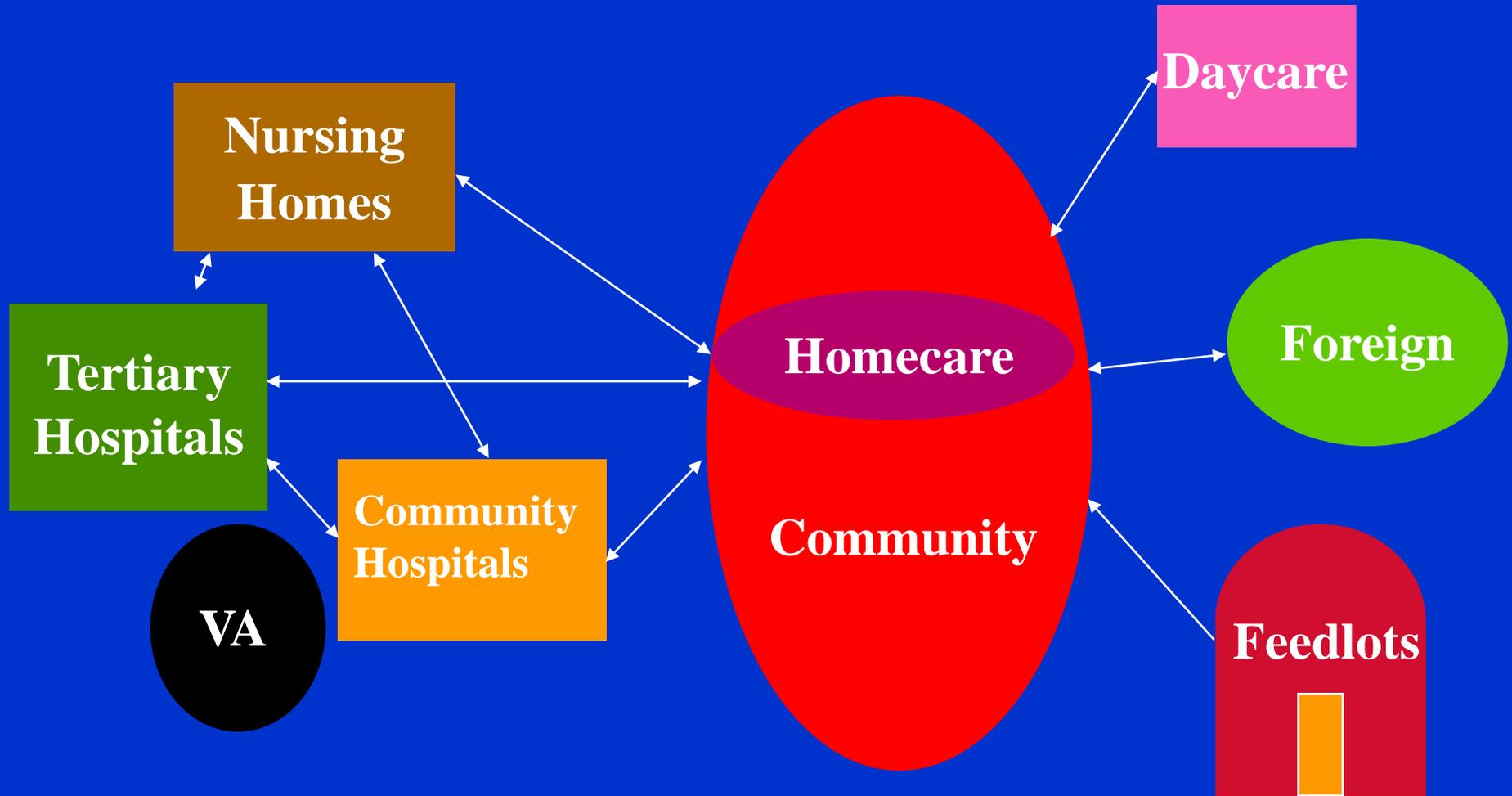
◆ Acute and ambulatory settings

- Efforts in ambulatory care lag behind hospital-based efforts
- Sustained improvement usually requires ongoing interventions*

*Gerber JS et al. JAMA 2013. 309:2345-52.

Arnold SR and Straus SE. Cochrane Database of Systematic Reviews, 2005.

Environments Where Antibiotic Resistance Develops and Their Relationships



Adapted from B. Murray

Antimicrobial Stewardship as a CMS CoP

- ◆ **CMS Condition of Participation by the end of 2017**
 - Antimicrobial Stewardship Officer
 - Institutional policies for appropriate use
 - Identify areas for improvement
 - Implement interventions
 - Measure and report antibiotic use
 - Leadership support to address problems (CEO, CMO, CNO)
- ◆ **Work with CDC and other content experts to develop Interpretive Guidelines**
- ◆ **Acute care hospitals, critical access hospitals, long-term care and nursing home facilities**
- ◆ **Phased in rapidly for other settings:**
 - Long-term acute care hospitals
 - Other post-acute care facilities
 - Ambulatory surgical centers
 - Dialysis centers

Stewardship in Ambulatory Settings

- ◆ **Expand Physician Quality Reporting System (PQRS) to include measures that discourage inappropriate use**
 - Non-bacterial infections
 - Respiratory tract infections
- ◆ **Currently voluntary**
 - Incentive to participate
 - Penalty for nonparticipation
- ◆ **Antibiotic reporting module should be mandatory**

Measuring Antibiotic Usage and Resistance

- ◆ **Reporting to NHSN Antibiotic Use and Resistance (AUR) module should be mandatory**
 - Results should be reported on Hospital Compare
 - Integrated into Value Based Purchasing
 - Submit to consensus body for endorsement and implementation by 2017
 - National mandatory implementation by 2020

Additional Support for AS

- ◆ **Federal agencies should require implementation of ASPs as a condition for receiving any Federal funding**
 - Healthcare delivery
 - Community Health Care Centers
- ◆ **Federal agencies should provide technical assistance**
- ◆ **Federal government should lead by example**
 - Veterans Administration facilities
 - Department of Defense
 - Health and Human Services
 - Indian Health System

Antimicrobial Stewardship Research Support

- ◆ **Design and implementation of most effective strategies**
- ◆ **Behavioral economics**
- ◆ **Engage care providers, patients and public at large**
- ◆ **Best mechanisms for patient education**
- ◆ **Development and interpretation of rapid point of care diagnostics**
 - Global Challenge Inducement Prizes

REVIEW ARTICLE

Antimicrobial Stewardship Programs in Inpatient Hospital Settings: A Systematic Review

Brittin Wagner, PhD;^{1,2} Gregory A. Filice, MD;^{2,3} Dimitri Drekonja, MD, MS;^{2,3} Nancy Greer, PhD;¹ Roderick MacDonald, MS;¹ Indulis Rutks, BS;¹ Mary Butler, PhD, MBA;⁴ Timothy J. Wilt, MD, MPH^{1,2}

-
- ◆ **Improve prescribing**
 - ◆ **Improve microbial outcomes**
 - ◆ **Little data on patient outcomes**
 - Mortality
 - LOS
 - Readmissions
 - ◆ **Strength of evidence was low**

Behavior

“You don't understand us
So don't reprimand us”

The Police

Understanding the Determinants of Antimicrobial Prescribing Within Hospitals: The Role of “Prescribing Etiquette”

E. Charani,¹ E. Castro-Sanchez,¹ N. Sevdalis,^{2,3} Y. Kyratsis,¹ L. Drumright,¹ N. Shah,¹ and A. Holmes¹

- Qualitative semi-structured interviews with doctors, pharmacists, nurses/midwives in 4 teaching hospitals (n=39)
- Three themes related to prescribing etiquette

- **Decision-making autonomy**
 - Senior doctors make whatever decisions they want and no one questions it
 - One doctor does not want to interfere with another doctor's decision
- **Limitations of local evidence-based policies**
 - Doctors frequently consider their patients to be outside the boundaries of local guidelines
 - Doctors are “above” the guidelines because of experience and expertise
- **Culture of hierarchy**
 - Senior doctors decide what is prescribed and junior doctors do not challenge it

Changing Prescriber Behavior

- Engagement of senior leadership (clinical and administrative) is critical
- Address stewardship message to the clinical leadership within existing clinical groups (rather than just the trainees or the ID doctors)
- Understand local culture and patient population

Prolonged Antibiotic Treatment in Long-term Care

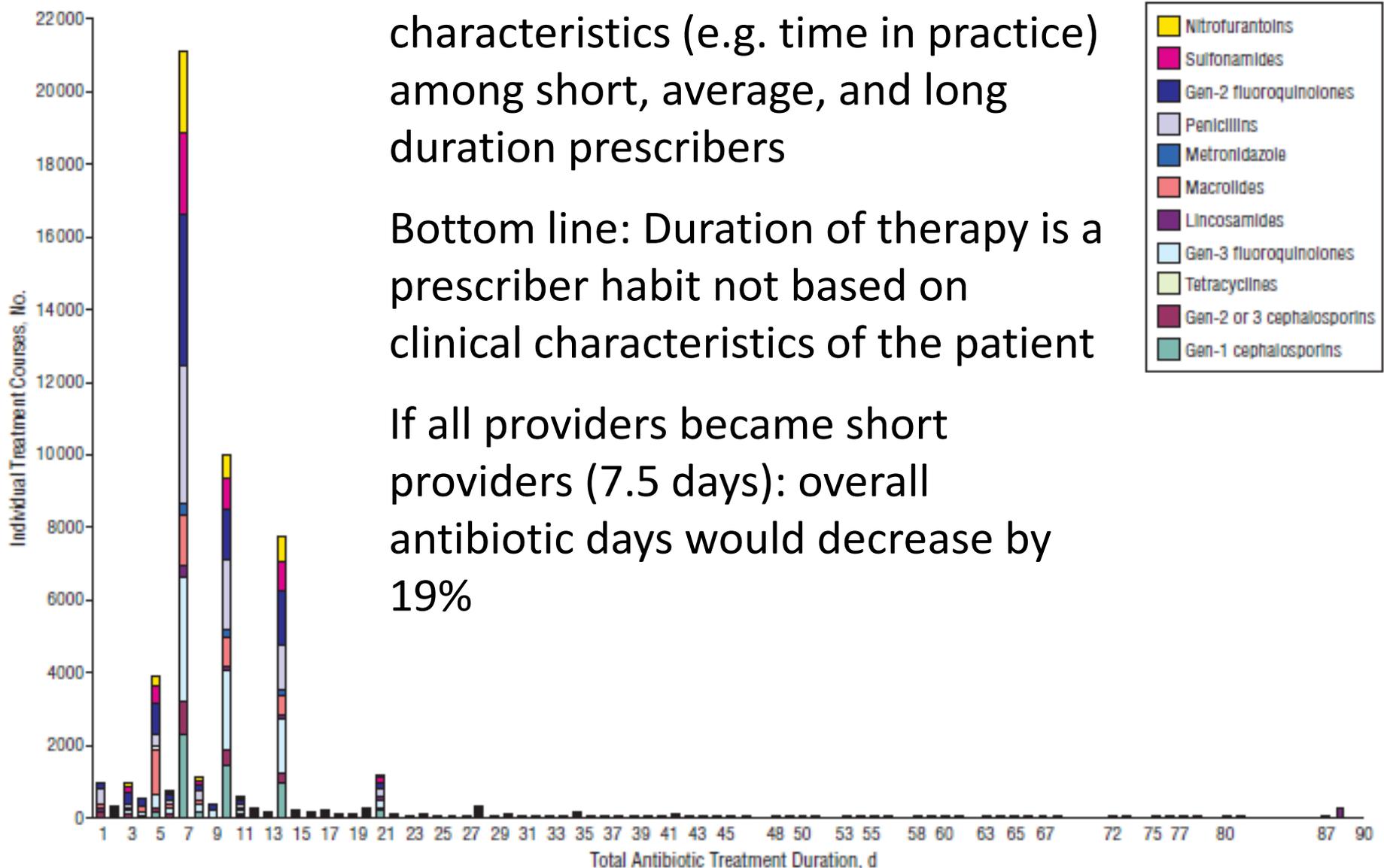
Role of the Prescriber

- Assessment of antibiotic prescribing patterns in 50,061 LTCF residents in 2010
- Most common antibiotics: FQ and penicillins
- Most common course: 7 days
 - BUT 45% were > 7 days and only 14% were < 7 days
- Providers divided into short (5-7 days, n=152), average (10 days, n=402) and long (14 days, n=145) duration prescribers

No significant differences in provider characteristics (e.g. time in practice) among short, average, and long duration prescribers

Bottom line: Duration of therapy is a prescriber habit not based on clinical characteristics of the patient

If all providers became short providers (7.5 days): overall antibiotic days would decrease by 19%



Summary

- **Changing prescriber behavior is a key factor in improving antibiotic use in the long term**
 - Need to evolve from top down stewardship approach to a bottom up approach
- **But, changing behavior is hard and the solution most likely multi-factorial**
 - More emphasis on shorter duration given expanding evidence base
 - Enhancing comfort level with new rapid microbiology approaches
 - Benchmarking and feedback at institutional and provider level
 - Need to engage senior leadership

7. Stewardship in Animal Agriculture

- ◆ **FDA should proceed with vigorous implementation of Guidances 209 and 213**
- ◆ **FDA should monitor sales and usage of antibiotics**
- ◆ **Additional measures to protect human health as needed**

State Initiatives

- ◆ **California Senate Bill 739**
- ◆ **California Senate Bill 1311**

California Antimicrobial Stewardship Program Initiative

California Senate Bill 739

Mandated that, by January 1, 2008, CDPH require general acute care hospitals to develop a process for the judicious use of antibiotics and monitor antibiotic use by a quality improvement committee

<http://www.cdph.ca.gov/programs/hai/Pages/AntimicrobialStewardshipProgramInitiative.aspx>

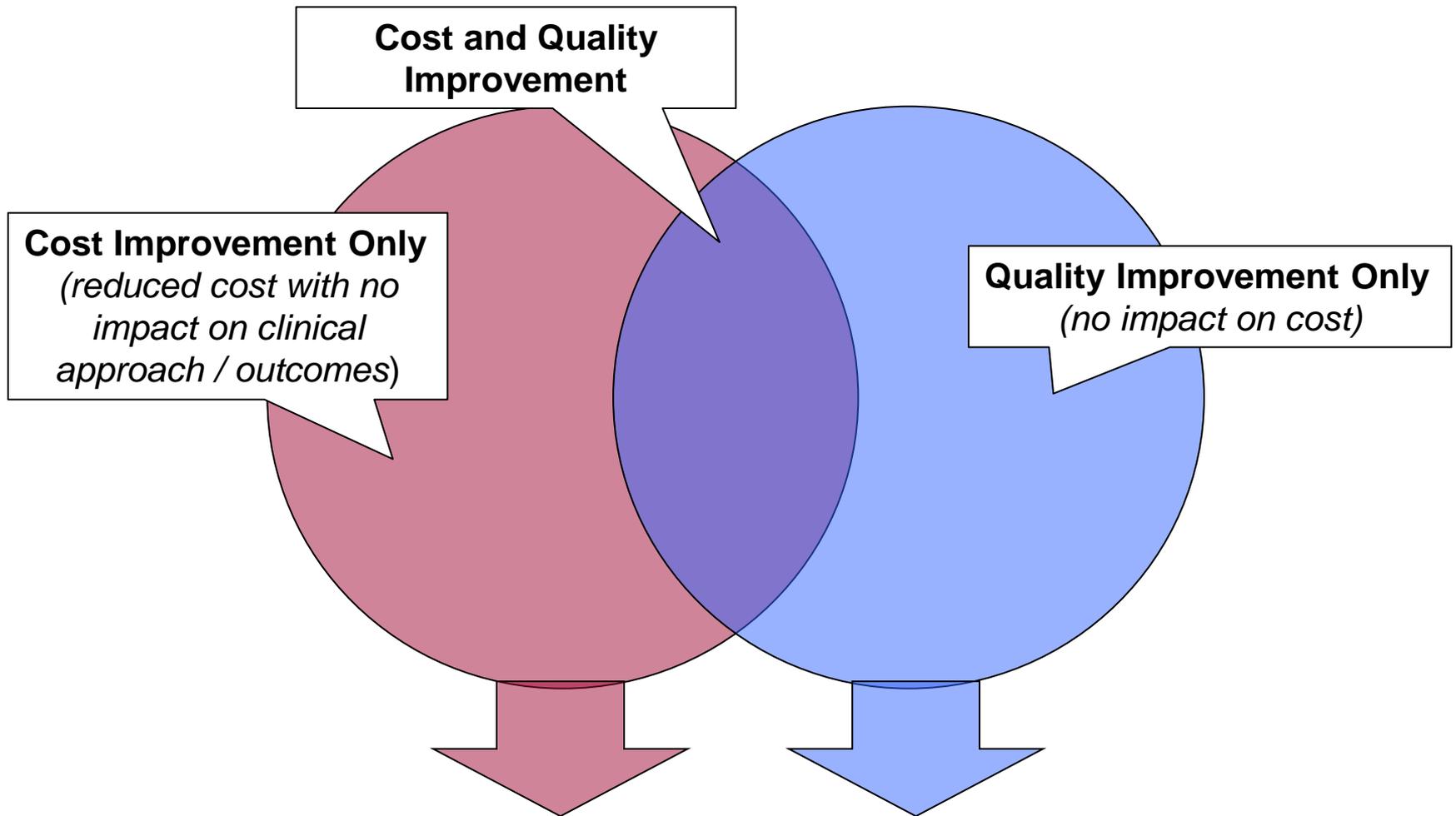
California Senate Bill 1311

- ◆ **All general acute care hospitals must develop and implement an Antimicrobial Stewardship Program by July 1, 2015**
- ◆ **Physician supervised multidisciplinary committee**
- ◆ **At least one physician or pharmacist in the group must be trained**
 - Completed training in Antimicrobial Stewardship (CDC, SHEA)
- ◆ **Report to Quality Committees at the institution**

Making the Case

- ◆ **Antibiotics are among the most commonly prescribed drugs in human medicine**
- ◆ **Antibiotics have an ecological impact**
- ◆ **Up to 50% of all antibiotics prescribed in the US are not needed or are not optimally prescribed**
- ◆ **The annual economic impact of antibiotic resistance in the US is \$55-70 billion**
 - \$20-35 billion in excess direct health care costs
 - Loss of productivity valued at \$35 billion annually
 - 8 million additional hospital days annually
 - 2 million people infected per year
 - 23,000 deaths annually
- ◆ **30% reduction in antibiotic resistance would save \$20 billion per year**
 - Reduce Medicare expenditures

What is Value?



Exploration in Parallel by Finance and Quality Improvement

Summary: Measurement in Antimicrobial Stewardship

- Measure something!
- Process measures
 - Antimicrobial use
 - Appropriateness of use
- Outcomes
 - Antimicrobial resistance
 - Costs
 - *C. difficile*
 - Mortality
 - Time to proper therapy
 - Length of stay (and possibly readmission)
 - Adverse drug events
- Focus on value and decreasing clinical variations in care

Conclusions

- **Options for measurement**
 - Should always measure antibiotic use over time in some way
 - Outcome measures are compelling to clinicians and should be measured if feasible
 - There should be a plausible relationship between changes in antimicrobial use and the outcome measure to attribute the result to stewardship activities
- **Benchmarking across institutions**
 - Provides useful information for a program to compare itself to peers and develop improvement strategies
 - Will likely become commonplace in the future
 - AUR Module
- **Demonstrate value**
 - Decreased clinical variations in care

Making the Case

- ◆ **Healthcare quality**
- ◆ **Patient safety**
- ◆ **Value**
- ◆ **Read the PCAST Report**
 - ◆ **It is the future!**

