Prevention & Reporting of Healthcare Associated Infections (HAIs) in Kentucky

Conference For Healthcare Transparency & Patient Safety

Kraig Humbaugh, MD, MPH
Lexington, KY
November 13, 2015

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Objectives

After this presentation, participants will be able to:

- Explain the importance of reporting HAIs
- Describe the characteristics of HAI outbreaks historically reported in Kentucky
- Understand changes in disease reporting in Kentucky
- Identify antibiotic stewardship as a strategy in the fight against antibiotic resistance

No disclosures of conflicts of interest

Population Health Surveillance for Communicable Diseases

- From the French: “to watch over”
- Surveillance helps to call attention to unusual events or numbers of events.
- Awareness of a potential public health problem from the outset allows more time for a thoughtful, considered response and more strategic use of limited resources.
- Surveillance also helps us understand the depth and breadth of a health event: the “who,” “what,” “where,” “when,” and possibly “why” and “how.”

Ultimate Goal

Control and reduce diseases of public health importance and impact

Reportable Disease Laws

- Kentucky Revised Statute 214.010
  - “Every physician and advanced practice registered nurse shall report all diseases designated by administrative regulation of the Cabinet for Health and Family Services as reportable”
- 902 Kentucky Administrative Regulation 2:020
  - Delineates who should report, the diseases and outbreaks to be reported, and how they are to be reported

Traditional Passive Surveillance

Relies on timely **recognition *and* reporting** of certain types of disease or clusters of illness.

- Presumes thorough knowledge and correct diagnosis of illness by clinician
- Presumes that all reportable diseases or unusual disease groupings will be reported to the health department
- Presumes reporting will occur promptly

What does Public Health do with the reports?

- Assists in determining whether outbreak is occurring, case investigation, and prevention/control of other cases
- In the case of healthcare facilities, can assist in providing guidance for control and with more detailed testing
- Can help determine if facility outbreaks are interrelated across county and state lines

Reportable Disease Investigations, 2012-2014*†‡

2012

- 8,466 total investigations
  - Lab report
  - Morbidity report from hospital
  - Faxed EPID 200 Form
- Campylobacteriosis= 552
- Salmonellosis = 757
- STEC = 120
- HAV, acute = 83
- HBV, acute = 275 (509 chronic‡)
- HCV, acute = 344 (2,57[illegible] chronic or resolved‡)
- Pertussis = 741

2013

- 9,689 total investigations
  - Lab report
  - Morbidity report from hospital
  - Faxed EPID 200 Form
- Campylobacteriosis= 683
- Salmonellosis = 562
- STEC = 177
- HAV, acute = 84
- HBV, acute = 289 (589 chronic‡)
- HCV, acute = 321 (3,222 chronic or resolved‡)
- Pertussis = 499

2014

- 9,330 total investigations
  - Lab report
  - Morbidity report from hospital
  - Faxed EPID 200 Form
- Campylobacteriosis= 679
- Salmonellosis = 645
- STEC = 182
- HAV, acute = 125
- HBV, acute = 232 (616 chronic‡)
- HCV, acute = 322 (3,092 chronic or resolved‡)
- Pertussis = 530

* Data retrieved from the National Electronic Disease Surveillance System (NEDSS)
† Investigations of Chlamydia, Gonorrhea, HIV/AIDS, Influenza, and Tuberculosis are not included
‡ Reporting of Chronic Hepatitis B and Chronic Hepatitis C is voluntary. Investigations created for Chronic Hepatitis do not represent the true burden of chronic hepatitis

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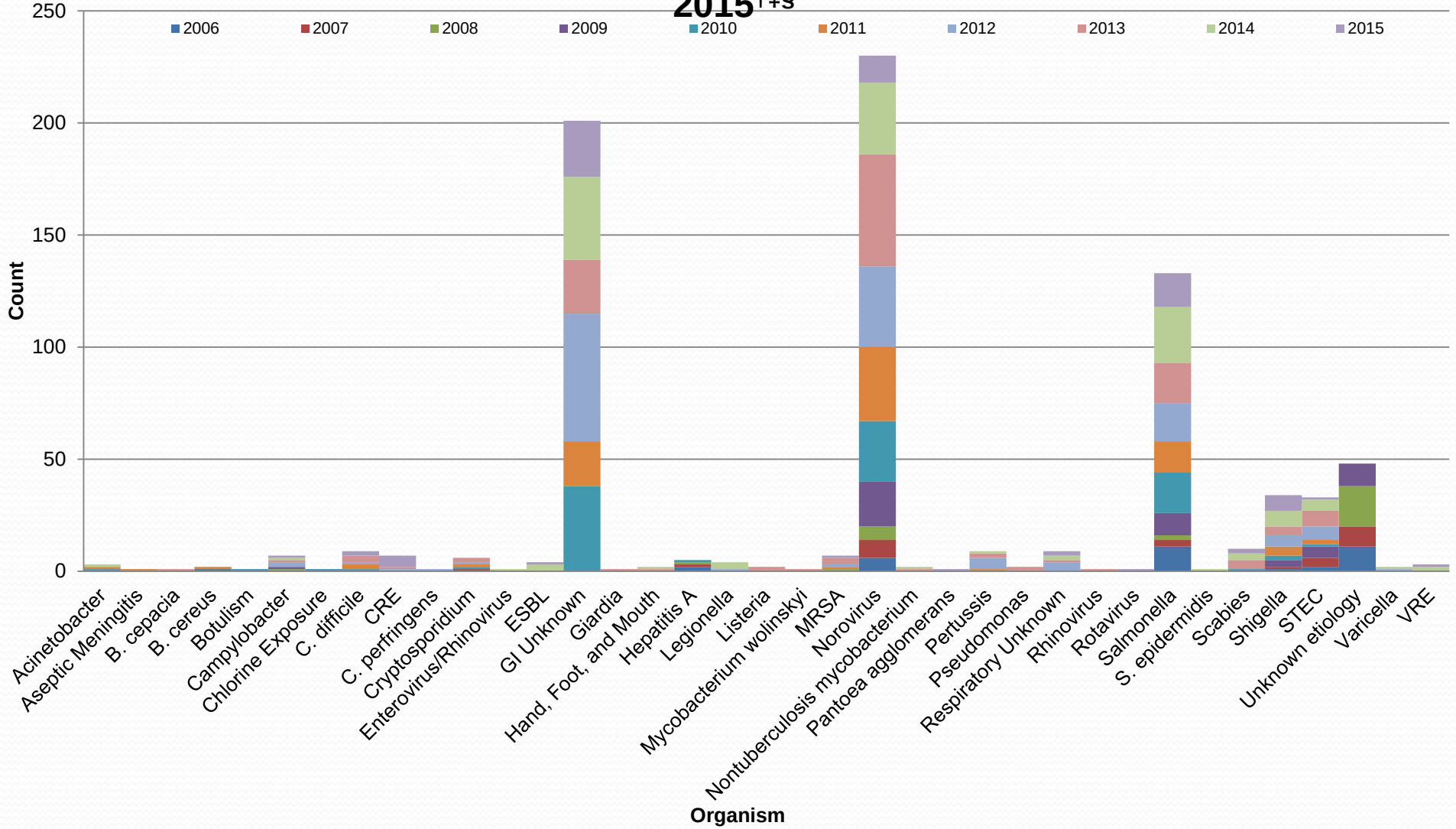
Reported Disease Outbreaks by Organism, Kentucky, 2006 - 2015†‡§

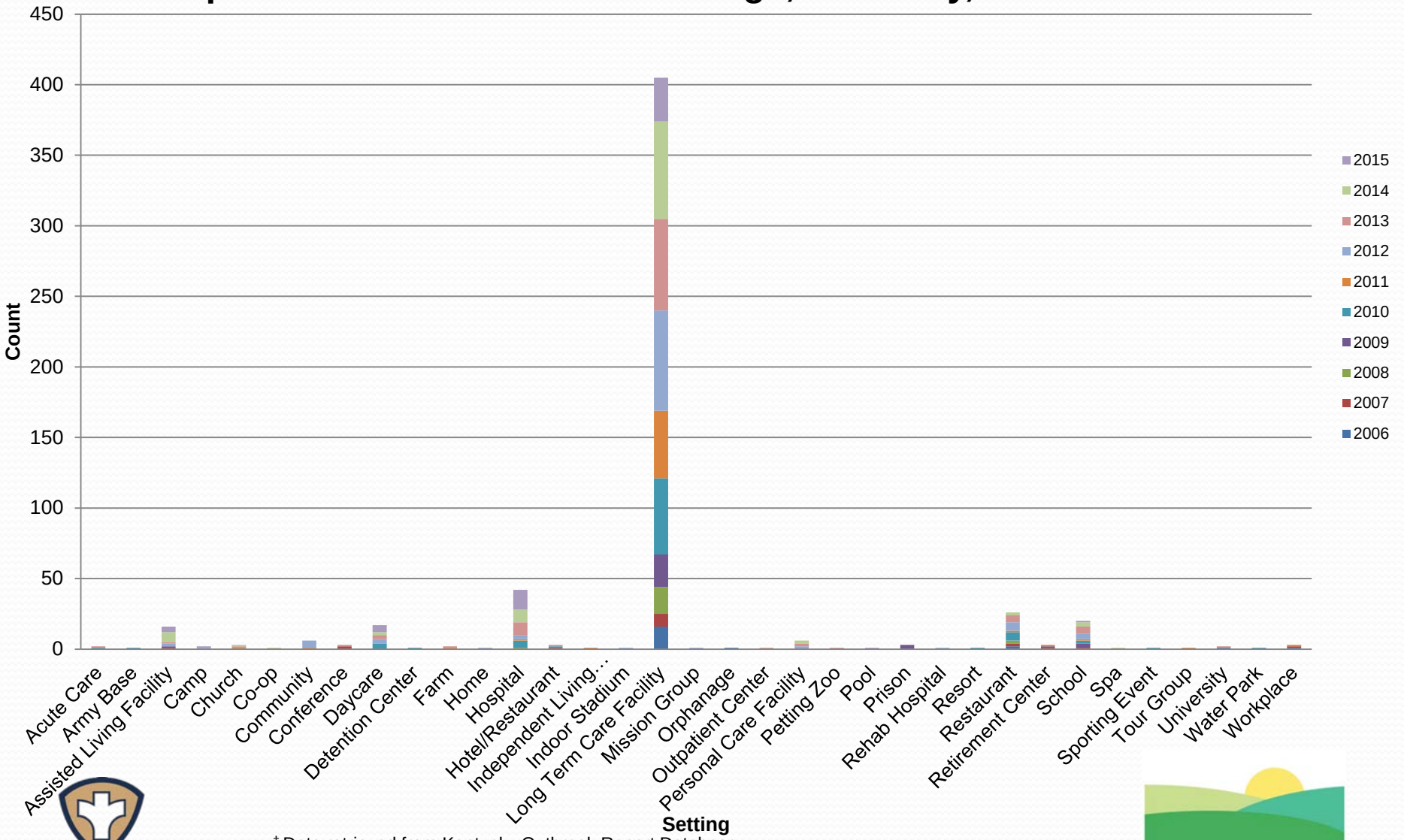


† Data retrieved from Kentucky Outbreak Report Database

‡ 2015 data only includes outbreaks reported between January 1, 2015 and August 31, 2015.

§Data on Influenza outbreaks includes reports in two calendar years and therefore has been excluded from this figure.

Reported Disease Outbreak Settings, Kentucky, 2006 - 2015†‡§



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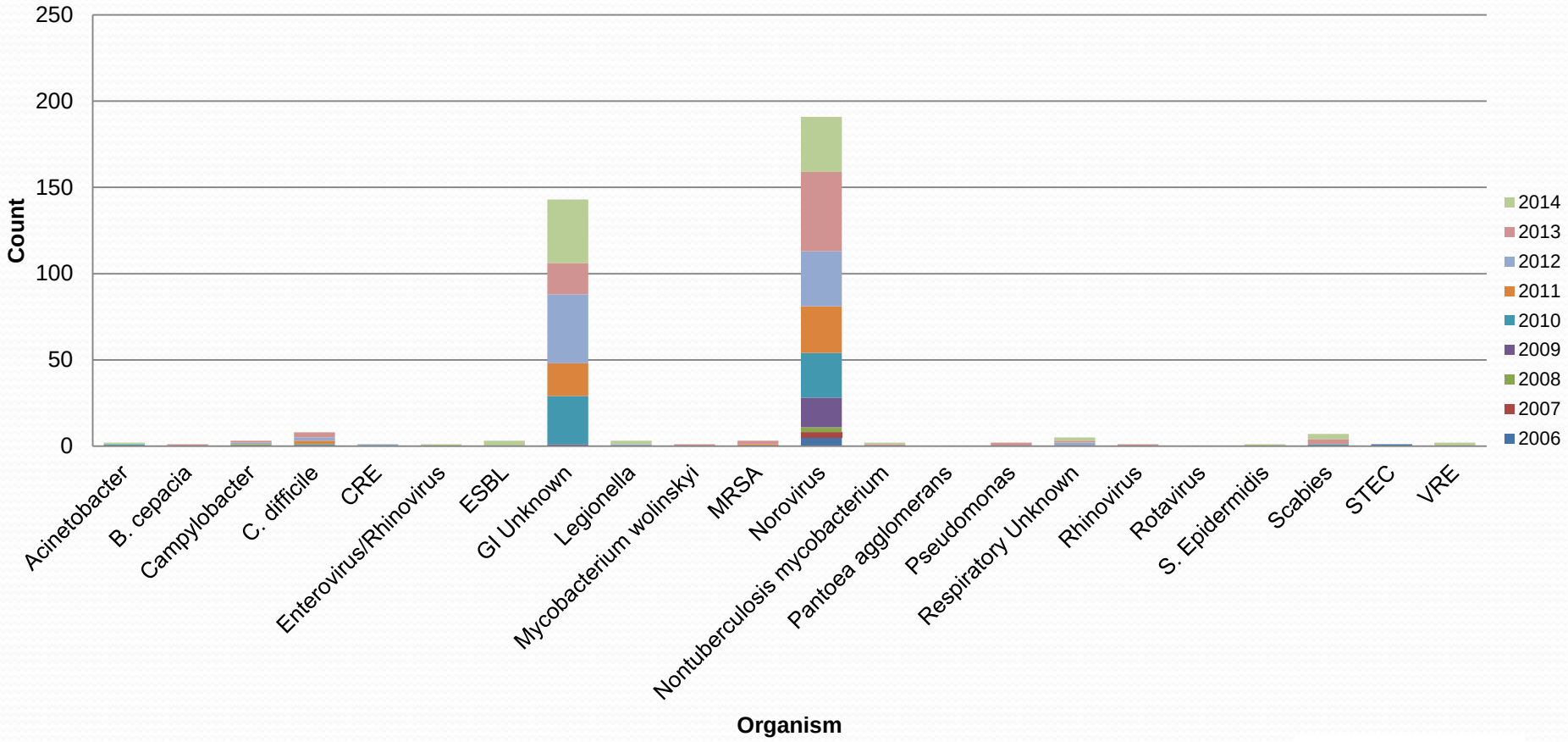
Healthcare Facility Disease Outbreaks by Organism, Kentucky, 2006 - 2015*†‡§



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* Outbreak considered for count if setting listed as “acute care,“ “hospital,” “long term care facility,” “outpatient setting,” “personal care hospital,” or “personal care facility.”

† Data retrieved from Kentucky Outbreak Report Database

‡ 2015 data only includes outbreaks reported between January 1, 2015 and August 31, 2015.

§ Data on Influenza outbreaks includes reports in two calendar years and therefore has been excluded from this figure.

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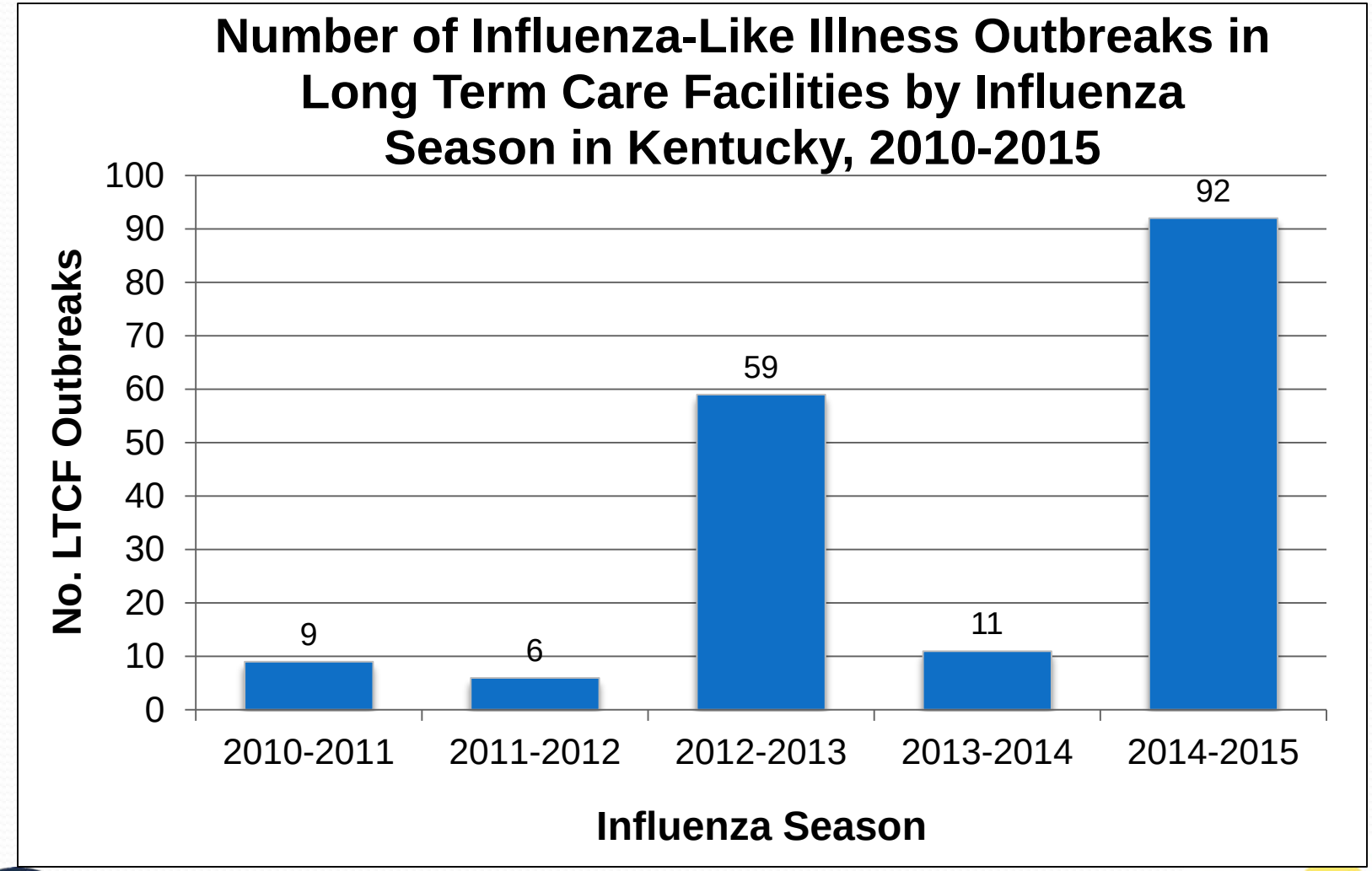

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Influenza Vaccination Coverage in U.S., Healthcare Personnel, 2014-2015 Season

- Pharmacists 95.3%
- Nurses 89.0%
- Physicians 88.9%
- Assistants/Aides 64.4%

Reference:
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6436a1.htm

Summary of New Regulation

- Defines HAIs and HAI outbreaks
- Mandates simultaneous reporting of HAI data to both Centers for Medicare and Medicaid Services (CMS) and the Kentucky Department for Public Health (KDPH) after regulation goes into effect
- Mandates electronic reporting of positive laboratory tests for certain Multidrug Resistant Organisms (MDROs) via the Kentucky Health Information Exchange beginning in October 2016

New Definitions and Reporting Requirements

- Healthcare-Associated Infection (HAI): An infection acquired by a person while receiving treatment for a separate condition in a healthcare setting
- Under the new regulation, certain HAIs are now reportable by facility through the National Healthcare Safety Network (NHSN)
- Cases of specific multidrug resistant organisms will be reported electronically beginning in October 2016.

New Definitions

- Healthcare-Associated Infection (HAI) Outbreak:
  - two or more HAIs that are epidemiologically linked or connected by person, place or time

  OR

  - a single case of an HAI not commonly diagnosed (for example, legionellosis acquired in a healthcare facility)

National Healthcare Safety Network (NHSN)

CDC's National Healthcare Safety Network (NHSN) is the nation's most widely used healthcare-associated infection tracking system. NHSN provides facilities, states, regions, and the nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate healthcare-associated infections.

http://www.cdc.gov/nhsn/about.html

NHSN (Continued)

NHSN provides medical facilities, states, regions, and the nation with data collection and reporting capabilities needed to:

- Identify infection prevention problems by facility, state, or specific quality improvement project
- Benchmark progress of infection prevention efforts
- Comply with state and federal public reporting mandates, and
- Ultimately, drive national progress toward elimination of HAIs

http://www.cdc.gov/nhsn/about.html

Simultaneous Reporting to Both CMS and KDPH

- HAIs are mandated to be reported routinely for hospitals that participate in the Centers for Medicare and Medicaid Services (CMS) Hospital Inpatient Quality Review (IQR) Program.
- Similar requirements exist for long term care facilities, outpatient dialysis centers, rehabilitation centers and others.
- Under new regulation, data submitted to CMS through NHSN are required to be submitted at same time to the KDPH.

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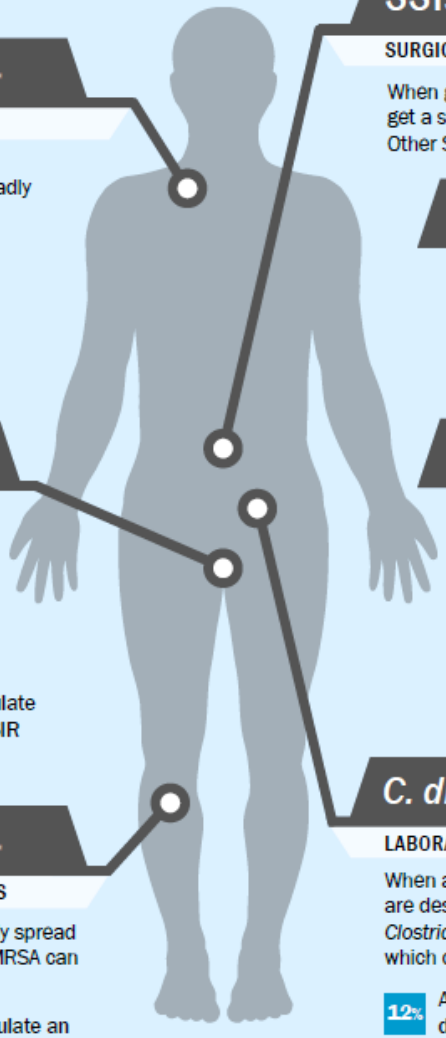
HEALTHCARE ASSOCIATED INFECTIONS PROGRESS

Healthcare-associated infections (HAIs) are infections patients can get while receiving medical treatment in a healthcare facility. Working toward the elimination of HAIs is a CDC priority. The standardized infection ratio (SIR) is a summary statistic that can be used to track HAI prevention progress over time; lower SIRs are better. The infection data are collected through CDC's National Healthcare Safety Network (NHSN). HAI data for nearly all U.S. hospitals are published on the Hospital Compare website.



CLABSIs

↓34% LOWER COMPARED TO NAT'L BASELINE*

CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS

When a tube is placed in a large vein and not put in correctly or kept clean, it can become a way for germs to enter the body and cause deadly infections in the blood.

- Kentucky hospitals reported a significant decrease in CLABSIs between 2012 and 2013.
- 8% Among the 38 hospitals in Kentucky with enough data to calculate an SIR, 8% had an SIR significantly worse than the national SIR of 0.54.

CAUTIs

↑21% HIGHER COMPARED TO NAT'L BASELINE*

CATHETER-ASSOCIATED URINARY TRACT INFECTIONS

When a urinary catheter is not put in correctly, not kept clean, or left in a patient for too long, germs can travel through the catheter and infect the bladder and kidneys.

- Kentucky hospitals reported no significant change in CAUTIs between 2012 and 2013.
- 11% Among the 54 hospitals in Kentucky with enough data to calculate an SIR, 11% had an SIR significantly worse than the national SIR of 1.06.

MRSA Bacteremia

↑27% HIGHER COMPARED TO NAT'L BASELINE*

LABORATORY IDENTIFIED HOSPITAL-ONSET BLOODSTREAM INFECTIONS

Methicillin-resistant *Staphylococcus aureus* (MRSA) is bacteria usually spread by contaminated hands. In a healthcare setting, such as a hospital, MRSA can cause serious bloodstream infections.

- 18% Among the 33 hospitals in Kentucky with enough data to calculate an SIR, 18% had an SIR significantly worse than the national SIR of 0.92.

SSIs

SURGICAL SITE INFECTIONS

When germs get into an area where surgery is or was performed, patients can get a surgical site infection. Sometimes these infections involve only the skin. Other SSIs can involve tissues under the skin, organs, or implanted material.

SSI: Abdominal Hysterectomy

↓11% LOWER COMPARED TO NAT'L BASELINE

- Kentucky hospitals reported no significant change in SSIs related to abdominal hysterectomy surgery between 2012 and 2013.
- 8% Among the 13 hospitals in Kentucky with enough data to calculate an SIR, 8% had an SIR significantly worse than the national SIR of 0.86.

SSI: Colon Surgery

↓24% LOWER COMPARED TO NAT'L BASELINE*

- Kentucky hospitals reported no significant change in SSIs related to colon surgery between 2012 and 2013.
- Several changes to the NHSN 2013 SSI protocol likely contributed to an increase in the national and some state-specific colon surgery SIRs compared to 2012.
- 6% Among the 36 hospitals in Kentucky with enough data to calculate an SIR, 6% had an SIR significantly worse than the national SIR of 0.92.

C. difficile Infections

↓3% LOWER COMPARED TO NAT'L BASELINE

LABORATORY IDENTIFIED HOSPITAL-ONSET *C. DIFFICILE* INFECTIONS

When a person takes antibiotics, good bacteria that protect against infection are destroyed for several months. During this time, patients can get sick from *Clostridium difficile* (*C. difficile*), bacteria that cause potentially deadly diarrhea, which can be spread in healthcare settings.

- 12% Among the 69 hospitals in Kentucky with enough data to calculate an SIR, 12% had an SIR significantly worse than the national SIR of 0.90.

*Statistically significant.

THIS REPORT IS BASED ON 2013 DATA, PUBLISHED JANUARY 2015

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HEALTHCARE ASSOCIATED INFECTIONS PROGRESS

HEALTHCARE-ASSOCIATED INFECTION (HAI) DATA give healthcare facilities and public health agencies knowledge to design, implement, and evaluate HAI prevention efforts.

Learn how your hospital is performing: www.medicare.gov/hospitalcompare
For additional information:

- 2013 HAI Progress Report: www.cdc.gov/hai/progress-report/
- NHSN: www.cdc.gov/nhsn
- HAIs and prevention activities in Kentucky: chfs.ky.gov/dph/epi/hai
- Kentucky validation efforts: www.cdc.gov/hai/pdfs/state-progress-landscape.pdf

LEGEND

- 2013 state SIR is significantly lower (better) than comparison group in column header
- or
- Change in 2013 state SIR compared to group in column header is not statistically significant
- 2013 state SIR is significantly higher (worse) than comparison group in column header
- 2013 state SIR cannot be calculated

HAI TYPE	# OF KENTUCKY HOSPITALS THAT REPORTED DATA TO CDC'S NHSN, 2013 Total Hospitals in State: 116+	2013 STATE SIR vs. 2012 State SIR‡	2013 STATE SIR vs. 2013 Nat'l SIR	2013 STATE SIR vs. Nat'l Baseline‡	2013 STATE SIR	2013 NAT'L SIR
CLABSI Nat'l Baseline: 2008	72	↓ 26%	↑ 24%	↓ 34%	0.67	0.54
CAUTI Nat'l Baseline: 2009	73	⇧ 3%	↑ 15%	↑ 21%	1.21	1.06
SSI, Abdominal Hysterectomy Nat'l Baseline: 2008	60	⇧ 12%	⇧ 5%	⇩ 11%	0.90	0.86
SSI, Colon Surgery Nat'l Baseline: 2008	66	⇩ 4%	↓ 17%	↓ 24%	0.76	0.92
MRSA Bacteremia Nat'l Baseline: 2011	71	2012 SIR not available	↑ 40%	↑ 27%	1.27	0.92
C. difficile Infections Nat'l Baseline: 2011	71	2012 SIR not available	↑ 7%	⇩ 3%	0.97	0.90

+Not all hospitals are required to report these infections; for example, some hospitals do not use central lines or urinary catheters, or do not perform colon or abdominal hysterectomy surgeries.
‡The state's 2012 SIR can be found in the data tables of this report.
‡Nat'l baseline time period varies by infection type. See first column of this table for specifics.

WHAT IS THE STANDARDIZED INFECTION RATIO?

The standardized infection ratio (SIR) is a summary statistic that can be used to track HAI prevention progress over time; lower SIRs are better. The SIR for a facility or state is adjusted to account for factors that might cause infection rates to be higher or lower, such as hospital size, teaching status, the type of patients a hospital serves, and surgery and patient characteristics.

WHAT IS KENTUCKY DOING TO PREVENT HEALTHCARE-ASSOCIATED INFECTIONS?

Prevention efforts to reduce specific HAIs:

- Central line-associated bloodstream infections
- Catheter-associated urinary tract infections
- Surgical site infections
- Multidrug-resistant infections (MRSA, *C. difficile*, CRE, and others)
- Long-term care facilities

Electronic Multidrug Resistant Organism (MDRO) Reporting

- Officially begins October 2016
- Can be used be facilities to demonstrate “meaningful use,” in order for facilities to continue to receive meaningful use payments
- Involves electronic reporting of positive laboratory results of certain MDROs as defined in the regulation, via the Kentucky Health Information Exchange

Kentucky Health Information Exchange (KHIE)

- Enables safe, secure electronic exchange of patient health information among participating providers and organizations throughout the state
- Participation fulfills meaningful use objectives of the Medicare and Medicaid Electronic Health Record Incentive Program

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http://khie.ky.gov

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State Mandate for HAI Reporting

- NHSN Surveillance data
- Allows KDPH to see how facilities are doing based on national benchmarks and in comparison with each other
- Facilities that report in the highest or lowest tertiles may be highlighted for data validation or consultation
- Individual patient level data is protected
- Hospital level data may be reported once finalized
- Also available on https://data.medicare.gov/data/hospital-compare

Advantages of MDRO Reporting

- Allows KDPH to have an understanding of “strains” or emerging important pathogens that may be present in our state
- Opportunity for quicker recognition and intervention in the event of a cluster or outbreak of an organism
- Allows KDPH to offer assistance with evaluating Infection Prevention activities, laboratory assistance with PFGE analysis, outbreak investigation expertise and on-site consultation
- Aids in understanding resistance patterns that may affect antimicrobial treatment limitations that could be more widespread than previously known
- Provides potential for development of regional/statewide antibiograms

Definition

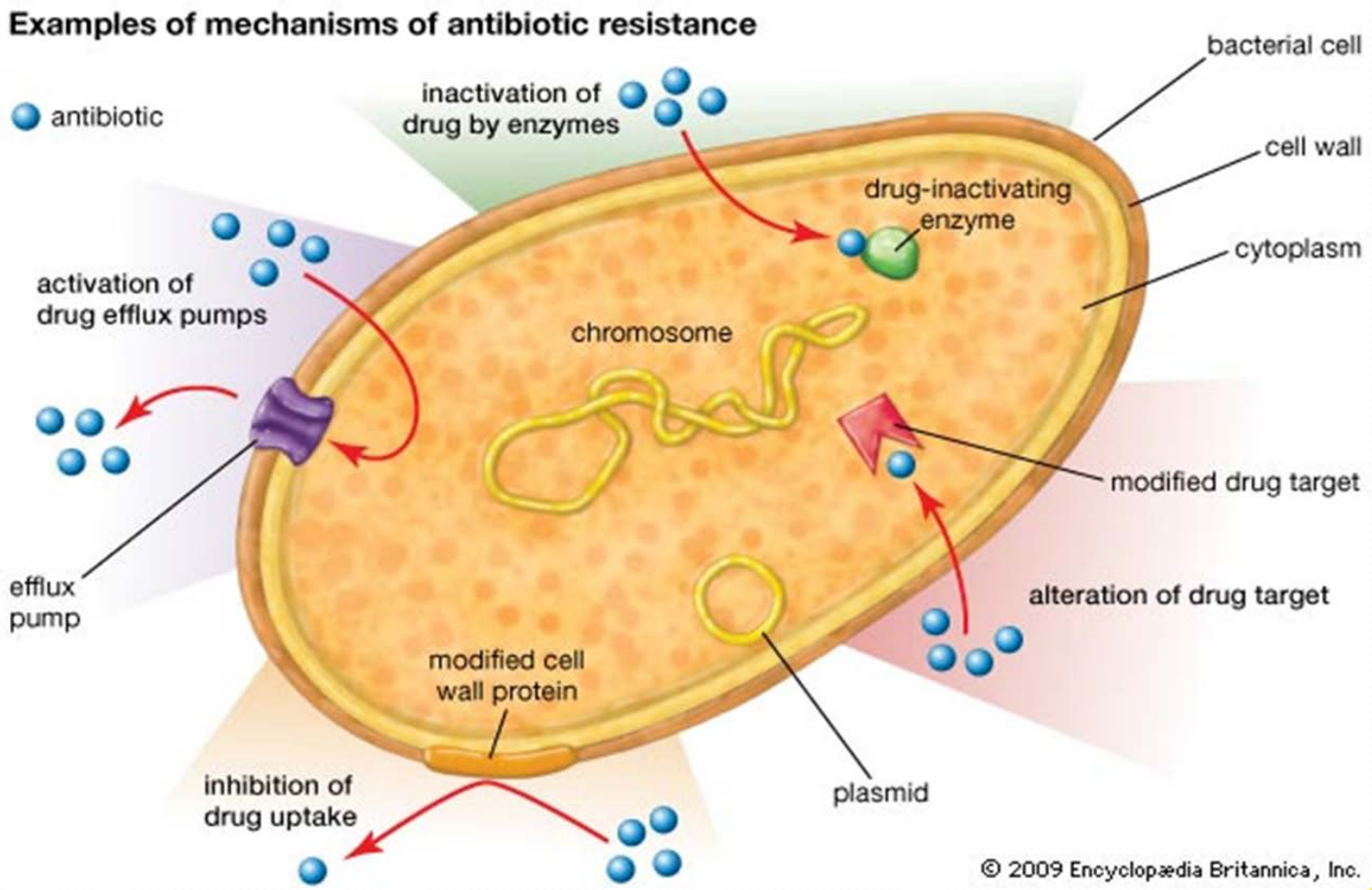
ANTIBIOTIC RESISTANCE IS THE ABILITY OF BACTERIA OR OTHER MICROBES TO RESIST THE EFFECTS OF AN ANTIBIOTIC. ANTIBIOTIC RESISTANCE OCCURS WHEN BACTERIA CHANGE IN SOME WAY THAT REDUCES OR ELIMINATES THE EFFECTIVENESS OF DRUGS, CHEMICALS, OR OTHER AGENTS DESIGNED TO CURE OR PREVENT INFECTIONS. THE BACTERIA SURVIVE AND CONTINUE TO MULTIPLY CAUSING

Did you know?

- Antibiotic Resistance is one of the world's most pressing public health threats
- Antibiotics are the most important tool to combat life-threatening bacterial infections….however, they come with side effects
- Antibiotic overuse increases the development of drug-resistant bacteria

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

Mechanisms of Antibiotic Resistance



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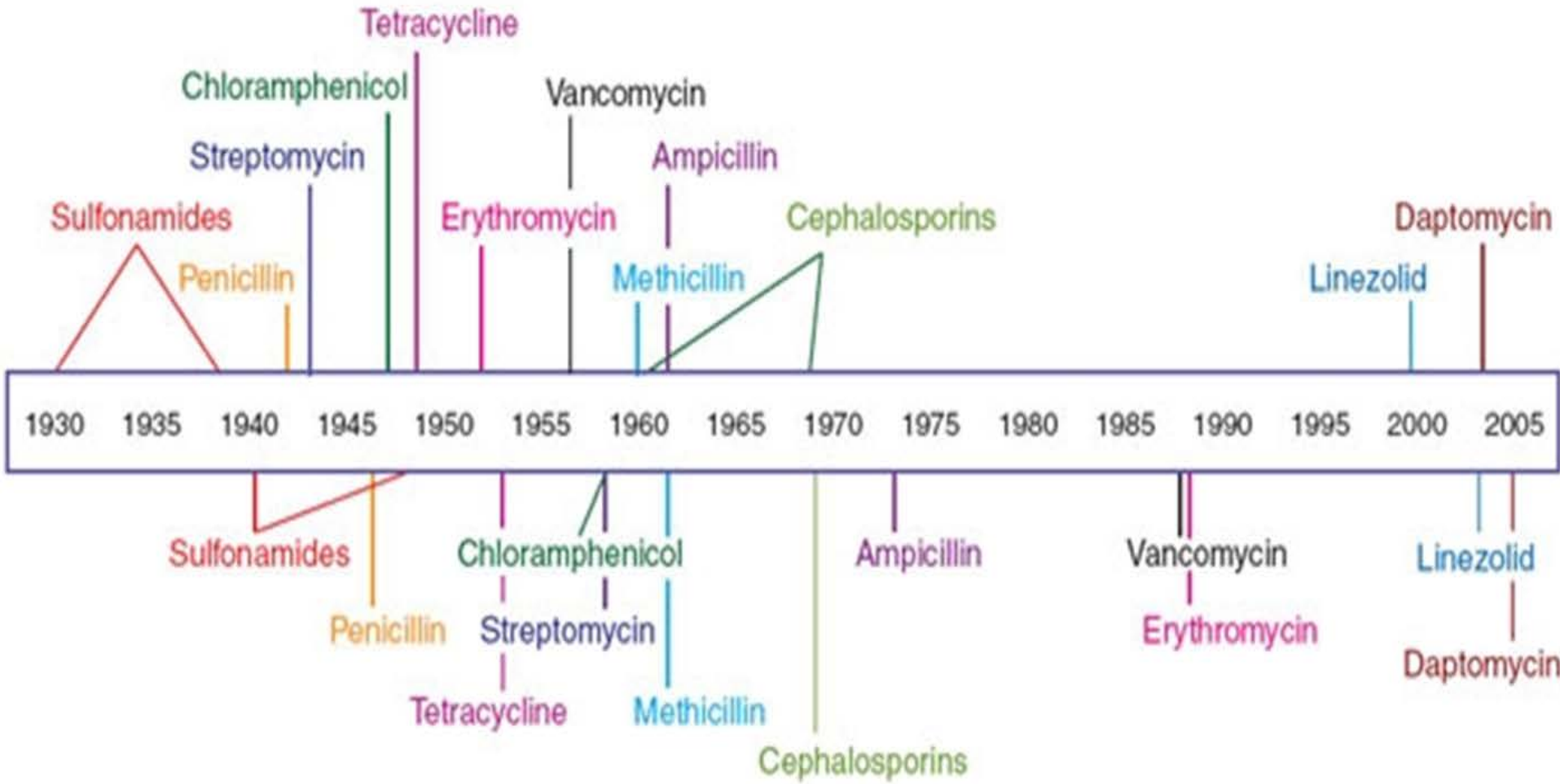
Why does this happen?

- Antibiotic use promotes development of antibiotic resistant bacteria
  - Sensitive bacteria are killed
  - Resistant bacteria survive
  - Resistant bacteria grow and multiply
- Repeated and improper uses of antibiotics are primary causes of the increase in drug-resistant bacteria: “Use it and lose it”

Antibiotic deployment

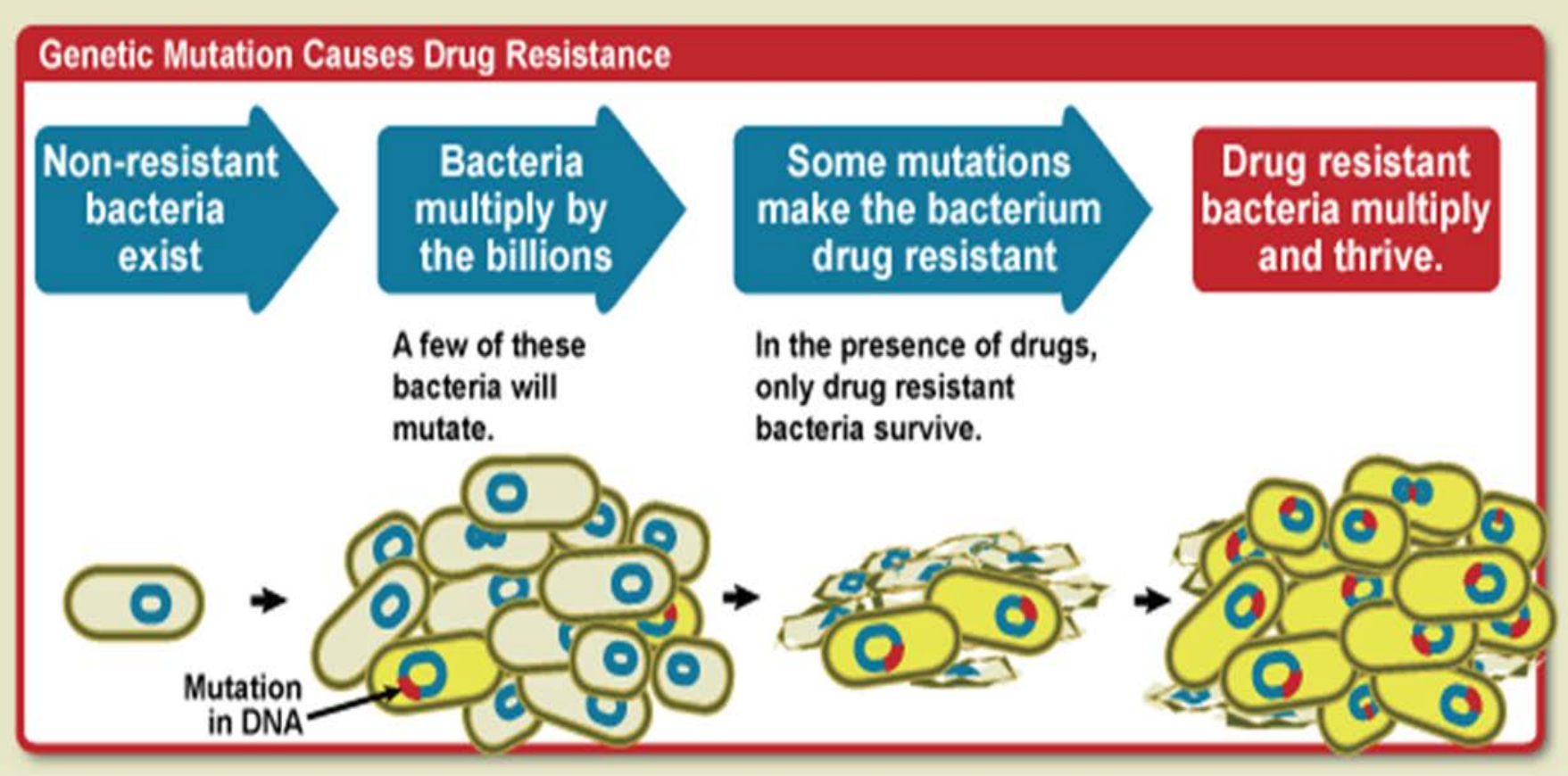


Antibiotic resistance observed

How do bacteria become resistant to antibiotics?

- Resistance occurs when bacteria change in some way that reduces or eliminates the effectiveness of drugs, chemicals or other agents designed to cure or prevent infections.
- Those bacteria that “escape” can multiply and replace all the susceptible bacteria that have been killed off providing “selective pressure” making the surviving bacteria more likely to be resistant

Development of Drug Resistant Bacteria



Scope of the problem

- Antibiotic resistance is associated with:
  - Increased risk of hospitalization
  - Increased length of stay
  - Increased hospital costs
  - Increased risk of transfer to the intensive care unit
  - Increased risk of death

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

2015 Infection Prevention Statements

- Microbiome is increasingly resistant
- Environmental hardiness of organisms is increasing
- Lack of consistent application of preventive measures by patients and healthcare workers
- Existing organisms colonizing the patient and/or the environment are of critical importance

Infection Prevention and Control Core Practices

- Hand hygiene
- Aseptic technique
- Safe injection practices
- Standard and transmission-based precautions
- Training and education of healthcare personnel
- Patient and family education
- Environmental hygiene
- Leadership support
- Monitoring of practice
- Employee/Occupational health
- Early removal of invasive devices

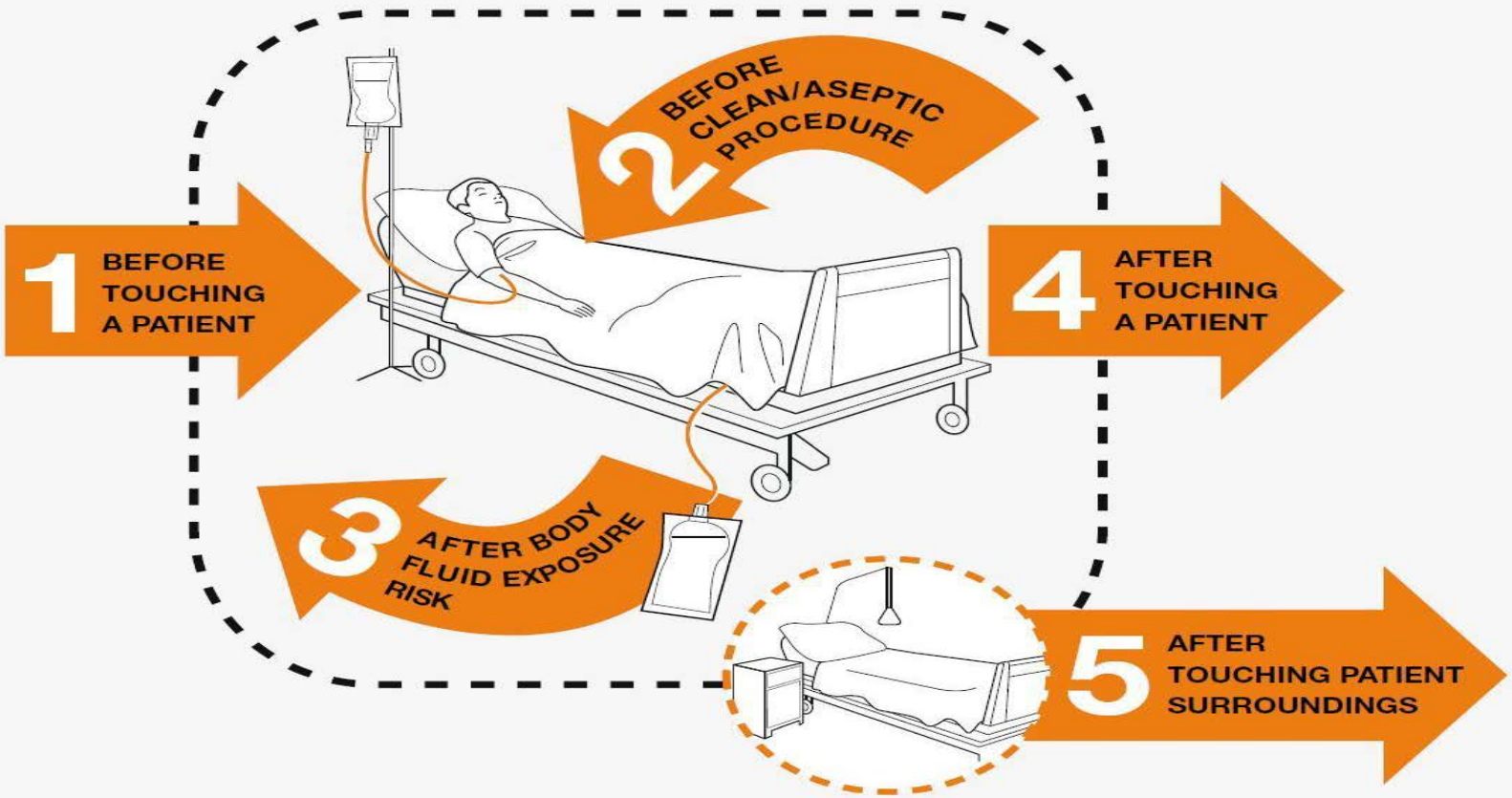
Rex and June Morgan know….

Hand Hygiene

- #1 way to disrupt the transmission of organisms at key points of time
- Continues to be one of “the most significant compliance challenges” in modern healthcare
  - Work load/acuity of patients negatively affects compliance
  - Time elapsed within the work shift negatively affects compliance
  - Longer breaks between work shifts positively affects compliance

Journal of Applied Psychology, Henigshen D., et al. Online publ.11/3/14 Accessed at http://dx.doi.org/10.1037/a0038067

5 moments for hand hygiene in healthcare

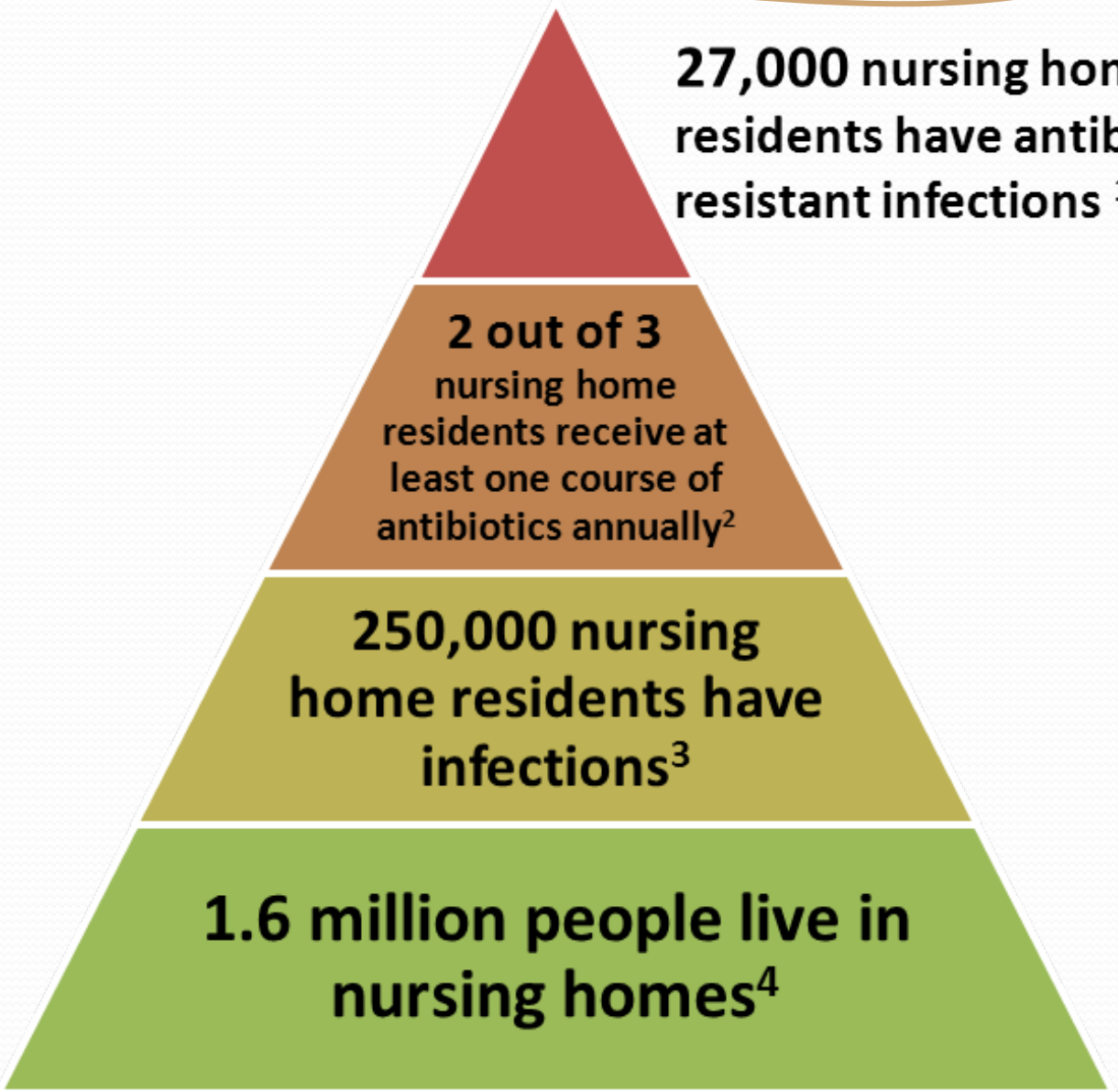


*Adapted from the WHO Alliance for Patient Safety 2006

Antibiotic use can adversely impact patients- *C. difficile*

- Antibiotic exposure is the single most important risk factor for the development of *Clostridium difficile* associated disease (CDAD).
- Up to 85% of patients with CDAD have antibiotic exposure in the 28 days before infection

Chang HT et al. Infect Control Hosp Epidemiol 2007; 28:926–931.



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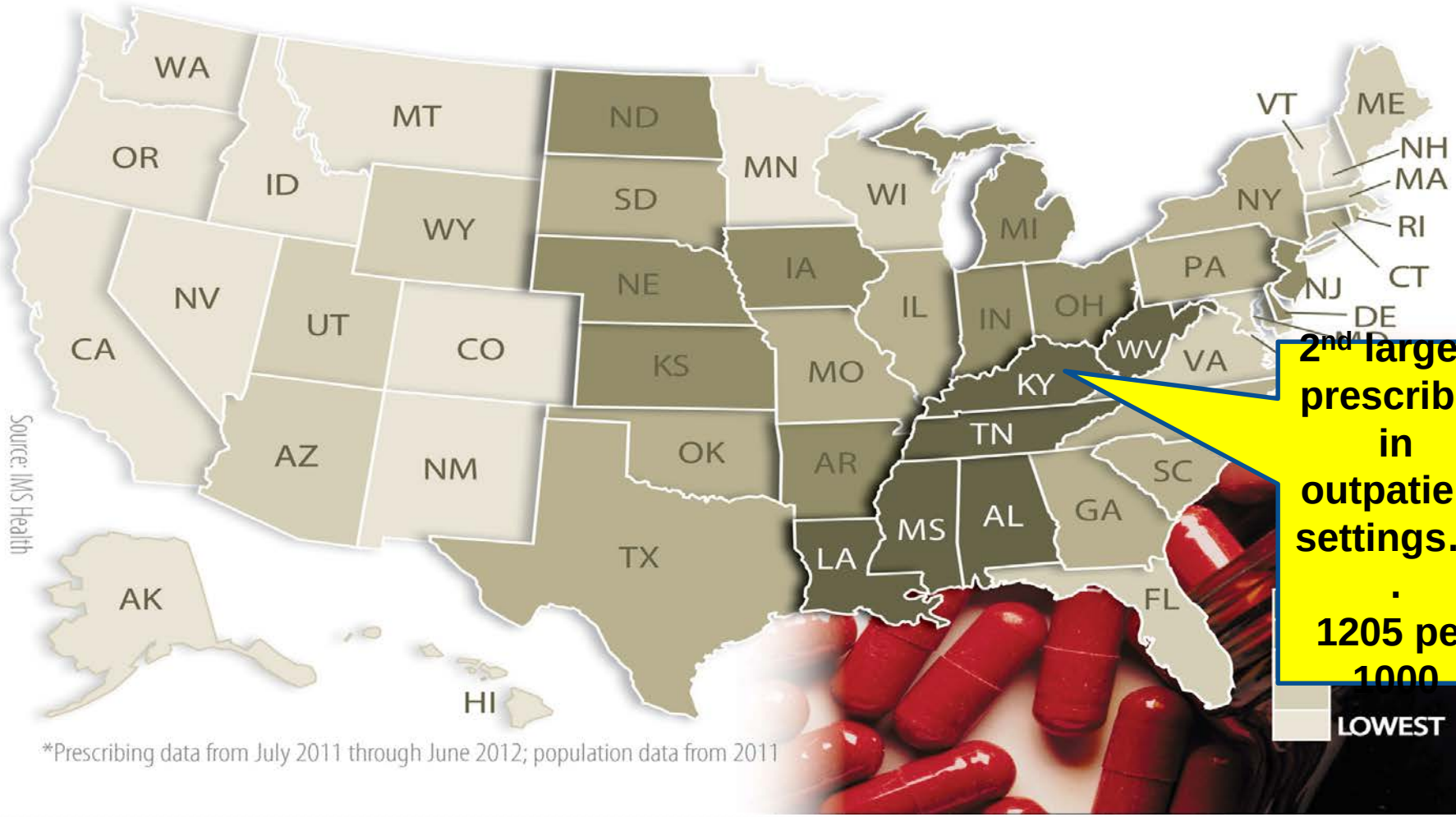
http://www.cdc.gov/getsmart/campaign-materials/week/promotional-media.html?tab=6#TabbedPanels1

Out-patient Settings

- Each year, tens of millions of antibiotics are prescribed unnecessarily for viral upper respiratory infections
- In states where there is more antibiotic use, there are more antibiotic-resistant pneumococcal infections
- The presence of antibiotic-resistant bacteria is greatest during the month following a patient's antibiotic use and may persist for up to 12 months.

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

Antibiotic prescribing rates by state across the U.S. (2011/12)*



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http://www.cdc.gov/getsmart/community/programs-measurement/measuring-antibiotic-prescribing.html#f4

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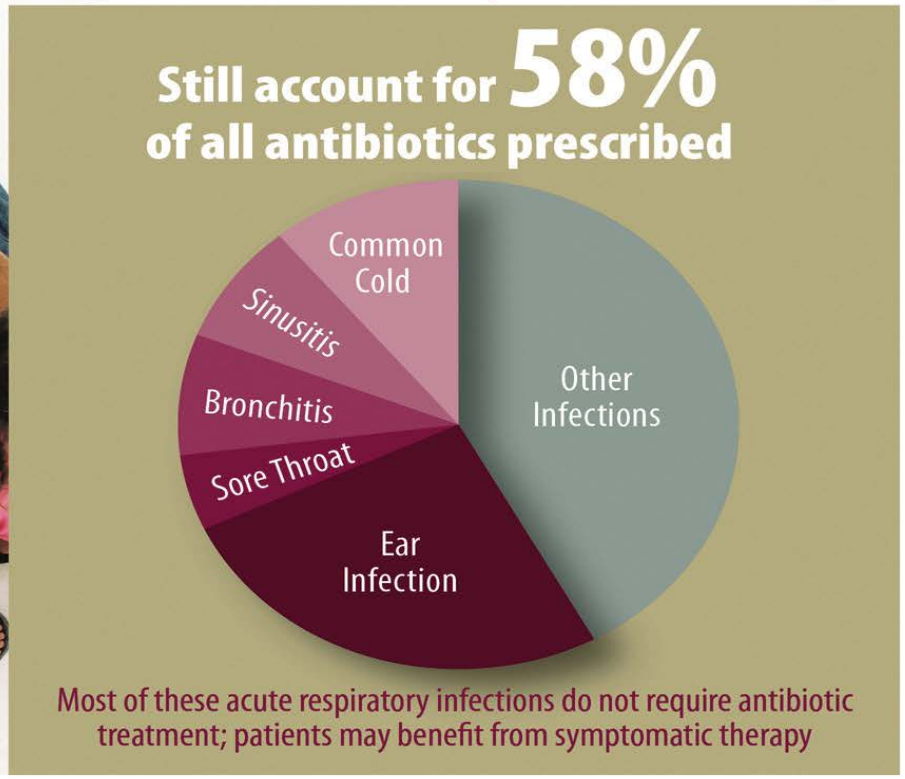
Good News / Bad News

Antibiotics prescribed for acute respiratory infections in kids younger than 15 years of age

*Comparing 1993–94 to 2007–08



Source: MMWR. 2011;60:1153-6

http://www.cdc.gov/getsmart/campaign-materials/week/promotional-media.html?tab=6#TabbedPanels1

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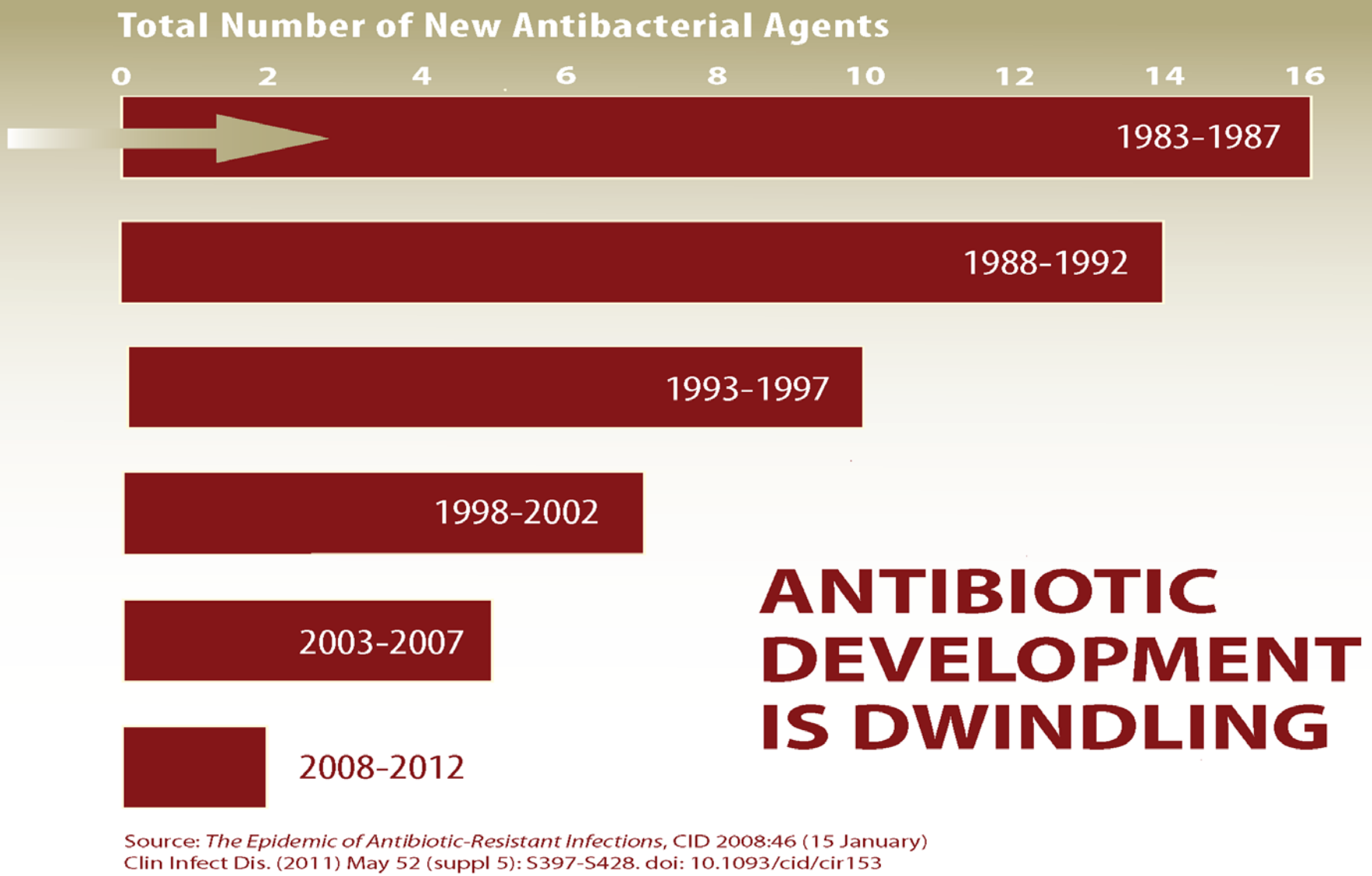
Improving antibiotic use saves money

- According to the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America Guidelines for Developing an Institutional Program to Enhance Antimicrobial Stewardship: "**Comprehensive programs have consistently demonstrated a decrease in antimicrobial use (22% -36%),with annual savings of $200,000 - $900,000…**"
- http://cid.oxfordjournals.org/content/44/2/159.full#sec-1



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http://www.cdc.gov/getsmart/campaign-materials/week/images/anti-dev.png

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Improving antibiotic use is a public health imperative

- Antibiotics are the only drug where use in one patient can impact the effectiveness in another
- Antibiotics are a shared resource, (and becoming a scarce resource)

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Core Elements of Antibiotic Stewardship programs – Outpatient settings

- Refrain from treating viral syndromes with antibiotics
- Prescribe: right antibiotic, right dose, right duration
- Include microbiology cultures when placing antibiotic orders
- Take an “antibiotic timeout” when a patient’s culture result comes back

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

Core Elements of Antibiotic Stewardship programs – Outpatient settings

- Talk to patients about appropriate use of antibiotics
- Work with pharmacists to counsel patients on appropriate antibiotic use, resistance and adverse effects
- Consider delayed prescribing
- Utilize patient and provider resources offered by CDC and other professional organizations

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

GET SMART:
Know When Antibiotics Work

GET SMART WEEK: November 16-22, 2015

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Embrace antibiotic stewardship

Goal: Improve antibiotic use in in-patient facilities, out-patient offices and in the community, through stewardship interventions and programs, which will improve individual patient outcomes, reduce overall burden of antibiotic resistance and save healthcare dollars.

http://www.cdc.gov/getsmart/healthcare/factsheets/hc_providers.html

Kraig E. Humbaugh, M.D., M.P.H.
Deputy Commissioner
Department for Public Health
Cabinet for Health & Family Services
(502) 564-3970
kraig.humbaugh@ky.gov

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