All Healthcare Professionals can *Be Antibiotics Aware*

BE ANTIBIOTICS AWARE
SMART USE, BEST CARE

Antibiotic Use & Resistance in Kansas: Are we doing more harm than good?

Kellie Wark, MD, MPH | November 17, 2022

Kansas Department of Health and Environment
Division of Public Health

CS335343-A

To receive continuing education, you must:

1. Complete sign-in sheet located at the back of today's handouts and return to jdaughhette@khconline.org

2. Participate in all polling questions

3. Complete the evaluation at the end of the presentation

Presenters

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Objectives

1. Review the background of antibiotic resistance trends in Kansas.
2. Describe how antibiotic use contributes to antibiotic resistance.
3. Examine ways clinicians can improve antibiotic use with special emphasis on outpatient setting.
4. Provide resources and tools to improve antibiotic use.

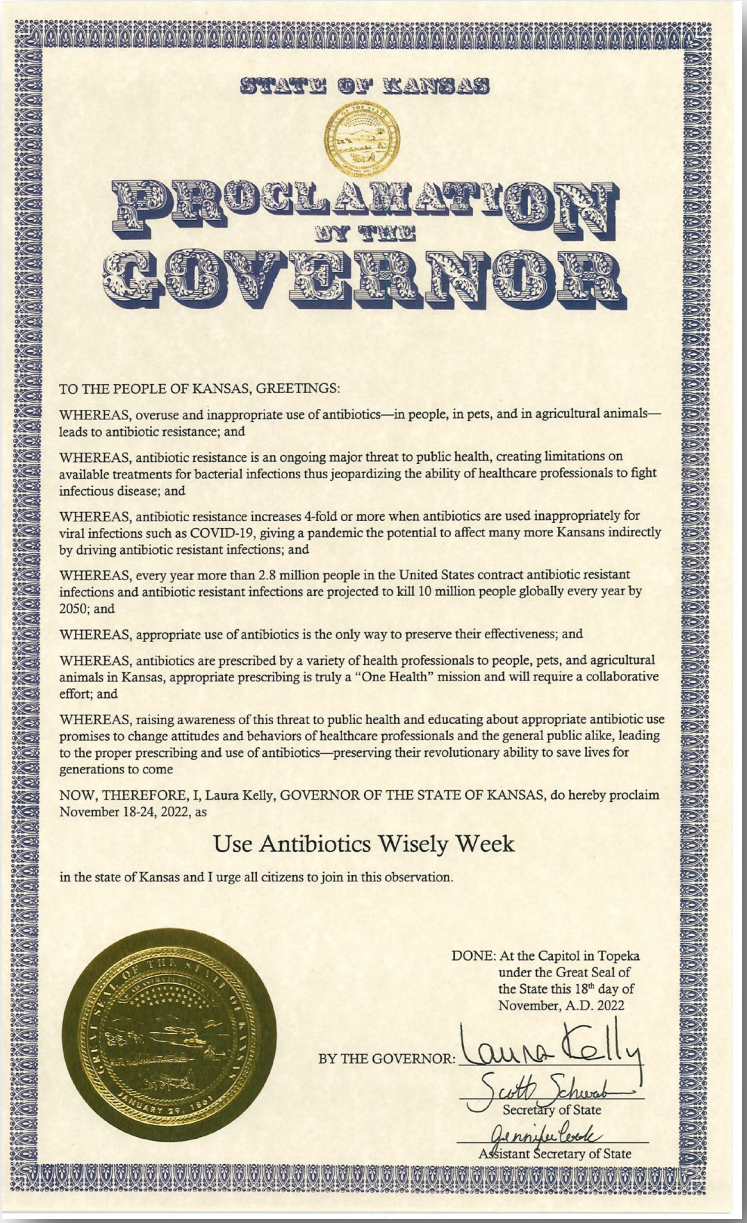
November 18-24, 2022

Globally = World Antimicrobial Awareness Week

Nationally = US Antibiotic Awareness Week

KS = Use Antibiotics Wisely Week

4th Gubernatorial Proclamation



STATE OF KANSAS

PROCLAMATION BY THE GOVERNOR

TO THE PEOPLE OF KANSAS, GREETINGS:

WHEREAS, overuse and inappropriate use of antibiotics—in people, in pets, and in agricultural animals—leads to antibiotic resistance; and

WHEREAS, antibiotic resistance is an ongoing major threat to public health, creating limitations on available treatments for bacterial infections thus jeopardizing the ability of healthcare professionals to fight infectious disease; and

WHEREAS, antibiotic resistance increases 4-fold or more when antibiotics are used inappropriately for viral infections such as COVID-19, giving a pandemic the potential to affect many more Kansans indirectly by driving antibiotic resistant infections; and

WHEREAS, every year more than 2.8 million people in the United States contract antibiotic resistant infections and antibiotic resistant infections are projected to kill 10 million people globally every year by 2050; and

WHEREAS, appropriate use of antibiotics is the only way to preserve their effectiveness; and

WHEREAS, antibiotics are prescribed by a variety of health professionals to people, pets, and agricultural animals in Kansas, appropriate prescribing is truly a "One Health" mission and will require a collaborative effort; and

WHEREAS, raising awareness of this threat to public health and educating about appropriate antibiotic use promises to change attitudes and behaviors of healthcare professionals and the general public alike, leading to the proper prescribing and use of antibiotics—preserving their revolutionary ability to save lives for generations to come

NOW, THEREFORE, I, Laura Kelly, GOVERNOR OF THE STATE OF KANSAS, do hereby proclaim November 18-24, 2022, as

Use Antibiotics Wisely Week

in the state of Kansas and I urge all citizens to join in this observation.

DONE: At the Capitol in Topeka under the Great Seal of the State this 18th day of November, A.D. 2022

BY THE GOVERNOR: Laura Kelly

Scott Schwab
Secretary of State

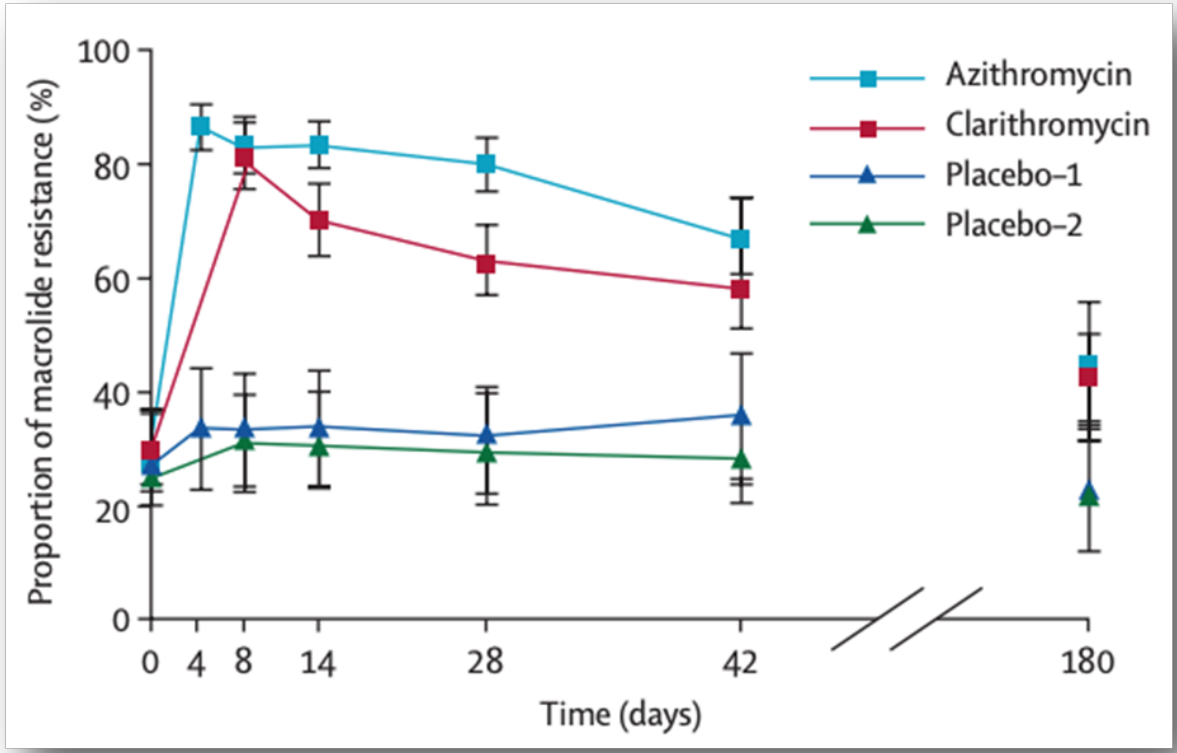
Jennifer Cook
Assistant Secretary of State

Why Focus on Antibiotics?

Antibiotic use contributes to:

- Antibiotic resistance (AR): **use it AND lose it?**
  - In as quickly as 4 days, 3x increase resistance pneumococcus in throat swabs while on macrolide vs. control
  - AR = increased costs (MDROs vs. susceptible **prolong hospitalizations 24% & costs 29%**)
- Adverse events (#1 med-related ED visit)
- Collateral damage (e.g., *C.diff*)

Changes in macrolide-resistant *S.pneumoniae* while on macrolides compared to placebo (no abx)



Pennsylvania HealthCare Cost Containment Council. Jan 2010 http://phc4.org/reports/hai/10/docs/hai2010report.pdf
Maudlin et al. Antimicrobial Agents and Chemotherapy. 2010; 54(109-15
Roberts et al. Clinical Infectious Diseases. 2009;49:1175-84.
Malhotra-Kumar S, et al Lancet 2007;369(9560):482-90.

The Toll of Antimicrobial Resistance

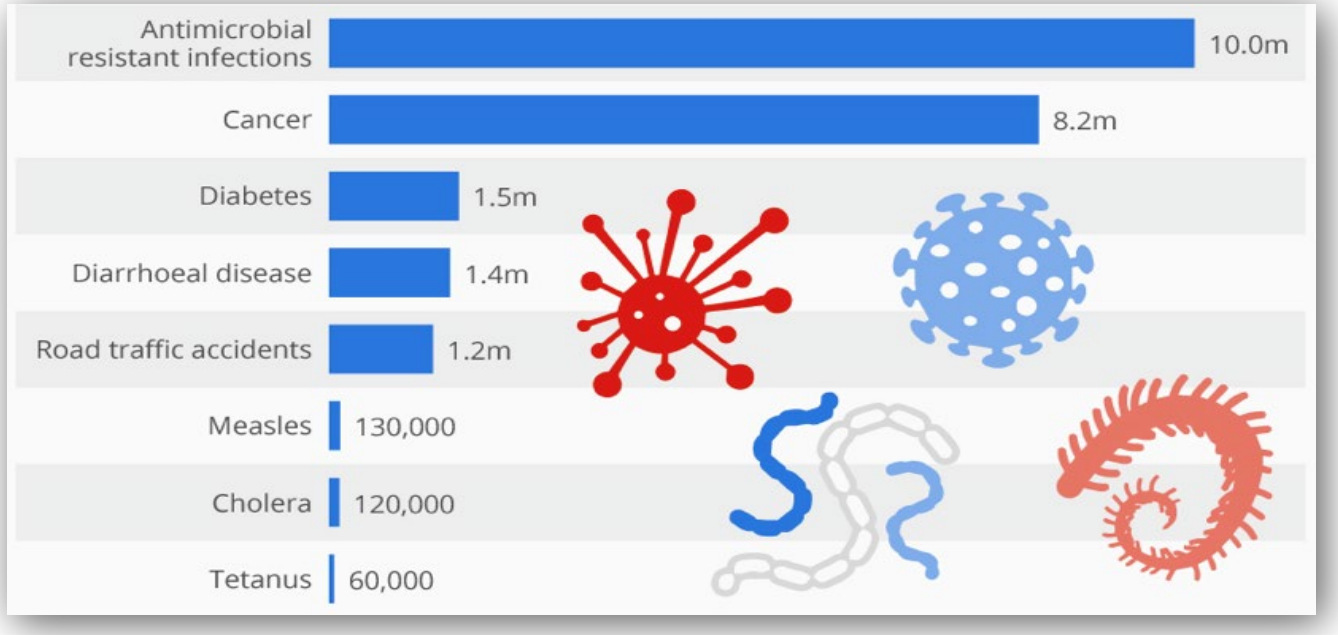
AR annually contributes to:

- **Deaths**
  - 35,000 (U.S.)
  - 700,000 (Global)
- **Infections (MDROs)**
  - 2.8 million (U.S.)
  - 10 million (Global)
- **Costs**
  - $55 billion added costs (U.S.)
  - $100 trillion (Global)

Equivalent to a 2008 financial crisis every year

Deaths from Antibiotic Resistant Infections Set to Skyrocket

Deaths from Resistant Infections & Other Causes in 2050



Worldbank; Smith R, Coast J., The true cost of antimicrobial resistance. BMJ 2013(346)
O'neill J. Tackling drug-resistant infections globally - AMR review. 2016; https://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf
CDC Threats Report 2019; https://cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf.

Question 1

True or False? The most common infection which is treated with antibiotics in the outpatient setting are viral upper respiratory infections

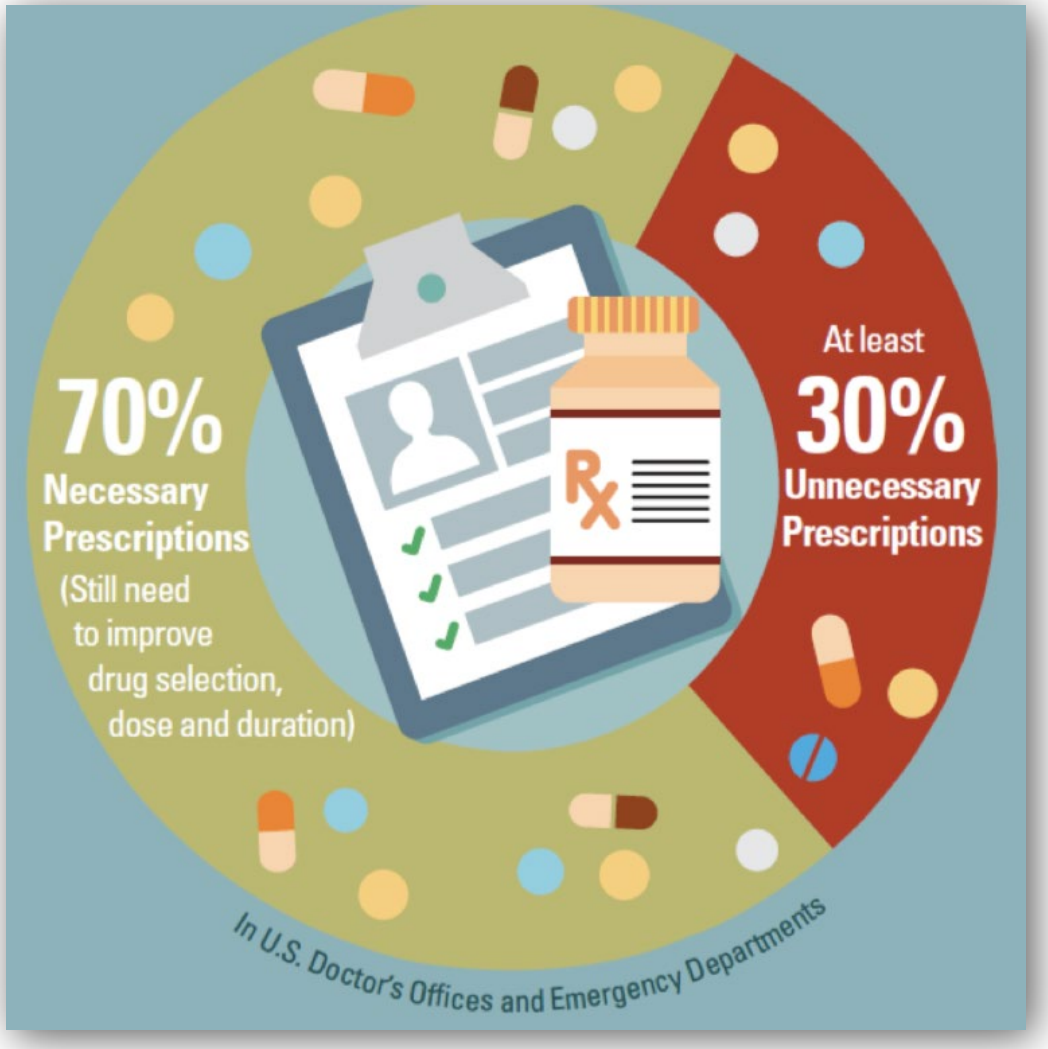
A. True

B. False

Where Are Antibiotics Prescribed?

Outpatient

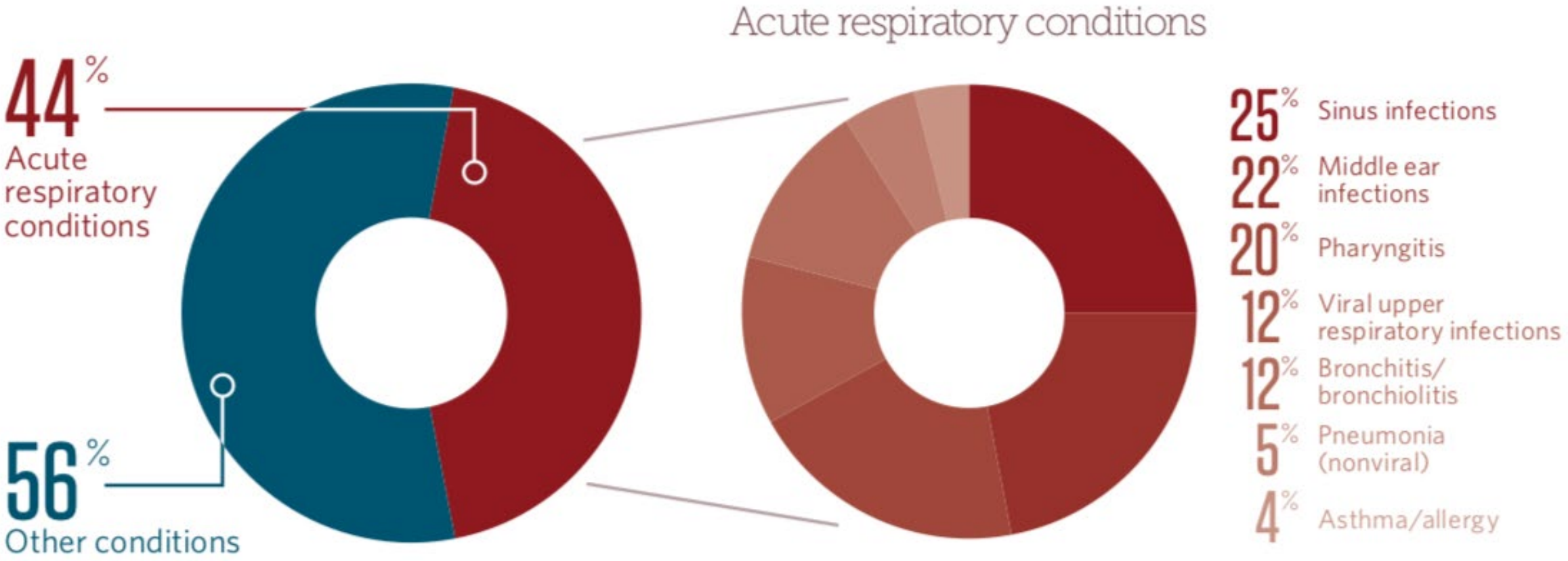
- 47 million unnecessary antibiotics/year
  - **30-40% abx unnecessary**
  - 613 abx Rx'd / 1000 pop
- **60% of all abx expenditures!**
- Acute Respiratory Infections (ARIs) are most common conditions associated with abx – despite most being viral



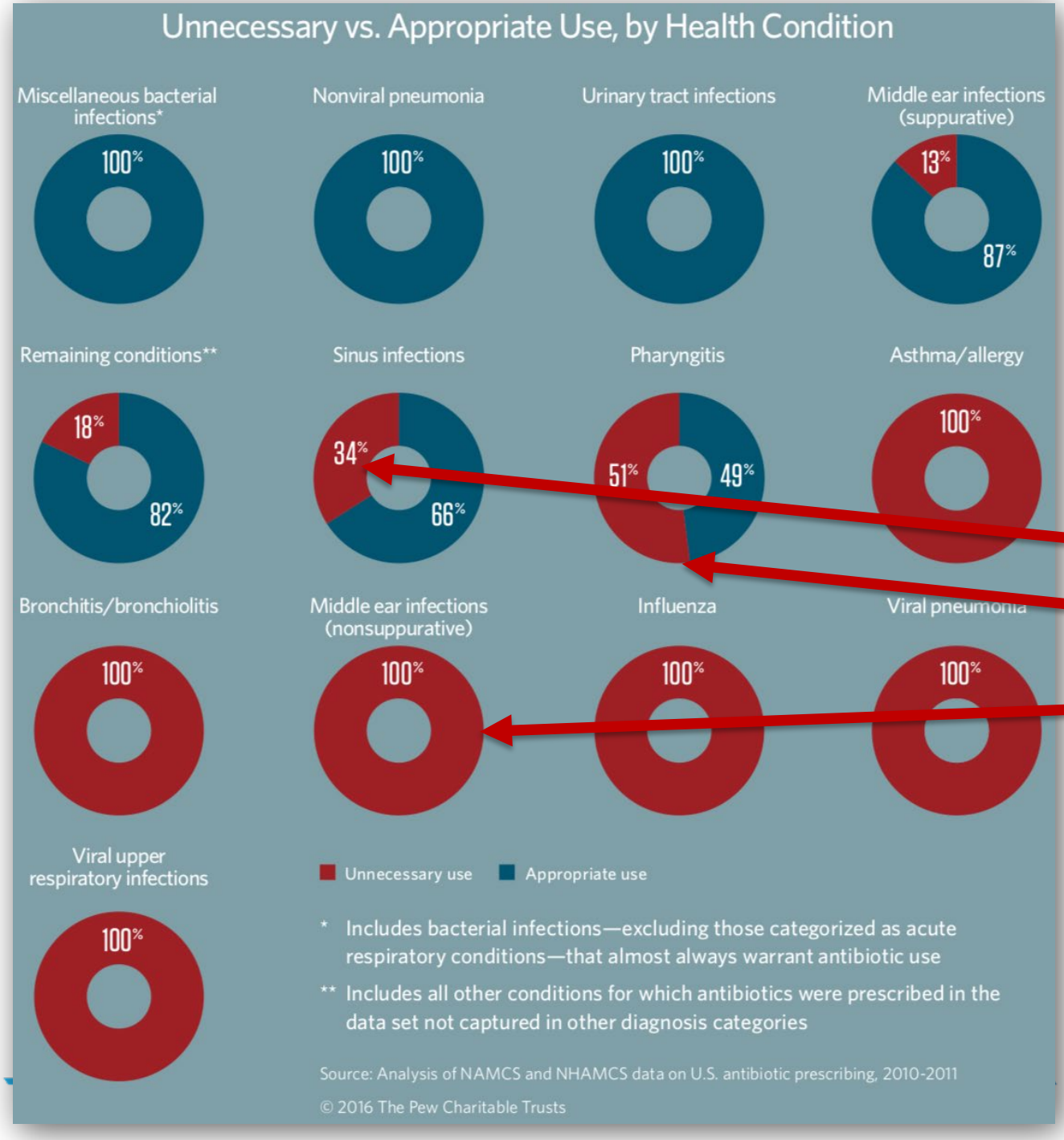
Talkington K. et al. Pew Charitable Trusts, May 2016
Parente D., et al. Antimicrob Resist Infect Control. 2017:(6):33.
Havers, et al. JAMA Netw Open 2018; 1(2):e180243.
Suda K., et al Antimicrob Chemother. 2013;68(3)
https://arpsp.cdc.gov/profile/antibiotic-use/all-classes

Outpatient Antibiotic Prescriptions by Diagnosis

Analysis of NAMCS & NHAMCS data on US antibiotic Prescribing, 2010-2011



Talkington K. et al. Pew Charitable Trusts, May 2016



1/3 of all antibiotics prescribed for:

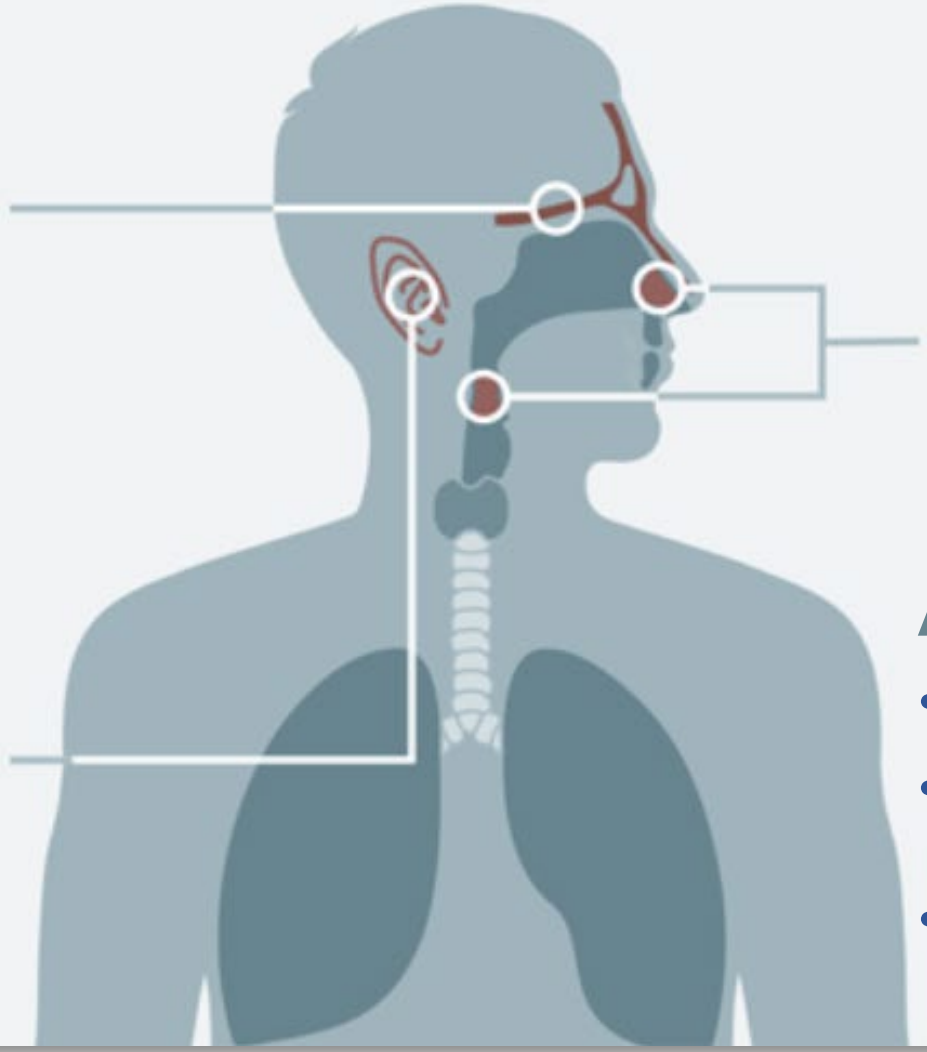
- Sinusitis
- Pharyngitis
- Otitis Media

Talkington K. et al. Pew Charitable Trusts, May 2016
Fleming-Dutra K. et al. JAMA 2016; 315(17):1864-73.

Outpatient Antibiotic for ARIs

Sinus infections
6 million unnecessary prescriptions each year

Middle ear infections
2.5 million unnecessary prescriptions each year



Viral upper respiratory infections, e.g., the "common cold"
8 million unnecessary prescriptions each year

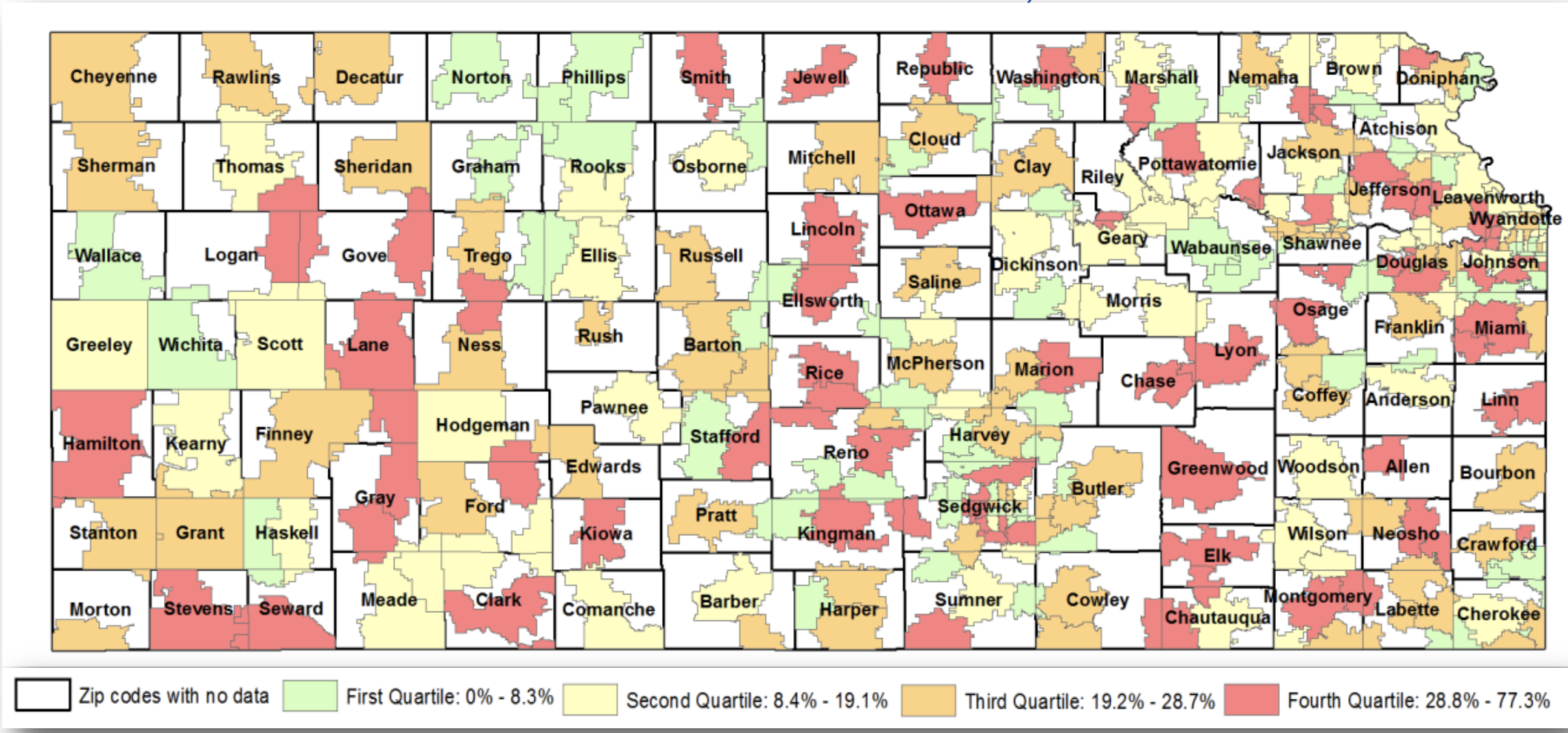
ARIs in 126 clinics:

- 41% unnecessary
- 56% broad spectrum (e.g., augmentin, levofloxacin, azithromycin)
- **29% dx flu Rx'd abx**

Havers, et al. JAMA Netw Open 2018; 1(2):e180243.

Percent of Potentially Inappropriate Prescribed Antibiotics for ARI among Kansas Prescribers

Medicare & Medicaid Claims Data, 2017-18



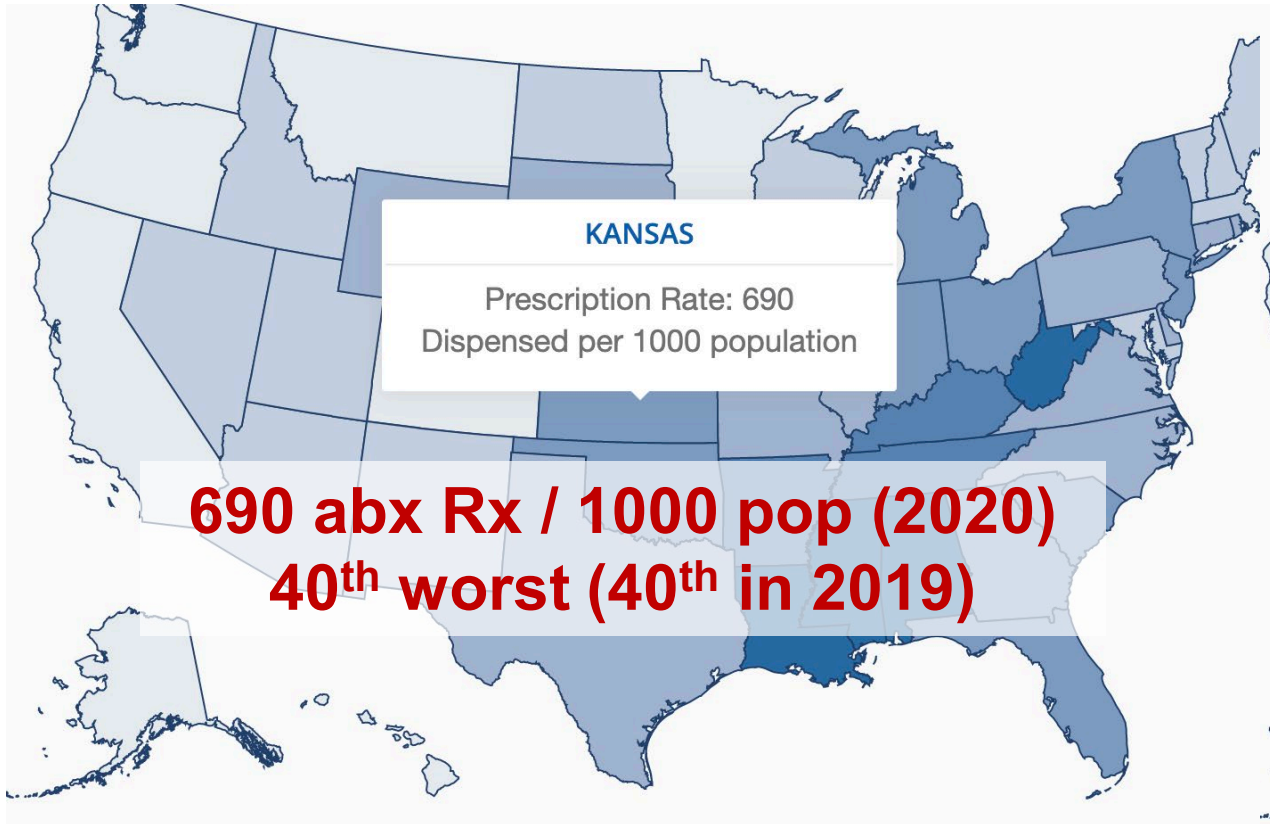
Question 2

True or False? Kansas is one of the **top (best)** states with optimal antibiotic prescribing in the outpatient setting?

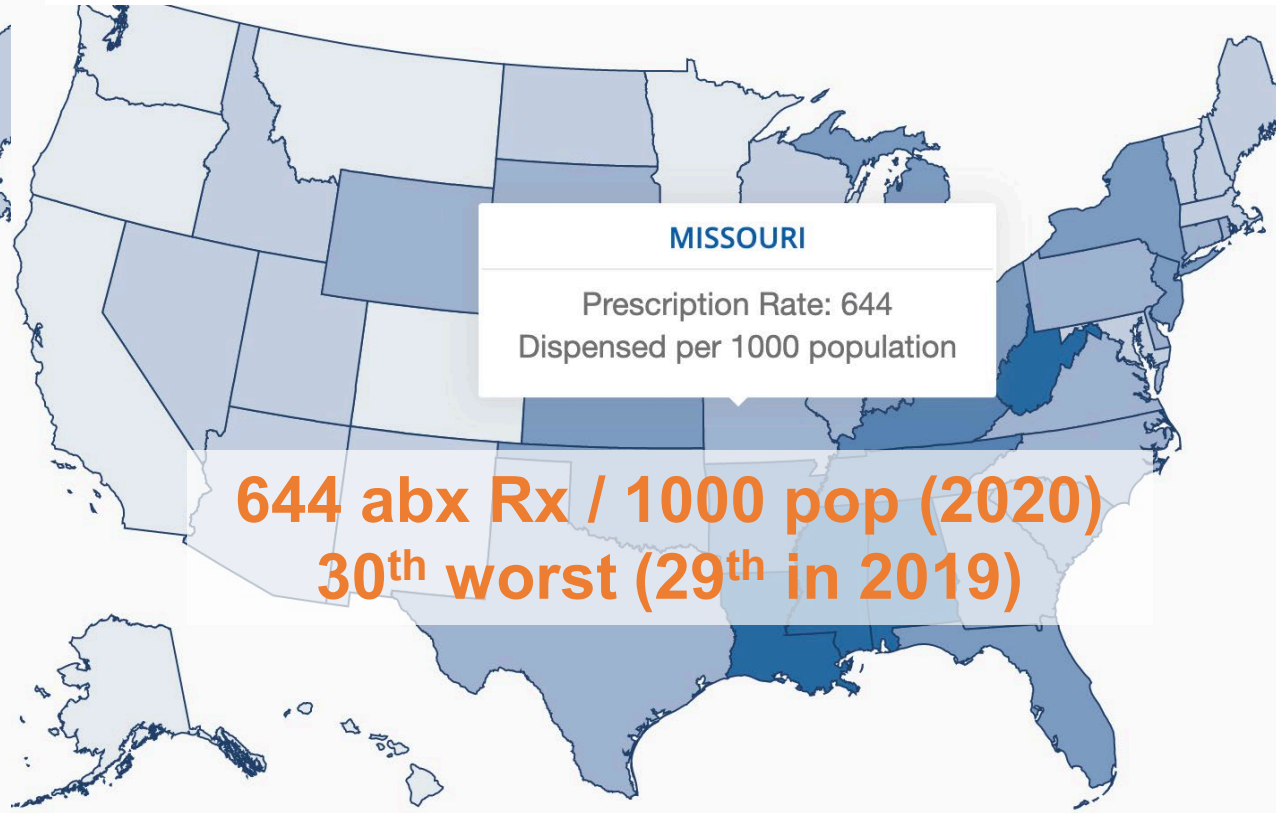
A. True

B. False

Current State(s): Outpatient Antibiotic Prescribing (2020)



690 abx Rx / 1000 pop (2020)
40th worst (40th in 2019)



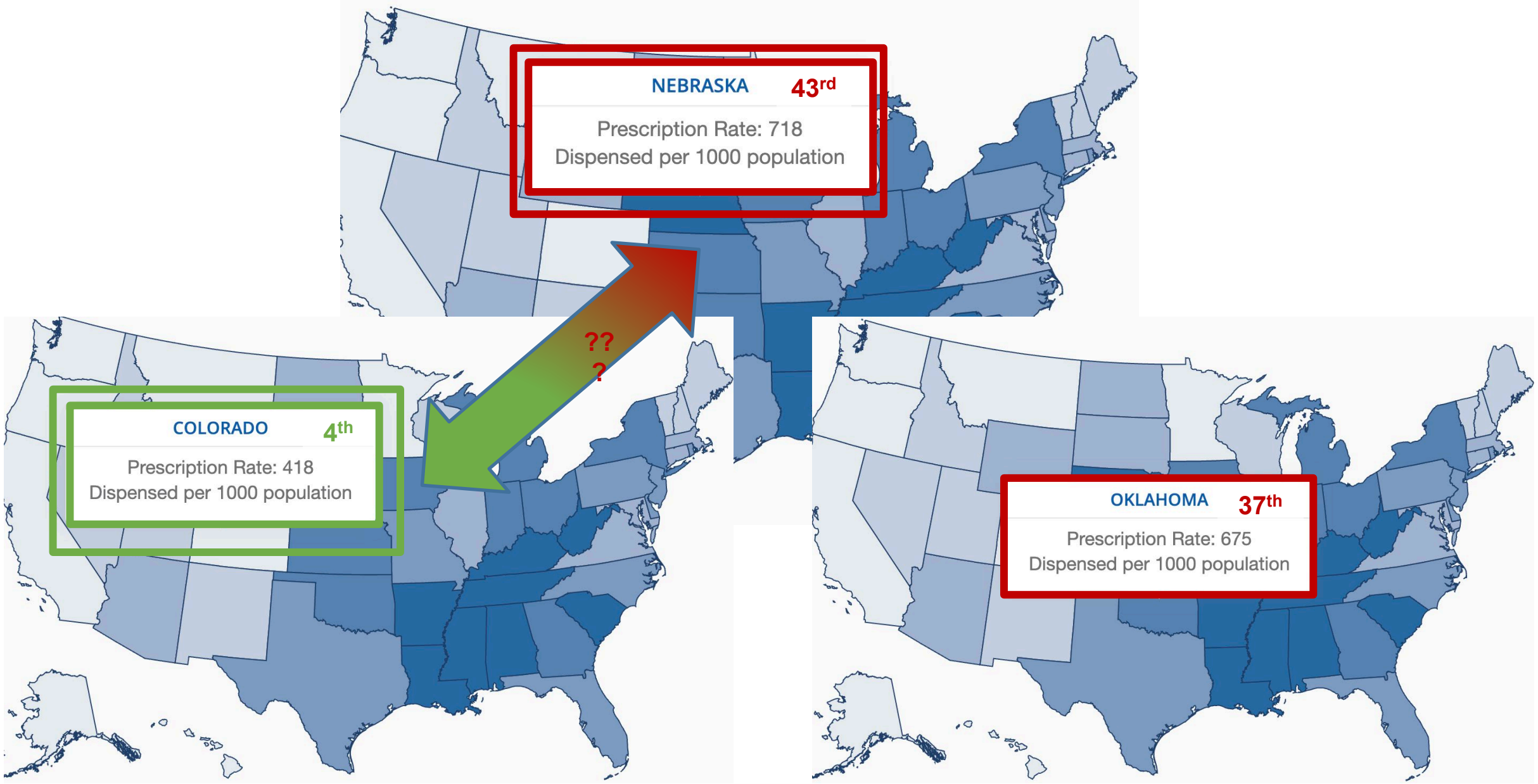
644 abx Rx / 1000 pop (2020)
30th worst (29th in 2019)

AR PATIENT SAFETY ATLAS

https://arpsp.cdc.gov/profile/antibiotic-use/all-classes

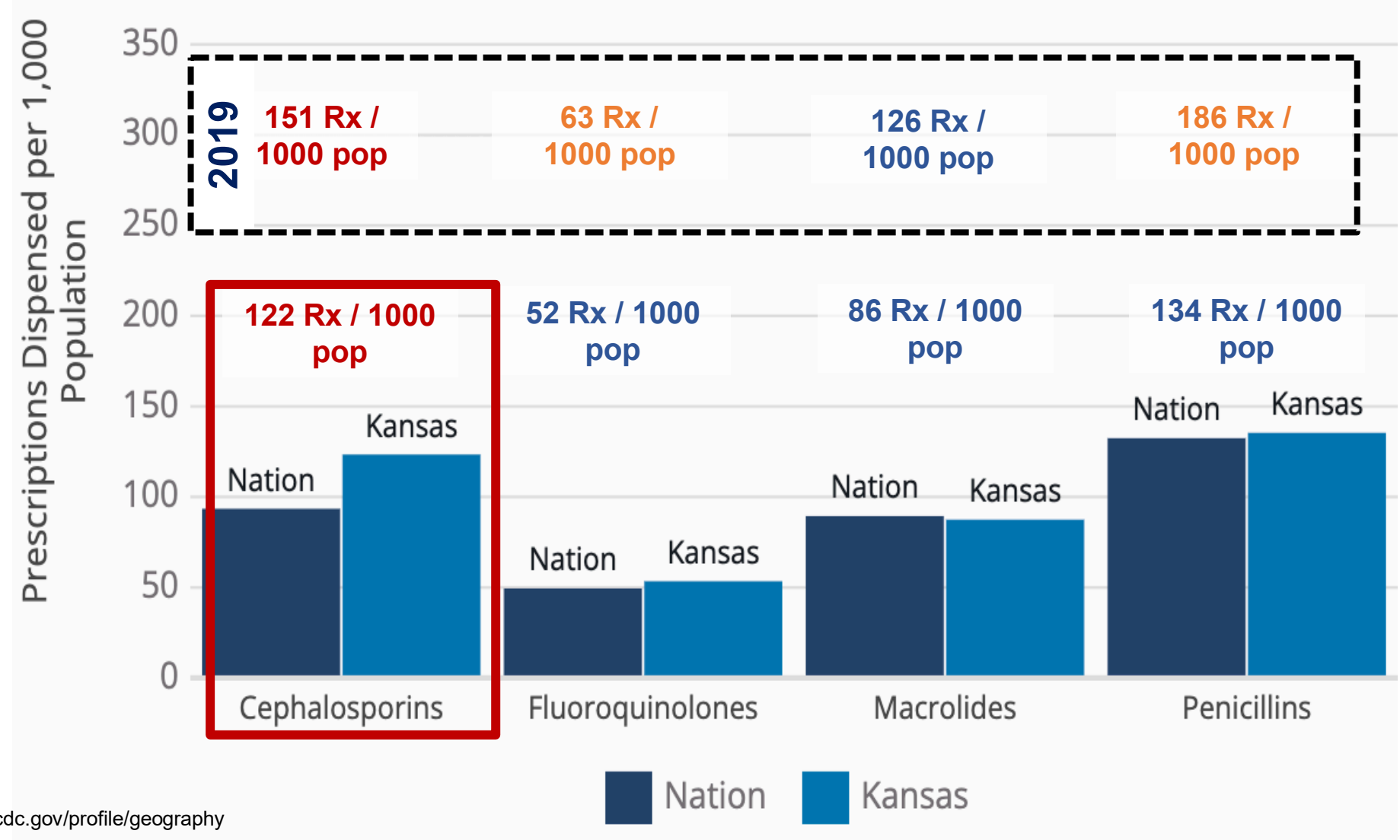
All Antibiotic Classes Prescriptions Dispensed per 1,000 Population

348 - 488 | 489 - 586 | 586 - 655 | 656 - 841 | 842 - 919 | 920+



https://arpsp.cdc.gov/profile/antibiotic-use/all-classes

Current State(s): Outpatient Antibiotic Prescribing (2020)



https://arpsp.cdc.gov/profile/geography

Question 3

What is the most **rapidly** spreading multi-drug resistant organism (MDRO) in Kansas?

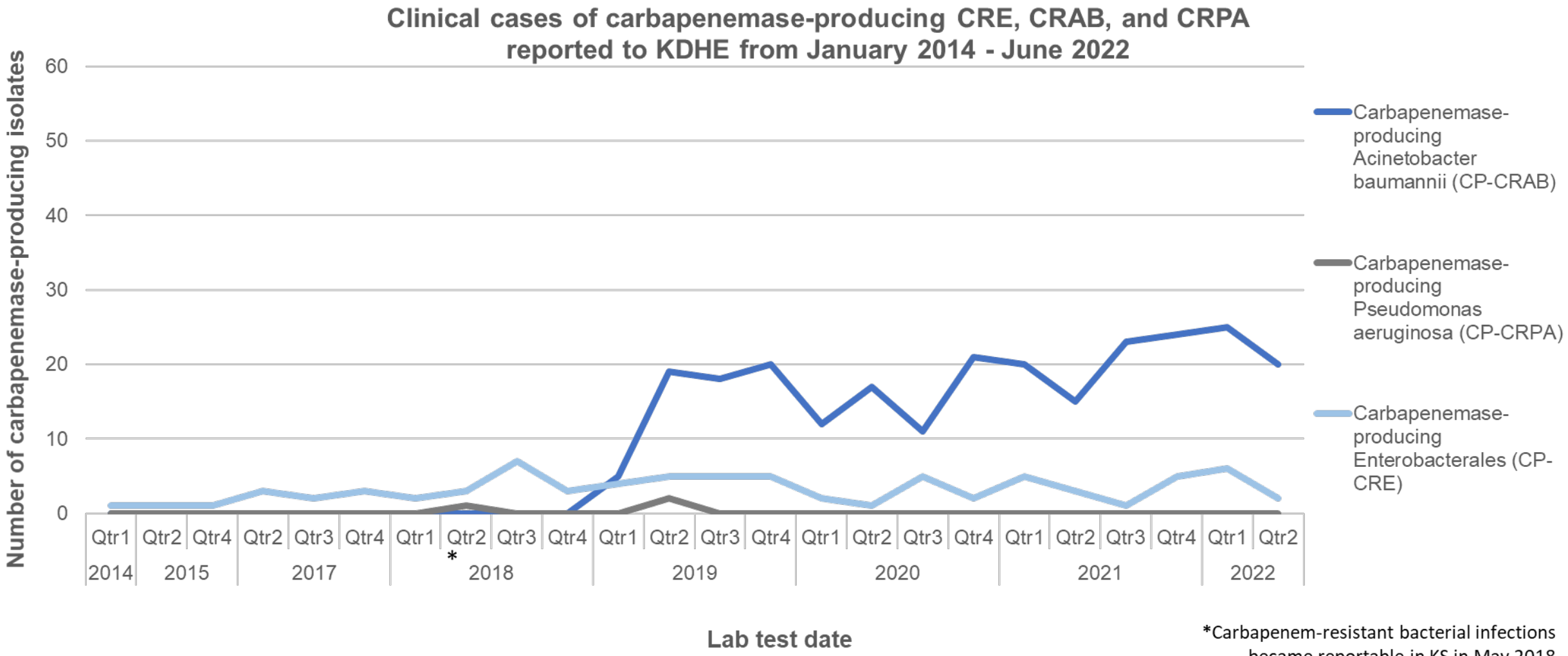
A. Carbapenem resistant *Acinetobacter baumannii* (CRAB)

B. Methicillin resistant *Staphylococcus aureus* (MRSA)

C. *Streptococcus pneumoniae*

D. *Neisseria gonorrhea*

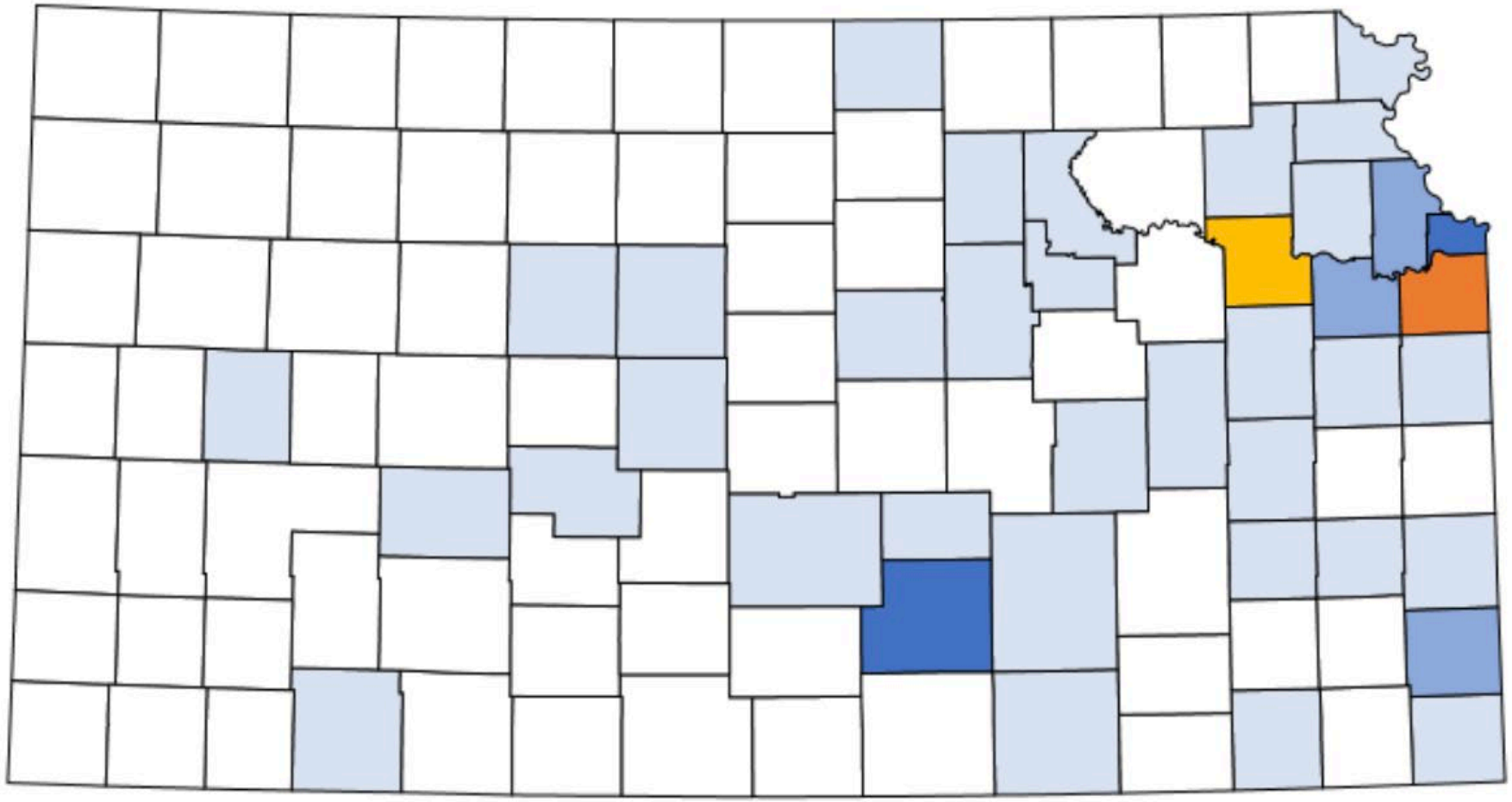
Carbapenemase-producing organism (CPO) Case Counts



*Carbapenem-resistant bacterial infections became reportable in KS in May 2018

Regional Antibiotic Trends

Carbapenemase-producing Organism (CPO) Distribution in Kansas, 1/2014 – 6/2022



No clinical cases detected or reported

≤ 10

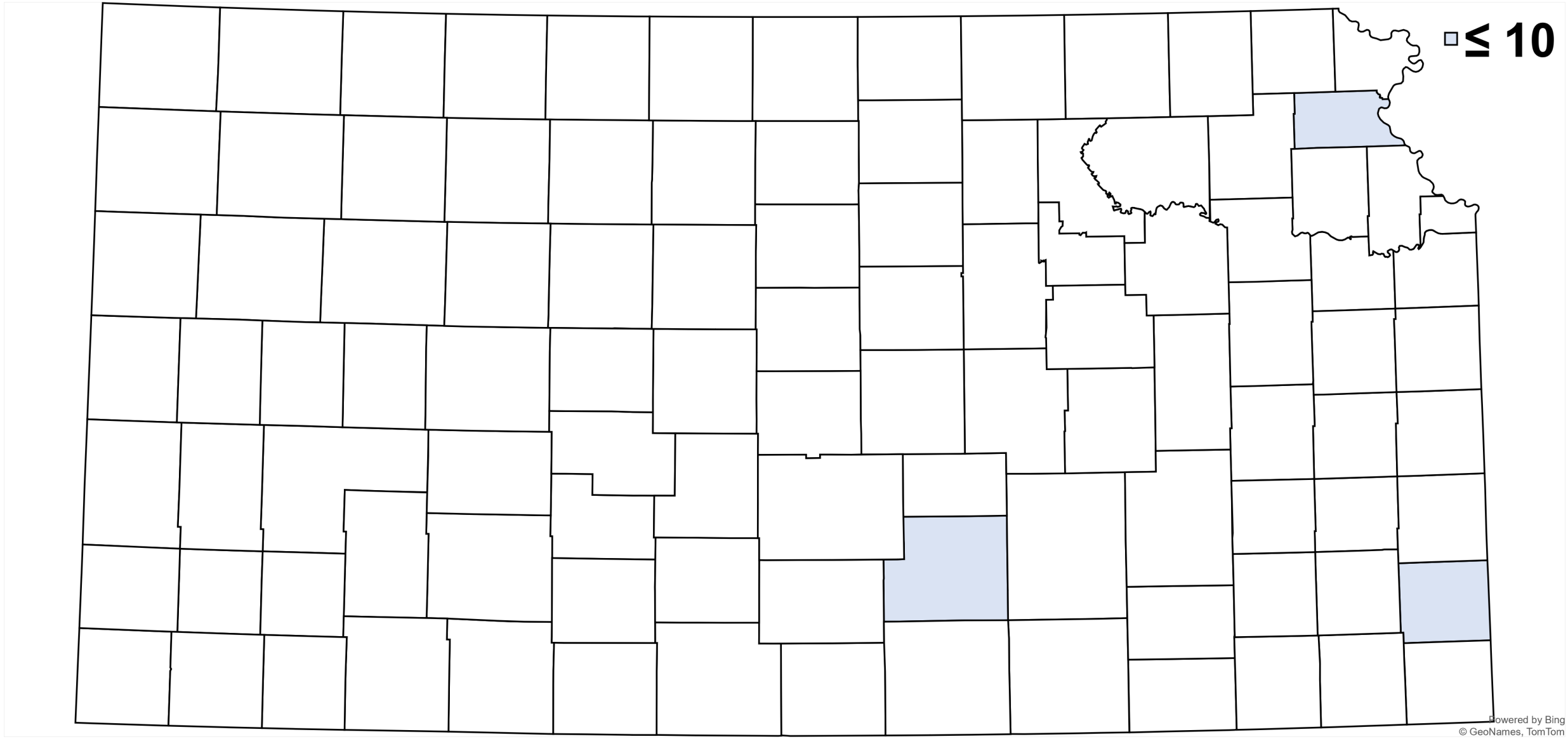
11 to 25

26 to 50

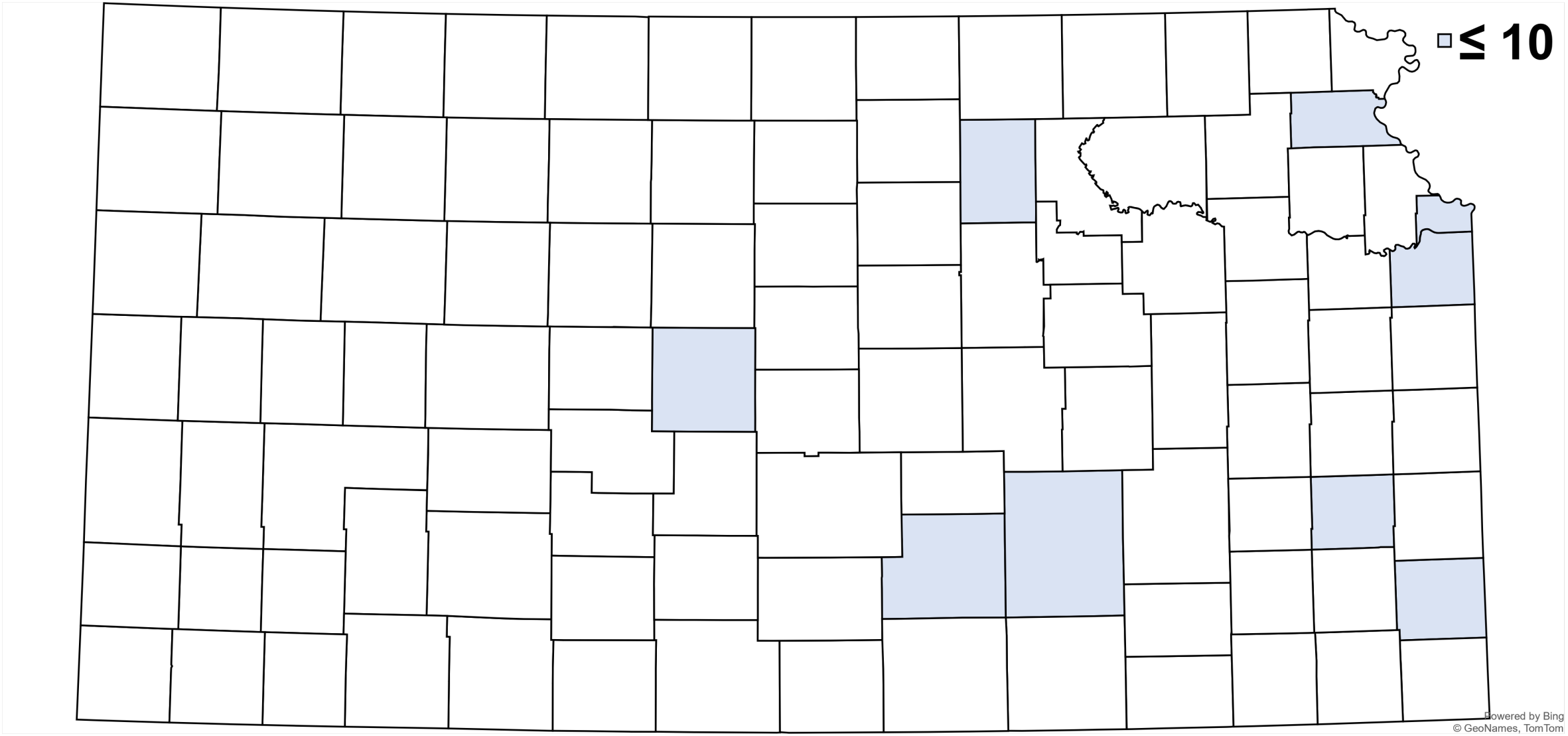
51 to 75

76 to 100

2015 – CP-CRE

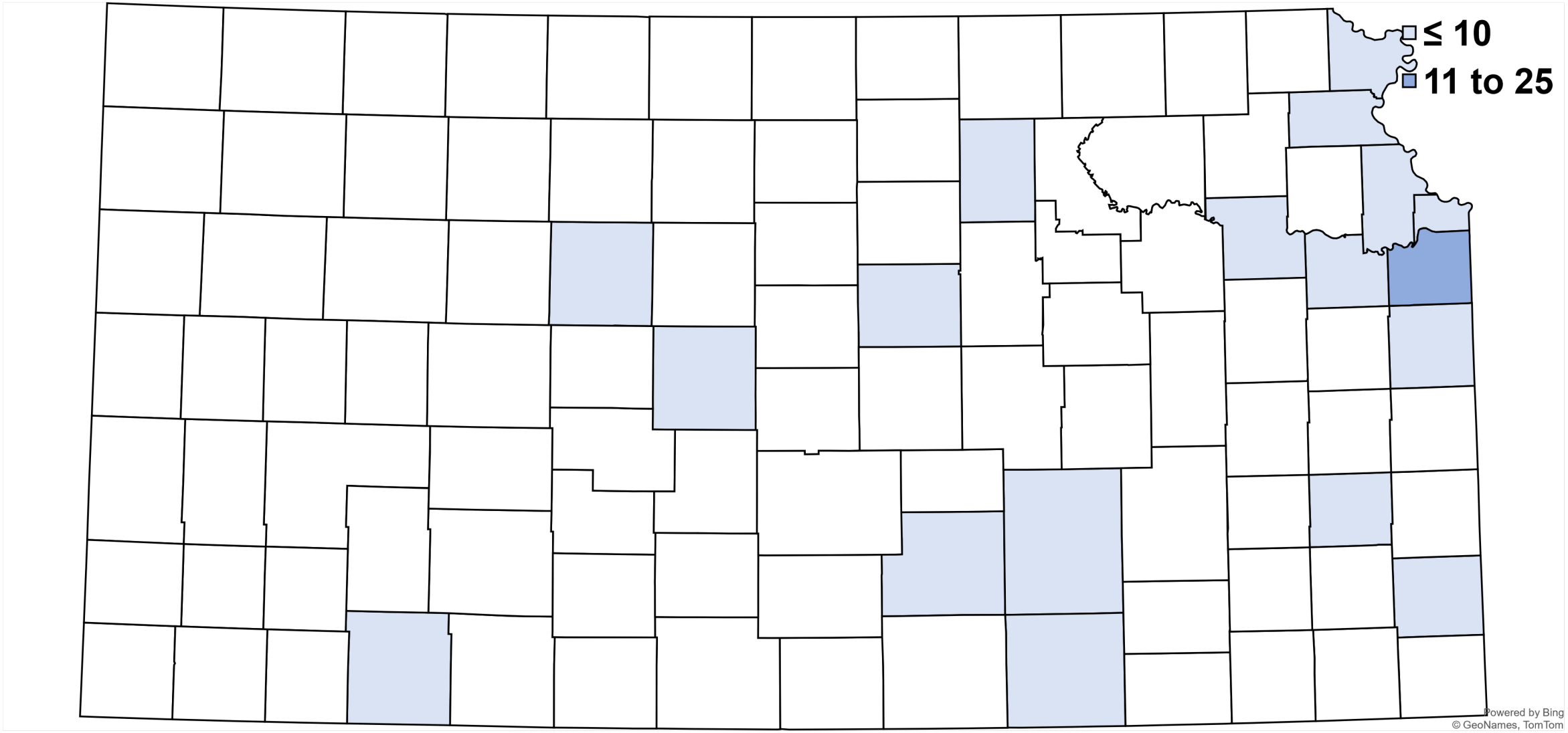


2017 – CP-CRE

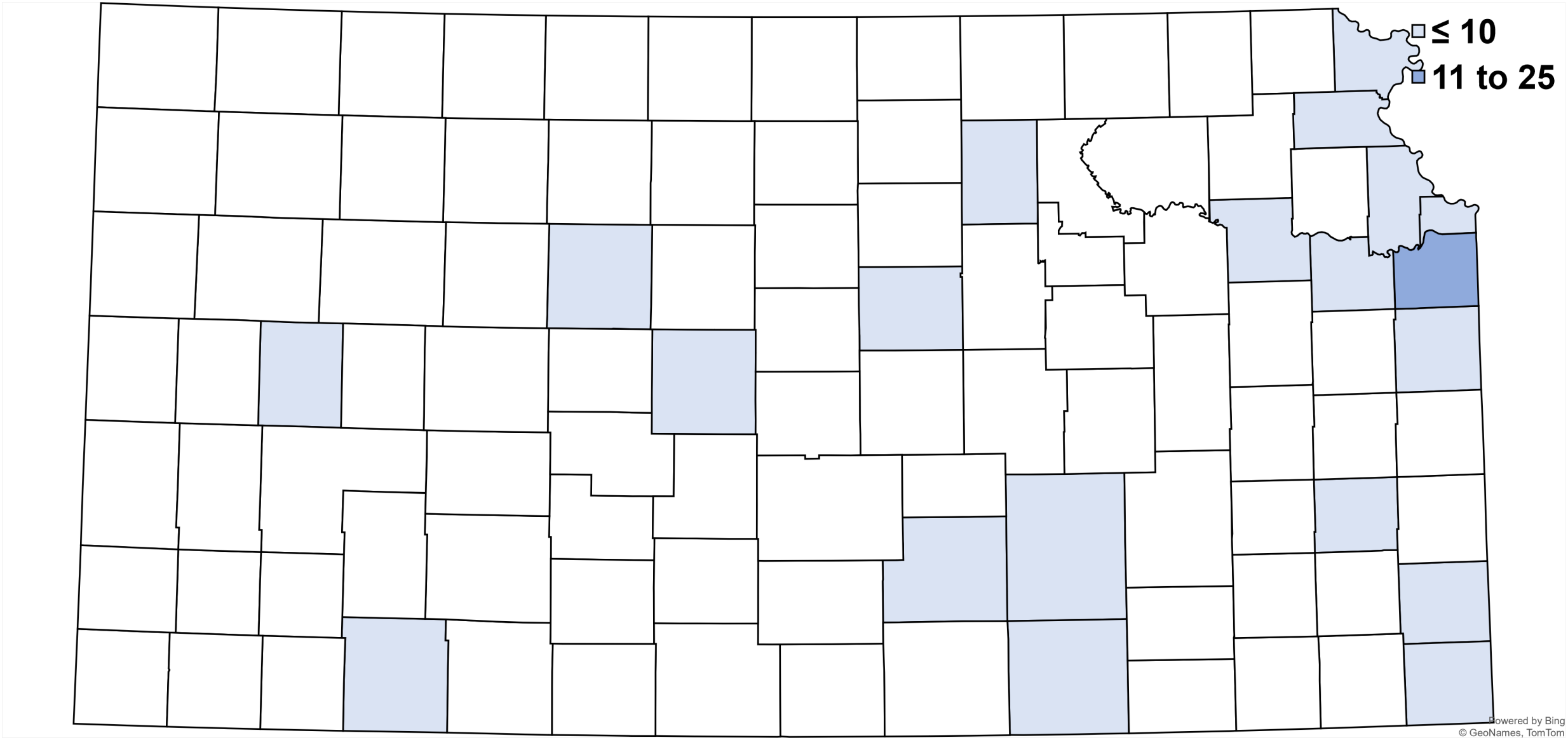


*Note: there were no new cases reported in 2016

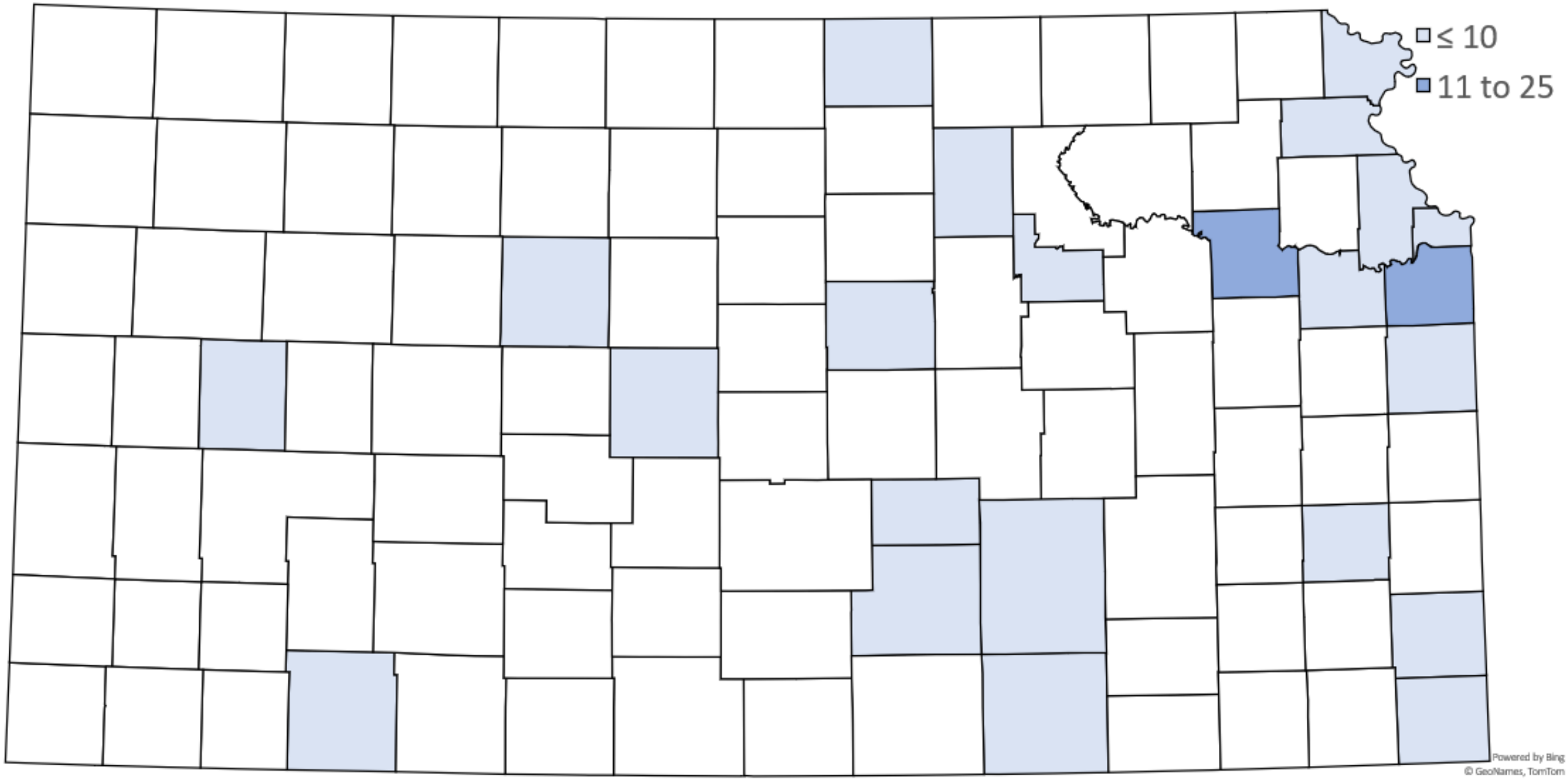
2019 – CP-CRE



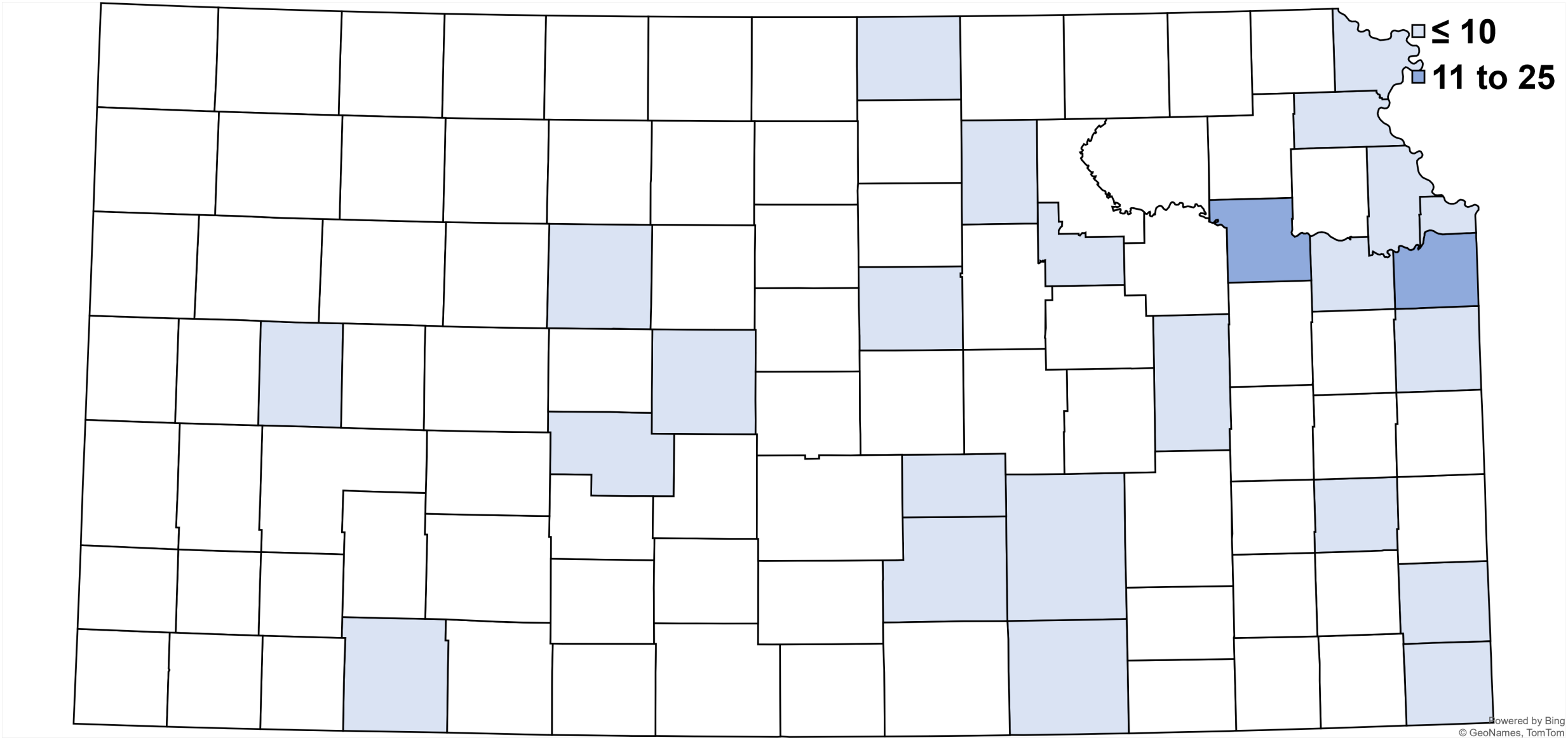
2020 – CP-CRE



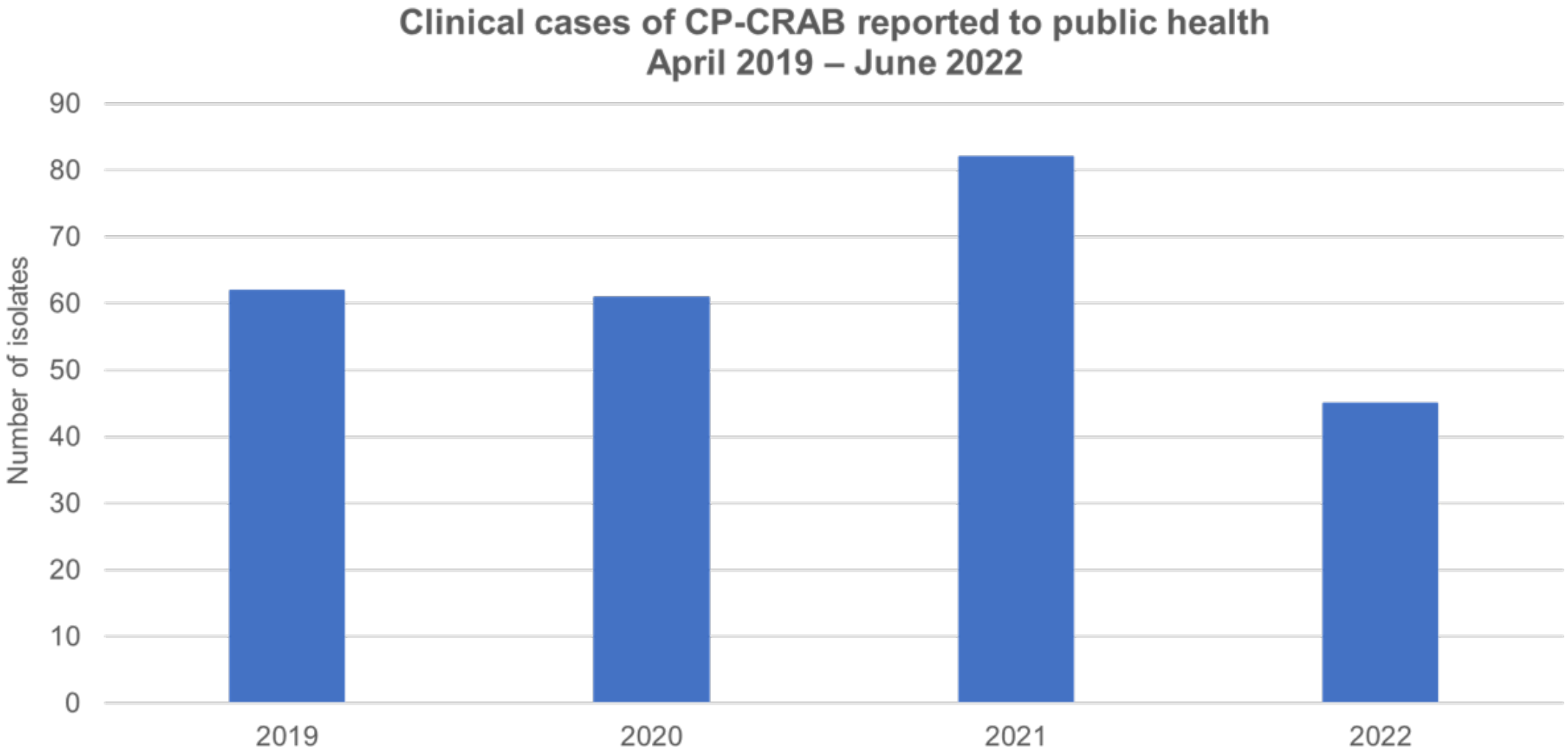
2021 – CP-CRE



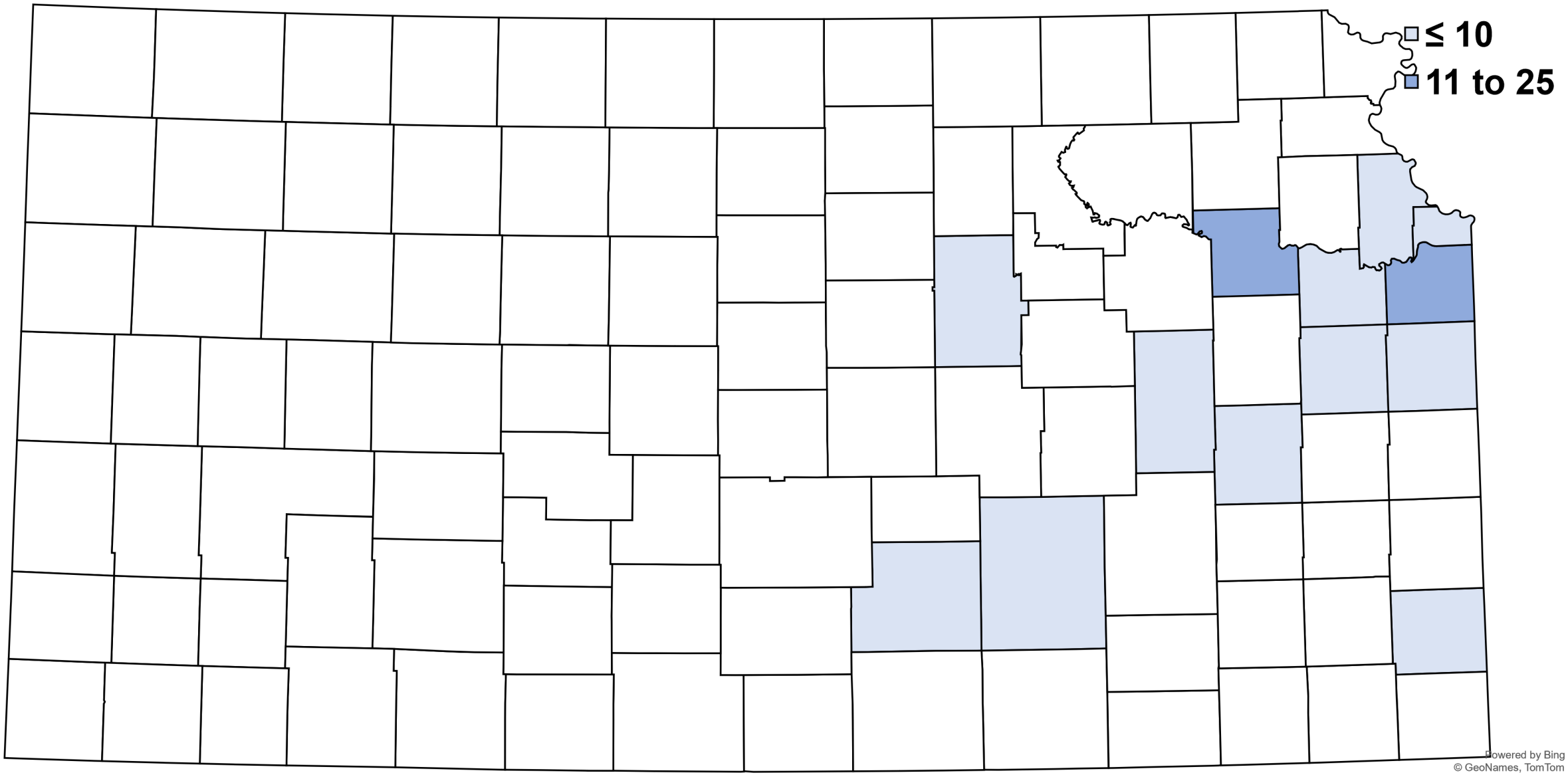
2022 – CP-CRE



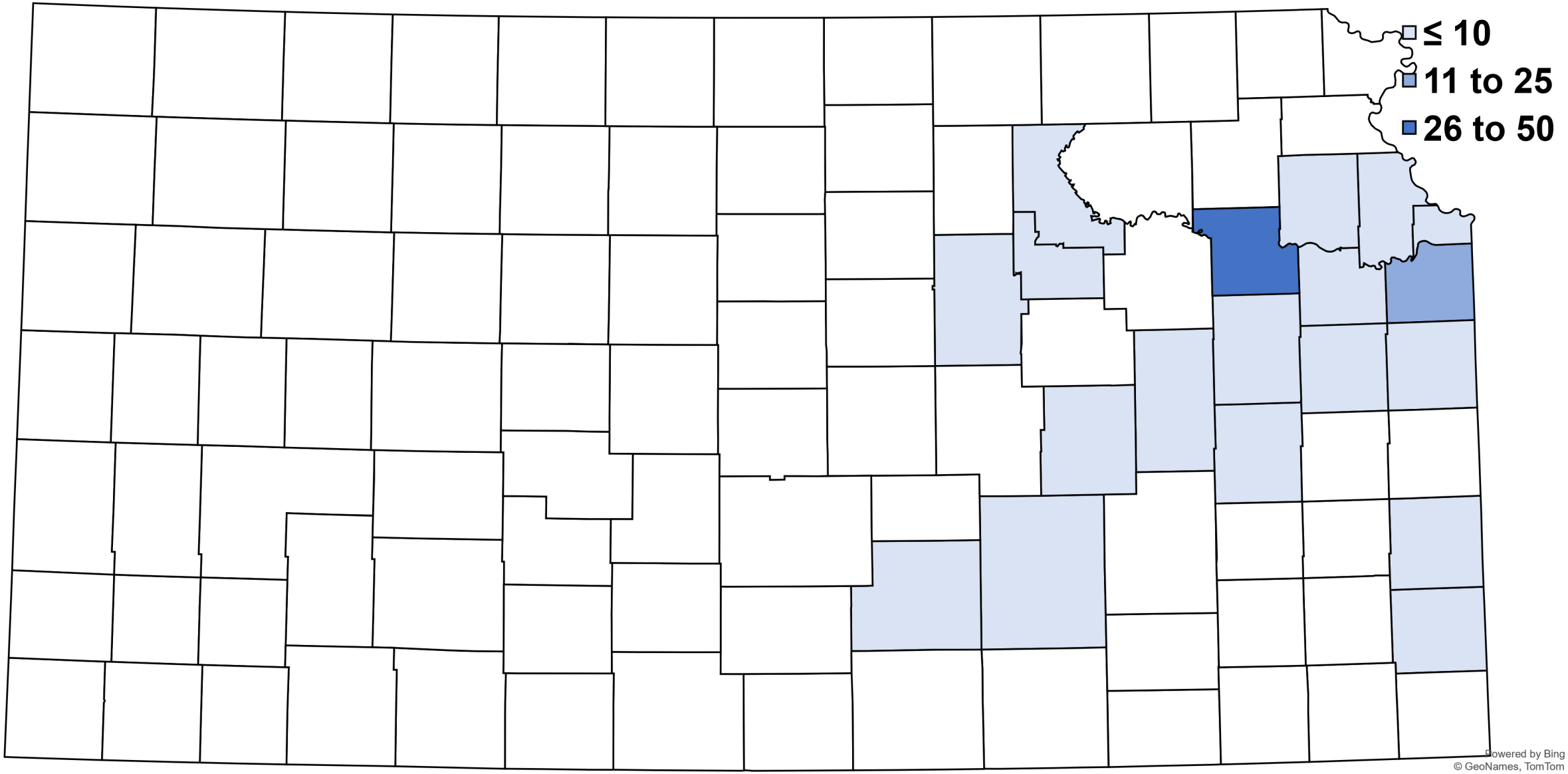
Regional Antibiotic Trends



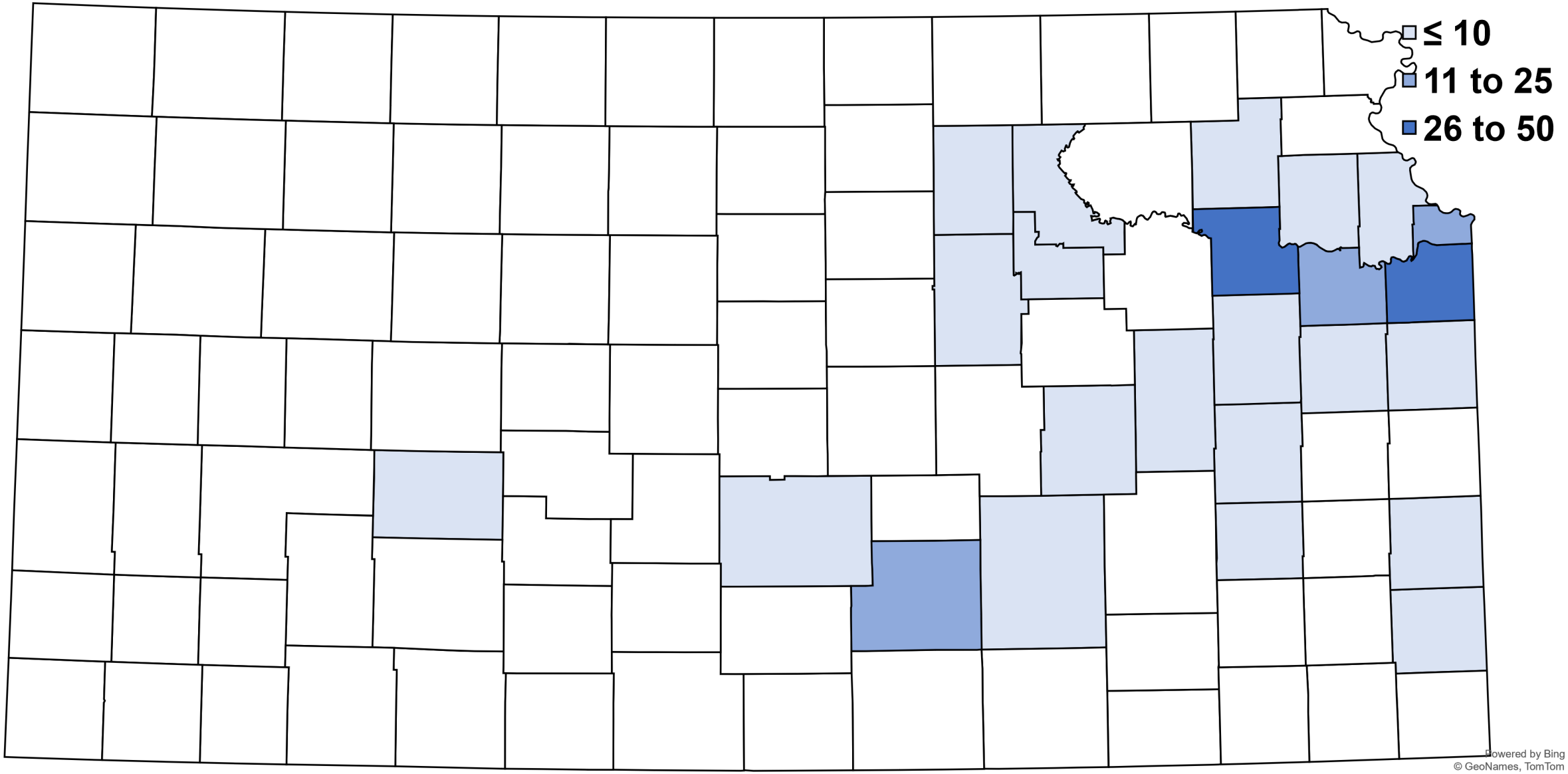
2019 – CP-CRAB



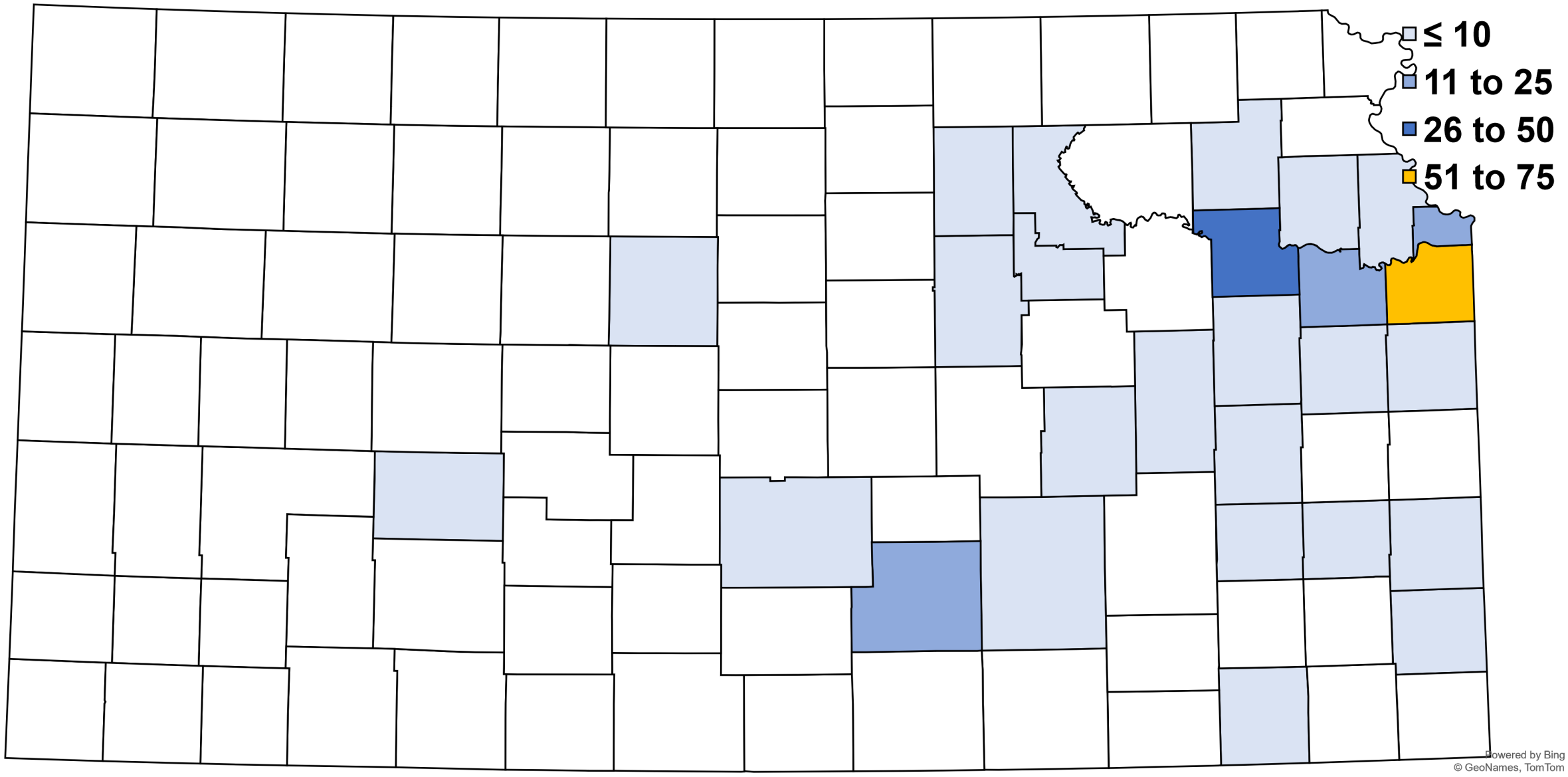
2020 – CP-CRAB



2021 – CP-CRAB



2022 – CP-CRAB



Impact of Antibiotic Resistance

Carbapenem Resistant Enterobacterales (CRE)

E.g., *E.coli, Klebsiella, Proteus, Enterobacter*

- 3-4-fold increased mortality (vs susceptible infections)
  - 60% mortality for CRE BSI
- 2-fold discharge to SNF
- $22-66k per CRE infection
- $130 million HC costs/yr ($553 million to society)

Gasink L., et al. ICHE 2009;30(12):1180-85
Tamma P., et al. CID 2017;64(3):257-64
Antonanzas F., et al. 2015;33(4):285-325
Bartsch S., et al. CID 2017;23(1):48:e9-48.

Carbapenem Resistant *Acinetobacter baumannii* (CRAB)

- Ubiquitous in nature, survive weeks on surfaces → prolonged outbreaks, patient-staff movements
- 5-fold increased mortality risk
- 70% mortality for CRAB BSI (28-day)
- 50% of *Acinetobacter* infections are MDR
- $130,000 (2016 est.) additonal per infection

Nelson R., et al. ICHE 2016;37(10):1212-18.
Spellberg B., et al Nat Rev Drug Discov 2013;12:963
Kim T., et al. Medicine. 2018;97(43):e12984.

Impact of Antibiotics on Resistance

How much *can* antibiotics increase antibiotic resistance?

Ceftriaxone	Fluoroquinolones	Carbapenems
↑ 15-fold ESBL*	↑ 8-fold ESBL	↑ 6-fold CRE
↑ 4-fold ampC*	↑ 4-fold CRE	↑ 28-fold CRAB

*ESBL=extended spectrum beta-lactam
*ampC=ampC beta-lactamase

Goyal D et al Open Forum Infect Dis 2019
Zerr D et al Antimicrob. Agents & Chemotherapy 2016
Jeon M. et al . Diagn Microbiol Infect Dis 2008
Falagas J Antimicrob Chemother. 2007

CRAB Antibiotic Options

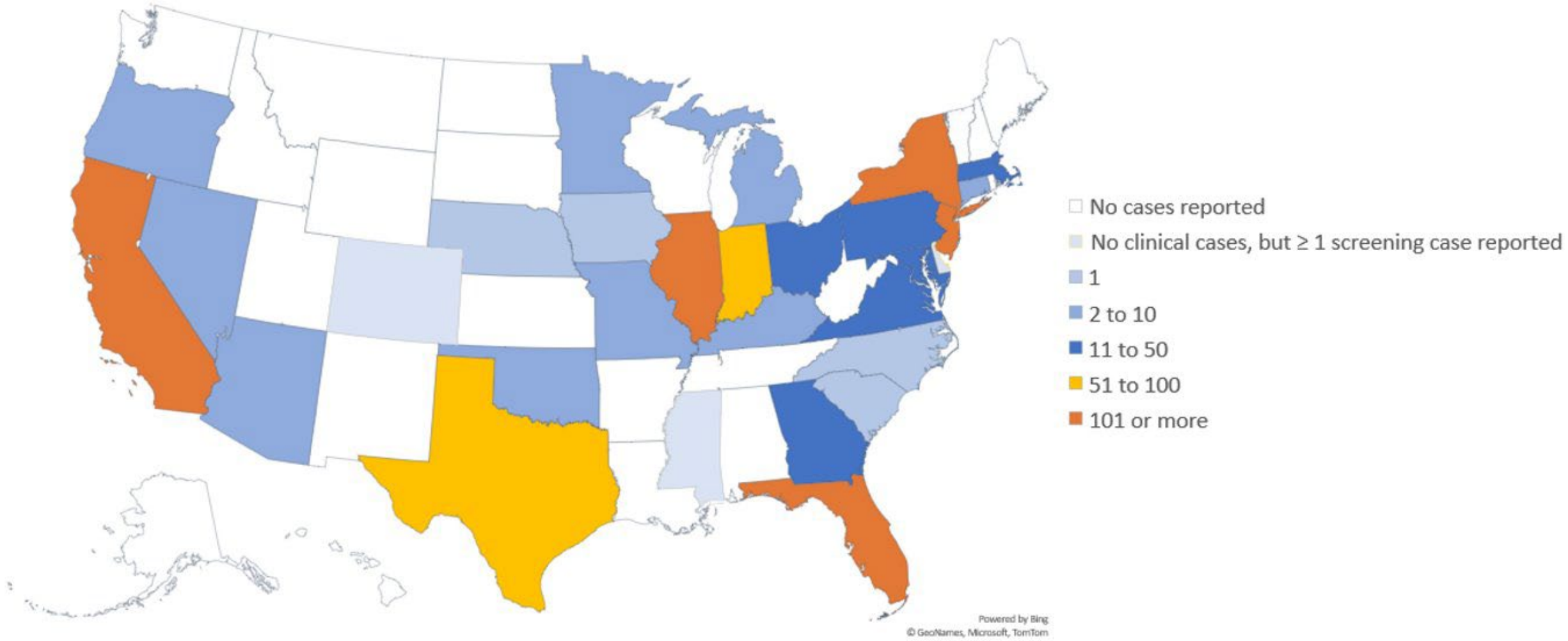
Cumulative antimicrobial susceptibility report

Percent Susceptible 2018-2021 Isolates	Total No. of Isolates	Aminoglycosides				Polymyxins		β-Lactams			β-Lactam/ inhibitor combo			Cephalosporins					Carbapenems					Folate pathway inhibitor	Fluoroquinolones		Glycopeptides	Lincosamides	Lipopeptides	Macrolides		Monobactam	Nitrofurans	Oxazolidinone	Tetracyclines	
														3rd	4th	5th																				
		Amikacin	Gentamicin	Tobramycin	Plazomicin	Polymyxin B	Colistin	Ampicillin	Oxacillin	Penicillin	Amoxicillin/clavulante	Ampicillin/sulbactam	Pipercillin-tazobactam	Ceftazidime	Cefepime	Cefiderocole	Ceftazidime-avibactam	ceftolozane-tazobactam	Ertapenem	Imipenem	Imipenem-cilastatin-relebactam	Meropenem	Meropenem-vaborbactam	Trimethoprim/ sulfamethoxazole	Ciprofloxacin	Levofloxacin	Vancomycin	Clindamycin	Daptomycin	Azithromycin	Erythromycin	Aztreonam	Nitrofurantoin(1)	Linezolid	Minocycline	Fosfomycin (Monurol)
Acinetobacter baumannii	134	26%	18%	19%	NT	95%	94%					29%	0%	1%	3%	NT	NT	NT		0%	NT	0%	NT	4%	0%	0%									63%	

Very few options for treatment!!

What do we NOT have (yet)

Reported clinical cases of *Candida auris*, January 2017 – February 2022



Most Urgent US MDROs

2019 Threat Report → 2022 Releases this week

Urgent Threats	Serious Threats	Concerning Threats	Watch List
*Carbapenem-resistant Acinetobacter baumannii	*Drug-resistant Campylobacter	*Erythromycin-Resistant Group A Streptococcus	*Azole-resistant Aspergillus fumigatus
*Candida auris	*Drug-resistant Candida	*Clindamycin-resistant Group B Streptococcus	*Drug-resistant Mycoplasma genitalium
*C. difficile	*ESBL- Producing Enterobacteriaceae		*Drug-resistant Bordetella pertussis
*Carbapenem-resistant Enterobacteriaceae	*Vancomycin resistant enterococcus		
*Drug-resistant Neisseria gonorrhoeae	*MDR P. aeruginosa		
	*Drug-resistant S. Typhi & nontyphoidal Salmonella		
	*Drug-resistant Shigella		
	*Methicillin-resistant Staphylococcus aureus		
	*Drug-resistant S. pneumoniae		
	*Drug-resistant Tuberculosis		

Question 4

What is the framework that the CDC has created for healthcare facilities to improve antibiotic prescribing practices?

A. Project Firstline

B. Infection Prevention & Control Program

C. Core Elements of Antibiotic Prescribing

D. Be Antibiotic Aware

Core Elements:

7 Inpatient

Hospital Leadership Commitment
Dedicate necessary human, financial, and information technology resources.

Accountability
Appoint a leader or co-leaders, such as a physician and pharmacist, responsible for program management and outcomes.

Pharmacy Expertise (previously "Drug Expertise"):
Appoint a pharmacist, ideally as the co-leader of the stewardship program, to help lead implementation efforts to improve antibiotic use.

Action
Implement interventions, such as prospective audit and feedback or preauthorization, to improve antibiotic use.

Tracking
Monitor antibiotic prescribing, impact of interventions, and other important outcomes, like *C. difficile* infections and resistance patterns.

Reporting
Regularly report information on antibiotic use and resistance to prescribers, pharmacists, nurses, and hospital leadership.

Education
Educate prescribers, pharmacists, nurses, and patients about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.

4 Outpatient

Commitment
Demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety.

Action for policy and practice
Implement at least one policy or practice to improve antibiotic prescribing, assess whether it is working, and modify as needed.

Tracking and reporting
Monitor antibiotic prescribing practices and offer regular feedback to clinicians, or have clinicians assess their own antibiotic prescribing practices themselves.

Education and expertise
Provide educational resources to clinicians and patients on antibiotic prescribing, and ensure access to needed expertise on optimizing antibiotic prescribing.

Evidence in Support of Antibiotic Stewardship

Outcome	Number of studies	% Reduction (IR, 95% CI range)
Meta-analysis of **32 studies** of ASPs in 20 countries from 1960-2016		
MDR-Gram Negative Incid.	19	**51%** (0.49, 0.35-0.68)
CR-A.baumannii (CRAB)		**56%** (0.44, 0.17-1.13)
CR-K.pneumoniae (CRE)		**48%** (0.52, 0.13-2.09)
MRSA Infection & Colonization	17	**37%** (0.63, 0.45-0.88)
C.diff infections	11	**32%** (0.68, 0.53-0.88)
Systematic review of 145 programs		
Mortality (guideline-adherence empiric tx)	19	**35%** (0.65, 0.54-0.80)
Mortality (de-escalation interventions)	19	**56%** (0.44, 0.30-0.66)
Nephrotoxicity	13	**50%** (0.50, 0.29-0.80))

Baue D., et al. Lancet Infect Dis 2017;(17): 990-1001.
Schuts E., et al. Lancet Infect Dis. 2016;16:857-56.

Evidence in Support of Antibiotic Stewardship

Antibiotic Reductions and Cost Savings

- 81% reported decrease in abx (60 programs, Cochrane Review)
- 22-36% reduction in abx usage
- 25% average cost reduction (27/29 studies)
- $200,000 -$900,000 annual savings (medium-large hospitals [also 2005, 2008 USD])

Cochrane Database Syst Rev. 2005(4):CD003543.
Patel D., et al. Expert Review of Anti-Infective Therapy. 2008;6:209-22.

Question 5

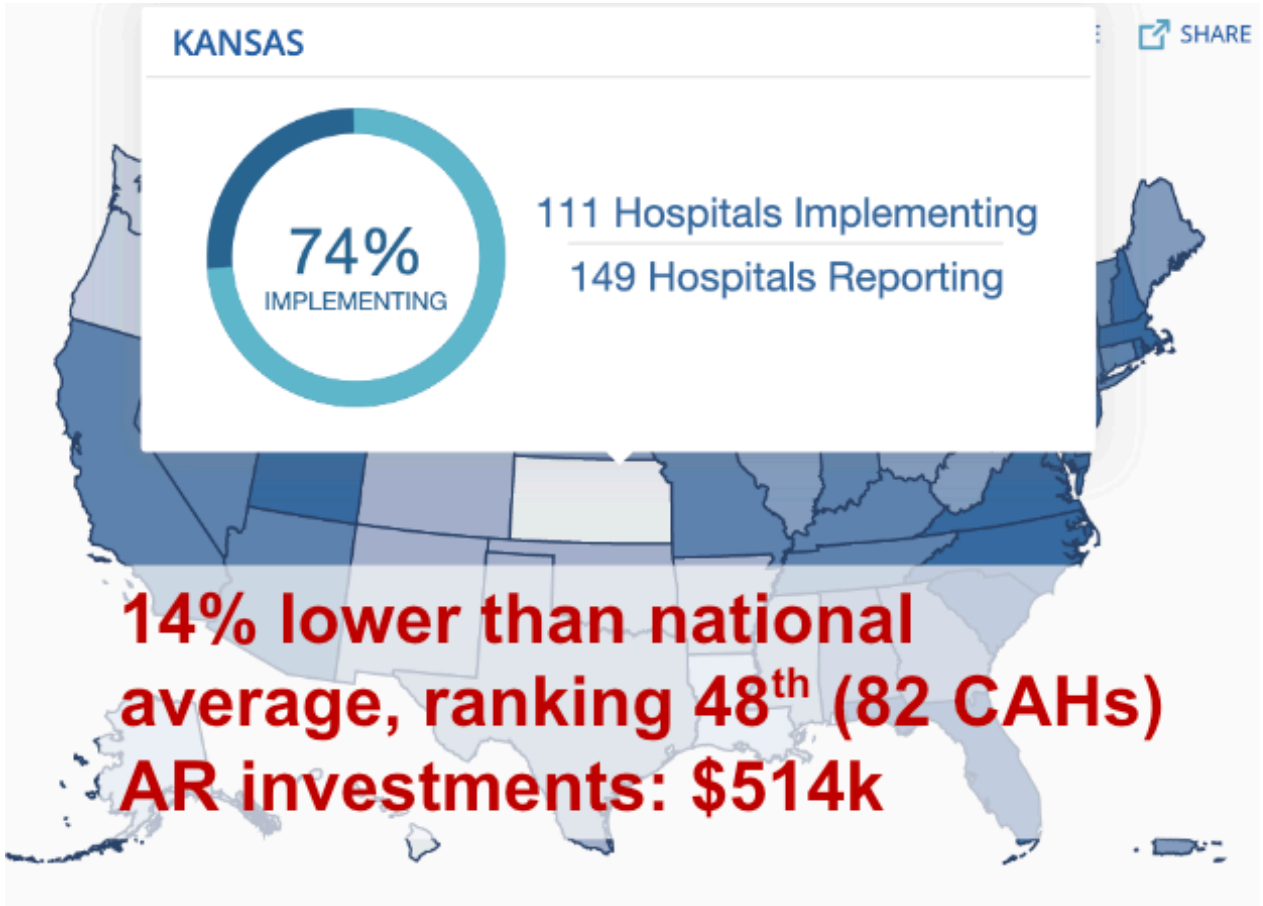
Kansas hospitals, compared to other states, have the **greatest** amount of core elements fullfilled.

True or False?

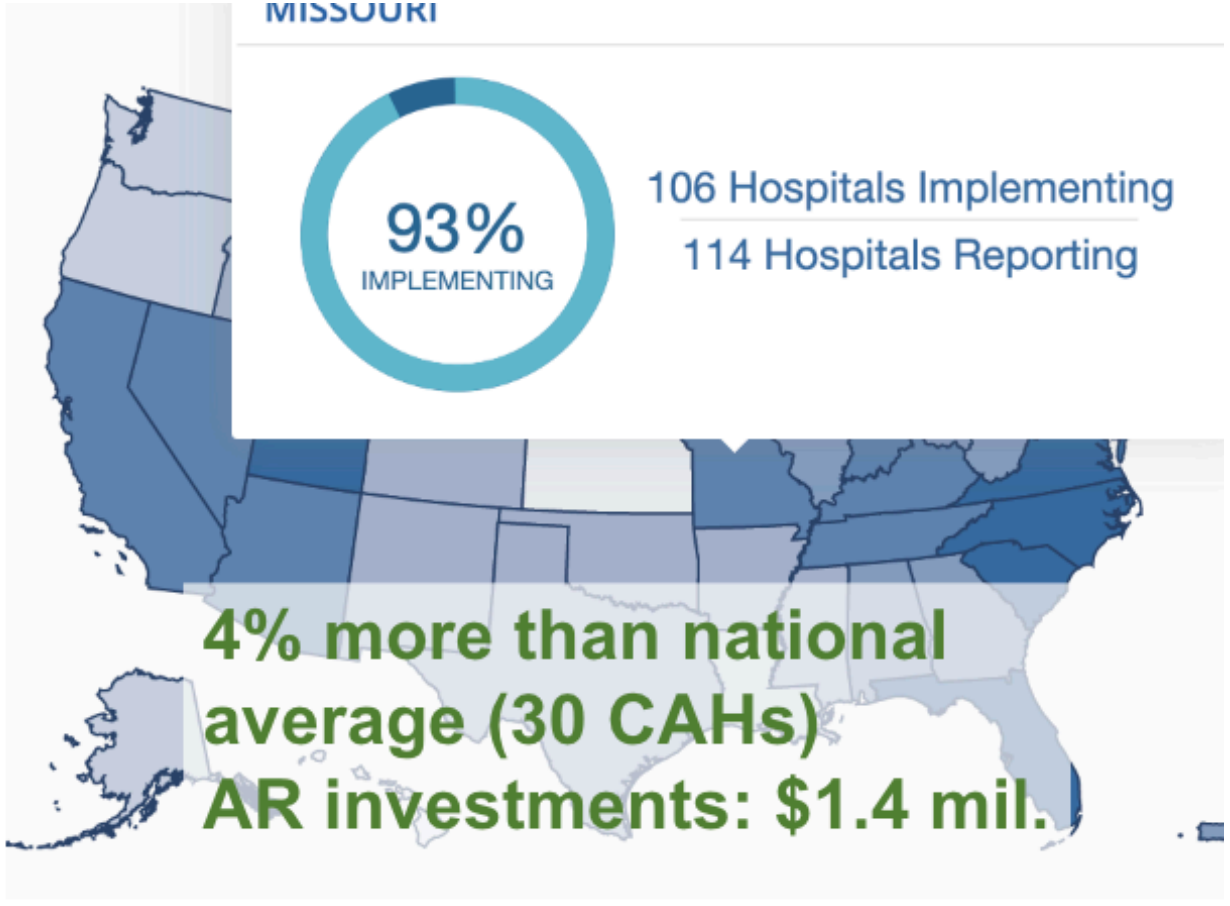
A. True

B. False

Current State(s): ASP Core Elements



14% lower than national average, ranking 48th (82 CAHs)
AR investments: $514k



4% more than national average (30 CAHs)
AR investments: $1.4 mil.

AR PATIENT SAFETY ATLAS

https://arpsp.cdc.gov/profile/stewardship

Percentage of All 7 Core Elements

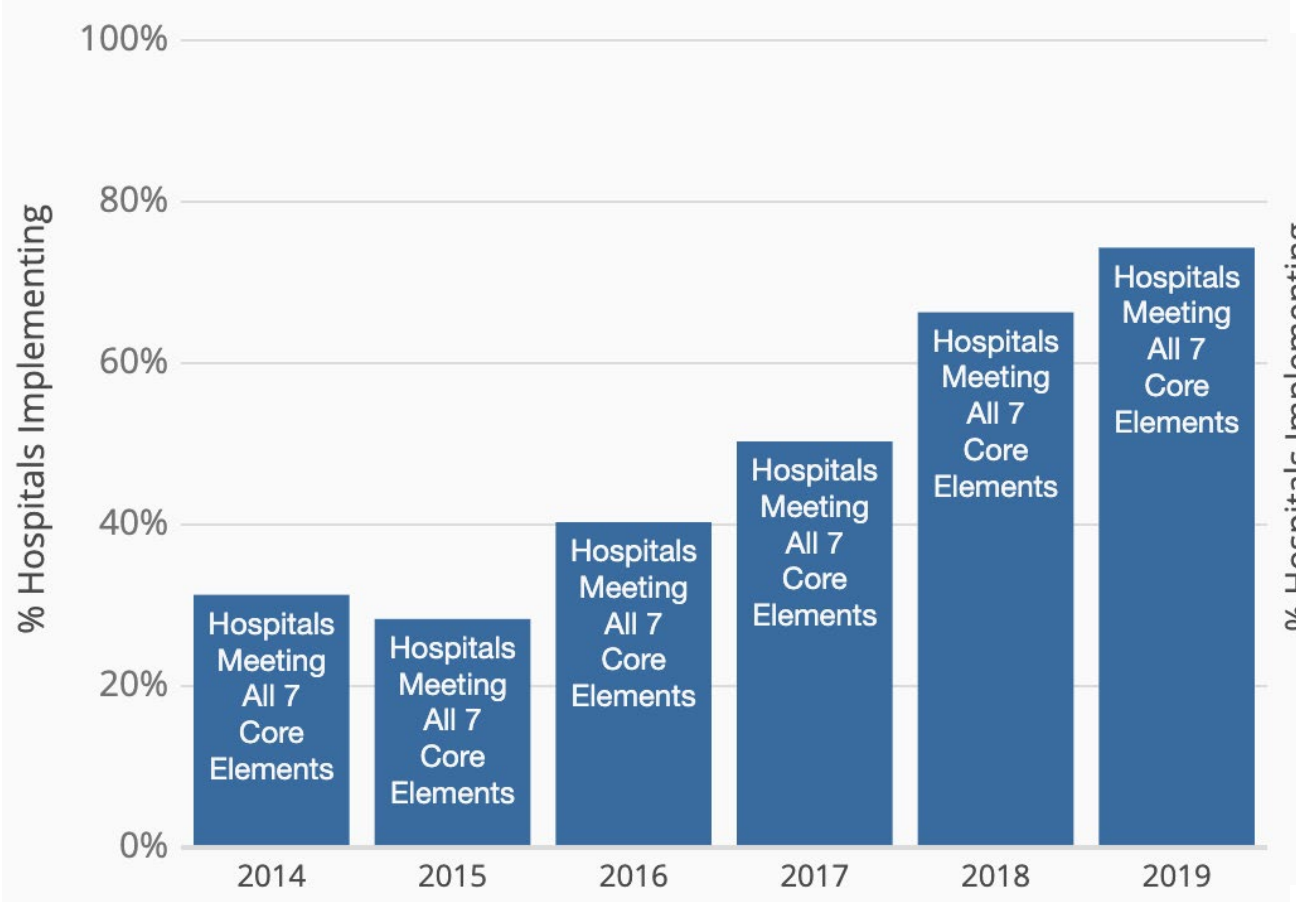
70% - 76% | 77% - 82% | 83% - 86% | 87% - 90% | 91% - 95% | 96%+

National: 89% of all reporting hospitals implementing all 7 core

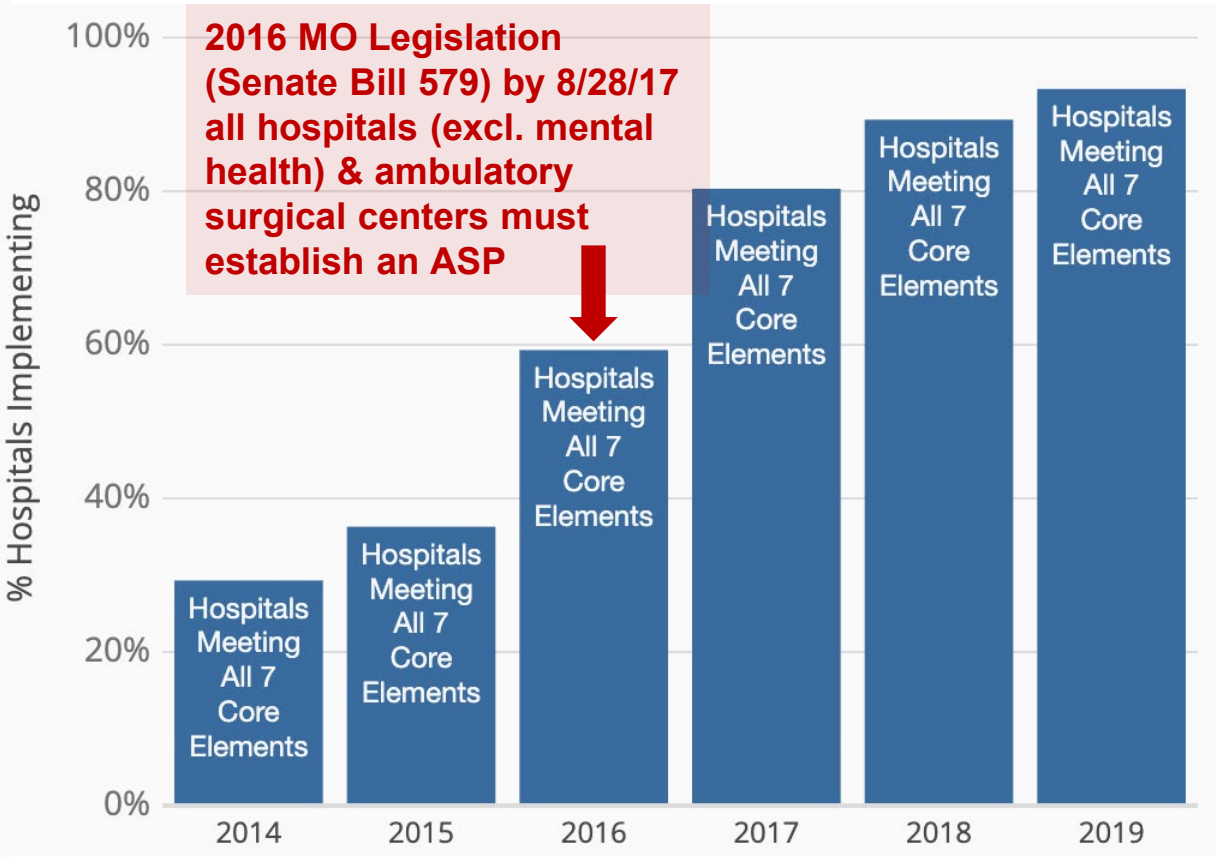
Current State(s): ASP Core Elements

National: 89% of all reporting hospitals implementing all 7 core

Kansas

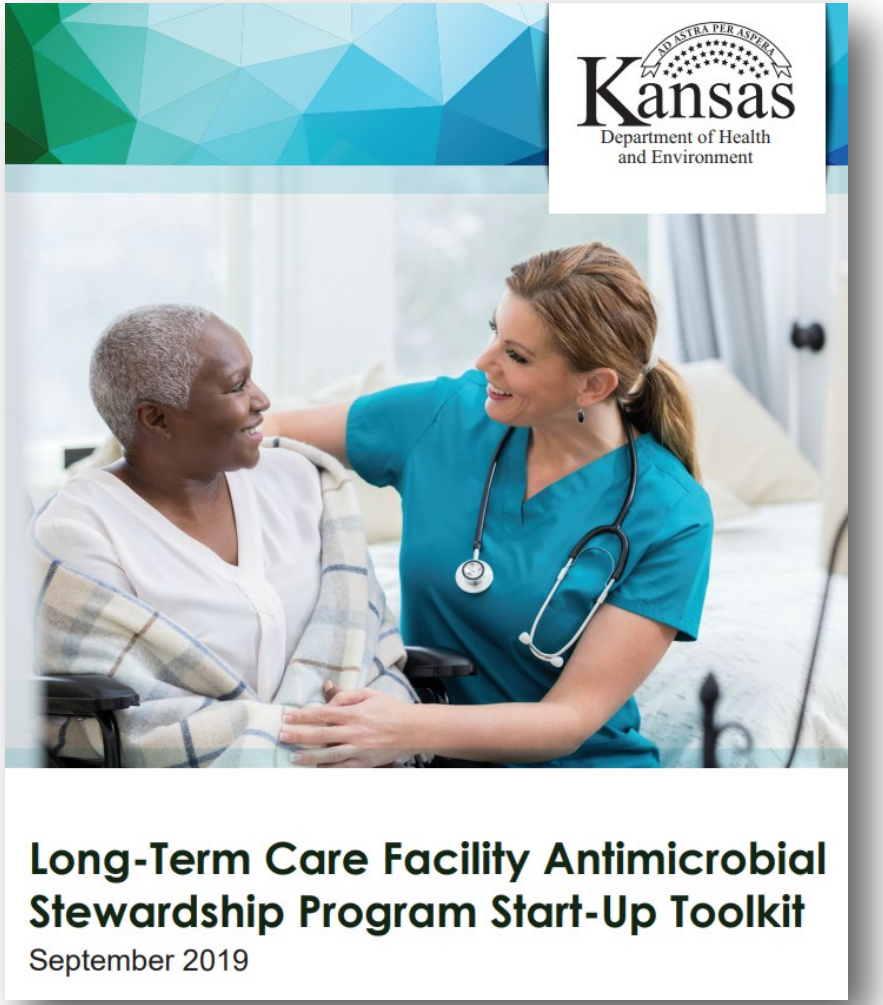


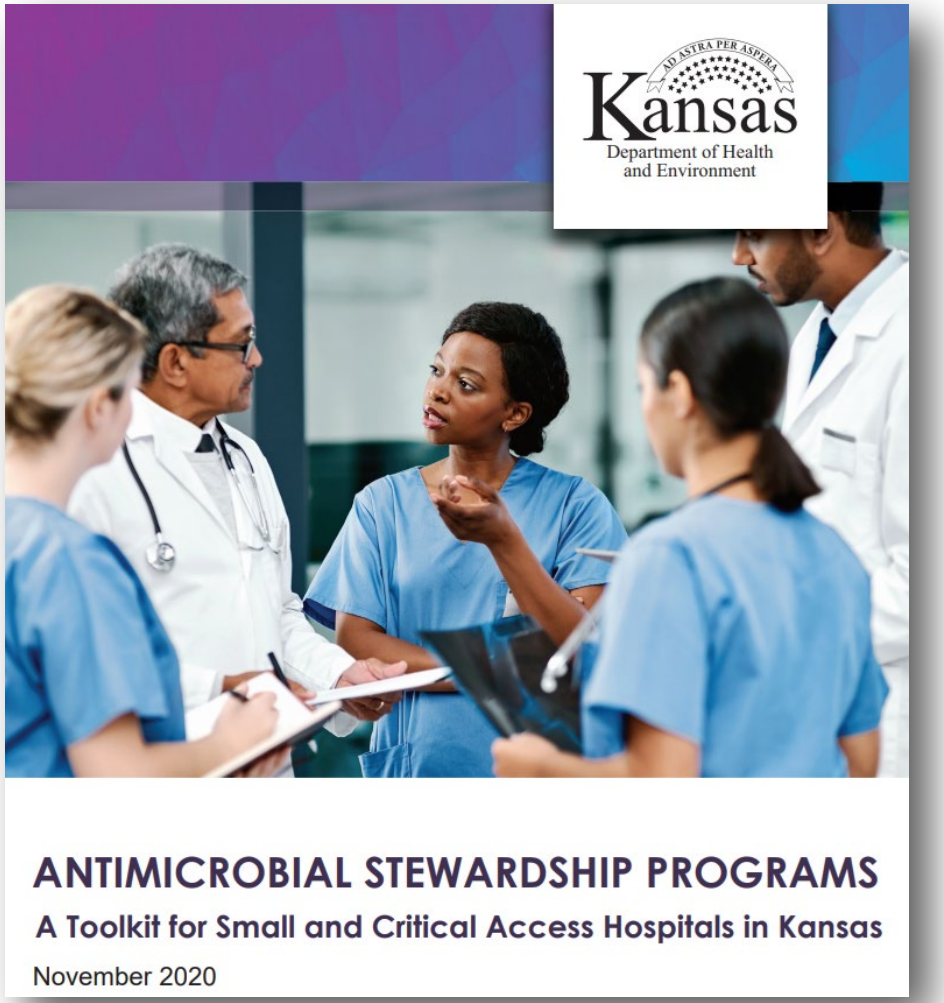
Missouri



https://arpsp.cdc.gov/profile/stewardship

Antibiotic Stewardship Toolkits

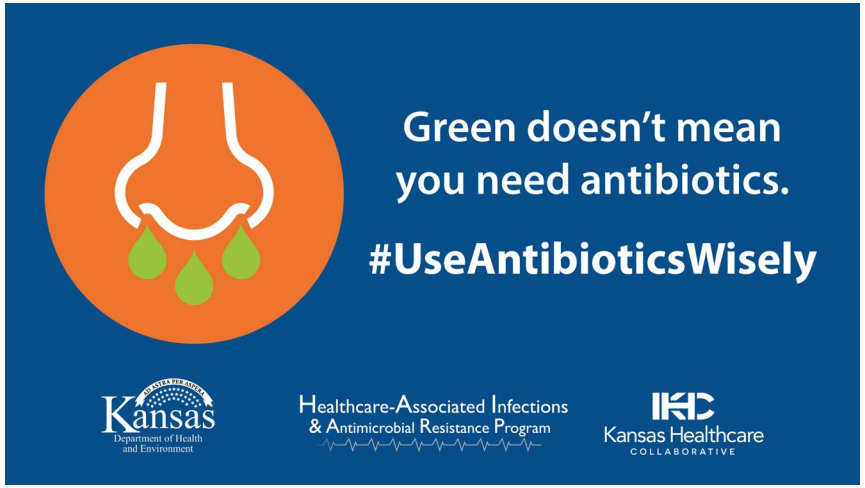


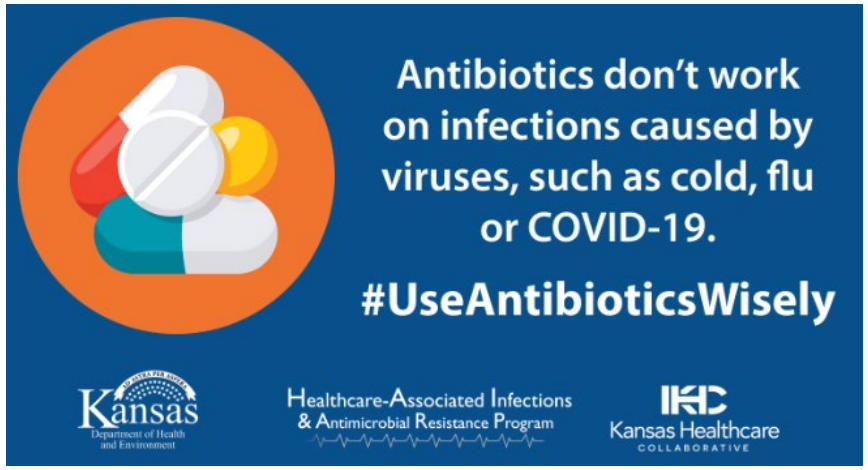


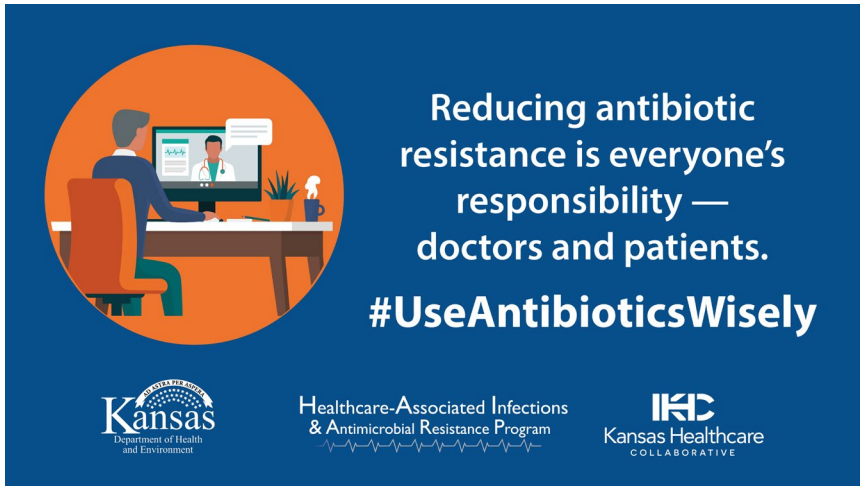
Download LTC AS Toolkit: https://kdhe.ks.gov/DocumentCenter/View/14470/

CAH AS Toolkit: https://kdhe.ks.gov/DocumentCenter/View/14468/

Social Medial Toolkit



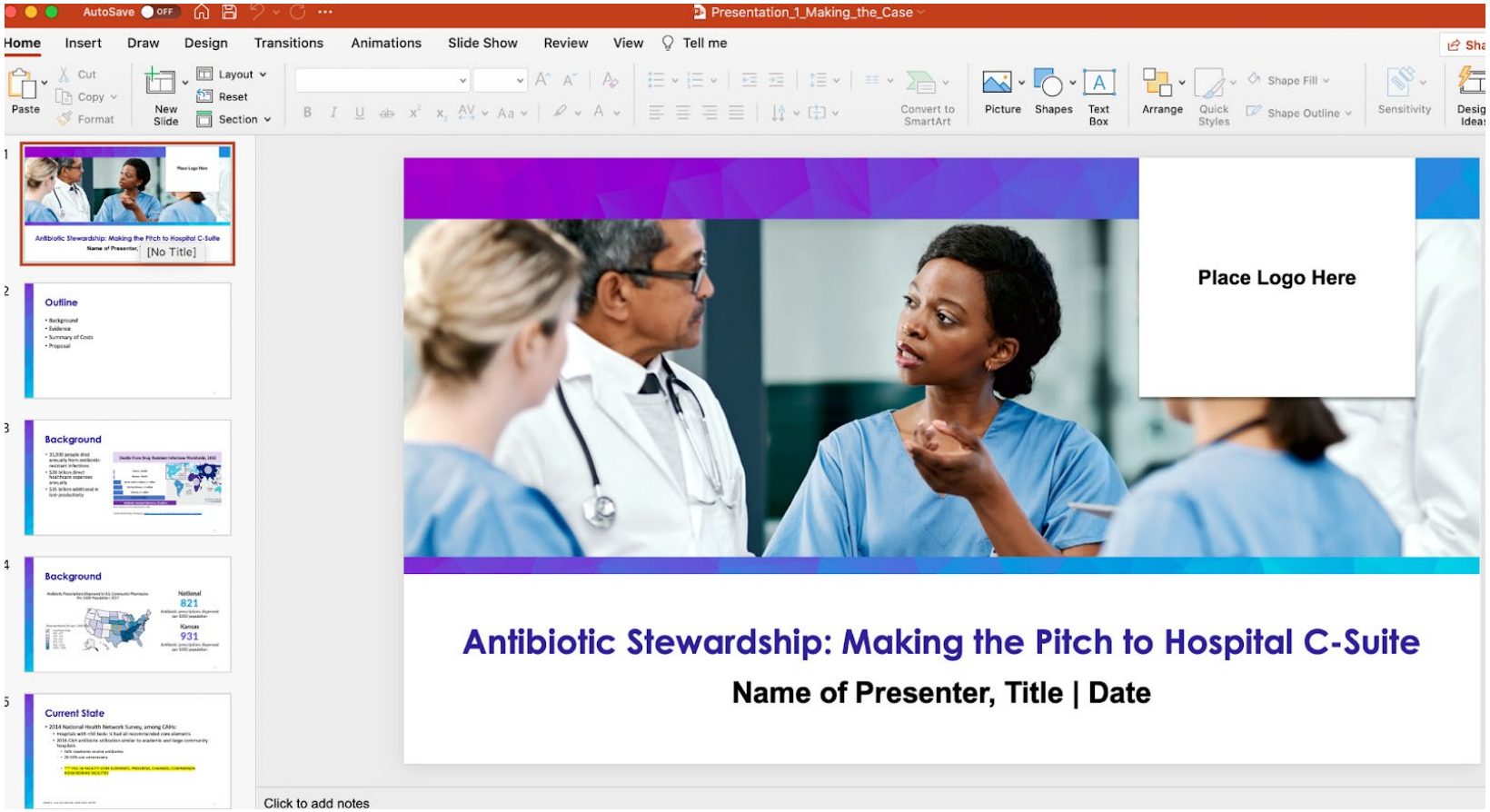




Download

Social Media Toolkit: https://khconline.org/files/USAAW-2020-images.zip
Updated with COVID_19: https://khconline.org/files/AntibioticsAwareness-toolkit.zip
CDC messages: https://www.cdc.gov/antibiotic-use/week/toolkit.html

Tools for Leadership Presentations - “making the case”



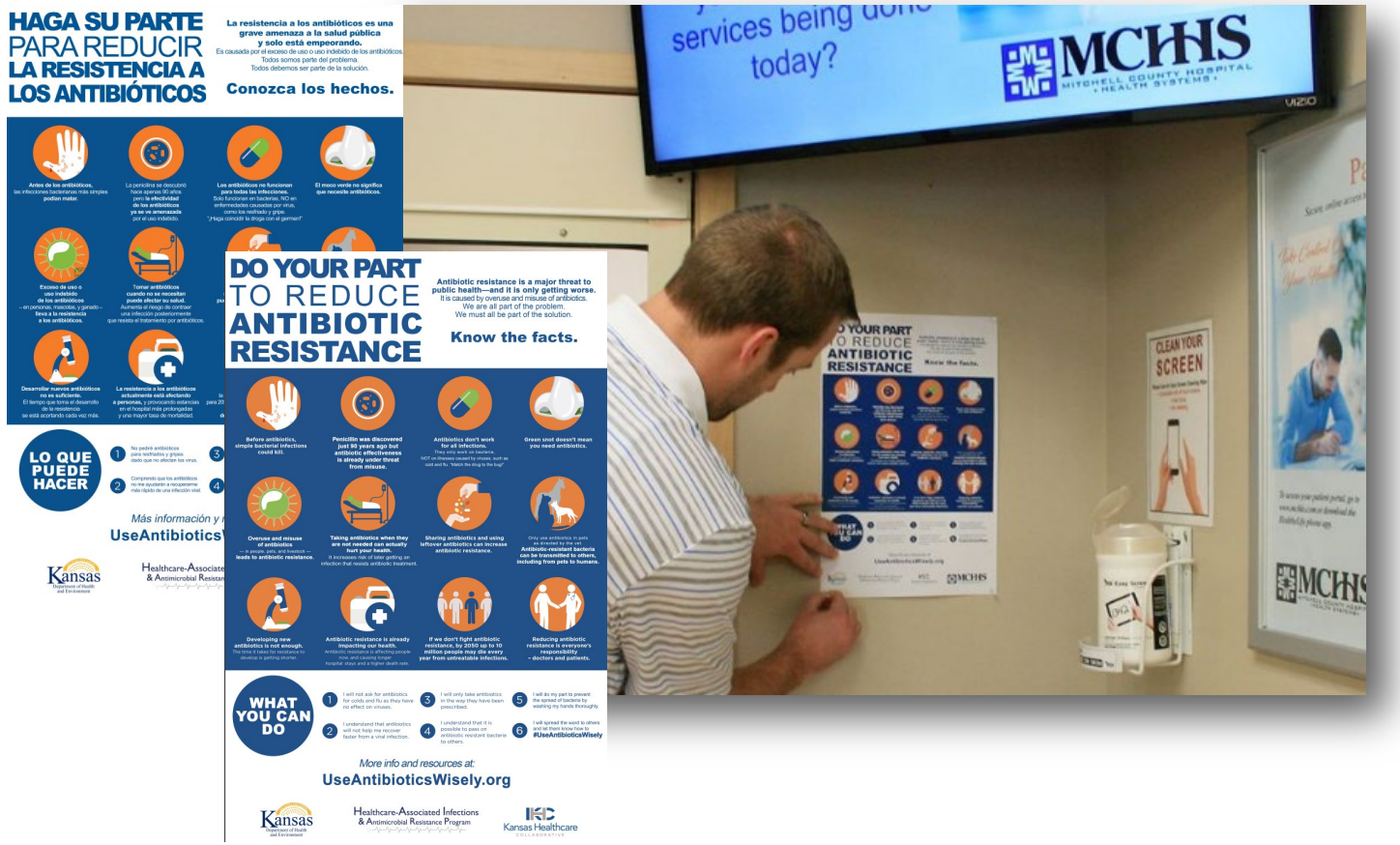
- State/local background, CMS regulations etc.
- Editable to your facility
- Costing estimators for ASP proposals
- Cost saving projections
- Goals / benefits to facility, individual, society

Download https://www.kdhe.ks.gov/DocumentCenter/View/14472/Presentation-1---Making-the-Case-PPTX

Tools: Nudging Posters

Commitment posters

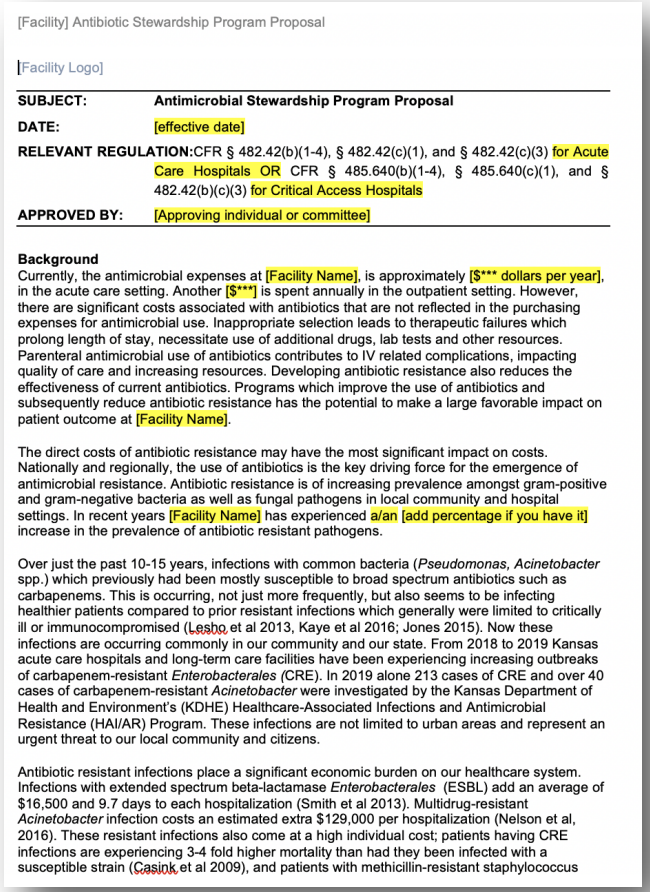
- Accountability when faced with pressure during the visit
- 20% reduction in inappropriate abx (RCT of 5 clinics)



Download

English customizable poster: http://khconline.org/files/POSTER-UseAntibioticsWisely11x17.pdf
Spanish poster: https://khconline.org/files/POSTER-UseAntibioticsWisely24x36_SPANISH.pdf

Tools: Policies



[Facility] Antibiotic Stewardship Program Proposal

[Facility Logo]

SUBJECT: **Antimicrobial Stewardship Program Proposal**

DATE: [effective date]

RELEVANT REGULATION: CFR § 482.42(b)(1-4), § 482.42(c)(1), and § 482.42(c)(3) for Acute Care Hospitals OR CFR § 485.640(b)(1-4), § 485.640(c)(1), and § 482.42(b)(c)(3) for Critical Access Hospitals

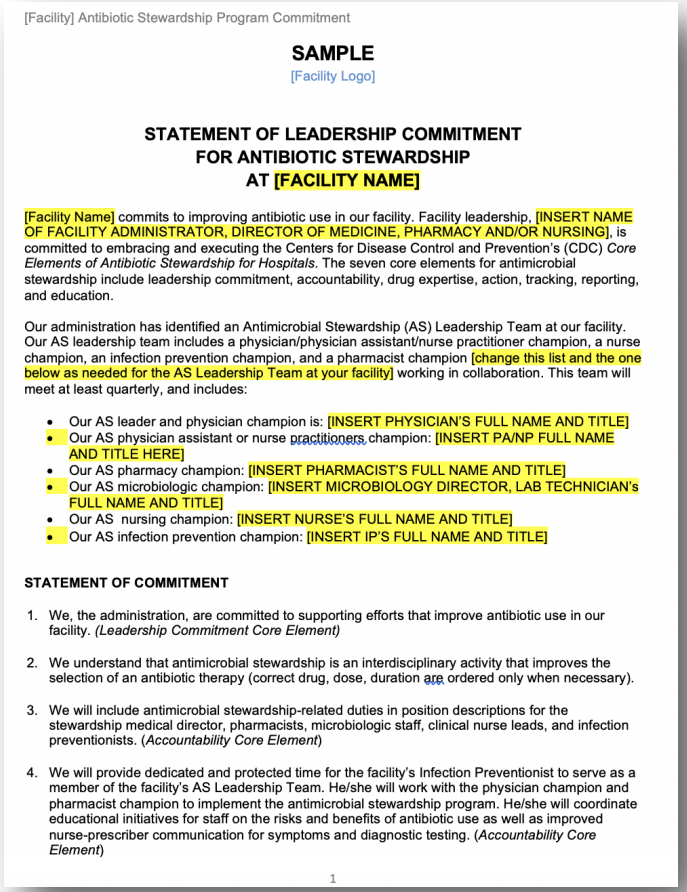
APPROVED BY: [Approving individual or committee]

Background
Currently, the antimicrobial expenses at [Facility Name], is approximately [$*** dollars per year], in the acute care setting. Another [$***] is spent annually in the outpatient setting. However, there are significant costs associated with antibiotics that are not reflected in the purchasing expenses for antimicrobial use. Inappropriate selection leads to therapeutic failures which prolong length of stay, necessitate use of additional drugs, lab tests and other resources. Parenteral antimicrobial use of antibiotics contributes to IV related complications, impacting quality of care and increasing resources. Developing antibiotic resistance also reduces the effectiveness of current antibiotics. Programs which improve the use of antibiotics and subsequently reduce antibiotic resistance has the potential to make a large favorable impact on patient outcome at [Facility Name].

The direct costs of antibiotic resistance may have the most significant impact on costs. Nationally and regionally, the use of antibiotics is the key driving force for the emergence of antimicrobial resistance. Antibiotic resistance is of increasing prevalence amongst gram-positive and gram-negative bacteria as well as fungal pathogens in local community and hospital settings. In recent years [Facility Name] has experienced a/an [add percentage if you have it] increase in the prevalence of antibiotic resistant pathogens.

Over just the past 10-15 years, infections with common bacteria (*Pseudomonas, Acinetobacter* spp.) which previously had been mostly susceptible to broad spectrum antibiotics such as carbapenems. This is occurring, not just more frequently, but also seems to be infecting healthier patients compared to prior resistant infections which generally were limited to critically ill or immunocompromised (Lesho et al 2013, Kaye et al 2016; Jones 2015). Now these infections are occurring commonly in our community and our state. From 2018 to 2019 Kansas acute care hospitals and long-term care facilities have been experiencing increasing outbreaks of carbapenem-resistant *Enterobacterales* (CRE). In 2019 alone 213 cases of CRE and over 40 cases of carbapenem-resistant *Acinetobacter* were investigated by the Kansas Department of Health and Environment's (KDHE) Healthcare-Associated Infections and Antimicrobial Resistance (HAI/AR) Program. These infections are not limited to urban areas and represent an urgent threat to our local community and citizens.

Antibiotic resistant infections place a significant economic burden on our healthcare system. Infections with extended spectrum beta-lactamase *Enterobacterales* (ESBL) add an average of $16,500 and 9.7 days to each hospitalization (Smith et al 2013). Multidrug-resistant *Acinetobacter* infection costs an estimated extra $129,000 per hospitalization (Nelson et al, 2016). These resistant infections also come at a high individual cost; patients having CRE infections are experiencing 3-4 fold higher mortality than had they been infected with a susceptible strain (Casink et al 2009), and patients with methicillin-resistant staphylococcus



[Facility] Antibiotic Stewardship Program Commitment

SAMPLE

[Facility Logo]

STATEMENT OF LEADERSHIP COMMITMENT FOR ANTIBIOTIC STEWARDSHIP AT [FACILITY NAME]

[Facility Name] commits to improving antibiotic use in our facility. Facility leadership, [INSERT NAME OF FACILITY ADMINISTRATOR, DIRECTOR OF MEDICINE, PHARMACY AND/OR NURSING], is committed to embracing and executing the Centers for Disease Control and Prevention's (CDC) *Core Elements of Antibiotic Stewardship for Hospitals*. The seven core elements for antimicrobial stewardship include leadership commitment, accountability, drug expertise, action, tracking, reporting, and education.

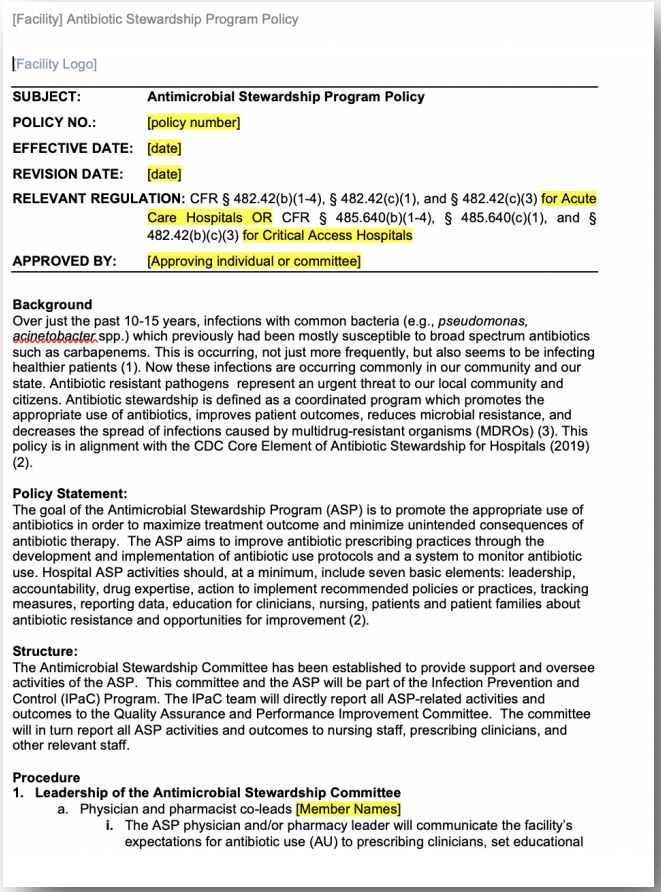
Our administration has identified an Antimicrobial Stewardship (AS) Leadership Team at our facility. Our AS leadership team includes a physician/physician assistant/nurse practitioner champion, a nurse champion, an infection prevention champion, and a pharmacist champion [change this list and the one below as needed for the AS Leadership Team at your facility] working in collaboration. This team will meet at least quarterly, and includes:

- Our AS leader and physician champion is: [INSERT PHYSICIAN'S FULL NAME AND TITLE]
- Our AS physician assistant or nurse practitioners champion: [INSERT PA/NP FULL NAME AND TITLE HERE]
- Our AS pharmacy champion: [INSERT PHARMACIST'S FULL NAME AND TITLE]
- Our AS microbiologic champion: [INSERT MICROBIOLOGY DIRECTOR, LAB TECHNICIAN's FULL NAME AND TITLE]
- Our AS nursing champion: [INSERT NURSE'S FULL NAME AND TITLE]
- Our AS infection prevention champion: [INSERT IP'S FULL NAME AND TITLE]

STATEMENT OF COMMITMENT

1. We, the administration, are committed to supporting efforts that improve antibiotic use in our facility. *(Leadership Commitment Core Element)*
2. We understand that antimicrobial stewardship is an interdisciplinary activity that improves the selection of an antibiotic therapy (correct drug, dose, duration are ordered only when necessary).
3. We will include antimicrobial stewardship-related duties in position descriptions for the stewardship medical director, pharmacists, microbiologic staff, clinical nurse leads, and infection preventionists. (*Accountability Core Element*)
4. We will provide dedicated and protected time for the facility's Infection Preventionist to serve as a member of the facility's AS Leadership Team. He/she will work with the physician champion and pharmacist champion to implement the antimicrobial stewardship program. He/she will coordinate educational initiatives for staff on the risks and benefits of antibiotic use as well as improved nurse-prescriber communication for symptoms and diagnostic testing. (*Accountability Core Element*)

1



[Facility] Antibiotic Stewardship Program Policy

[Facility Logo]

SUBJECT: **Antimicrobial Stewardship Program Policy**

POLICY NO.: [policy number]

EFFECTIVE DATE: [date]

REVISION DATE: [date]

RELEVANT REGULATION: CFR § 482.42(b)(1-4), § 482.42(c)(1), and § 482.42(c)(3) for Acute Care Hospitals OR CFR § 485.640(b)(1-4), § 485.640(c)(1), and § 482.42(b)(c)(3) for Critical Access Hospitals

APPROVED BY: [Approving individual or committee]

Background
Over just the past 10-15 years, infections with common bacteria (e.g., *pseudomonas, acinetobacter* spp.) which previously had been mostly susceptible to broad spectrum antibiotics such as carbapenems. This is occurring, not just more frequently, but also seems to be infecting healthier patients (1). Now these infections are occurring commonly in our community and our state. Antibiotic resistant pathogens represent an urgent threat to our local community and citizens. Antibiotic stewardship is defined as a coordinated program which promotes the appropriate use of antibiotics, improves patient outcomes, reduces microbial resistance, and decreases the spread of infections caused by multidrug-resistant organisms (MDROs) (3). This policy is in alignment with the CDC Core Element of Antibiotic Stewardship for Hospitals (2019) (2).

Policy Statement:
The goal of the Antimicrobial Stewardship Program (ASP) is to promote the appropriate use of antibiotics in order to maximize treatment outcome and minimize unintended consequences of antibiotic therapy. The ASP aims to improve antibiotic prescribing practices through the development and implementation of antibiotic use protocols and a system to monitor antibiotic use. Hospital ASP activities should, at a minimum, include seven basic elements: leadership, accountability, drug expertise, action to implement recommended policies or practices, tracking measures, reporting data, education for clinicians, nursing, patients and patient families about antibiotic resistance and opportunities for improvement (2).

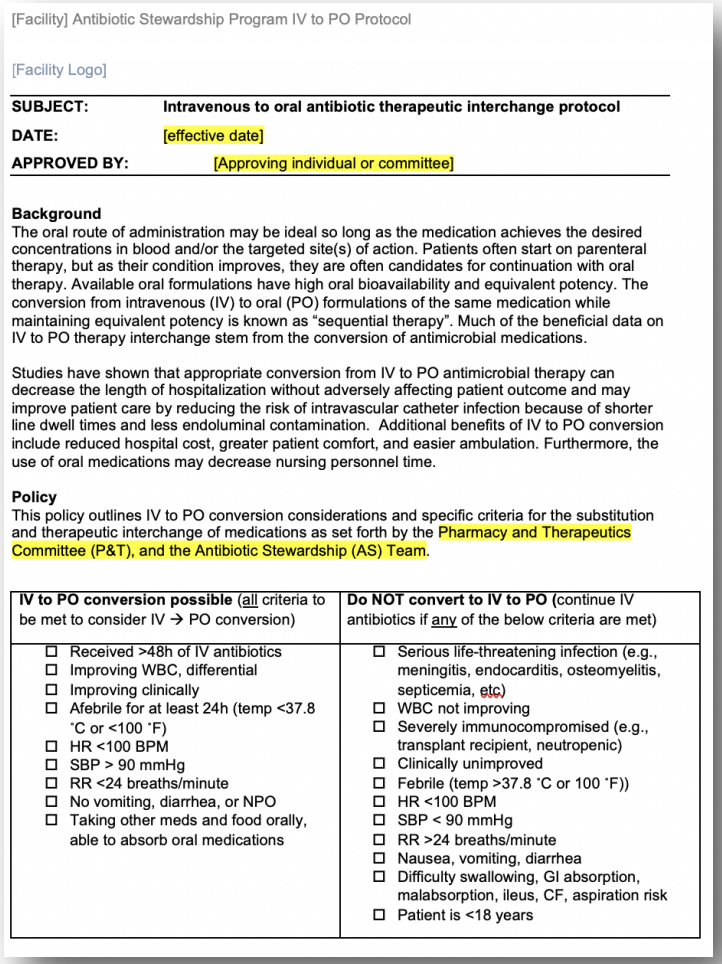
Structure:
The Antimicrobial Stewardship Committee has been established to provide support and oversee activities of the ASP. This committee and the ASP will be part of the Infection Prevention and Control (IPaC) Program. The IPaC team will directly report all ASP-related activities and outcomes to the Quality Assurance and Performance Improvement Committee. The committee will in turn report all ASP activities and outcomes to nursing staff, prescribing clinicians, and other relevant staff.

Procedure
1. **Leadership of the Antimicrobial Stewardship Committee**
   a. Physician and pharmacist co-leads [Member Names]
      i. The ASP physician and/or pharmacy leader will communicate the facility's expectations for antibiotic use (AU) to prescribing clinicians, set educational

Download

- Policy Proposal: https://www.kdhe.ks.gov/DocumentCenter/View/14463/Template-1---ASP-Proposal-DOCX
- Leadership commitment: https://www.kdhe.ks.gov/documentcenter/view/14464
- Institutional ASP Policy: https://www.kdhe.ks.gov/documentcenter/view/14465

Tools: Policies



[Facility] Antibiotic Stewardship Program IV to PO Protocol

[Facility Logo]

SUBJECT: **Intravenous to oral antibiotic therapeutic interchange protocol**

DATE: [effective date]

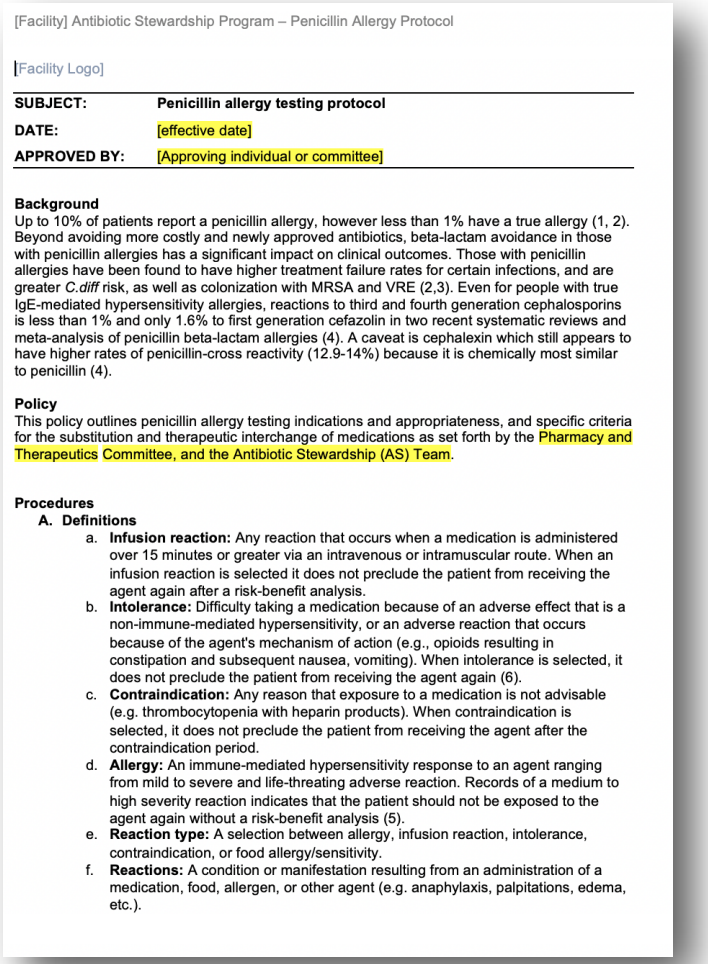
APPROVED BY: [Approving individual or committee]

Background
The oral route of administration may be ideal so long as the medication achieves the desired concentrations in blood and/or the targeted site(s) of action. Patients often start on parenteral therapy, but as their condition improves, they are often candidates for continuation with oral therapy. Available oral formulations have high oral bioavailability and equivalent potency. The conversion from intravenous (IV) to oral (PO) formulations of the same medication while maintaining equivalent potency is known as "sequential therapy". Much of the beneficial data on IV to PO therapy interchange stem from the conversion of antimicrobial medications.

Studies have shown that appropriate conversion from IV to PO antimicrobial therapy can decrease the length of hospitalization without adversely affecting patient outcome and may improve patient care by reducing the risk of intravascular catheter infection because of shorter line dwell times and less endoluminal contamination. Additional benefits of IV to PO conversion include reduced hospital cost, greater patient comfort, and easier ambulation. Furthermore, the use of oral medications may decrease nursing personnel time.

Policy
This policy outlines IV to PO conversion considerations and specific criteria for the substitution and therapeutic interchange of medications as set forth by the Pharmacy and Therapeutics Committee (P&T), and the Antibiotic Stewardship (AS) Team.

IV to PO conversion possible (all criteria to be met to consider IV → PO conversion)	**Do NOT convert to IV to PO** (continue IV antibiotics if any of the below criteria are met)
☐ Received >48h of IV antibiotics ☐ Improving WBC, differential ☐ Improving clinically ☐ Afebrile for at least 24h (temp <37.8 ˚C or <100 ˚F) ☐ HR <100 BPM ☐ SBP > 90 mmHg ☐ RR <24 breaths/minute ☐ No vomiting, diarrhea, or NPO ☐ Taking other meds and food orally, able to absorb oral medications	☐ Serious life-threatening infection (e.g., meningitis, endocarditis, osteomyelitis, septicemia, etc) ☐ WBC not improving ☐ Severely immunocompromised (e.g., transplant recipient, neutropenic) ☐ Clinically unimproved ☐ Febrile (temp >37.8 ˚C or 100 ˚F)) ☐ HR <100 BPM ☐ SBP < 90 mmHg ☐ RR >24 breaths/minute ☐ Nausea, vomiting, diarrhea ☐ Difficulty swallowing, GI absorption, malabsorption, ileus, CF, aspiration risk ☐ Patient is <18 years



[Facility] Antibiotic Stewardship Program – Penicillin Allergy Protocol

[Facility Logo]

SUBJECT: **Penicillin allergy testing protocol**

DATE: [effective date]

APPROVED BY: [Approving individual or committee]

Background
Up to 10% of patients report a penicillin allergy, however less than 1% have a true allergy (1, 2). Beyond avoiding more costly and newly approved antibiotics, beta-lactam avoidance in those with penicillin allergies has a significant impact on clinical outcomes. Those with penicillin allergies have been found to have higher treatment failure rates for certain infections, and are greater *C.diff* risk, as well as colonization with MRSA and VRE (2,3). Even for people with true IgE-mediated hypersensitivity allergies, reactions to third and fourth generation cephalosporins is less than 1% and only 1.6% to first generation cefazolin in two recent systematic reviews and meta-analysis of penicillin beta-lactam allergies (4). A caveat is cephalexin which still appears to have higher rates of penicillin-cross reactivity (12.9-14%) because it is chemically most similar to penicillin (4).

Policy
This policy outlines penicillin allergy testing indications and appropriateness, and specific criteria for the substitution and therapeutic interchange of medications as set forth by the Pharmacy and Therapeutics Committee, and the Antibiotic Stewardship (AS) Team.

Procedures

A. Definitions

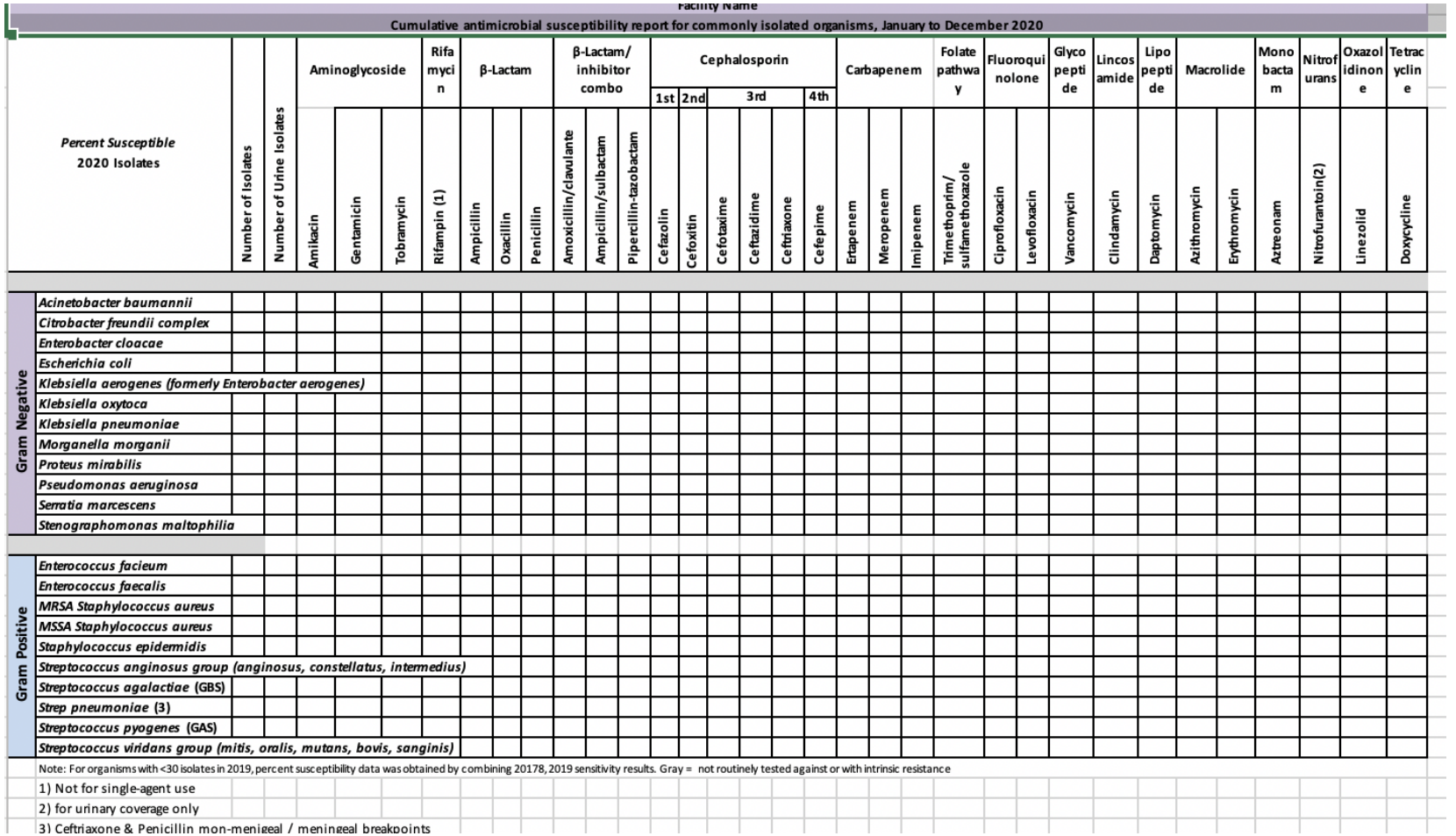
a. **Infusion reaction:** Any reaction that occurs when a medication is administered over 15 minutes or greater via an intravenous or intramuscular route. When an infusion reaction is selected it does not preclude the patient from receiving the agent again after a risk-benefit analysis.
b. **Intolerance:** Difficulty taking a medication because of an adverse effect that is a non-immune-mediated hypersensitivity, or an adverse reaction that occurs because of the agent's mechanism of action (e.g., opioids resulting in constipation and subsequent nausea, vomiting). When intolerance is selected, it does not preclude the patient from receiving the agent again (6).
c. **Contraindication:** Any reason that exposure to a medication is not advisable (e.g. thrombocytopenia with heparin products). When contraindication is selected, it does not preclude the patient from receiving the agent after the contraindication period.
d. **Allergy:** An immune-mediated hypersensitivity response to an agent ranging from mild to severe and life-threating adverse reaction. Records of a medium to high severity reaction indicates that the patient should not be exposed to the agent again without a risk-benefit analysis (5).
e. **Reaction type:** A selection between allergy, infusion reaction, intolerance, contraindication, or food allergy/sensitivity.
f. **Reactions:** A condition or manifestation resulting from an administration of a medication, food, allergen, or other agent (e.g. anaphylaxis, palpitations, edema, etc.).

PCN allergies reported in up to 10% but <1% have true allergy

Download

- IV to PO Policy: https://www.kdhe.ks.gov/DocumentCenter/View/14466/Template-4---ASP-IV-to-PO-Protocol-DOCX
- PCN allergy Policy: https://www.kdhe.ks.gov/DocumentCenter/View/14467/Template-5---ASP-PCN-Allergy-Protocol-DOCX

Tools: Antibiogram Template & State Antibiogram



Facility Name

Cumulative antimicrobial susceptibility report for commonly isolated organisms, January to December 2020

	Percent Susceptible 2020 Isolates	Number of Isolates	Number of Urine Isolates	Aminoglycoside			Rifamycin	β-Lactam			β-Lactam/ inhibitor combo			Cephalosporin						Carbapenem			Folate pathway	Fluoroquinolone		Glycopeptide	Lincosamide	Lipopeptide	Macrolide		Monobactam	Nitrofurans	Oxazolidinone	Tetracycline
														1st	2nd	3rd			4th																
				Amikacin	Gentamicin	Tobramycin	Rifampin (1)	Ampicillin	Oxacillin	Penicillin	Amoxicillin/clavulanate	Ampicillin/sulbactam	Pipercillin-tazobactam	Cefazolin	Cefoxitin	Cefotaxime	Ceftazidime	Ceftriaxone	Cefepime	Ertapenem	Meropenem	Imipenem	Trimethoprim/ sulfamethoxazole	Ciprofloxacin	Levofloxacin	Vancomycin	Clindamycin	Daptomycin	Azithromycin	Erythromycin	Aztreonam	Nitrofurantoin(2)	Linezolid	Doxycycline
Gram Negative	*Acinetobacter baumannii*																																	
	Citrobacter freundii complex																																	
	Enterobacter cloacae																																	
	Escherichia coli																																	
	Klebsiella aerogenes (formerly Enterobacter aerogenes)																																	
	Klebsiella oxytoca																																	
	Klebsiella pneumoniae																																	
	Morganella morganii																																	
	Proteus mirabilis																																	
	Pseudomonas aeruginosa																																	
	Serratia marcescens																																	
	Stenographomonas maltophilia																																	
Gram Positive	*Enterococcus facieum*																																	
	Enterococcus faecalis																																	
	MRSA Staphylococcus aureus																																	
	MSSA Staphylococcus aureus																																	
	Staphylococcus epidermidis																																	
	Streptococcus anginosus group (anginosus, constellatus, intermedius)																																	
	Streptococcus agalactiae (GBS)																																	
	Strep pneumoniae (3)																																	
	Streptococcus pyogenes (GAS)																																	
	Streptococcus viridans group (mitis, oralis, mutans, bovis, sanginis)																																	

Note: For organisms with <30 isolates in 2019, percent susceptibility data was obtained by combining 20178, 2019 sensitivity results. Gray = not routinely tested against or with intrinsic resistance

1) Not for single-agent use

2) for urinary coverage only

3) Ceftriaxone & Penicillin non-meningeal / meningeal breakpoints

Download

- Template: https://www.kdhe.ks.gov/documentcenter/view/14445
- Kansas Antibiogram (2020): https://www.kdhe.ks.gov/DocumentCenter/View/14422/2020-Kansas-Antibiogram-PDF?bidId=

Clinical Decision Support: URI Rx Pads

Rx **Name:** _____

DIAGNOSIS	Symptom duration
❑ **Bronchitis** (chest cold, cough)	7-21 days
❑ **COVID-19**	3-21 days (+)
❑ **Influenza** (flu)	7-14 days
❑ **Otitis media** (ear infection)	7-10 days
❑ **Upper respiratory infection** (common cold)	7-10 days
❑ **Viral pharyngitis** (sore throat)	3-10 days
❑ **Viral sinusitis** (sinus infection)	7-14 days

The symptoms you presented with today suggest a VIRAL infection.

You have not been prescribed antibiotics because **antibiotics are <u>not</u> effective for viral infections,** cause side effects, and may cause serious harm

Please return or call if symptoms do not improve in ____ day(s), you develop persistent fevers, shortness of breath, or other symptoms: _____

Kansas Healthcare-Associated Infections & Antimicrobial Resistance Advisory Group

SYMPTOM RELIEF MEDICATIONS	
Always use medications according to package instructions Stop the medication when symptoms get better	
❑ **Acetaminophen, 325-650 mg every 4-6 hours as needed**	fever and aches
❑ **Ibuprofen, 400-800 mg every 4-6 hours as needed**	fever and aches
❑ **Naproxen, 250-500 mg every 12 hours as needed**	fever and aches
❑ **Lozenges - benzocaine, dyclonine or zinc acetate**	sore throat
❑ **Saltwater gargle** -1 tbsp. salt /1 cup warm water	sore throat
❑ **Honey** - 2 tbsp. /1 cup tea or hot water every 4-6 hours as needed (*do not give honey to babies under 1 year)*	sore throat, cough
❑ **Nasal / sinus saline irrigation** (i.e., neti pot, saline squeeze bottle) 1-4 times daily as needed (*do not use irrigations in kids under 6)*	nasal congestion
❑ **Cool mist humidifier or vaporizer**	chest & nasal congestion
❑ **Dextromethorphan, 20-30 mg every 6 hours as needed** (*do not use cough suppressants in kids under 4)*	cough
If none of above working, you do NOT have heart problems or high blood pressure, may consider:	
❑ **Phenylephrine or pseudoephedrine**, limit 2-3 days (*do not use in kids under 4)*	cough & congestion

Prescriber: _____ **Date:** _____

Clinical Decision Support: GU Rx Pads

Rx **Name:** _____

DIAGNOSIS

- ❑ **Asymptomatic bacteriuria** (bacteria in urine without infection)
- ❑ **Dysuria** (painful urination without infection)
- ❑ **Dyspareunia** (painful sex)
- ❑ **Interstitial cystitis** (bladder wall inflammation)
- ❑ **Pelvic floor dysfunction** (pelvic muscle pain)
- ❑ **Vaginitis** (vaginal irritation)

The symptoms and/or urinalysis you presented with today do NOT suggest an infection.

Antibiotics were not started because they are ineffective for dysuria without infection and asymptomatic bacteriuria, may cause side effects, harm & **may lead to resistant bacteria limiting future antibiotic options.**

Please return or call if symptoms do not improve in ____ day(s), develop fevers or chills, lower abdominal or back pain, blood in the urine, or other new or concerning symptoms.

Kansas Healthcare-Associated Infections & Antimicrobial Resistance Advisory Group

Kansas

SYMPTOM RELIEF MEDICATIONS

Always use medications according to package instructions

❑ **Acetaminophen 325-650 mg every 4-6 hours as needed**	Pain, burning
❑ **Phenazopyridine 100-200 mg three times daily as needed** *(orange urine discoloration expected; limit 3 days continuously)*	Pain, burning
❑ **Methenamine Hippurate 162 mg + sodium salicylate 162 mg daily, 2 tablets three times daily as needed**	Burning +/- prevent infection
❑ **Estrogen topically, 2 to 5 times weekly***	Vaginal irritation, healthy vaginal flora

PREVENTIVE MEDICATIONS

❑ **Methenamine Hippurate 1000 mg twice daily*** (take with vitamin C 1000 mg to activate; don't take same time as sulfa meds, *strong urine smell expected)*	Prevent bladder bacterial growth
❑ **Cranberry supplement** or 10-30 oz cranberry juice daily	Prevent *E.coli* bladder wall attachment
❑ **D-mannose 2 gram daily**	Prevent bacterial bladder wall attachment
❑ **Probiotic,** lactobacillus at least 10 billion cfu daily	Protect from (harmful) bacterial overgrowth

** Rx required*

DIET / HYGIENE

- ❑ Avoid caffeine, alcohol, artificial sweeteners, spicy foods
- ❑ Consider diet for interstitial cystitis (ichelp.org)
- ❑ Avoid irritants (spermicide, diaphragms, feminine hygiene sprays, powders, douches)
- ❑ Urinate after sex, wear cotton undergarments
- ❑ Avoid constipation and diarrhea
- ❑ Empty bladder at regular intervals

Prescriber: _____ **Date:** _____

Clinical Decision Support: Dental Prophylaxis Pads

Rx Dental Prophylaxis Decision Script

Patient Name: _____ Date: _____

Prophylaxis INDICATED[1]

- ❑ Prosthetic heart valve
- ❑ Prosthetic material used to repair valve (e.g., annuloplasty)
- ❑ History of infective endocarditis
- ❑ Unrepaired congenital heart defect
- ❑ Repaired congenital heart defect with residual shunt or regurgitation
- ❑ Heart transplant with valvular regurgitation

Prophylaxis NOT generally indicated[2]

- ❑ History of prosthetic joint infection
- ❑ Extensive & invasive procedure planned
- ❑ Active or recovered prosthetic joint issues (hematoma, drainage)
- ❑ Immunosuppressed (e.g., history of transplant, leukemia, RA, Crohn's)
- ❑ Diabetic with poor control
- ❑ Risk of ORN[3] (from bisphosphonates)

AHA, ADA recommended antibiotic regimens

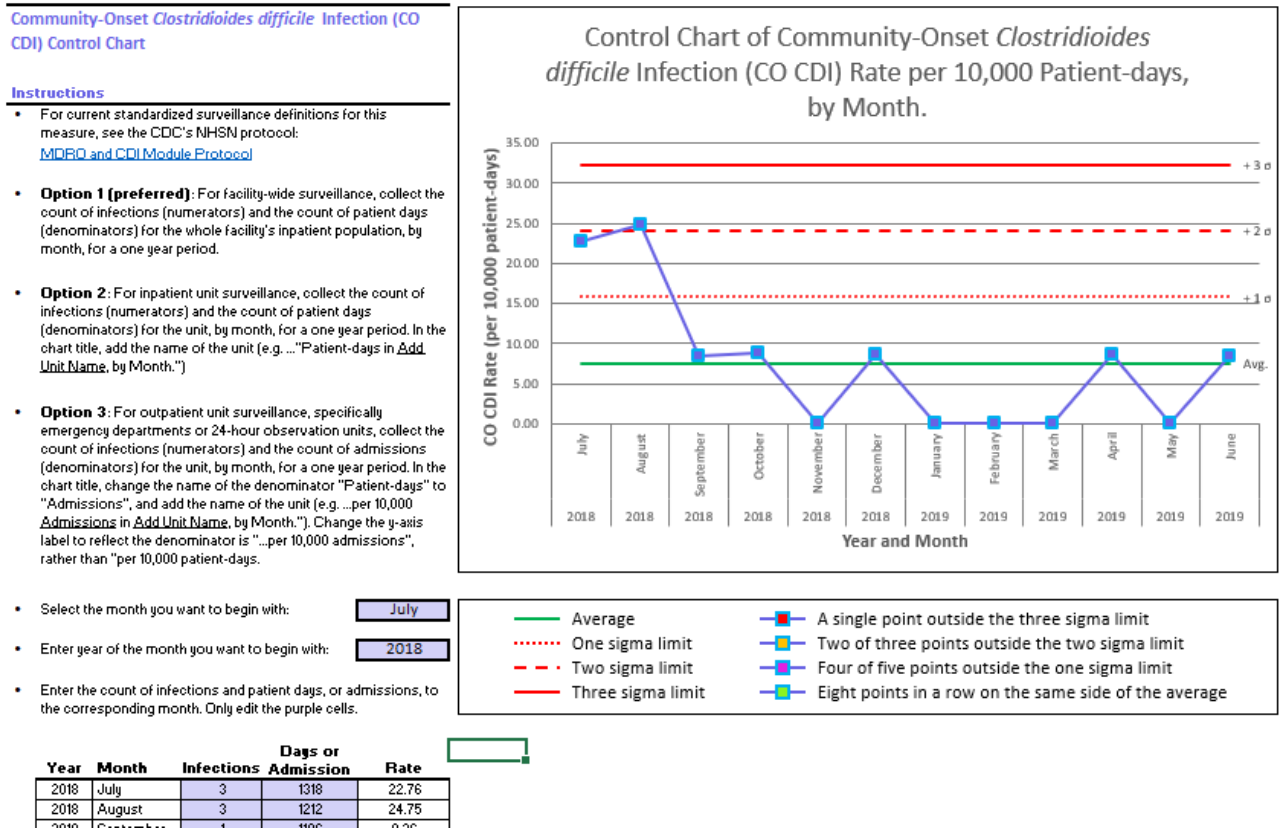
Antibiotic[4]	Adults	Children
Amoxicillin	❑ 2 g	❑ 50 mg/kg
PCN-allergic		
Cephalexin[5]	❑ 2 g	❑ 50 mg/kg
Clindamycin	❑ 600 mg	❑ 20 mg/kg
Azithromycin	❑ 500 mg	❑ 15 mg/kg
Unable to take PO		
Ampicillin	❑ 2 g IM or IV	❑ 50 mg/kg IM or IV
Cefazolin or ceftriaxone[5]	❑ 1 g IM or IV	❑ 50 mg/kg IM or IV
Clindamycin	❑ 600 mg IM or IV	❑ 20 mg/kg IM or IV

1. Gingival or peri-apical tissue manipulation
2. Consider discussing with patient's orthopedics or physician, underlying morbidity risk
3. ORN = osteoradionecrosis of the jaw
4. Single dose 30-60 min prior to procedure
5. Cephalosporins should not be used in those with penicillin-related anaphylactic history, angioedema or urticaria

Kansas Healthcare-Associated Infections & Antimicrobial Resistance Advisory Group

Kansas

Tools: Interactive HAI Spreadsheets



Community-Onset *Clostridioides difficile* Infection (CO CDI) Control Chart

Instructions

- For current standardized surveillance definitions for this measure, see the CDC's NHSN protocol: MDRO and CDI Module Protocol
- **Option 1 (preferred)**: For facility-wide surveillance, collect the count of infections (numerators) and the count of patient days (denominators) for the whole facility's inpatient population, by month, for a one year period.
- **Option 2**: For inpatient unit surveillance, collect the count of infections (numerators) and the count of patient days (denominators) for the unit, by month, for a one year period. In the chart title, add the name of the unit (e.g. ..."Patient-days in Add Unit Name, by Month.")
- **Option 3**: For outpatient unit surveillance, specifically emergency departments or 24-hour observation units, collect the count of infections (numerators) and the count of admissions (denominators) for the unit, by month, for a one year period. In the chart title, change the name of the denominator "Patient-days" to "Admissions", and add the name of the unit (e.g. ...per 10,000 Admissions in Add Unit Name, by Month."). Change the y-axis label to reflect the denominator is "...per 10,000 admissions", rather than "per 10,000 patient-days.

- Select the month you want to begin with: July
- Enter year of the month you want to begin with: 2018
- Enter the count of infections and patient days, or admissions, to the corresponding month. Only edit the purple cells.

Year	Month	Infections	Days or Admission	Rate
2018	July	3	1318	22.76
2018	August	3	1212	24.75

- Intro/step-by-step
- CAUTI
- UTIs
- Urinary utilization
- CLABSIs
- CVC utilization
- C.diff

Download

HAI Tracking: https://www.kdhe.ks.gov/DocumentCenter/View/14446/Spreadsheet-2---Interactive-HAI-Tracking-Tools-XLSX

- How & What to Track: https://www.khconline.org/files/KHC_KDHE_AS_LAN_3_6-2-22_Breakout_1_with_bookend_slides.pdf
- Recording, Basics: https://youtu.be/jLPs7HGRGdg
- Recording, Advanced: https://www.youtube.com/watch?v=1d17rSQtr68

Tools: Templates

ID resources, Stakeholders, Duties, Oversight

Stakeholder identification	Who? (name or role)	How? (which core element(s) or other means of assistance)	When? (planning, implementation, scale-up, evaluation stage)
ex) DON	**1.** *ex)* responsible for *nursing staff* **2.** **3.** **4.** **5.**	**1.** *ex) education (awareness of symptoms of infection vs. colonization, facility issues), engagement (ASP planning [i.e. what do staff perceive as significant drivers of misuse] barriers [i.e. provider prescribing norms, communication])* **2.** **3.** **4.** **5.**	**1.** *ex) all stages, especially development, implementation, evaluation* **2.** **3.** **4.** **5.**
Who is involved in the program's operations?	**1.** **2.** **3.** **4.** **5.**	**1.** **2.** **3.** **4.** **5.**	**1.** **2.** **3.** **4.** **5.**
Who will benefit from the program?	**1.** **2.** **3.** **4.** **5.**	**1.** **2.** **3.** **4.** **5.**	**1.** **2.** **3.** **4.** **5.**

Key Stakeholder engagement ("what's in it for them?")			
	List key stakeholders identified above	**Which activities or outcomes are most important to this stakeholder**	**How can the facility address this stakeholder's needs?**
1.	*ex) nursing staff*	*ex) implementation and leadership (i.e. administrative, medical and nursing roles clearly delineated) ASP direction & goals (i.e. provision of materials, meetings regarding ASP expectations, guidelines, education)*	*ex) allocated educational time, auditing and feedback*
2.			
3.			
4.			
5.			
6.			

Team member	Activities this member is accountable for	Estimation of weekly hours	What needs are to be met for this person to serve as an ASP team member?
Medical Director			
Pharmacist			
Nurse leader			
Infection preventionist			
Microbiologist			
Physician / Clinician			
Nurse			
Nurse aids			
Patient or family advocates			
Environmental service staff			
Other			

Resource	Needed	Frequency of need	Description of need	Actions	Cost estimates
Education (for ASP team members)	☐ Yes ☐ No	☐ Once ☐ Ongoing: _____ (monthly, annually, other)	*Ex) 1) courses on prescribing practices (i.e. antibiotic indications, duration, institutional misuse), 2) ASP processes (i.e. approaches to technology uses, stop orders, development guidelines and algorithms)*	*Ex) 1) surveys / assessments ASP members (for deficiencies), 2) survey attitudes (for needs), 3) determine number of educational programs, 4) determine number attendees for each (and when)*	*Ex) antibiotic or process course = [assemble materials (5h x $/hr)] + [create power point & materials (7h x $/h)] + [print materials x $/attendee] + [attendees (# attendees x $/hr, salary compensated)] = $950 per event for est. 15 attendees*
Education (for ASP members)	☐ Yes ☐ No	☐ Once ☐ Ongoing: _____ (monthly, annually, other)			
Education (for staff)	☐ Yes ☐ No	☐ Once ☐ Ongoing: _____ (monthly, annually, other)			
Supplies	☐ Yes ☐ No	☐ Once ☐ Ongoing: _____ (monthly, annually, other)			

Download

Stakeholder ID: https://www.kdhe.ks.gov/DocumentCenter/View/14449/Table-1---Key-Stakeholder-Identification-DOCX
Stakeholder Engagement: https://www.kdhe.ks.gov/DocumentCenter/View/14450/Table-2---Stakeholder-Engagement-DOCX
Members & Duties: https://www.kdhe.ks.gov/DocumentCenter/View/14451/Table-3---Members-and-Duties-DOCX
Resource ID: https://www.kdhe.ks.gov/DocumentCenter/View/14452/Table-4---Resource-Identification-DOCX

Tools: Audits

Antibiotics, Infection types, Patient Mix

Hospital Antibiotic Use	
Last calendar year or last 12 months ***(alternatively, start with one month)***	
What are the 3 most common infections, or conditions, (i.e., asymptomatic bacteriuria, acute COPD exacerbation) for which patients are treated with antibiotics	1. ____________ 2. ____________ 3.
What proportion of **asymptomatic bacteriuria** cases are treated with an antibiotic	%
What are the 3 most common antibiotics prescribed for **UTIs** (including asymptomatic bacteriuria)	1. ____________ 2. ____________ 3. ____________
What proportion of **acute bronchitis** (without COPD) are treated with an antibiotic	%
What proportion of **acute bronchitis** cases (with COPD) are treated with an antibiotic	____________%
What are the 3 most common antibiotics prescribed for **acute bronchitis** (regardless of whether the patient has COPD or not)	1. ____________ 2. ____________ 3.
What are the 3 most common antibiotics prescribed for **community acquired pneumonia**	1. ____________ 2. ____________ 3.
What are the 3 most common antibiotics prescribed for **hospital acquired pneumonia**	1. ____________ 2. ____________ 3. ____________
What are the 3 most common antibiotics prescribed for **cellulitis or infected wounds** (and/or other skin and soft tissue infections [**SSTIs**])	1. ____________ 2. ____________ 3.
Other infections a concern in your facility: What are the 3 most common antibiotics prescribed for	1. ____________ 2. ____________ 3.
Other infections a concern in your facility: What are the 3 most common antibiotics prescribed for ____________	1. ____________ 2. ____________ 3. ____________
Facility Guidelines	

Summary of facility antibiotics	Number	
Total number antibiotics reviewed		
Total number of data sources reviewed (in addition to antibiotic orders)		
Summary of facility antibiotic appropriateness	Number	%

Patient name/ date	Antibiotic (drug, dose, duration)	Indication for antibiotic	Clinical notes	Micro/ imaging results	Infection surveillance log	CDC Infection surveillance criteria met	Facility policy alignment (if there is a policy)
ex) A, 1/1/20	*ex) Cipro 250 mg p.o. BID x 14 days*	*ex) UTI*	*ex) Urine catheter in place, cloudy urine*	*ex) UA packed WBC, UC<10k contaminants*	*ex) UTI*	*ex) No*	*ex) No*
ex) B, 1/2/20	*ex) cefazolin*	*ex) cellulitis*	*ex) erythema, fevers*	*ex) n/a*	*ex) SSTI*	*ex) Yes*	*ex) Yes*

Infection	# cases	Antibiotic regimen most often prescribed		
		Antibiotic 1	Antibiotic 2	Antibiotic 3
Ex) UTI (catheter)	*Ex) 15/mo (avg)*	**Drug**: *ceftriaxone* **Dose**: *1 gram* **Route**: *IV* **Duration**: *4 days*	**Drug**: *piperacillin/tazobactam** **Dose**: *4.5 g (1/4 Rx were 3.375 g)* **Route**: *IV* **Duration**: *5 days (average))*	**Drug**: *levofloxacin* **Dose**: *500 mg (2/3 Rx were 750) ** **Route**: *IV (1/3 Rx PO)* **Duration**: *7 days (average, including IV to PO conversion)*
		Drug: **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**
		Drug: **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**
		Drug: **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**
		Drug: **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**	**Drug:** **Dose:** **Route:** **Frequency:** **Duration:**

**Dosage adjusted by renal function (e.g., if 3.375g piperacillin/tazobactam was dosed for a patient with a creatinine clearance of 35, ensure counted as the antipseudomonal dosing of 4.5g); pay attention to trends as reviewing data, and if consistent guideline-misaligned antibiotics, provider or structural recurring issues, make a note - you may identify an issue not previously recognized*

Download

- Abx Use: https://www.kdhe.ks.gov/documentcenter/view/14454
- Most Commonly Used Abx: https://www.kdhe.ks.gov/documentcenter/view/14455
- Summary of Facility Abx: https://www.kdhe.ks.gov/documentcenter/view/14459
- Abx by patient: https://www.kdhe.ks.gov/documentcenter/view/14458

Resources & More Information

We want to help with AS/AR, Contact:

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HAI/AR Section Contact

KDHE.HAIAR@ks.gov
kdhe.ks.gov/1514/

785-296-4167

24/7 Epidemiology Hotline

KDHE.EpiHotline@ks.gov

877-427-7317

https://www.kdhe.ks.gov/1514/Healthcare-Associated-Infections-Antimic

Healthcare-Associated Infections
& Antimicrobial Resistance Program

Thank You / Questions