



# Antimicrobial Stewardship Program

**Kentucky Department for Public Health**

**Report 2025**

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**Cover Image:** Big Four Bridge, Louisville, illuminated purple for U.S. Antibiotic Awareness Week "Go Purple" campaign, 2024.

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## Executive Summary

Antimicrobial stewardship is a top priority for the Kentucky Department for Public Health (KDPH) in addressing the growing challenge of antimicrobial resistance. This effort is driven by the Healthcare-Associated Infections and Antimicrobial Resistance (HAI/AR) Prevention Program, led by the Stewardship Lead, with support from the Program Manager and the National Healthcare Safety Network (NHSN) Lead. The Program supports healthcare facilities across Kentucky in improving antimicrobial use and strengthening stewardship practices. These efforts are guided by the Centers for Disease Control and Prevention's (CDC) Core Elements of Antibiotic Stewardship for Health Departments.

This report outlines the scope of KDPH's antimicrobial stewardship activities and highlights the state's ongoing commitment to addressing antimicrobial resistance. The HAI/AR Prevention Program works across hospitals, long-term care, and outpatient settings, helping hospitals improve antimicrobial data reporting, supporting stewardship in nursing homes, and optimizing outpatient antibiotic prescribing statewide. The following sections highlight key accomplishments and initiatives.

**Acute Care Hospitals:** The Program provides ongoing technical support and guidance to hospitals to expand NHSN Antimicrobial Use and Resistance (AUR) reporting capabilities. Grants were awarded to 69 hospitals, including rural and critical access facilities, to increase participation in AUR reporting. For hospitals already submitting antimicrobial use data to NHSN, the Program offers data-driven feedback and technical support to strengthen stewardship practices.

**Outpatient Care:** The Program is using Kentucky Medicaid prescription data to better understand outpatient antimicrobial prescribing patterns across the state. This work helps identify prescribing trends and contributing factors, providing the foundation for targeted feedback to outpatient providers. The goal is to support prescribers in making informed decisions that improve patient outcomes and reduce unnecessary antimicrobial use.

**Long-Term Care:** To strengthen stewardship in nursing homes, the Program is working with the Kentucky Association of Health Care Facilities (KAHCF) to support facilities and build more effective partnerships.

**Stewardship Education and Training:** In collaboration with the Kentucky Antimicrobial Stewardship Innovation Consortium (KASIC), the Program offers free educational programs and consultation services to healthcare facilities. KASIC provides expert resources, training materials, and guidance designed to strengthen stewardship practices at the facility level.

**Antibiotic Awareness Week:** Each year, the Program leads a statewide campaign with KASIC as part of U.S. Antibiotic Awareness Week (USAAW), observed November 18–24. The campaign uses social and traditional media to highlight the importance of appropriate antimicrobial use and to raise awareness of the growing threat of antimicrobial resistance.

## Acute Care & Critical Access Hospitals

### Accomplishments

- Strong hospital engagement: 96% of acute care hospitals (ACHs) are now in compliance with all seven Core Elements of Antimicrobial Stewardship.
- Progress on CDC priorities: 15% of hospitals have successfully implemented all six CDC-designated priority elements for stewardship programs.
- Support for facilities: Awarded financial grants to 69 hospitals, including rural and critical access hospitals (CAHs), to help offset the costs of reporting to the NHSN AUR module.
- Expanded reporting: Participation in National Healthcare Safety Network (NHSN) AUR reporting has grown to 94% of ACHs and 73% of CAHs statewide.

### NHSN Annual Hospital Survey Data

All ACHs complete the NHSN Patient Safety Annual Survey each year, reporting on their antimicrobial stewardship program activities from the previous year. The survey's stewardship questions align with the CDC's Core Elements of Hospital Antibiotic Stewardship Programs, giving the HAI/AR Prevention Program a consistent framework for evaluating programs statewide. The Program distributed individualized benchmark reports based on the survey results to each participating hospital in June 2025, showing how their stewardship program compared to other Kentucky hospitals. This helps facilities see where they stand and identify areas for improvement.

The following sections describe key findings from the 2024 annual hospital survey organized by ACH and CAH. Kentucky's 2024 survey participation included 27 CAHs and 69 ACHs.

### Priorities for Hospital Core Elements Implementation

The CDC introduced the [Core Elements of Antibiotic Stewardship for Hospitals](#) in 2014 as a foundational framework to help healthcare institutions build effective antibiotic stewardship programs. The survey questions related to antibiotic stewardship were mapped to the seven Core Elements: leadership, accountability, drug expertise, action, tracking, reporting, and education. Uptake of a Core Element was identified through an affirmative response to at least one corresponding survey question. This initiative has shown success, with Kentucky achieving a 96% compliance rate (100% among ACHs, 93% for CAHs) for having implemented at least one item under all seven core elements by 2024.

In 2022, the CDC introduced the Priorities for Hospital Core Elements Implementation to emphasize key strategies shown to improve the success of hospital antibiotic stewardship programs. The six priorities are summarized in Table 1.

**Table 1.** Priorities for Hospital Core Elements Implementation

<b>Hospital Leadership Commitment</b>	Antibiotic stewardship physician and/or pharmacist leader(s) have antibiotic stewardship responsibilities in their contract, job description, or performance review.
<b>Accountability</b>	The antibiotic stewardship program is co-led by a physician and pharmacist. For critical access hospitals, the CDC's Priorities document states that this criterion can be met if the hospital has a physician leader with a pharmacist involved in stewardship.
<b>Pharmacy/Stewardship Expertise</b>	The antibiotic stewardship physician and/or pharmacist leader(s) have completed infectious diseases specialty training, a certificate program, or other training on antibiotic stewardship.
<b>Action</b>	The program has facility-specific treatment recommendations for common clinical conditions and performs prospective audit and feedback or preauthorization for specific antibiotic agents.
<b>Tracking</b>	Hospital submits antibiotic use data to the NHSN Antimicrobial Use (AU) Option.
<b>Reporting</b>	Prescriber, unit, or service-level antibiotic use reports are provided at least annually to target feedback to prescribers and the program monitors adherence to facility-specific treatment recommendations for at least one common clinical condition.

### Priorities for Core Elements Implementation in Kentucky hospitals

Based on the 2024 annual hospital survey, ACHs consistently outperformed CAHs across all priority categories (see Figure 1). ‘Reporting’ presented the greatest improvement opportunity for both hospital types, with the lowest implementation rates among all priorities. In 2024, approximately 15% of Kentucky's acute care hospitals implemented all six priority elements. This performance aligns closely with national data from 2023, when 14% of U.S. ACHs achieved full implementation (CDC, ARPSP). Still, significant room for improvement remains, particularly in reporting and among CAHs.

Priorities for Hospital Core Element Implementation  
NHSN Annual Hospital Survey 2024 (KY Hospitals)

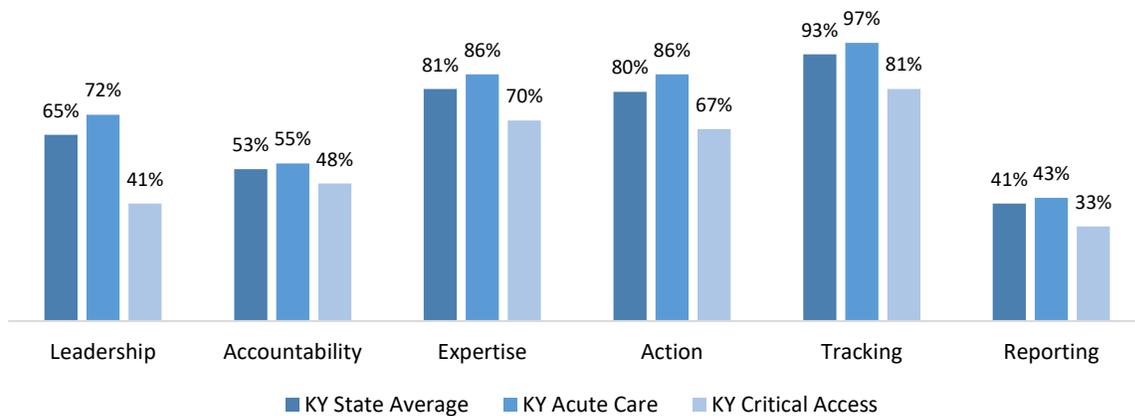
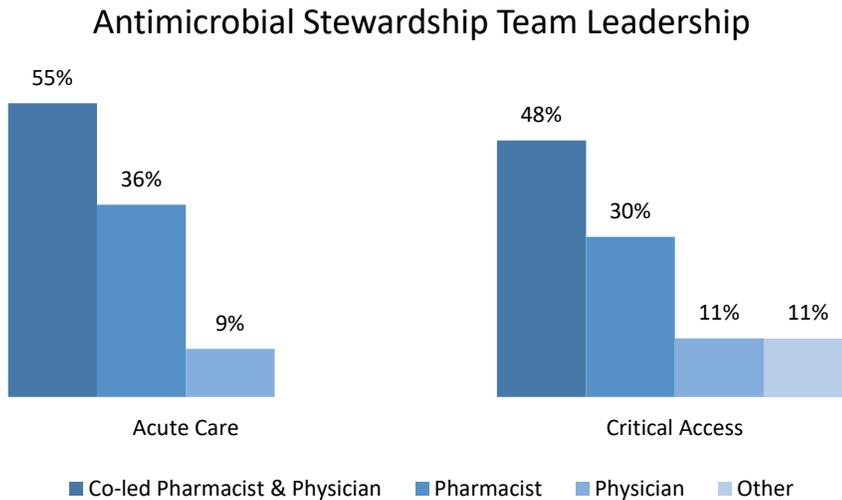


Figure 1.

### Who Leads Kentucky Hospitals in Stewardship Efforts?

Large ACHs achieve optimal stewardship leadership slightly more often than CAHs, with 53% utilizing pharmacist-physician co-leadership compared to 48% of CAHs. ACHs also rely more heavily on pharmacist-only models than CAHs (36% vs. 30%). In contrast, 11% of CAHs report stewardship programs led by other clinical staff, which suggest gaps in establishing appropriate leadership structures (see Figure 2). These findings indicate that CAHs face greater challenges in building strong stewardship leadership.

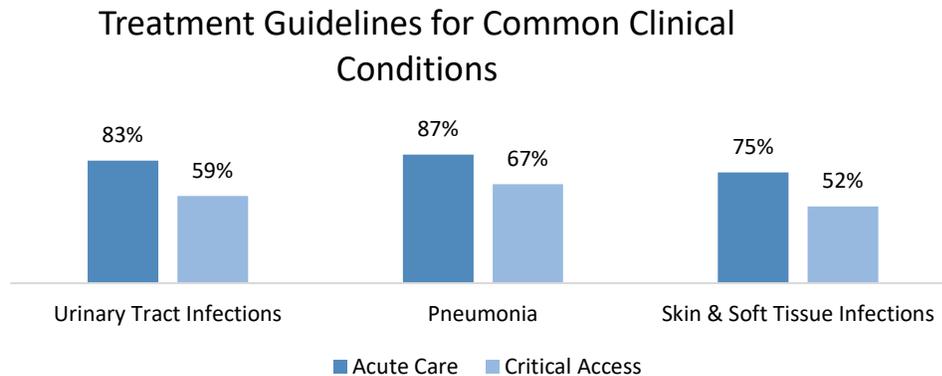
Figure 2.



### Treatment Guidelines: Are Kentucky Hospitals Following Best Practices?

In 2024, about 80% of Kentucky hospitals had treatment recommendations for at least one common condition based on national guidelines and local pathogen susceptibilities (see Figure 3). ACHs were more likely to have these guidelines, with 83% providing recommendations for urinary tract infections (UTIs), 87% for pneumonia, and 75% for skin and soft tissue infections, representing steady improvement from previous years. Among CAHs, guideline adoption was lower but improving: 59% for UTIs, 67% for pneumonia, and 52% for skin and soft tissue infections. Despite this progress in both facility types, opportunities remain to expand access to evidence-based treatment protocols.

Figure 3.

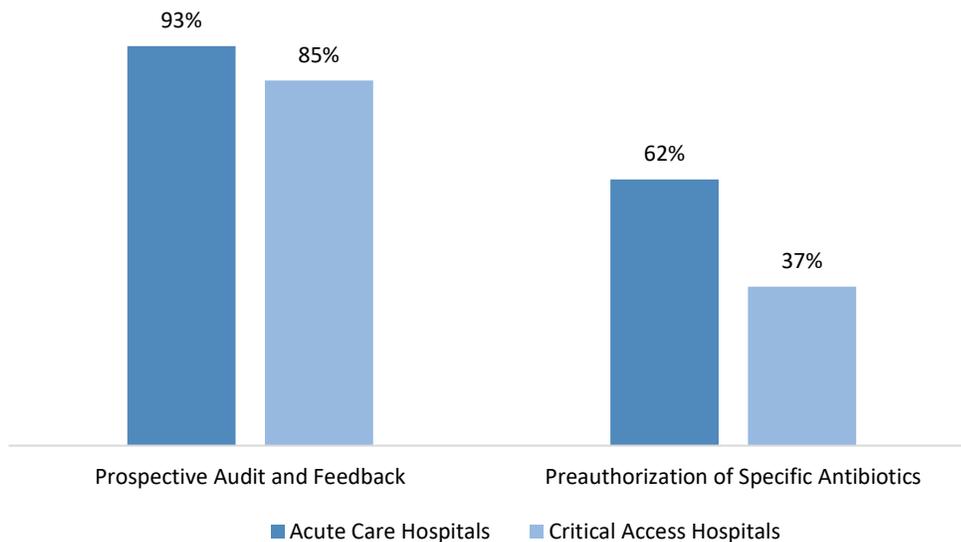


### Putting Guidelines into Practice: Preauthorization and Audit of Antimicrobial use

Preauthorization and prospective audit and feedback are well-established, evidence-based strategies to improve antimicrobial use. Both strategies help ensure antibiotics are prescribed appropriately and provide real-time guidance to prescribers. Among Kentucky hospitals, prospective audit and feedback is more common in ACHs than in CAHs (93% vs. 85%). CAHs showed notable progress in 2024, with a 15% increase in audit and feedback participation compared with a 6% increase among ACHs from the prior year (see Figure 4).

Figure 4.

#### Prospective Audit/Feedback and Preauthorization for Antibiotics



For preauthorization, the gap is wider. In 2024, only 37% of CAHs in Kentucky required preauthorization for specific antibiotics, unchanged from the prior year, while ACHs rose from 54% to 62%. This difference is expected, as preauthorization often requires specialized expertise that may be harder for CAHs to sustain (Heil et al., 2023).

Given their smaller size and closer relationships with prescribers, prospective audit and feedback may be a more practical and effective stewardship approach for CAHs (Anderson et al., 2019). Evidence also suggests that limiting preauthorization to a small set of the highest-risk antibiotics can be effective for smaller facilities (Heil et al., 2023). CAHs may further benefit from tele-stewardship partnerships, collaborations with larger health systems or academic centers that provide remote infectious disease and stewardship expertise. These partnerships can strengthen oversight while remaining feasible for smaller facilities.

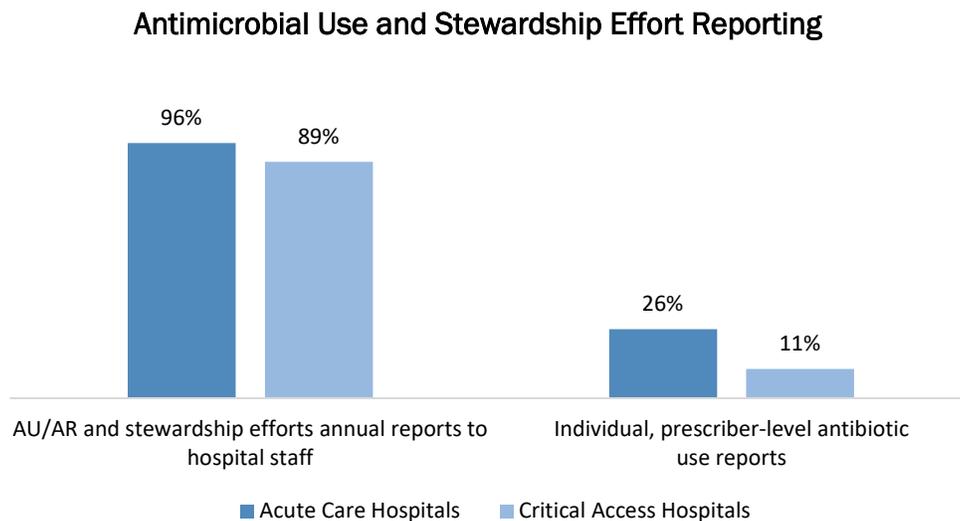
## Sharing Data: How Well Are Kentucky Hospitals Communicating About Antimicrobial Use?

Sharing antibiotic use and resistance data within the hospital is a core component of stewardship. Unlike NHSN reporting to the CDC, internal communication keeps prescribers, pharmacists, nurses, and leaders engaged in stewardship. It builds awareness, promotes accountability, and supports interventions like audit and feedback. Most Kentucky hospitals are doing well on this front. In 2024, nearly all ACHs (96%) and most CAHs (89%) shared stewardship data with staff at least once a year (see Figure 5).

The largest gap in antibiotic stewardship reporting remains at the prescriber level. In 2024, only 26% of ACHs and 11% of CAHs provided individual clinicians with their own antibiotic use reports. This represents a small increase among ACHs but a decline among CAHs compared with the prior year. Instead, more hospitals are reporting by unit or service—42% of ACHs and 33% of CAHs in 2024, rather than by individual provider.

Unit-level reporting works well in settings where antibiotic prescribing involves interdisciplinary teams and shared decision-making, such as ICUs and surgical services. However, direct prescriber feedback remains essential in clinical areas where prescribing decisions are made more independently. Although hospitals are performing well in broad stewardship reporting, individualized feedback is still underused, even though it is one of the most effective ways to improve prescribing and reduce inappropriate antibiotic use at the bedside (Barlam TF et al., 2016).

**Figure 5.**



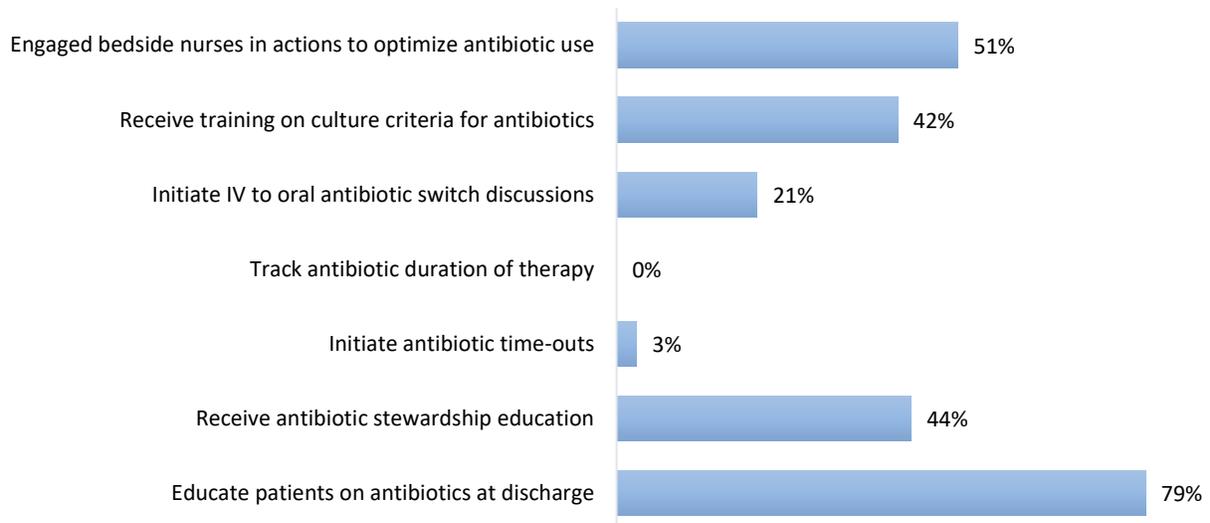
### Engaging Nurses in Stewardship: Untapped Potential

Nurses play a key role in antimicrobial administration, yet the annual survey data show that they are significantly underutilized in formal stewardship activities (see Figure 6). Only 51% of facilities actively engage bedside nurses in actions to optimize antibiotic use. Even fewer hospitals involve nurses in antibiotic time-outs (3%), duration tracking (0%), or IV-to-oral switch discussions (21%), activities where nurses are naturally positioned to contribute. This is a missed opportunity.

While 79% of hospitals rely on nurses to educate patients about antibiotics at discharge, less than half of these nurses receive formal stewardship education (44%). Given nurses' central role in medication administration and patient monitoring, their structured engagement offers a low-barrier, high-impact opportunity (Bos et al., 2023). Investing in nursing education and creating clear pathways for stewardship involvement could substantially strengthen programs without requiring extensive new resources (Camerini F G. et al., 2024).

**Figure 6.**

### Nursing Engagement in Antimicrobial Stewardship



### NHSN Antimicrobial Reporting Implementation in Kentucky Hospitals

In 2024, the NHSN AUR module became a mandatory reporting requirement under the Public Health and Clinical Data Exchange objective of the Centers for Medicare & Medicaid Services (CMS) Promoting Interoperability Program. Recognizing the unique challenges faced by smaller healthcare facilities, the HAI/AR Prevention Program provided targeted support by awarding grants totaling \$539,418 to 69 hospitals, with particular focus on helping critical access and rural hospitals meet this new requirement.

The NHSN AUR module serves as Kentucky's primary surveillance tool for tracking antibiotic use patterns across ACHs. This requires hospitals to submit monthly antimicrobial use data electronically to the NHSN AUR module, a system for monitoring antibiotic use in select inpatient locations. Under Kentucky regulation 902 KAR 2:020, all short-term ACHs must report inpatient antimicrobial use data to the KDPH on a quarterly basis. Hospitals that report complete calendar-year data through the NHSN AUR module automatically satisfy this state reporting requirement.

### Data Analysis and Hospital Feedback

Since 2021, the HAI/AR Prevention Program has used NHSN AUR surveillance data to provide individualized feedback to hospitals every six months. Each hospital receives a comprehensive report that includes:

- Overall facility-wide antibiotic use trends and patterns
- Comparative analysis of seven antimicrobial drug classes used in adult wards and ICUs against peer hospitals within Kentucky
- Regional benchmarking data

### Reporting Compliance and Data Quality

Kentucky has demonstrated substantial progress in AUR module participation. In the first half of 2024, reporting compliance reached 94% among ACHs and 81% among CAHs, a significant improvement from 2023 levels of 75% and 36%, respectively. While these compliance rates represent encouraging progress toward comprehensive statewide surveillance, data quality remains an ongoing challenge, particularly among newly participating facilities. The HAI/AR Prevention Program continues to provide technical assistance and training to support hospitals in meeting reporting requirements and improving data accuracy, ensuring that the surveillance system produces reliable and actionable insights to inform antimicrobial stewardship efforts.

## Understanding SAAR: A Benchmark for Hospital Antibiotic Use

To strengthen hospital-based antibiotic stewardship efforts, the HAI/AR Prevention Program provides quarterly feedback on antimicrobial use using a national metric called the Standardized Antimicrobial Administration Ratio (SAAR). Developed by the CDC and implemented through the NHSN, the SAAR is a risk-adjusted measure that enables fair comparisons across hospitals of varying sizes and patient populations.

Interpreting SAAR values:

- A SAAR of 1.0 indicates antibiotic use is in line with national expectations.
- A SAAR below 1.0 means usage is lower than expected, which may reflect effective stewardship practices, if patient outcomes remain stable.
- A SAAR above 1.0 suggests higher-than-expected use, potentially highlighting areas for further review or targeted interventions.

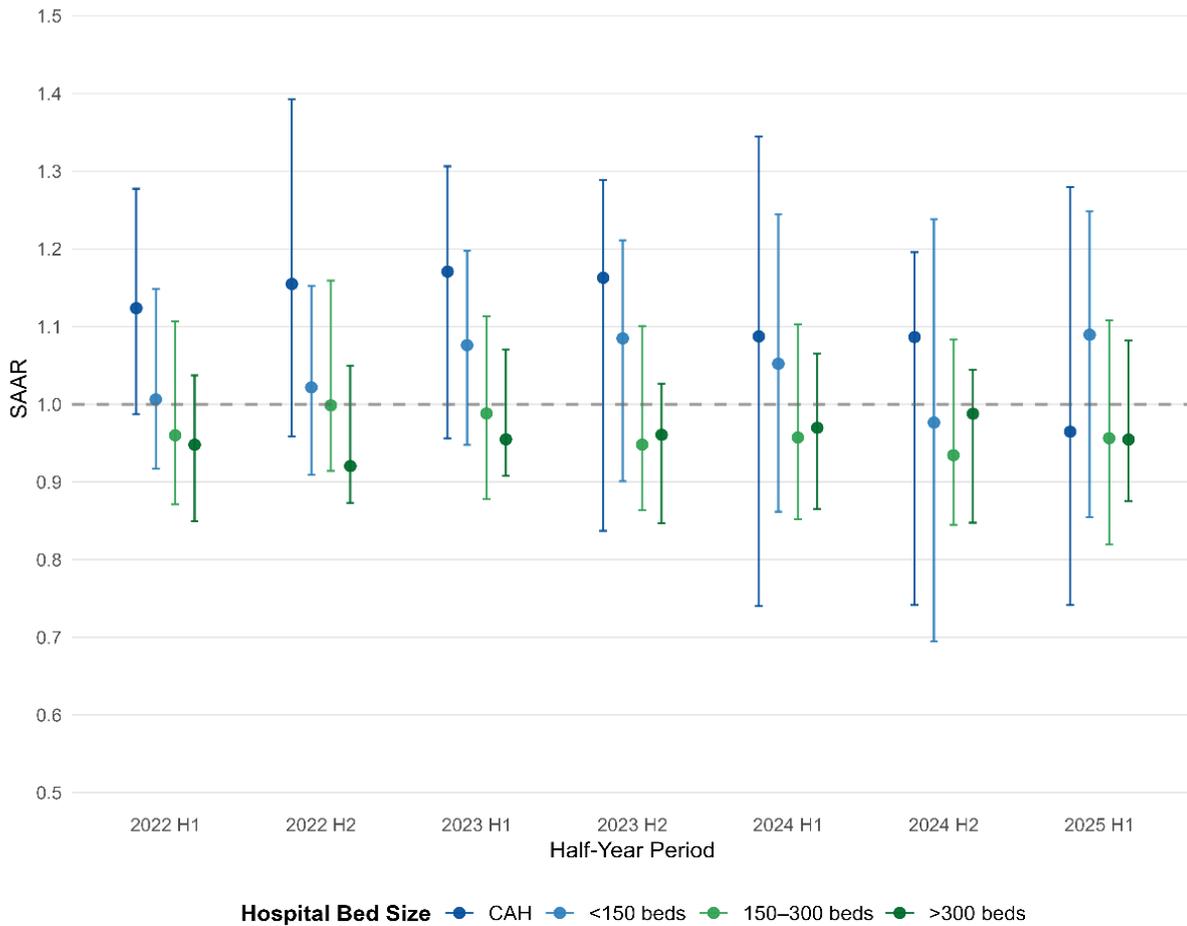
The following section summarizes antibiotic use data reported by Kentucky hospitals.

### SAAR Trends by Hospital Bed Size (2022–2025)

The chart below shows median SAAR values for inpatient all-antibacterial use, grouped by hospital bed size, across Kentucky facilities from the first half of 2022 through the first half of 2025 (Figure 7). Each dot represents the median SAAR for each hospital bed-size category at each half-year period. Vertical bars show the interquartile range (IQR), capturing the middle 50% of hospitals in each group. Wider bars indicate greater variation in performance, while narrower bars suggest more consistency. These data were shared with hospitals as part of the Program's semiannual stewardship feedback reports.

Figure 7.

### Half-Year SAAR (Median) by Bed Size — Adult All-Antibacterial 2022–2025



Bed Size	2022 H1	2022 H2	2023 H1	2023 H2	2024 H1	2024 H2	2025 H1
CAH	1.12	1.15	1.17	1.16	1.09	1.09	0.96
<150 beds	1.01	1.02	1.08	1.08	1.05	0.98	1.09
150–300 beds	0.96	1.00	0.99	0.95	0.96	0.93	0.96
>300 beds	0.95	0.92	0.95	0.96	0.97	0.99	0.95

### Key Observations from Half-Year SAAR Trends (2022–2025)

Large hospitals (over 300 beds) consistently maintain SAAR values below 1.0. Medium-sized hospitals (150–300 beds) started near a SAAR of 1.0 in 2022 but have remained below 1.0 since, showing sustained improvement over the reporting period.

In contrast, CAHs continue to face challenges, with SAAR values persistently above 1.0, ranging from 1.09 to 1.17. While these facilities have shown modest improvement since 2022, their SAAR values remain elevated. The wide interquartile ranges also indicate substantial variability in performance across CAHs. Similarly, small hospitals (under 150 beds) have SAAR values slightly above 1.0, ranging from 1.01 to 1.09, with only one brief exception in late 2024.

Elevated rates in CAH and smaller hospitals likely reflect a combination of factors, including limited access to infectious disease expertise, fewer dedicated stewardship and pharmacy resources, and constraints in implementing and sustaining comprehensive monitoring systems.

## Kentucky Hospitals: 2025 Pooled SAAR Findings by Antimicrobial Category

The Program’s semiannual stewardship reports to hospitals include a summary of SAAR results across key antimicrobial categories. The findings below reflect data from the first half of 2025. The analysis examined SAARs across seven adult antimicrobial categories using the 2017 NHSN baseline. The table below presents pooled SAAR values for Kentucky hospitals by antimicrobial category, shown separately for ACHs and CAHs.

**Table 2.**

**Pooled Standardized Antimicrobial Administration Ratio (SAAR) values  
Kentucky Hospitals 2025 H1**

SAAR Type	Statewide SAAR (Pooled- Acute Care)	SAAR Interpretation	Statewide SAAR (Pooled- Critical Access)	SAAR Interpretation
<b>All-Antibacterial</b>	0.97 (0.97–0.98)	Less than predicted	1.00 (0.99–1.01)	Within the predicted range
<b>Antifungal</b>	0.86 (0.84–0.88)	Less than predicted	1.91 (1.80–2.02)	Greater than predicted
<b>BSCA</b> ( <i>Broad-spectrum agents for community-acquired infections</i> )	0.94 (0.94–0.95)	Less than predicted	0.83 (0.81–0.85)	Less than predicted
<b>BSHO</b> ( <i>Broad-spectrum agents for hospital-onset infections</i> )	1.17 (1.16–1.17)	Greater than predicted	1.36 (1.33–1.40)	Greater than predicted
<b>CDI</b> ( <i>Agents posing the highest risk for C. difficile infection</i> )	1.06 (1.06–1.07)	Greater than predicted	0.86 (0.85–0.88)	Less than predicted
<b>GramPOS</b> ( <i>Agents for resistant Gram-positive infections</i> )	1.06 (1.05–1.06)	Greater than predicted	1.20 (1.17–1.24)	Greater than predicted
<b>NSBL</b> ( <i>Narrow-spectrum beta- lactam agents</i> )	1.01 (1.00–1.02)	Within the predicted range	0.67 (0.64–0.7)	Less than predicted

## Key Observations

The 2025 statewide pooled SAAR values for Kentucky hospitals show that overall antibacterial use remains within predicted national benchmarks. However, category-level results highlight measurable variation between ACHs and CAHs.

Use of broad-spectrum agents for hospital-onset infections (BSHO) is elevated in both ACHs (1.17) and CAHs (1.36). In contrast, community-acquired broad-spectrum agent use (BSCA) was below predicted levels in both facility types (0.94 in ACHs, 0.83 in CAHs). SAARs for agents targeting resistant Gram-positive organisms were 1.06 in ACHs and 1.20 in CAHs, while *Clostridioides difficile* (CDI) high-risk antibiotic classes showed a modest elevation in ACHs (1.06).

Use of narrow-spectrum beta-lactams was near predicted levels in ACHs (1.01) and lower than expected in CAHs (0.67). While a lower SAAR typically indicates less use relative to the model, underuse of narrow-spectrum beta-lactam agents may reflect limited adoption of targeted therapy or heavier reliance on broad-spectrum options. Antifungal use showed the largest deviation, with a SAAR of 1.91 in CAHs, nearly double the predicted rate.

### Implications and Caution in Interpretation

These findings point to opportunities for targeted stewardship interventions across Kentucky's hospitals. CAHs may benefit from enhanced support such as standardized protocols, telemedicine consultations, and diagnostic stewardship tools, while acute care facilities could focus on timely review of empiric therapy and reducing BSHO prescribing. However, these interpretations should be viewed as opportunities for further review rather than definitive explanations. Consistent with CDC guidance, SAAR is not a standalone measure of appropriateness but a screening tool to help facilities identify areas that need closer examination. Because pooled statewide values can mask wide variation, facilities are encouraged to use their biannual SAAR reports from the HAI/AR Prevention Program to compare with peers, understand local patterns, and design interventions suited to their resources and patient populations.

## Long Term Care Facilities

### Antibiotic Use and Regulatory Background

Antibiotics are among the most frequently prescribed medications in long-term care facilities (LTCFs), with studies suggesting that 40–75% of antibiotics prescribed in nursing homes may be unnecessary or inappropriate. Since November 2019, CMS has required nursing homes (skilled nursing facilities and nursing facilities certified to participate in Medicare and/or Medicaid) to maintain an antibiotic stewardship program as a condition for participation. While this requires tracking antibiotic use and reviewing prescribing patterns, CMS does not currently mandate routine reporting of specific antibiotic use data.

### Kentucky Participation in NHSN Stewardship Reporting

Kentucky does not currently require antibiotic use reporting from nursing homes, but the HAI/AR Prevention Program encourages LTCFs to complete the NHSN Annual Facility Survey. The survey includes a stewardship module that collects baseline information on each facility's program, including leadership commitment, presence of stewardship policies, designated leads, tracking and reporting practices, staff and resident education, and actions taken to improve prescribing.

For the 2023 NHSN LTCF Annual Facility Survey, about 48 percent of Kentucky facilities submitted responses. Participation declined to roughly 30 percent (n = 78) for the 2024 survey year, a trend also observed in several other states. This drop may reflect lower engagement with NHSN reporting as the immediate urgency of the COVID-19 pandemic has diminished.

### Stewardship Implementation in Kentucky LTCFs

Among Kentucky facilities that submitted data, more than 90 percent reported successfully implementing the Core Elements of Antimicrobial Stewardship. Because participation is voluntary, these respondents were likely facilities already more engaged in stewardship activities. The results are encouraging but may not represent all facilities statewide, an important consideration when interpreting the data.

The HAI/AR Prevention Program is launching new initiatives to strengthen antibiotic stewardship in LTCFs across Kentucky. The Program plans to partner with the Kentucky Association of Health Care Facilities (KAHCF) to create a voluntary stewardship collaborative where facilities can share new approaches. KAHCF represents nursing homes and has strong education and leadership networks that bring facilities together for peer learning and professional development. As part of this effort, KASIC will continue providing free consultation

and practical tools, including its Long-Term Care Facility Treatment Guide with tailored prescribing recommendations. The new initiatives aim to boost adoption of these resources through shared protocols, peer learning and training.

## Outpatient Facilities

### High Outpatient Prescribing Rates and Data Gaps

Kentucky consistently reports some of the highest outpatient antibiotic prescribing rates in the nation, with Medicaid claims indicating rates well above national averages. Despite this, outpatient stewardship efforts have lagged behind hospital-based programs. One major challenge has been the lack of accessible, reliable outpatient prescribing data. Unlike most inpatient settings, where NHSN AU/AR reporting is mandatory, there are no comparable federal or state requirements for outpatient antibiotic use reporting. This limits the state health department's ability to assess where antibiotics are being prescribed, for which conditions, and whether those prescriptions are appropriate.

In addition to data limitations, outpatient stewardship is influenced by factors such as provider mix (including a high proportion of nurse practitioners and general practitioners in rural regions), patient expectations for antibiotics, and the high burden of chronic respiratory disease in many Kentucky communities. These challenges make it difficult for clinicians to reduce unnecessary antibiotic use without better access to data, performance feedback, and community-level support.

### Kentucky Medicaid Outpatient Stewardship Project

To address these issues, the HAI/AR Prevention Program launched the Kentucky Medicaid Outpatient Antimicrobial Stewardship Project. Through an interagency agreement finalized with Kentucky Medicaid in late 2024, the Program is analyzing 2022–2023 Medicaid pharmacy claims to establish a statewide baseline for outpatient antibiotic prescribing.

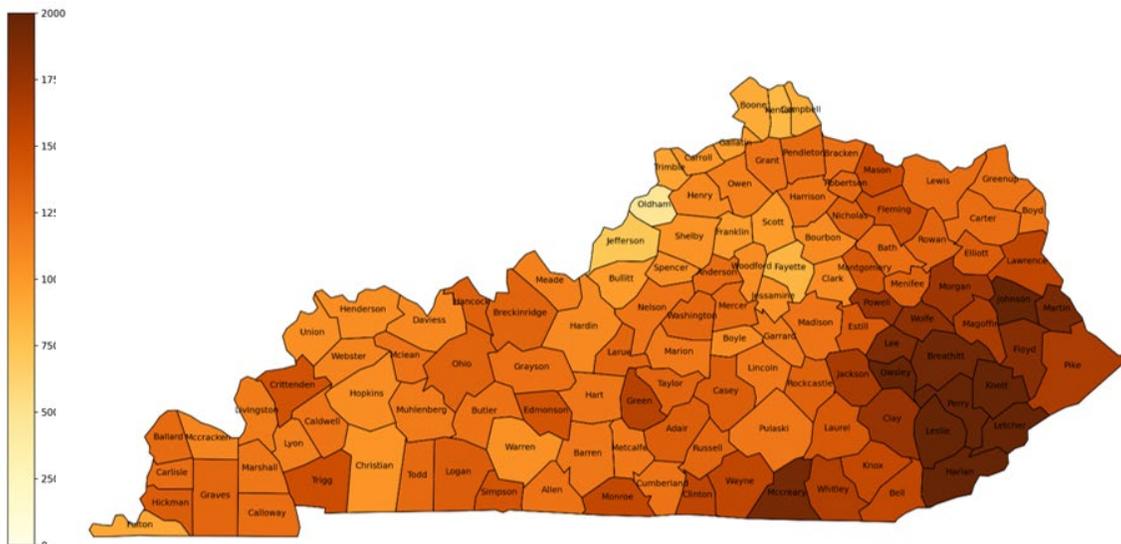
This project aims to close critical data gaps by quantifying prescribing volumes, mapping geographic variation, and examining different antibiotic types used in outpatient settings. By identifying high-volume prescribers and assessing appropriateness, the Program seeks to improve understanding of outpatient antibiotic use across Kentucky. Insights from this analysis will guide the next phase of outpatient stewardship work, including developing targeted feedback reports, offering data-driven support to providers, and prioritizing outreach to high-prescribing regions. Over time, these activities will promote more appropriate antibiotic use and improve patient outcomes across Kentucky's outpatient healthcare system.

## Preliminary Results

The Program’s preliminary analysis examined county-level variation in outpatient antibiotic prescribing across Kentucky. The 2023 data show clear geographic differences, with southeastern counties consistently reporting the highest dispensing rates in the state (see map below-Figure 8). These findings reveal substantial regional variation and provide a detailed picture of prescribing patterns among Medicaid enrollees.

**Figure 8**

**County-Level Variation in Outpatient Antibiotic Dispensing, KY Medicaid 2023**  
Antibiotic Pharmacy Claims per 1,000 Enrollees



Several factors may contribute to these regional patterns. Studies suggest that higher antibiotic prescribing in Southern states reflects differences in provider habits, patient expectations, and local practice environments (Sanchez et al., 2016; Bizune et al., 2023). Southeastern Kentucky also bears a higher burden of chronic respiratory disease. The region’s history of coal mining is associated with elevated rates of COPD and other respiratory illnesses (Almberg et al., 2023; CDC, 2023), which lead to more frequent healthcare visits and, in turn, more opportunities for antibiotic prescribing.

Although current data cannot yet confirm the relative impact of these factors, the HAI/AR Prevention Program will continue to analyze the Medicaid dataset to better understand what drives these geographic patterns and where targeted outpatient stewardship efforts can have the greatest effect.

## Antibiotic Awareness Week Celebration

Kentucky celebrates U.S. Antibiotic Awareness Week each year from November 18–24, joining the CDC’s national effort to raise awareness about antimicrobial resistance and promote responsible antibiotic use. In 2024, the CDC’s theme, “Fighting Antimicrobial Resistance Takes All of Us,” emphasized the importance of collective action through a One Health approach that connects human, animal, plant, and environmental health.

Governor Andy Beshear issued an official proclamation recognizing Antibiotic Awareness Week, demonstrating the state’s commitment to addressing antimicrobial resistance. Kentucky also participated in the CDC’s Go Purple campaign, which encouraged people to wear purple, share purple content on social media, and illuminate landmarks to promote awareness. The Big Four Bridge in Louisville was lit purple to mark the start of the week, serving as a symbol of Kentucky’s dedication to responsible antibiotic use (cover image of this report).

KDPH coordinated statewide participation through social media outreach, sharing key messages about proper antibiotic use. KASIC, a key partner, collaborated with WLKY News on a feature about responsible antibiotic prescribing. The segment included Matthew Song, PharmD, an infectious diseases pharmacist and KASIC co-leader, who noted that “Kentucky ranks among the top five states in the U.S. for antibiotic prescriptions per capita,” underscoring the need to build public trust in healthcare providers’ recommendations.

In 2025, KDPH will continue celebrating U.S. Antibiotic Awareness Week through similar activities. The Department will again participate in the Go Purple campaign, share key messages on social media, and promote stewardship education through the KDPH Clinical Webinar Series and the Local Health Departments Information Sharing Webinar. These efforts will help sustain momentum, raise public awareness, and reinforce the importance of responsible antibiotic use across Kentucky.

## Summary and Future Priorities

This report documents Kentucky's comprehensive approach to antimicrobial stewardship across acute care hospitals, long-term care facilities, and outpatient settings. Key findings include steady progress in hospital stewardship implementation, persistent challenges among smaller facilities and rural areas, and significant geographic variation in outpatient antibiotic prescribing. While Kentucky has made meaningful strides, opportunities remain to strengthen prescribing practices statewide and reduce unnecessary antibiotic use.

Building on this progress, the HAI/AR Prevention Program at KDPH continues to advance antimicrobial stewardship efforts across hospitals, long-term care facilities, and outpatient settings. These efforts focus on improving reporting and data quality, optimizing antimicrobial prescribing practices, building stewardship capacity, and strengthening partnerships across the healthcare system.

### **Acute Care and Critical Access Hospitals**

In hospitals, the HAI/AR Prevention Program will continue supporting facilities in achieving full participation and compliance with NHSN AU reporting requirements. Key priorities include improving data accuracy and completeness, with technical assistance and guidance available from KDPH's antimicrobial stewardship team. The Program will also encourage and support facilities in using the NHSN Antibiotic Resistance Module, which will help facilities link prescribing and resistance patterns and apply those insights to strengthen stewardship practices.

### **Long-Term Care Facilities**

The Program is exploring opportunities to expand stewardship efforts in LTCFs through partnerships and peer learning. In collaboration with KAHCF, the Program plans to establish a voluntary Long-Term Care Stewardship Collaborative to test new approaches and serve as a model for facilities across the state. KASIC's expertise and resources, including the Long-Term Care Treatment Guide and free consultation services tailored to LTCF environments, will continue to support this work.

### **Outpatient Data and Medicaid Analysis**

The Program is using Kentucky Medicaid outpatient prescription data to better understand antibiotic use patterns across the state. A key next step is providing prescriber feedback through targeted, data-driven reports for high-volume prescribers to promote best practices and help reduce unnecessary antibiotic use. Because Medicaid data represent only a portion of

outpatient antibiotic prescribing, KDPH is exploring the purchase of IQVIA outpatient prescribing data to enable statewide benchmarking by comparing Kentucky's prescribing rates against national and regional averages.

Through these coordinated efforts across healthcare settings, Kentucky is building the long-term infrastructure and partnerships needed to reduce unnecessary antibiotic use and combat antimicrobial resistance statewide.

## References

- AlMBERG KS, Friedman LS, Sarmiento RF, Samet JM, Cohen RA. 2023. Excess mortality among underground coal miners, 1979–2016. *J Occup Environ Med.* 65(2):e65–e70.
- Anderson DJ, Watson S, Moehring RW, Komarow L, Moehring TD, Lewis SS, Sexton DJ, et al. 2019. Feasibility of post prescription review of broad-spectrum antimicrobials in community hospitals: A multicenter cross-sectional study. *JAMA Network Open.* 2(7):e197147.
- Barlam TF, Cosgrove SE, Abbo LM, et al. 2016. Implementing an antibiotic stewardship program: guidelines by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America. *Clin Infect Dis.* 62(10):e51–e77.
- Bizune D, Tsay S, Srinivasan A, Winqvist A, Oliva M, Whitham H, Adams L, Chea N, Geller A, Gerber JS, Lessa FC, Lind JN, Mourani PM, Patel PR, Saavedra S, Habing K, Gouin KA, Hersh AL. 2023. Regional variation in outpatient antibiotic prescribing for acute respiratory tract infections in a commercially insured population, United States, 2017. *Open Forum Infect Dis.* 10(2):ofac584.
- Bos M, Schouten J, de Bot C, Vermeulen H, Hulscher M. 2023. *A hidden gem in multidisciplinary antimicrobial stewardship: a systematic review on bedside nurses' activities in daily practice regarding antibiotic use.* *JAC Antimicrob Resist.* 5(6):dlad123
- Camerini F G, Cunha T L, Fassarella C S, de Mendonça Henrique D, Fortunato J G S. 2024. Nursing strategies in antimicrobial stewardship in the hospital environment: a qualitative systematic review. *BMC Nursing.*
- Centers for Disease Control and Prevention. 2023. Modern coal miners have higher death rates from lung diseases than their predecessors. NIOSH Science Blog. February 27, 2023. Available at: <https://blogs.cdc.gov/niosh-science-blog/2023/02/27/mining-lung-disease/>
- Heil EL, Goff DA, Dellit TH, Barlam TF, Ha DRT, Hermsen ED, Moehring RW, et al. 2023. Improving the efficiency of antimicrobial stewardship actions in acute care facilities. *Clin Infect Dis.* 77(2):327–335.
- Sanchez GV, Roberts RM, Albert AP, Johnson DD, Hicks LA. 2014. Effects of knowledge, attitudes, and practices of primary care providers on antibiotic selection, United States. *Emerg Infect Dis.* 20(12):2041-2047.

