

Texas
Antimicrobial Stewardship
2024 Annual Report
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TEXAS
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Introduction

The Centers for Disease Control and Prevention (CDC) [reported](#) 2.8 million infections and 35,900 deaths each year from [Antimicrobial Resistance](#) in the United States (U.S.), costing \$4.6 billion annually. [Antimicrobial Resistance](#) occurs when germs, like bacteria or fungi, adapt to fight the medicines designed to kill them. Antimicrobial Resistance increases the risk of treatment failures, morbidity, mortality, hospitalization, and expensive Antimicrobial Use (if common medications are ineffective due to resistance).

See the [2023-2024 Texas Antibigram](#) to learn more about Texas Antimicrobial Resistance rates, which uses Texas hospital healthcare-associated infection data to show the susceptibility or vulnerability of bacteria and fungi to antimicrobials. Organisms not susceptible or vulnerable are “resistant” (i.e., medications are ineffective). For example, the “All” Texas antibiogram shows that 57% of the 1,367 *E. coli* samples tested were resistant to Ciprofloxacin, a type of fluoroquinolone. See the [2023-2024 Texas Antibigram](#) for all organisms tested.

Nursing home and skilled nursing facility residents are particularly vulnerable to antimicrobial resistant infections due to increased antimicrobial exposure during facility stays, decreasing the efficacy of antimicrobial medicines (i.e., resistance). It is estimated that more than 50% of nursing home residents are colonized with multidrug-resistant organisms (McKinnell, et al., 2019) (Mody, et al., 2018).

The CDC encourages [antimicrobial stewardship](#) in healthcare facilities to improve the treatment of infections. The Texas Department of State Health Services’ (DSHS) [Antimicrobial Stewardship Team](#) promotes appropriate antimicrobial use through CDC’s [Five “D”s](#) and [Core Elements](#) of Antimicrobial Stewardship.

Five “D”s of Antimicrobial Stewardship

The [Five "D"s of Antimicrobial Stewardship](#) are designed to keep individuals healthy and prevent diseases from disrupting lives. It is essential that all healthcare professionals actively participate in and support responsible antimicrobial use by following these Five “D”s of Antimicrobial Stewardship.

1. **Diagnosis:** Does the patient’s diagnosis require antimicrobial use?
2. **Drug choice:** Antimicrobial selection based on suspected or confirmed organism.
3. **Dose:** Optimize dosage based on the site of infection, pharmacokinetics, and patient-specific considerations.
4. **Duration of therapy:** What is the shortest effective duration of treatment for the specific type of infection?
5. **De-escalation:** Antimicrobials should be reviewed every 24-48 hours to evaluate if antimicrobial spectrum can be narrowed or discontinued based on culture results.

Core Elements of Antimicrobial Stewardship

The [CDC's Core Elements of Antimicrobial Stewardship](#) for public health departments provide guidelines for public health professionals to build an effective antimicrobial stewardship program based on the [Core Elements framework](#) in healthcare settings. The Core Elements of Antimicrobial Stewardship for health departments include:

1. **Leadership commitment:** Dedicate human and financial resources for state and local health department antimicrobial stewardship programs.
2. **Accountability:** Designate a leader or co-leaders, such as a physician and pharmacist, responsible for health department antimicrobial stewardship programs.
3. **Stewardship expertise:** Ensure that the antimicrobial stewardship program leader or co-leaders have expertise and experience implementing stewardship activities.
4. **Action:** Support the implementation of antimicrobial stewardship activities by leveraging local partners or stewardship collaboratives.
5. **Tracking:** Monitor stewardship activities and antimicrobial use data to inform and assess stewardship action across the spectrum of health care.
6. **Reporting:** Report data on stewardship activities and antimicrobial use to health department leadership, local partners, stewardship collaboratives, healthcare professionals, and the public.
7. **Education:** Provide antimicrobial stewardship education to healthcare professionals and the public to optimize antimicrobial use.

Core Elements of Antimicrobial Stewardship Adherence in Texas

The [CDC reports that 96% of Texas hospitals](#) implemented all seven Core Elements of Antimicrobial Stewardship in 2023, a figure that showed no change from 2022. [91% of Texas Long-Term Care Facilities](#) (LTCFs) implemented all seven Core Elements in 2023, an increase from 89% in 2022. Despite LTCFs facing higher Antimicrobial Resistance rates, implementation of the Core Elements shows commitment to improving antimicrobial stewardship in hospitals and LTCFs.

Antimicrobial Stewardship Initiatives

Academic Partnership

Dell Medical School at The University of Texas at Austin

In January 2024, the DSHS Antimicrobial Stewardship Team began a two-year collaboration with Dell Medical School. The objective was to pilot an antimicrobial stewardship quality improvement initiative, with a focus on urinary tract infections (UTIs), designed to:

1. Improve tracking of antimicrobial resistance data in Texas LTCFs.
2. Improve antimicrobial stewardship education in Texas LTCFs.



3. Reduce antimicrobial resistance by implementing standard UTI treatment guidelines and diagnostic protocols in Texas LTCFs.

Dell Medical School provided clinical and antimicrobial expertise to develop UTI antimicrobial stewardship guidelines, best practices, and tools to improve misdiagnosis. [Loeb and McGreer criteria](#) were referenced regarding treatment, tracking, and reporting antimicrobial use for UTIs. DSHS identified and engaged nursing homes to develop and maintain a quality improvement webpage, administered surveys and data collection tools, and performed data analysis. Seven LTCFs were contacted for participation in the initiative, including 5 skilled nursing facilities, one combined skilled nursing and assisted living facility, and one nursing home.

A UTI data collection tool was created in April 2024 for the pilot to collect vital data, including initiation dates, antimicrobial treatment duration, antimicrobial names, laboratory findings, symptoms, and UTI surveillance criteria based on the updated Loeb and McGreer standards. The data needed to complete the tracking sheet was accessible through various sources such as infection control records, daily summaries, pharmaceutical and laboratory reports, and patient medical histories.

A two-part webinar series titled “Antimicrobial Stewardship Implementation for Proper Diagnosis and Treatment of Urinary Tract Infections in Long-Term Care Facilities” was hosted on Microsoft Teams in October and November 2024 to promote the “Antimicrobial Use Data Pilot” and additional resources for LTCFs.

1. Part One, “Understanding Antimicrobial Harm,” was October 25, 2024, and reviewed antimicrobial stewardship needs, antimicrobial resistance, and avoidable antimicrobial-related harm, signs, symptoms, and proper UTI diagnosis using case studies.
2. Part Two, “Understanding Asymptomatic Bacteria vs UTI,” was held November 4, 2024, and featured a continuation of signs, symptoms, and proper diagnosis of UTIs using case studies. Evidence-based tools and several easy-to-use resources were provided to improve communication with residents, families, and providers to assist LTCF staff.

Antimicrobial Stewardship Regional Advisory Committees

Per [Texas Government Code Sec. 2110.008](#) “Duration of Advisory Committees” statute, Texas advisory committees are automatically abolished on the fourth anniversary of their creation. Texas [Antimicrobial Stewardship Regional Advisory Committee](#) (ASRAC) meetings were officially ended as of September 1, 2023, however, full implementation was deferred due to COVID-19 response efforts by DSHS and the potential applicants for the regional advisory committees. Final ASRAC meetings occurred June 2024.



As directed by [House Bill 1848](#), an ASRAC was established in each of Texas' eight Public Health Regions (PHRs). Every ASRAC had five voting members, including physicians, directors of nursing, public health professionals, pharmacists, and microbiologists. Meetings were open to the public, with meeting notices and agendas posted on the [ASRAC webpage](#). In March and April 2024, each PHR met the required number of meetings (once per year) and members, except PHR 1. PHR 1 did not meet the number of committee members required for quorum and were unable to meet. Meeting agendas addressed the concerns of each PHR and committee. Agenda items included regional antibiogram creation and educational materials for residents/families, physicians, and healthcare staff on antimicrobial use and antimicrobial stewardship. All-Chairs meetings were held in June 2024 to address PHR-specific concerns.

Antimicrobial Stewardship Risk Analysis

In October 2024, the DSHS Antimicrobial Stewardship Team analyzed data to examine relationships between Texas PHRs and the CDC's Core Elements of antimicrobial Stewardship for 2023. The independent variable was Texas PHRs, and the dependent variable was the number of Core Elements of Antimicrobial Stewardship missing for each facility's antimicrobial stewardship program.

Table 1. Facilities that reported Core Elements of Antimicrobial Stewardship Adherence by Texas Public Health Region, 2023

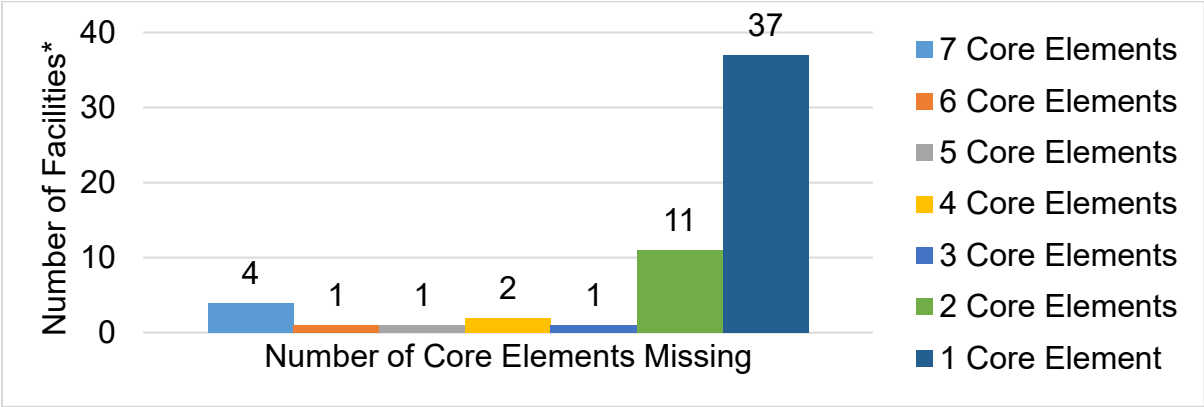
Public Health Region (PHR)	Number of Facilities*
PHR 1	53
PHR 2/3	246
PHR 4/5N	83
PHR 6/5S	154
PHR 7	104
PHR 8	74
PHR 9/10	53
PHR 11	49
Total	816

*Facilities: General, Children's, Critical Access, Oncology, Surgical, Psychiatric, and Military Hospitals, Skilled Nursing, and Assisted Living Facilities.

Overall, 816 Texas facilities reported the number of Core Elements of Antimicrobial Stewardship they adhere to in their program (Table 1).



Figure 1. Core Elements Missing from Facilities' Antimicrobial Stewardship Programs, 2023



*Texas Facilities included General, Children's, Critical Access, Oncology, Surgical, Psychiatric, and Military Hospitals, and Skilled Nursing and Assisted Living Facilities.

Fifty-seven facilities (7%) reported missing at least one core element (Figure 1). The most missed core elements were “Reporting” (n = 29) and “Education” (n = 16). Stratified averages were calculated to assess variables related to missing core elements for all reporting facilities. The DSHS antimicrobial stewardship team plans to share the results summary with five community partners to determine community-specific responses to improve antimicrobial use.

National Healthcare Safety Network Antimicrobial Stewardship Analysis

In 2024, the Texas antimicrobial stewardship team conducted an analysis on adherence to the seven Core Elements of Antimicrobial Stewardship among LTCFs (per annual [NHSN](#) facility surveys). Analyses consisted of stratified frequency tables by facility type, year, and [DSHS PHR](#). 344 Texas LTCFs reported adhering to all seven Core Elements (Table 2).

Table 2. Core Elements of Antimicrobial Stewardship in Long-term Care Facilities by Texas Public Health Region, 2023

Met Core Elements	PHR 1	PHR 2/3	PHR 4/5N	PHR 6/5S	PHR 7	PHR 8	PHR 9/10	PHR 11	Total LTCFs
0	0	0	0	1 (1%)	0	1 (3%)	0	0	2 (<1%)
1	0	0	0	0	0	0	0	0	0
2	0	0	1 (2%)	0	0	0	0	0	1 (<1%)
3	0	0	0	0	0	1 (3%)	0	0	1 (<1%)
4	0	0	0	0	1 (2%)	0	0	0	1 (<1%)
5	0	3 (3%)	1 (2%)	0	0	1 (3%)	0	0	5 (1%)
6	2 (10%)	9 (7%)	6 (12%)	1 (1%)	3 (6%)	1 (3%)	1 (5%)	4 (20%)	27 (7%)
7 (all)	19 (90%)	109 (90%)	41 (84%)	73 (98%)	43 (91%)	25 (86%)	18 (95%)	16 (80%)	344 (90%)
Total LTCFs	21	121	49	75	47	29	19	20	381



The analysis revealed PHR 11, PHR 4/5N, and PHR 8 had the lowest adherence with the core elements among LTCFs in Texas. Out of 20 LTCFs in PHR 11, four indicated gaps in meeting all seven of the core elements (20%), with reporting and education being the most frequently missed elements. PHR 4/5N had the second-lowest adherence with core elements among LTCFs in Texas. Eight of the 49 LTCFs in PHR 4/5N reported not meeting all seven core elements (16%), with reporting, drug expertise, and education being frequently missed elements. Four LTCFs in PHR 8 did not meet all seven core elements (14%) (Table 2).

The antimicrobial stewardship team used this adherence analysis to develop an evaluation for LTCFs, focusing on the two lowest adherence regions, PHR 4/5N and PHR 11. The “Texas Antimicrobial Stewardship Team Evaluation for LTCFs” objective was to conduct a comprehensive evaluation of PHR 4/5N and PHR 11 LTCF antimicrobial stewardship programs, including: (1) Develop a logic model to guide the evaluation plan; (2) analyze antimicrobial use trends and patterns for targeted intervention; and (3) assess resistance trends among pathogens across antimicrobial classes in PHR 4/5N and PHR 11 LTCFs.

Texas Antimicrobial Prescriber Data Report

The Texas Healthcare Safety Unit’s Antimicrobial Stewardship and Data Validation teams created a report to analyze prescription claims among individuals enrolled in Medicare Part D. The goal was to share these insights with healthcare professionals and antimicrobial stewardship advocates to assist in understanding prescribing trends, identify areas for improvement, and promote responsible prescribing to combat antimicrobial resistance. The [report](#) was created in 2024 and posted on the antimicrobial stewardship website to engage public health professionals and improve awareness of antimicrobial resistance and antimicrobial prescribing practices in healthcare facilities across the state.

Education

Antimicrobial Stewardship Annual Webinar

In December 2024, the antimicrobial stewardship team created a webinar series, available [on-demand](#), to introduce strategies of antimicrobial stewardship and introduce an antimicrobial use/antimicrobial stewardship assessment tool. Public health professionals in healthcare settings can use the assessment tool to improve awareness and facility engagement.

Antimicrobial Stewardship Orientation Webinar

The DSHS antimicrobial stewardship team presented their mission and projects during Healthcare Safety Unit orientations for all new staff, including public health program specialists, managers, and HAI/AR epidemiologists. Webinars were on February 9th, June



14th, and October 25th, 2024. The information shared during the orientation provided resources and tools for staff to support antimicrobial stewardship activities across Texas.

Outreach and Communications

United States Antimicrobial Awareness Week

The DSHS antimicrobial stewardship team participated in CDC's annual [U.S. Antimicrobial Awareness Week](#) (USAAW) from November 18-24, 2024 to raise awareness of optimizing use of antimicrobials to prevent antimicrobial resistance. Activities included:

1. Disseminated CDC antimicrobial resistance and antimicrobial stewardship content adapted by DSHS Communications via Instagram and Facebook posts. Social media content included: (1) post focused on an overview of what antimicrobial resistance is and how the audience can use infection control precautions to help; and (2) post that broadly shared the definition of antimicrobial stewardship and why we recognize antibiotic awareness week.
2. Sent CDC-approved antimicrobial stewardship content to listserv members, community and academic partners, and professional contacts.
3. Posted antimicrobial stewardship resources and tools to DSHS website, including the 5 D's of Antimicrobial Stewardship, and CDC's Core Elements of Antibiotic Stewardship. Specifically, for USAAW, the 2024 USAAW toolkit, daily themes, and how to be involved.
4. Created interactive, USAAW quiz to promote USAAW and emphasize importance of antimicrobial stewardship to DSHS epidemiologists and public health professionals.
5. Utilized and promoted CDC-approved USAAW graphics and webinar background.

Newsletters

Updates on antimicrobial stewardship initiatives? was included in every edition of Texas Healthcare Safety Unit's two newsletters: 1) quarterly "Healthcare-Associated Infection (HAI)-Lights" newsletter; and 2) Healthcare Safety Unit newsletter. The HAI-Lights newsletter aims to increase education and outreach for external academic partners and public health and healthcare professionals. The Healthcare Safety Unit newsletter is an internal publication to inform DSHS colleagues and leadership about ongoing projects and key developments.

Antimicrobial Stewardship Infection Control Assessment and Response

The antimicrobial stewardship team offered free, non-regulatory, and voluntary Infection Control Assessment and Response (ICARs) for all Texas healthcare settings. The ICAR's purpose was to identify antimicrobial use concerns, strategies to improve antimicrobial use within the facility, and track outcomes. Antimicrobial use and stewardship assessment data will be analyzed and used to direct future antimicrobial stewardship initiatives and serve as a baseline for future assessments. In 2024, the DSHS antimicrobial stewardship team continued to promote ICARs through a dedicated antimicrobial use and stewardship assessment page on



the DSHS antimicrobial stewardship website. An on-demand antimicrobial use and stewardship assessment tool overview was added to inform healthcare facilities on the benefits of an ICAR. An [interest survey](#) was created in Qualtrics and posted on the antimicrobial stewardship website for facilities to schedule an assessment.

Summary

The DSHS antimicrobial stewardship team supports and promotes CDC's "Five D's" and Core Elements of Antimicrobial Stewardship to encourage and reinforce responsible antimicrobial use across Texas. The 2025 Texas goals include:

1. Increase collaboration with regional and local health departments.
2. Increase educational webinar series on several Antimicrobial Resistance and antimicrobial stewardship-related topics to promote easily digestible public health professional trainings.
3. Continue antimicrobial stewardship ongoing projects (e.g., U.S. Antimicrobial Awareness Week; annual LTCF webinar; Texas webinar series; and data analyses).
4. Complete CDC grant-funded milestones, including the Antimicrobial Use Data Pilot and antimicrobial stewardship ICARs.

Resources

Department of State Health Service's Antimicrobial Stewardship Team

1. [DSHS Antimicrobial Stewardship Team](#)
2. [DSHS Antimicrobial Stewardship Resources and Training](#)
3. [DSHS Antimicrobial Use/Stewardship Assessment Support](#)
4. [Texas Antibiotic Prescriber Data Report](#)

Centers for Disease Control and Prevention

1. [CDC Antibiotic Use Report](#)
2. [Antimicrobial Resistance Report](#)
3. [Antimicrobial Resistance & Patient Safety Portal \(AR & PSP\)](#)

Core Elements

1. [Core Elements of Hospital Antibiotic Stewardship Programs](#)
2. [Core Elements of Outpatient Antibiotic Stewardship](#)
3. [Core Elements of Antibiotic Stewardship for Nursing Homes](#)
4. [Core Elements of Antibiotic Stewardship Programs in Resource-Limited Settings](#)
5. [Core Elements of Antibiotic Stewardship for Health Departments](#)



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