

COMBATING ANTIBIOTIC RESISTANCE: Policies To Promote Antimicrobial Stewardship Programs





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Executive Summary

There is a critical need for comprehensive programs to address antimicrobial resistance (AMR). State and territorial health agencies (SHAs) play a role in addressing resistance because they are responsible for protecting patients across the healthcare system and serve as a bridge between healthcare organizations and the community. It is important that health agencies have adequate capacity to comprehensively address AMR.

SHAs can help fight AMR by coordinating and facilitating prevention activities, monitoring resistance across the state, leveraging existing partnerships and resources, and developing policies to address improved antimicrobial prescribing and use (stewardship). To better understand different states' and territories' approaches to AMR and stewardship, ASTHO conducted a survey of healthcare-associated infections (HAI) coordinators in July 2013. Over half of respondents reported that their SHA collects surveillance data related to AMR, and 25 states (69% of respondents) reported conducting antimicrobial stewardship activities, such as providing education and training, conducting surveys, and disseminating communications.

Antimicrobial stewardship programs (ASPs) can ensure judicious antimicrobial use to improve individual patient outcomes, prevent death from resistant infections, slow resistance, and reduce healthcare costs. ASTHO and CDC supported three state projects to conduct assessments of policy gaps and barriers to implementing ASPs and identify potential options for bridging these gaps. State teams worked to assess stewardship in a variety of healthcare settings and explore the challenges that providers experience with antibiotic prescribing. Common themes from the identified policy areas to further explore include collecting and analyzing data, working with partners, and examining existing policies.

ASTHO and CDC have also engaged with a stewardship subject matter expert to inventory state stewardship activities and compile practical guidance and examples for states looking to initiate or enhance stewardship activities. The inventory found that as of May 2014, 71 percent of SHA websites addressed AMR, but only 42 percent addressed the issue of appropriate antibiotic use—a missed opportunity. This report provides options and resources for SHAs to develop and promote ASPs as they work toward an overall strategy for combatting AMR.

SHAs are critical to building important partnerships to address AMR and stewardship and to implementing stewardship activities across the continuum of care. This report describes current state activities and presents a range of options for engagement, giving health agencies at all levels of capacity opportunities to develop or enhance stewardship policies and activities.



Introduction



Antibiotic resistance is one of the most pressing public health concerns, responsible for over two million illnesses and 23,000 deaths annually in the United States. CDC’s recently-released report, [Antibiotic resistance threats in the United States, 2013](#), provides an overview of the burden that AMR poses to the United States. The report suggests specific actions that SHAs can take to detect, control, and prevent the spread of resistant organisms by working with other groups at the national, state, and local levels.

SHAs play a role in addressing resistance because they are responsible for protecting patients across the healthcare system and serve as a bridge between healthcare organizations and the community. SHAs can address AMR by coordinating and facilitating prevention activities (e.g., through immunization or food safety), tracking where infections occur and where resistance grows (surveillance), leveraging existing partnerships and resources, and developing policies and activities to address

improved antimicrobial prescribing and use (stewardship) to better protect patients across the healthcare system. The [ASTHO Antimicrobial Resistance and Stewardship Position Statement](#) affirms the need for an ongoing public health commitment to support these roles and ensure adequate capacity to address AMR.

In particular, creating ASPs to ensure judicious antimicrobial use can improve individual patient outcomes, prevent death from resistant infections, slow antibiotic resistance, and reduce healthcare costs. Yet, widespread adoption of standardized stewardship programs in the United States does not currently exist. SHAs provide an avenue by which states and territories can develop and implement ASPs by leveraging policies, providing education or training, conducting surveys, sending out communications, or supporting collaboratives.

As an example, feedback on rates of antimicrobial use and resistance to healthcare providers can improve appropriate use. Adopting tools like the National Healthcare Safety Network’s (NHSN) Antimicrobial Use and Resistance (AUR) Module or Multidrug-Resistant Organism & *Clostridium difficile* Infection (MDRO/CDI) Module could provide mechanisms for facilities to report and analyze antimicrobial use or resistance data. These data can help SHAs work with healthcare facilities to implement ASPs by telling them where resistant infections occur, what types of resistance are most common, and where to improve prescribing practices to tailor interventions to the problems.

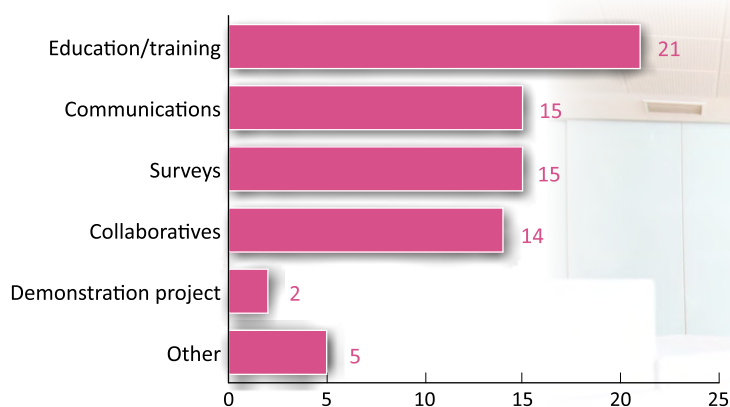
ASTHO is engaged in supporting and enhancing state and territorial efforts to address stewardship through use of effective policy and collaboration. To gain an understanding of the work states are doing to promote stewardship, ASTHO conducted a survey of all state HAI coordinators. With support from CDC, ASTHO funded capacity-building projects for three states to conduct an assessment of policy gaps and barriers to implementing state and territorial ASPs and develop action steps to address them. ASTHO and CDC engaged with a stewardship subject matter expert to further inventory state stewardship activities. Findings from this work informed recommendations, tools, and examples for states looking to initiate or enhance stewardship activities.

State Strategies to Address AMR – Survey Results

To better understand different states' and territories' work on and approaches to AMR and stewardship, ASTHO conducted a survey of HAI coordinators from the United States, Washington, D.C., and Puerto Rico in July 2013, with a response rate of 69 percent (36 out of 52 locations). The survey's purpose was to identify (1) activities and policies the health agencies are using to promote antimicrobial stewardship; (2) incentives and tools the health agencies need; and (3) promising practices to share with other states and territories. For the purposes of this survey, antimicrobial stewardship was defined as "efforts to improve antimicrobial prescribing and use in any setting."

Over half of respondents (19 out of 34, or 56%) reported that their SHA collects surveillance data related to AMR. However, only 12 percent (4 out of 34) currently receive state funding for work on this issue.

Twenty-five respondents (69%) reported conducting antimicrobial stewardship activities, including education or training, surveys, communications, collaboratives, demonstration projects, and other activities.



Almost all (21 respondents) reported conducting education or training, including daylong conferences, one-time live trainings, or webinars. States mainly targeted healthcare providers in acute care hospitals and long-term care facilities. Topics covered included an overview of stewardship, suggestions or considerations for implementing stewardship activities or ASPs, or targeted stewardship topics (e.g., the Institute for Healthcare Improvement Antibiotic Stewardship Driver Diagram). Almost half provided printed materials through the trainings.

Fifteen respondents reported communicating about AMR, mostly via email. Some states targeted groups (e.g., HAI or infection control listservs or collaborative members) while others disseminated materials aimed at healthcare providers in all facilities (hospitals and long-term care). All told, states distributed a variety of materials to providers and facilities, including educational packets, CDC Get Smart materials, toolkits, and other print materials.

Fifteen states used data gathered from surveys to inform state stewardship activities. Most states that administered surveys had done so to acute care hospitals, though some also surveyed long-term care facilities, and most targeted infection preventionists. Most surveys were conducted to ascertain if facilities had implemented an ASP or what stewardship practices were in place. A few determined barriers to ASPs or assessed the facilities' needs to implement activities.

SHAs in fourteen states worked with groups of facilities and other partners to share information and learn from common experiences through surveys, webinars, workshops, and conference calls. The

collaboratives comprised of a range of partners including SHAs, acute care hospitals, long-term care facilities, long-term acute care facilities, hospital associations, quality improvement organizations, local health departments, and infection prevention associations. Most collaboratives discussed an array of AMR and stewardship issues, while a few focused on *Clostridium difficile* (*C. difficile*) infections.

Two respondents completed demonstration projects to explore ASP needs and effects, and five respondents conducted other activities, including providing individual consultations to hospitals to help overcome specific barriers to implementing ASPs; meeting with a local infectious disease fellow to coordinate hospital education; supporting an antibiotic stewardship committee; developing a statewide strategic plan; and conducting medical record reviews at facilities. Some suggested incentives that would motivate agencies to implement antimicrobial stewardship activities, including trainings, certifications, awards, involvement of physician leadership, demonstration of benefits, and public reporting.

Eleven out of 34 respondents (32%) have considered creating policies on antimicrobial stewardship, and in five of those a policy has been developed or implemented. These policies included:

- A law requiring hospitals to evaluate judicious use of antibiotics.
- Regulations that expanded the reporting of antimicrobial-resistant organisms and cumulative antibiotic susceptibility test results.
- A policy regarding consultation for multidrug-resistant tuberculosis.
- Working with community partners to adopt ASPs and promote a recognition program.
- Working with long-term care on *C. difficile* and the appropriate use of antibiotics.

HAI Capacity Building Projects – Overview

To increase SHA capacity to promote stewardship activities, ASTHO and CDC worked with three states (Georgia, Vermont, and Illinois) to conduct assessments of policy gaps and barriers to implementing ASPs and develop goals, strategies, and action steps to address them. State teams worked to assess stewardship in a variety of healthcare settings and the challenges that providers experience with regard to antibiotic prescribing.

The specific components of the projects included:

- Building a state team of stakeholders.
- Conducting an assessment of policy barriers.
- Developing goals, strategies, and action steps for addressing these barriers.

Each of the three state teams, comprised of public health and external stakeholders, met multiple times over the course of the project to inform their activities, discuss their progress, and analyze their findings. Assessment activities included surveys, interviews, and a review of the published data. Each state team participated in a daylong meeting during which the state team, ASTHO, and CDC shared information and engaged in strategic planning. State team members shared their assessment findings, which they then used to inform the goals, strategies, and action steps used to address identified policy barriers.

The three state projects investigated ASPs in acute care settings (Georgia); antibiotic prescribing and the Get Smart campaign in emergency department settings (Vermont); and the policies, practices, and activities that impact stewardship efforts in long term care facilities (Illinois). Details about project activities, assessment findings, and identified policy areas to explore are presented in the Appendix.

TABLE 1. STATE TEAM FOCUS AREAS, GOALS, AND STRATEGIES.

GEORGIA	Acute Care Settings: Driver Diagram and Recognition Program	
	<p>Goal: Increase antimicrobial stewardship activity in healthcare facilities.</p>	<ul style="list-style-type: none"> • Establish health department as leader and identify champions (partners). • Measure current stewardship activities and status at facilities. • Establish and promote core activities of a stewardship program. • Implement a recognition program and provide tools for hospitals to achieve recognition by meeting program requirements.
VERMONT	Emergency Departments: Antibiotic Prescribing and the Get Smart Campaign	
	<p>Goal 1: Enhance partnerships with Emergency Department (ED) providers.</p>	<ul style="list-style-type: none"> • Make providers part of the process. • Engage ED directors group. • Examine and offer support for managing patient expectations and satisfaction (focus on upper respiratory infections and urinary tract infections). • Provide CDC's Get Smart materials. • Reach all provider types – physicians, physician assistants, and nurse practitioners. • Link with work of the MDRO Collaborative and link with other community providers. • Incorporate stewardship into current workflow (discharge summary).
	<p>Goal 2: Generate a prescribing profile for Vermont.</p>	<ul style="list-style-type: none"> • Examine data to identify and understand prescribing differences. • Examine range of datasets. • Present data to providers for quality improvement. • Facilitate ability to query EMRs for relevant data. • Include institutional antibiograms.
ILLINOIS	Long Term Care Facilities (LTCFs)	
	<p>Goal 1: Increase awareness of AMR, and knowledge and practice regarding appropriate antibiotic use.</p>	<ul style="list-style-type: none"> • Enhance partnerships with long term care, consumer, and provider groups. • Work with stakeholders to develop and implement a strategic plan for antibiotic stewardship. • Educate and engage LTCF staff and providers by disseminating assessment findings and statewide advocacy and education on harms of antibiotic misuse. • Provide LTCF staff and providers with tools and resources. • Educate residents, families, and the public.
	<p>Goal 2: Promote policies that facilitate antimicrobial stewardship in long term care facilities.</p>	<ul style="list-style-type: none"> • Create a crosswalk to identify how federal and state nursing home regulations align with and influence infection prevention and stewardship practices. • Increase engagement with state regulatory agencies. • Mandate training or certification related to judicious antibiotic use for individuals designated for IC/P and for medical directors and other prescribers who work in LTCFs. • Align LTCFs with new service delivery networks that are being created through health reform (e.g., Accountable Care Organizations and medical care homes).
	<p>Goal 3: Explore and further define the issue.</p>	<ul style="list-style-type: none"> • Collaborate with stakeholders to investigate and outline best practices and what stewardship looks like in the long term care setting. • Examine LTCF prescribing data.

HAI Capacity Building Projects – Conclusions

Common themes from the states’ identified policy areas to explore include collecting and analyzing data, working with partners, and examining existing policy.

DATA	PARTNERS	POLICY
<ul style="list-style-type: none"> • States can explore a range of collection activities. • Good data can inform quality improvement and recommended core activities. • Health departments can use data to establish programs and policy. 	<ul style="list-style-type: none"> • Need varied partners. • Activities with partners (e.g., collaboratives) can depend on, and help build, health department capacity. • Partnership learnings can guide future activities and policy. 	<ul style="list-style-type: none"> • Examining current policy may reveal opportunities and facilitators for stewardship. • Aligning policies and activities can enhance outcomes.

DATA

All state teams identified the need to collect data and explore ways to support stewardship efforts in different settings. Depending on capacity, data collection activities can range from investigating prescribing practices to inform stewardship activities, to measuring stewardship activities at facilities to identify the current status and any gaps, to determining stewardship best practices in specific healthcare settings. Analyzed data can be presented back to facility stakeholders to inform quality improvement. Successful and best practices can be used to establish recommended core activities of a stewardship program across a facility type (e.g., acute care hospitals or long-term care facilities). For example, states can explore the value of stewardship training or certification requirements for facility staff. Core activities can also be informed by CDC’s [Checklist for Core Elements of Hospital Antibiotic Stewardship Programs](#). The health department can promote the core activities and provide trainings to facilities on how to incorporate them. They could also, as in the case of Georgia, develop a program to recognize facilities implementing those activities. Health departments can also explore ways of using data collected from facilities to inform and enhance policy.

PARTNERS

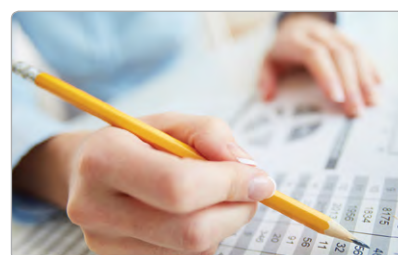
The state teams also identified the importance of communicating with and engaging partners. Partners can include individual providers, healthcare facilities, and associated organizations (e.g., hospital associations). Through data analysis, education, and collaboratives, health departments can establish themselves as leaders in stewardship efforts and build capacity to assist partners in implementing stewardship programs. Health departments can disseminate information or materials (e.g., CDC Get Smart materials or stewardship toolkits), provide support and technical assistance (e.g., for managing patient expectations for antibiotics), or convene stakeholders to collaboratively inform planning and stewardship activity implementation. With appropriate capacity, health departments could implement collaborative groups of facilities and other partners to share information, pilot activities, measure outcomes, learn from common experiences, and refine what stewardship “looks like” in different facility settings. Learning from these activities, health departments can also work with partners to develop or support policies promoting stewardship activities.



POLICY

The Illinois state team specifically discussed examining current regulations to identify how they might influence stewardship practices and suggested ways to incorporate stewardship into future state and federal policies. States can examine relevant state and federal policy regulating facilities and conduct a crosswalk review to identify opportunities, best practices, and policy facilitators related to infection prevention and stewardship. States can also check for consistency in policies, recommendations, and language and seek alignment if any differences or ambiguity are found. In terms of partnerships, state program staff can work with state regulatory staff to include surveyors in educational offerings regarding stewardship and suggest that surveyors provide antibiotic stewardship tools and evidence-based practices during facility visits.

These projects were designed to enhance the knowledge base for policy implementation through project teams sharing learnings and potential policy options or areas to explore with all states. Understanding policies that foster the implementation of ASPs can guide future efforts. The findings from these projects can inform state antimicrobial stewardship activities and policies and assist health departments' work with healthcare facilities to implement ASPs. State teams continue to disseminate assessment findings and lessons learned at the local and national levels to a variety of stakeholders.



ASTHO continues to be engaged in identifying and promoting state antimicrobial stewardship activities. Building on the results from the state survey and learnings from the capacity building projects, ASTHO and CDC partnered with Kavita Trivedi, MD¹ to compile existing stewardship resources with a set of practical guidance that can be used by SHAs to effectively educate facilities, partners, and policymakers about the importance of establishing strategies and programs to address judicious antibiotic use. This work is presented in the following sections of this report.

Inventory of SHA Stewardship Activities and Web Pages

In May 2014, an inventory and assessment of antimicrobial stewardship activities in SHAs from the fifty states, Washington, D.C., and Puerto Rico was conducted. AMR was addressed on 71 percent of SHA websites, but only 42 percent of SHA websites addressed the issue of appropriate antibiotic use—a missed opportunity. In addition, 31 percent of SHA websites did not showcase the SHA's known antimicrobial stewardship activities.

Additional findings from the inventory include:

- Forty-two percent of SHA websites linked to CDC's Get Smart program, 17 percent linked to the Alliance for the Prudent Use of Antibiotics (APUA), and 12 percent linked to CDC's March 2014 *Vital Signs* report on antibiotic stewardship.

¹ Dr. Trivedi was formerly the public health medical officer of California Department of Public Health's HAI program.

- Thirty-three percent of SHAs have conducted antimicrobial stewardship needs assessments and 52 percent of SHAs have partnered to provide antimicrobial stewardship education. Twenty-seven percent of SHAs have engaged in collaboratives, and 13 percent of SHAs have engaged in demonstration projects that address antimicrobial stewardship in various settings. Only two SHAs have developed tiers of hospital ASPs with associated mentorship availability.
- Forty-six percent of SHAs have addressed antimicrobial use in the non-hospital setting, the majority focusing on long-term care facilities and the outpatient setting.
- Seventy-one percent of SHA websites have AMR content, with 42 percent of SHAs engaging in AMR assessments such as compiling state-specific antibiograms (23 percent of SHAs). Thirty-eight percent of SHA websites address carbapenem-resistant *Enterobacteriaceae* (CRE). Only 13 percent of SHA websites linked to CDC's Antibiotic Threats 2013 Report.

Please visit www.astho.org for links to SHA AMR and Stewardship web pages.

Recommendations and Tools for State Health Agencies

SHAs are increasingly viewed as leaders in antimicrobial stewardship in both hospital settings and outpatient clinics. To solidify this leadership and to signify to stakeholders that antimicrobial stewardship is a priority public health area, SHAs should consider posting information about antimicrobial stewardship on their website, especially given recent CDC recommendations that every United States hospital have an ASP. Websites can link to CDC's March 2014 *Vital Signs* and *Core Elements of Hospital Antibiotic Stewardship Programs* to provide information. In addition, states that are actively engaged in promoting antimicrobial stewardship could showcase even preliminary activities and reports on their websites for appropriate and well-deserved recognition. To the extent possible, websites should be kept up-to-date, which is not simple in the area of antimicrobial stewardship and resistance due to continuously changing knowledge. However, websites can reference key antimicrobial stewardship resources.

In order to get buy-in and support from the prescriber community, it is helpful to engage external partners, specifically the Healthcare Associated Infections Advisory Committee, Quality Improvement Organization (QIO), pharmacy and medical societies, and hospital associations. Regulatory agencies or surveyors provide another potential avenue for collaboration to communicate with facilities.



Other important resources include internal partners who can work together to improve antibiotic use (e.g., those working with inpatient and outpatient settings) as well as food and agricultural colleagues committed to the “One Health” concept, which recognizes health of humans is connected to the health of animals and the environment.

SHAs can begin outreach to facilities with a survey or needs assessment to ascertain what stewardship practices are in place and what facilities need to develop or enhance a stewardship program. SHAs can also collect data on antimicrobial susceptibility patterns. The gathered information can help identify areas or settings with the greatest gaps on which to focus limited resources. This can be followed by targeted communications and education across the continuum of care and available via a variety of media (online, onsite, or webinars).

SHAs can address antimicrobial stewardship across the continuum of care and protect patients across the healthcare system. SHAs can help inpatient facilities address the spread of resistance, for example, through requiring alerts for inter-facility transfer of patients who may be harboring resistant organisms. In primary care settings, SHAs can share patient and provider education materials which present up-to-date information on appropriate antibiotic use and outpatient antibiotic stewardship interventions.



SHAs must be viewed as leaders in antimicrobial stewardship across the healthcare system. SHAs may increase involvement in this area by showcasing the important antimicrobial stewardship work that is being done at the state level and stressing the importance of judicious use of antibiotics on relevant web pages. SHAs are critical in conducting antimicrobial stewardship needs assessments, education, and implementation across the continuum of care.

The following recommendations and tools were compiled using input from the state survey, HAI capacity building projects, and SHA stewardship inventory. SHAs can use them to engage and improve antimicrobial stewardship outreach.

1) Establish the SHA as a leader and identify champions:

- Issue a call-to-action letter about antimicrobial stewardship from a state public health official and post online (e.g. Georgia).
 - > Healthcare facilities can sign on to the call-to-action.
- Develop a communications strategy.
 - > Include SHA goal to increase antimicrobial stewardship in the state in the call-to-action.
 - > Audience – healthcare facility quality, infection prevention, and nursing staff; prescribers; hospital C-suite; and the general public.
 - > Develop network and communications platforms (e.g., listserv, tools, blogs, call-to-action letter).
- Identify potential partners and have them sign on to call-to-action (see #3-4 on whom to engage).
- Keep website up-to-date; including links.
 - > When website addresses AMR, insert language and expectations on antimicrobial stewardship with key resources and links (see #2).

2) Make key antimicrobial stewardship resources available on website, including:

- Infectious Diseases Society of America (IDSA)-Society of Healthcare Epidemiology of America (SHEA) Antimicrobial Stewardship Program (ASP) Guidelines 2007: <http://cid.oxfordjournals.org/content/44/2/159.long>
- SHEA-IDSA-PIDS 2012 Policy Statement: <http://www.jstor.org/stable/10.1086/665010>
- CDC Get Smart Program:
 - > General and outpatient focused: <http://www.cdc.gov/getsmart/>
 - > Acute and long-term care focused: <http://www.cdc.gov/getsmart/healthcare/>

- CDC Antibiotic Threats 2013 Report: <http://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf>
- CDC Vital Signs March 2014: <http://www.cdc.gov/vitalsigns/antibiotic-prescribing-practices/>
- CDC Core Elements of Hospital ASPs: <http://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html>
- American Hospital Association: Antimicrobial stewardship toolkit for hospitals: <http://www.ahaphysicianforum.org/resources/appropriate-use/antimicrobial/index.shtml>
- Joint Commission Resources: Antimicrobial Stewardship Toolkit: <http://www.jcrinc.com/antimicrobial-stewardship-toolkit/>
- WHO April 2014 report on antibiotic resistance worldwide: <http://www.who.int/drugresistance/documents/surveillancereport/en/>

3) Engage a Healthcare Associated Infections (HAI) advisory committee on antimicrobial stewardship, which might be best done through a subcommittee (e.g., Arizona¹, Illinois, and South Dakota²):

- Committee representation can comprise members from public health, healthcare systems, hospital, pharmacy, nursing, and medical associations, quality improvement organizations, infection preventionists, and hospital prescribers (both physicians and pharmacists representing both academics and community facilities). Buy-in within the prescriber community can support the SHA role.

4) Engage both internal and external partners:

- Coordinate all state work regarding judicious antibiotic use in the inpatient and outpatient settings, in animals, and in the environment; ideally, the relevant websites should link to one another.
- Work with external partners to support and advocate for one another's efforts.
 - > Engage QIO. The QIO may provide support for educational sessions or webinars, or may host an AMR website that cuts across SHA programs and other organizations. The QIO website should link directly to the SHA website so that information is easily obtained and partnerships are well-delineated.
 - > Engage hospital associations, pharmacy and medical societies, and other partners.

5) Implement healthcare facility ASP surveys and needs assessments (e.g., California³, Tennessee, and Washington):

- Provides avenue to engage partners, understand what stewardship practices are currently in place and how they are being implemented, and determine gaps in state ASPs.
- Helps identify what educational offerings or partnerships may be needed.
- Allows limited public health resources to be targeted on gaps.

¹ <http://www.azdhs.gov/phs/oids/hai/advisory-committee/antimicrobial-stewardship.htm>

² <http://doh.sd.gov/diseases/hai/stewardship.aspx>

³ <http://www.cdph.ca.gov/programs/hai/Documents/TheStateofAntimicrobialStewardshipProgramsinCalifornia.pdf>

6) Conduct online or in-person educational and training sessions. Statewide educational series should include (at the very least) the following topics (e.g., Arizona⁴ and North Dakota⁵):

- Justification and rationale for antimicrobial stewardship across continuum of care, including outpatient facilities.
- Components of antimicrobial stewardship program (tailored to audience):
 - > CDC Core Elements of Hospital Antibiotic Stewardship Programs.
 - > ASP strategies.
 - > ASP process and outcome measures.
- Examples of ASPs in healthcare facilities in your state.
 - > ASPs with various personnel.
 - > ASPs in various settings (e.g., critical access hospitals, long-term care facilities, or primary care clinics).

7) Engage in antimicrobial stewardship collaboratives to share information and lessons learned across facilities:

- Collaborative members can be facilities across the continuum of care and partner organizations.
- Collaboratives can pilot stewardship activities and measure outcomes to inform future implementation efforts.

State Examples of Activities

Please visit www.astho.org for a list of state examples highlighting antimicrobial stewardship activities.



⁴ <http://www.azdhs.gov/phs/oids/hai/advisory-committee/antimicrobial-stewardship.htm>

⁵ <http://www.ndhealth.gov/disease/hai/>

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This report describes current state activities and presents a range of options for engagement, giving health agencies at all levels of capacity opportunities to develop or enhance stewardship policies and activities. Please visit www.astho.org/Antimicrobial-Stewardship for links to additional information, including:

- State antimicrobial resistance and stewardship web pages.
- Examples for states looking to initiate or enhance stewardship activities.
- Tools and resources to engage and improve antimicrobial stewardship outreach.

Acute Care Settings: Driver Diagram and Recognition Program (Georgia)

Setting	<ul style="list-style-type: none"> Acute care settings: pharmacists and physicians.
Activities	<ul style="list-style-type: none"> Pharmacist training, assessment, and focus group. Physician training and evaluation. Honor Roll development.
Key Findings	<ul style="list-style-type: none"> Most facilities reported not having de-escalation protocols or formal procedures to review appropriateness of antimicrobials after the initial order (antibiotic “time out”). Barriers to implementing stewardship programs include physician staffing, FTE pharmacist, and cultural barriers. Physicians find it useful to learn about other stewardship programs and understand the importance of physician involvement.
Policy Options	<ul style="list-style-type: none"> Establish health department as leader; recruit partners to promote stewardship. Define core activities of a stewardship program; recognize facilities that implement these activities.

BACKGROUND

In October 2012, the Georgia Department of Public Health (GDPH) convened an Antibiotic Stewardship Subcommittee to evaluate the growing threat of antibiotic resistance in the state. The subcommittee is comprised of stakeholders representing a range of provider roles, including hospital epidemiologist, medical epidemiologist, infection preventionist, and pharmacist, as well as GDPH public health professionals and CDC subject matter experts. The subcommittee developed a statewide strategic plan to address stewardship and outlined a recognition program (Honor Roll) to incentivize acute care providers to implement stewardship programs. In developing the Honor Roll, GDPH worked with CDC to identify essential elements to determine minimum criteria for stewardship recognition.

PROJECT ACTIVITIES AND ASSESSMENT FINDINGS

The Georgia state team conducted pharmacist and physician trainings. The Georgia Antibiotic Stewardship Subcommittee developed an educational program for pharmacists and physicians regarding antibiotic stewardship programs and the state Honor Roll program. Advisory committee members discussed the most effective training strategies for the two target populations. Based on this discussion, it was recommended that pharmacist training should be face-to-face, while physician training should be offered as a webinar.

PHARMACIST TRAINING: The training consisted of presentations and workshops on stewardship topics, including starting or re-engineering an antibiotic stewardship program and using the IHI Driver Diagram for stewardship. Attendees discussed pharmacists’ role in developing and implementing effective multidisciplinary ASPs and how to facilitate interactions with medical staff and management to promote acceptance of stewardship programs. Eighty-two pharmacists from 48 acute care facilities attended the in-person pharmacist training. Pharmacists completing the program could receive 3.5 hours of continuing pharmacy education. Two methods were used to gather information and evaluate the pharmacist training: (1) an assessment tool to collect details on baseline stewardship activities at participating facilities, and (2) a focus group to collect qualitative data.



ASSESSMENT FORM: The goal of the assessment was to gather information on the current state of resources and efforts to support appropriate antimicrobial use at hospitals participating in the training. The form was adapted from an assessment tool that CDC was developing to evaluate stewardship activity at individual facilities. All attendees were asked to complete and return the form prior to the end of the training.

Fifty attendees from 48 facilities responded. Based on the assessment tool findings, key areas for improvement included:

- *Policies, guidelines and protocols:* 63.6 percent of facilities did not have facility-specific guidelines to assist with antimicrobial selection for urinary tract infections. Facilities reported higher rates of guidelines for community-acquired pneumonia and surgical prophylaxis (85% and 87%, respectively).
- *Protocols for therapy de-escalation:* 73.9 percent of facilities reported not having de-escalation protocols, while 26.1 percent reported having protocols to address de-escalation of anti-microbial therapy.
- *Reviewing appropriateness of antimicrobial after initial order:* 63.8 percent of facilities reported not having a formal procedure for a physician or pharmacist to review the appropriateness of an antimicrobial two to three days after its initial order (antibiotic time out). In addition, 64.4 percent of facilities indicated a lack of order entry systems with embedded clinical decision-making support for prescribing antimicrobial agents.
- *Antimicrobial use reports:* 59.1 percent of respondents did not give antimicrobial use reports to prescribers, which would improve monitoring consumption.

FOCUS GROUP: Immediately after the training, 10 pharmacists participated in a focus group to give their input on the training event and future technical assistance needs. Some of the focus group discussion questions and responses include:

1. **What did you like most/least about the training?** Overall, participants responded very positively to the training. Participants found the speakers to be “good, engaging, enthusiastic, and knowledgeable.” Participants especially liked the pharmacist who “made it real for life.” The training’s focus on pharmacists’ role in antimicrobial stewardship was also appreciated. Participants felt that the training was applicable to any size hospital and indicated that the training message of starting small and tailoring the antimicrobial stewardship activities to individual hospitals’ needs and resources was helpful. One downside of the training was not enough time to network and have small group discussions to learn what other hospitals, particularly different-sized hospitals, were doing.
2. **What is the one most useful idea or technique you learned today that you will take back with you?** Responses included using a multidisciplinary approach, conducting an assessment and gap analysis, and starting small.

Start small and tailor stewardship activities to individual hospitals’ needs and resources.

3. What are the barriers that currently exist in implementing antibiotic stewardship activities?

Responses included physician staffing, not having a FTE pharmacist, and cultural barriers. For large hospitals, physician staffing issues included identifying a physician champion and having the pharmacist and physician “on the same page.” One barrier for small hospitals was the lack of an infectious disease (ID) physician. A noted cultural barrier was that younger hospitalists were more accustomed to working with a pharmacist than older physicians.

4. What can GDPH do to help you promote antibiotic stewardship at your facility?

Focus group participants indicated that GDPH could help promote antibiotic stewardship programs at their facilities by providing education or training support. Suggested training activities included

education for pharmacists working in hospitals without a pharmacist who had specific ID training, physician training on how to start an antibiotic stewardship program, and physician ID training. In addition, it was suggested that more meetings “like this one” be held and that GDPH consider partnering

with pharmacy schools and providing reduced (or free) tuition or stipends for future antibiotic stewardship trainings for pharmacists.

5. If GDPH had to focus its efforts on “one thing,” what would it be?

Responses included ID training for pharmacists and DPH paying for training events, including providing stipends.

6. What are your initial thoughts on an Honor Roll Program?

Responses were positive for the most part. One noted concern was that while an Honor Roll could encourage improvement and growth, it might also give the impression that “we are not doing a good job.” Small hospital administrators may not look at the recognition in the same way as those at larger hospitals because it was perceived that larger hospitals have better trained physicians and pharmacists. The Honor Roll was seen as a “good start” to work toward antibiotic stewardship and an opportunity for hospitals of the same size to work together and share information. One participant noted that “down the road” antibiotic stewardship will be a core measure, and that it was important to begin to now rather than wait until it was required.

The health department can promote stewardship by providing education and training support.

In summary, participants liked the training speakers, content, and format. They wanted more education, as well as support to facilitate participation in further training. Participants supported the Honor Roll program, but saw a need to be sensitive to the resources available at smaller facilities.

PHYSICIAN TRAINING: A one-hour webinar for physicians, “Stepping Up to Antimicrobial Stewardship: The Role of the Physician Leader in Acute Care Settings,” was presented at three separate times to accommodate different schedules. The webinar included a 45-minute presentation session with three speakers (which was recorded during the first webinar and replayed for the other two), as well as a live 15-minute question and answer session in which all three presenters participated. The training’s objectives were to emphasize that physician leadership is integral in starting, rejuvenating, and sustaining an effective antimicrobial stewardship program in an acute care setting, as well as to provide information on practice tools, including antibiotic timeouts and standardizing the length of treatment for common diagnoses associated with antibiotic overuse. Webinar participants were also given a resource list to assist them in future stewardship efforts, and physician attendees could receive one hour of continuing medical education. The three webinar training sessions were attended by a total of 75 participants, including 31 physicians.

Forty-five participants completed evaluations. The comments regarding what was most useful centered on two themes:

- Seeing other antibiotic stewardship programs, particularly those deemed successful, at smaller facilities, in a hospital setting, or that included outcomes. *(Five comments)*
- The importance of physician involvement, including choosing a physician champion, providing evidence to physicians on why it is better to limit antibiotic use, and understanding the need for physician involvement. *(Four comments)*

Assessment findings emphasized the need for both a physician and clinical pharmacist to guide stewardship activities.

Participants also commented that the webinar was accessible and that they appreciated learning about the appropriate duration of therapy, how to get management on board, and reinforcement for a current stewardship program.

HONOR ROLL: Based on the results of the antimicrobial stewardship assessment, GDPH plans to revise its preliminary Honor Roll program as follows:

- Each applying facility will need to identify both a physician champion and a clinical pharmacist on the antibiotic stewardship team. (Previously, either a physician or a clinical pharmacist champion was required.)
- To apply for the Honor Roll, a facility will need to complete an Antimicrobial Stewardship Assessment (ASA) each year so that the state and the facility can evaluate change over time.
- GDPH will no longer require an antibiogram for the implementation phase of stewardship, as the ASA results indicated that a high percentage of facilities were already using it. Also, other states have indicated facility confusion regarding the definition and use of an antibiogram, so GDPH's will educate providers on how to create and use an antibiogram.



POLICY AREAS TO EXPLORE

Georgia set a broad goal to increase antimicrobial stewardship activity in healthcare facilities in Georgia. To achieve that goal, the state team developed the following strategies:

- **Establish the health department as a leader and identify champions to partner with.** GDPH will develop a call-to-action letter and communications strategy to publicize its goal to increase antimicrobial stewardship. Partners will be able to sign on to the call-to-action letter.
- **Measure current stewardship activities within facilities.** GDPH will send the assessment tool to all acute care facilities and evaluate additional state HAI data, such as from NHSN. They will then use the collected data to set benchmarks for stewardship activities. Later on, GDPH will create assessment tools for other types of healthcare facilities (e.g., for long-term care).

- **Promote core activities of a stewardship program.** GDPH will use the data collected to define the critical elements of a stewardship program. It will promote these elements through the communications strategy, the GDPH website, and facility trainings. Long term, GDPH will develop the capacity to measure antimicrobial use in facilities.
- **Implement a recognition program (Honor Roll).** GDPH will define the critical elements of a stewardship program (above), develop a dedicated website to host the Honor Roll, and launch the program through the communications plan. They will also examine ways to assist facilities in meeting Honor Roll criteria, such as peer mentoring or providing toolkits.



Emergency Departments: Antibiotic Prescribing and the Get Smart Campaign (Vermont)

Setting	<ul style="list-style-type: none"> • Emergency departments.
Activities	<ul style="list-style-type: none"> • HEDIS data review (adults with acute bronchitis and children with upper respiratory infections). • Interviews with emergency department practitioners.
Key Findings	<ul style="list-style-type: none"> • Medical claims data shows inappropriate prescriptions occur in the ED; however, practitioners report that antibiotic prescribing is more appropriate than reflected in reports because of incomplete capture of critical clinical details in analyzed data sets. • Colorful, targeted Get Smart materials may get wider attention than electronic medical record-generated discharge summaries. • No EDs currently track the antibiotic use for respiratory tract infections, but half of them track and report data for other infectious processes.
Policy Options	<ul style="list-style-type: none"> • Enhance partnerships with ED providers; make them part of the process and incorporate stewardship into the current ED workflow. • Using a range of data sets, generate a prescribing profile for Vermont that can be fed back to providers for quality improvement.

BACKGROUND

The Vermont Multi-Drug Resistant Organism (MDRO) Collaborative, implemented in September 2010, is a partnership of the Vermont Department of Health (VDH), all Vermont hospitals, the Dartmouth-Hitchcock Medical Center in New Hampshire, 31 long-term care facilities, the Vermont Program for Quality in Health Care (VPQHC), the Northeast Healthcare Quality Foundation (Vermont’s QIO) and the CDC. Acute care facilities are grouped with the geographically localized long-term care facilities that use their clinical laboratory into “healthcare clusters.” The clusters meet regularly to discuss best practices and work on policies that help them as a group to prevent MDRO transmission.

Individual facilities and healthcare clusters are implementing interventions—including antimicrobial stewardship—to decrease the clinical incidence of healthcare-associated MDRO infections, including *Clostridium difficile*, in Vermont. From November 2012 to April 2013 VDH sponsored an Institute for Healthcare Improvement (IHI) expedition based upon the Antibiotic Stewardship Drivers and Change Package developed by CDC and IHI.

Since July 2013, the Vermont Department of Health has partnered with Blue Cross and Blue Shield of Vermont (BCBSVT) to promote the appropriate use of antibiotics in the outpatient setting. Activities included distributing Get Smart prescription pads, virus and bacteria charts, and pharmacy bag inserts to every primary care practice and community pharmacy in Vermont.

PROJECT ACTIVITIES AND ASSESSMENT FINDINGS

HEDIS DATA REVIEW: The Vermont state team reviewed BCBSVT Healthcare Effectiveness Data and Information Set (HEDIS) rates and summary data for two measures – adults with acute bronchitis and children with upper respiratory infections. In 2012, 1722 adults in the BCBSVT HEDIS dataset were diagnosed with acute bronchitis, and 1384 received inappropriate antibiotics; of these, 96 diagnoses

and 69 inappropriate prescriptions occurred in the ED. The BCBSVT rate of antibiotic treatment avoidance in adults with acute bronchitis (across healthcare settings) in 2012 was 19.63 percent. Regarding children with upper respiratory infections, in 2012, 1398 children were diagnosed and 118 received inappropriate antibiotics; of these, 26 diagnoses and three inappropriate prescriptions occurred in the ED.

INTERVIEWS: Dr. Cy Jordan, Vermont Medical Society Foundation director, interviewed emergency room practitioners in 12 of Vermont's 14 hospitals and Dartmouth-Hitchcock Medical Center about their use of antibiotics for respiratory tract infections and barriers to appropriate antibiotic prescribing. The goal of the assessment was to identify opportunities to assist advancing antibiotic stewardship in the region. The interviews included questions about the conditions for which the providers most frequently prescribed antibiotics, their opinion of their own practice and the practices of other ED practitioners of using antibiotics for outpatient respiratory infections, challenges to appropriate prescribing, and strategies and resources to overcome those challenges. In addition to assessing challenges to following prescribing guidelines, the interviews included questions about professional and patient education resources and assessed the appeal and perceived efficacy of the CDC's *Get Smart: Know When Antibiotics Work* campaign materials.



Antibiotics are prescribed appropriately and judiciously in the ED setting.

The predominant opinion among Vermont's ED providers is that antibiotics are being prescribed appropriately and judiciously in the ED setting. Broad spectrum antibiotics are rarely prescribed, and when they are used, it is typically for ease of compliance with the treatment regimen or uncertainty about the diagnosis.

Documentation processes in the ED are inadequate to capture all the nuances and details that influence the clinical decision-making process.

Nearly everyone opined that appropriate narrow spectrum targeted antibiotics are prescribed more frequently in EDs than would be predicted by an external review of clinical indications. This would be the case if the external review utilized billing claims and, to a lesser extent, if the review was based on a clinical record review. The reason for the variation between what would be categorized as appropriate by the external reviews and the actual prescribing behavior is the inadequacy of documentation processes to capture the nuances and all the details pertinent to the clinical decisionmaking process.

Clinical uncertainty, concern over the lack of follow up, and patient expectations.

The most common factors cited as influencing prescribing decisions not captured in a rigid interpretation of current best practice are:

- Clinical uncertainty about the diagnosis.
- Concern over the lack of follow up for the patient if their condition worsened.
- Patient expectations about the appropriateness of antibiotic treatment.

Other factors mentioned more than once included:

- Time pressures on busy days to move patients through the department: “It’s always faster to prescribe a pill than educate a patient.”
- “Last case bias” causing increased clinical anxiety (a practitioner or a peer having just missed a diagnosis and having the affected patient suffer untoward consequences).
- Pressure and consequences from management to avoid patient complaints.
- Concern about pertussis, which was prevalent in many communities this past year.

Patient education and the Get Smart program.

Only a few practitioners had seen the Get Smart materials or were aware of the program. Those who had seen the program did so on the CDC website, which they use as a professional resource for infectious disease issues, particularly sexually transmitted diseases. The most common response to the Get Smart materials was that they contained redundant information that was already discussed in the discharge instructions generated by their departmental electronic medical records (EMRs), and the materials didn’t fit in to the EDs’ busy work flow and cramped work space. Several interviewees were adamant that the materials did not provide any added value.

The visually appealing Get Smart materials may get more attention, but need to be incorporated into the busy ED workflow.

The remaining practitioners were somewhat or very enthusiastic about the materials. Those who liked the materials appreciated their high quality, specifically the paper quality, colorful presentation, and direct, clear content. Participants stated that many patients did not pay attention to the EMR generated discharge summaries because they tended to be too long and verbose, and the colorful, targeted, and unique Get Smart pamphlets might be treated differently and get more and wider attention among family members.

Promote Get Smart campaign through EMRs.

Interviewees shared that they saw value in EMR vendors incorporating the Get Smart materials into the EMR discharge instructions. Patient education documentation is easier if materials are already contained in the EMR, practitioner salaries are affected by EMR patient education documentation, and using materials outside of the EMR work flow isn’t appealing in the often-hectic ED setting.

Data collection and process improvement.

No emergency departments reported tracking antibiotic use for respiratory tract infections. Half of the institutions are tracking and reporting data on other infectious processes, urinary tract infections being the most common. Nearly all institutions track data on pneumonia patients admitted to the hospital to comply with Centers for Medicare & Medicaid Services (CMS) Core Measures demands.

Value of claims data and performance audits.

No interviewees were aware of the HEDIS claims based quality reporting measures. Most felt claims data are too removed from the nuances of the clinical setting and all the factors at play for determining who did and did not need antibiotics. Respondents did not discount the value of performance reporting and would welcome valid useful reports that could be reconciled with their clinical documentation. A few interviewees mentioned that if the departments themselves could easily generate performance reports from their EMRs, they would likely do so, but at present, the difficulties involved with extracting meaningful performance reports from their clinical records were too great to justify the necessary time and resources.

Practitioners would welcome meaningful performance reports, but it is difficult to generate them from EMRs.

POLICY AREAS TO EXPLORE

The Vermont team brainstormed ways to address the challenges identified in the interviews. They then set two goals, which encompass enhancing partnerships with ED providers to promote stewardship activities and collecting data to generate a prescribing profile for the state. To achieve these goals, the state team developed the following strategies:

Goal 1: Enhance partnerships with ED providers.

- Make providers part of the process. The Vermont team plans to engage the ED directors group as well as reach out to all provider types (physicians, PAs, and NPs) to solicit feedback on what data providers find useful.
- Link with the work of the MDRO Collaborative and other community providers.
- Examine and offer support to managing patient expectations and satisfaction, including through Get Smart Materials.
- Incorporate stewardship into current ED workflow (e.g., through inclusion in the discharge summary).

Goal 2: Generate a prescribing profile for Vermont.

- Examine a range of datasets to identify and understand prescribing differences. Datasets can include IMS Health, HEDIS, VHCURES all-payer database, or NAMCS. The state team also hopes to include institutional antibiograms and facilitate the ability to query EMRs for relevant data. The data can then be presented to the providers for quality improvement.

Long Term Care Facilities (Illinois)

Setting	<ul style="list-style-type: none"> • Long term care facilities (LTCFs).
Activities	<ul style="list-style-type: none"> • Online survey (directors of nursing). • In-depth interviews with select facilities.
Key Findings	<ul style="list-style-type: none"> • Few survey respondents thought that antibiotic resistance or use is a problem at their facility. • Most LTCFs have an individual designated for infection control and prevention, but nearly half of these individuals lack training specific to infection control and prevention. • Barriers to implementing stewardship activities include expectations from residents' families, expectations from residents, and prescriber knowledge, beliefs, or attitudes.
Policy Options	<ul style="list-style-type: none"> • Increase awareness of AMR, knowledge, and practice around appropriate antibiotic use. • Promote policies that facilitate antimicrobial stewardship in LTCFs, e.g., training requirements for LTCF staff and prescribers. • Define stewardship activities for long term care settings.

BACKGROUND

Since 2009, the Illinois Department of Public Health (IDPH) has collaborated with infection prevention stakeholders and subject matter experts to implement and promote initiatives and policies that advance prevention of HAIs. Efforts such as the Illinois Campaign to Eliminate *Clostridium difficile* (ICE *C. diff*), prevention collaboratives, and a statewide antimicrobial stewardship summit have engaged facilities across the healthcare spectrum in dialogue and quality improvement efforts around *C. difficile* prevention and antimicrobial stewardship.

State mandated hospital and long term acute care hospital (LTACH) reporting of certain HAIs like *C. difficile* and methicillin-resistant *Staphylococcus aureus* to the National Healthcare Safety Network incentivizes these facilities to prioritize HAI prevention activities. Similar reporting requirements do not exist for Illinois LTCFs. However, skilled nursing facilities have been required to have a designated Infection Prevention and Control Professional since January 2012.

IDPH's initial assessment of healthcare facility antimicrobial stewardship practices focused on acute care settings, beginning in 2011 with in-depth qualitative assessments at five hospitals. From this collaborative, a stewardship assessment framework for hospitals was developed and a statewide hospital survey was administered in 2012.

PROJECT ACTIVITIES AND ASSESSMENT FINDINGS

To assess stewardship infrastructure, practices, and barriers in LTCFs, the IDPH Division of Patient Safety and Quality convened a project team with representation from infectious disease, infection prevention, quality improvement, public health, and long term care. An infectious disease physician and a registered nurse were secured as consultants to assist in developing and administering the assessment. The team used a mixed methods approach to carry out the assessment in two phases, an online survey and in-depth interviews.

ONLINE SURVEY: The team developed a survey with some questions adapted from CDC’s annual facility survey for long term care, the National Campaign for Advancing Excellence in America’s Nursing Homes antibiotic stewardship assessment checklist, and existing stewardship surveys. The survey was pilot tested with directors of nursing (DON) at two LTCFs. Email and fax announcements were sent to LTCFs licensed to provide skilled or intermediate levels of nursing care (n=755) encouraging them to complete the survey. The directions indicated that one survey be completed per facility by a clinical leader, preferably the DON. Survey participation was voluntary and the project team engaged various partners to assist with getting the word out to facilities. A total of 462 facilities (61%) completed the survey, and findings reported are for the 433 facilities certified by the Centers for Medicare & Medicaid Services.



IN-DEPTH INTERVIEWS: Following the online survey, IDPH conducted in-depth interviews to better understand some of the survey responses and learn more about the roles of various LTCF staff regarding stewardship. Responses from the online survey informed the areas selected to explore through the interviews and, importantly, addressed some of the minimum standards for LTCF antibiotic stewardship couched within the context of the operational goals of stewardship. The project consultants conducted a total of 52 phone and in-person interviews at 11 facilities. At each facility, each of the following groups was interviewed separately: direct care licensed nurses, DONs, Assistant DONs and individuals designated for infection control, nursing home administrators, medical directors, and pharmacists.

Results from the online survey are presented below with supplementary information from the interviews.

Perception of the problem.

In total, 462 facilities (61%) completed the survey; findings reported are for the 433 facilities certified by the Centers for Medicare and Medicaid. Only 14 percent of survey respondents agreed that antibiotic use is a problem at their facility. In the interviews, the few who agreed that antibiotic use is a problem at their facility mentioned a variety of reasons for their opinion, including facility overprescribing of antibiotics, testing for cure, and the presence of many independent physicians. Interviewees who disagreed that antibiotic use is a problem at their facility mentioned their facility’s judicious antibiotic prescribing practices, implementation of auto stop dates, participation in quality improvement programs, availability of nurse practitioners to educate nursing staff, and having a medical director who is diligent about stewardship.

On the whole, most interviewees believed that antibiotic use is more of a problem nationally than at their facilities. Many indicated that they had not previously thought about the issue of antibiotic resistance and use, nor considered what their role could be in improving the use of antibiotics at their facilities.

Individual designated for infection control and prevention.

Based on online survey responses, 93 percent of LTCFs have an individual designated for infection control and prevention (IC/P). However, the majority of these individuals spend fewer than 20 hours a week on IC/P activities, with a median of eight hours per week. Fifty-one percent of these individuals have received IC/P related training with continuing education units or a certificate. Only 2 percent are certified in infection control (CIC).

Most facilities have an individual designated for infection control and prevention (I/CP), but the median time spent on I/CP activities is eight hours per week.

Drivers of antibiotic prescribing.

Guidelines: Only 39 percent of survey respondents indicated that their facility has clinical practice guidelines or treatment pathways for infectious syndromes to guide prescribers in deciding when to prescribe an antibiotic.

Process for communicating change in resident's condition: The nurses and DONs interviewed indicated that the nurse caring for the resident notifies the resident's prescriber, most often via phone or fax, as soon as a change is noticed in the resident's condition. While some of these facilities have communication tools (e.g., the Situation-Background-Assessment-Recommendation tool) to relay information to the prescriber, there is variability in whether and how these tools are used.

Prescribing practices: Half of the facilities surveyed indicated that they have a protocol requiring specimen collection before initiating antibiotics. Among the 11 facilities interviewed, one reported having a standing order for specimen collection (for urinalysis); otherwise, a physician's order had to be obtained to collect a specimen. Interviewees indicated that antibiotic orders are almost always obtained over the phone and treatment is often initiated empirically. Interviewees indicated that, on average, it takes three days to receive culture and sensitivity lab results.

Susceptibility report: In response to the survey question "Does the laboratory provide your facility with a report of antibiotic resistance (e.g., antibiogram) based on cultures sent from your facility?" 90 percent of facilities surveyed responded yes. The interviews highlighted that many interviewees were unfamiliar with the antibiogram or hadn't seen one for their facility: they were interpreting the survey question to mean the weekly or monthly culture and sensitivity reports sent by the lab. Two pharmacists did report having seen an antibiogram for the facility (e.g., from a nearby hospital), and one of these pharmacists provided the interview team with a copy.

Follow-up assessment — the antibiotic "time out": Forty-nine percent of survey respondents indicated that their facility has a process in place to perform a follow up assessment within three days of the start of a new antibiotic to determine whether it is still indicated. The nurses, DONs, and medical directors interviewed explained that the follow up mainly targets potential drug reaction and therapy effectiveness. Few respondents mentioned any steps taken to reassess the appropriateness and need for continued antibiotic therapy based on review of culture results.

In the survey, most facilities reported having an antibiogram, but interviews revealed respondents misinterpreted the meaning of "antibiogram", and few actually know what one was or had seen one from their facility.

Monitoring practices.

Over 90 percent of LTCFs respondents reported that their facility requires documentation of the indication and anticipated duration of therapy. The majority of these facilities (>90%) indicated that they check for documentation of the indication and duration.

Eighty-nine percent of responding facilities reported monitoring antibiotic use. However, the data is most often reviewed by the DON or ADON (93 percent of facilities) and less often by the administrator (25 percent of facilities), medical director (32 percent of facilities), or pharmacy staff (37 percent of facilities).

Education and Training.

Ninety-six percent of the facilities reported educating nursing staff on appropriate antibiotic use. At the facilities interviewed, interviewees indicated that this education focuses on general infection control and not on antibiotic use per se.

Challenges to implementing stewardship activities.

Facilities were asked to identify major barriers to implementing antibiotic stewardship activities. The top three barriers cited were expectations from residents' families, expectations from residents, and the knowledge, beliefs, or attitude of prescribers serving the facility. Other challenges commonly mentioned by interviewees included communication with prescribers, regulations and requirements that are unclear and constantly changing, and long term use of prophylactic antibiotics for urinary tract infections. Contrary to what might be expected, funding and staff turnover were identified as minor barriers by most survey respondents and interviewees.

Role for state and local health departments.

Interviewees were asked how the state or local health department can help to improve the use of antibiotics at their facility. Common responses centered on the following themes:

Education

- Educate LTCF staff on the why, what, and how of antibiotic stewardship.
- Educate residents, their families, and the general public on the harms of inappropriate antibiotic use.
- Share success and lessons learned from other LTCFs.
- Share the results from this assessment.

Easy to use tools and resources

- Provide reports on antibiotic use trends and resistance in Illinois LTCFs.
- Create a list of antibiotic stewardship best practices for LTCFs.
- Provide CDC and health department resources for all levels of nursing care, including certified nursing assistants.

Clear regulations that support quality improvement

- Institute standardized protocols for how antibiotic stewardship and infection control activities should be carried out in LTCFs.
- Provide more guidance and clear recommendations for antibiotic stewardship and infection control that are consistent across agencies.

- Institute requirements or minimum standards for credentialing and training physicians and other prescribers who work in LTCFs.
- Institute minimum training requirements for individuals charged with infection control and prevention.
- Provide more support for quality improvement.

POLICY AREAS TO EXPLORE

Based on the assessment, the Illinois state team identified three key areas for action: communication and training, policy, and the need to continue to explore stewardship in long term care facilities. The state team developed the following strategies around these areas:

Key Area 1: Communication and training

- Enhance partnerships with long term care, consumer, and provider groups.
- Work with stakeholders to develop and implement a strategic plan for antibiotic stewardship.
- Educate, engage, and support LTCF staff and providers through dissemination of assessment findings, statewide advocacy and education on harms of antibiotic misuse, and stewardship resources (e.g., LTCF stewardship toolkit).
- Educate residents, families, and the public. Work with CDC and stakeholders on messaging and language, leverage Get Smart Week, and utilize social media.

Key Area 2: Policy

- Create a crosswalk to identify how federal and state nursing home regulations align with and influence infection prevention and stewardship practices.
- Increase engagement with state regulatory agencies.
- Mandate minimum training or certification related to judicious antibiotic use for individuals designated for IC/P, medical directors, and other prescribers who work in LTCFs.
- Align LTCFs with new service delivery networks that are being created through health reform (e.g., Accountable Care Organizations, medical care homes).

Key Area 3: Exploring, understanding, and defining the issue

- Collaborate with stakeholders to investigate and outline best practices and what stewardship looks like in the LTC setting, e.g., by implementing a pilot collaborative.
- Examine LTCF prescribing data.



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