Tracking and Reporting Antibiotic Use and Outcomes in LTCF

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NE ASAP

2025 Nebraska Antimicrobial Stewardship Summit

Disclosures

Neither presenter has any relevant financial conflicts of interest to report related to this presentation.

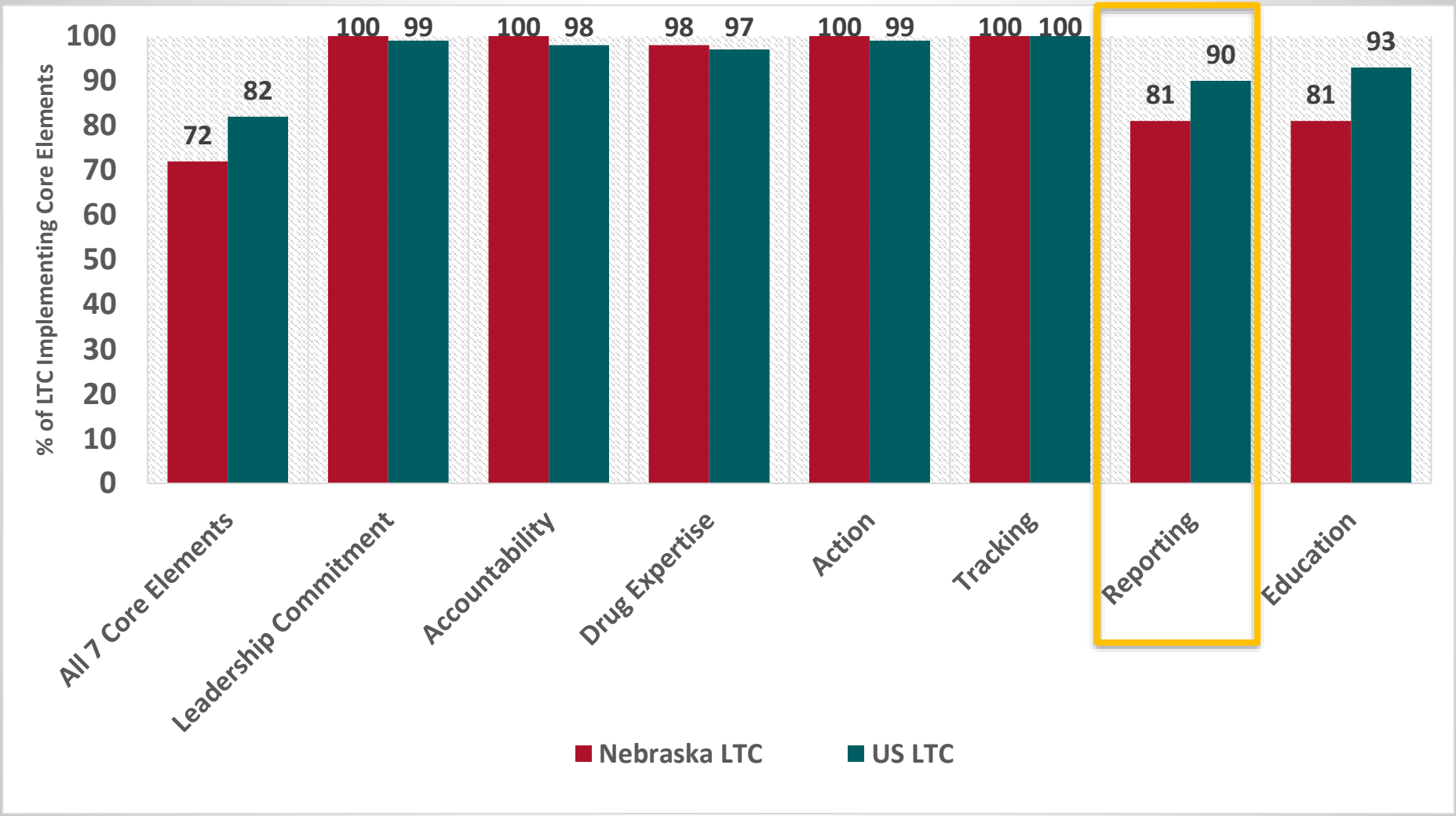
Objectives

- Describe the core elements of tracking and reporting antibiotic use in long-term care settings, including key metrics used to monitor prescribing practices
- Review the Nebraska ASAP Antibiotic Use Tracking log as a strategy for nursing homes to track and summarize antibiotic use data

CDC Core Element Implementation

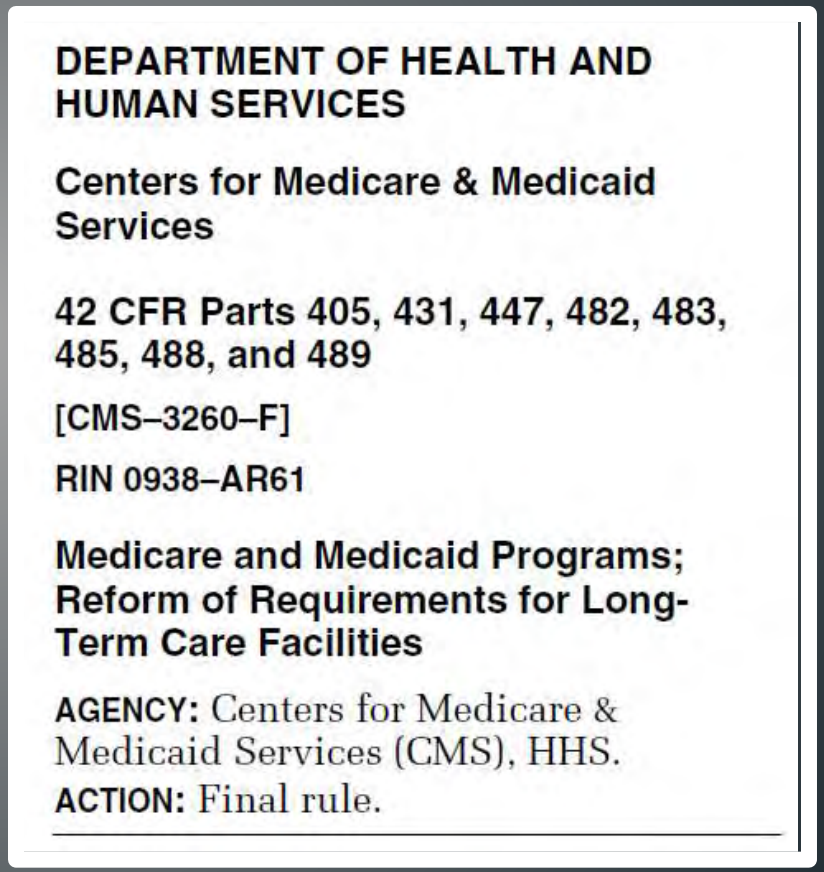
Long-Term Care 2023

53 LTCF reporting



CMS Regulations for Antibiotic Stewardship Programs

§483.80(a)(3)
As part of their IPCP program, the facility must establish an antibiotic stewardship program that includes antibiotic use protocols and **a system to monitor antibiotic use**.



DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

42 CFR Parts 405, 431, 447, 482, 483, 485, 488, and 489

[CMS–3260–F]

RIN 0938–AR61

Medicare and Medicaid Programs; Reform of Requirements for Long-Term Care Facilities

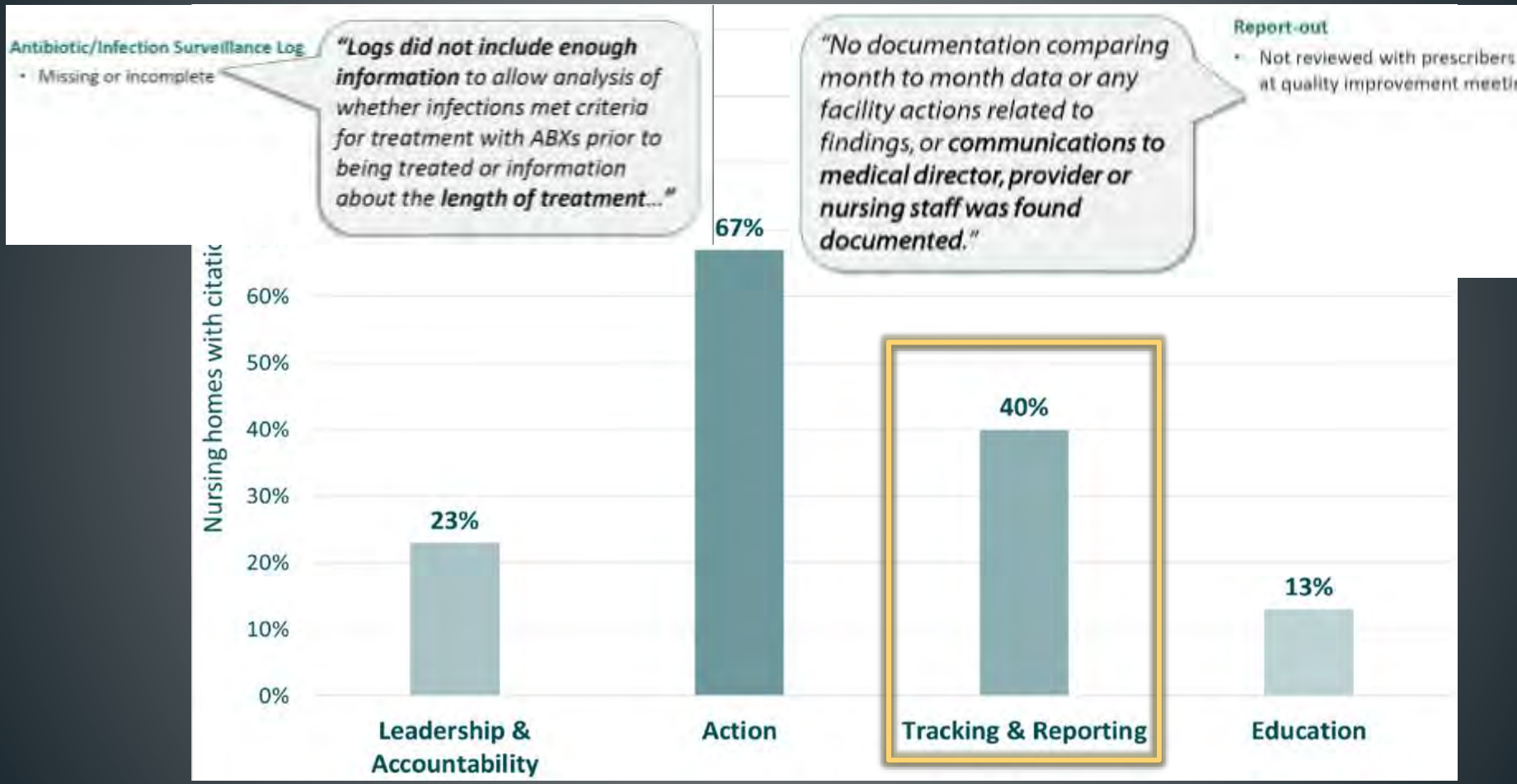
AGENCY: Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION: Final rule.

https://www.federalregister.gov/documents/2016/10/04/2016-23503/medicare-and-medicaid-programs-reform-of-requirements-for-long-term-care-facilities

NE ASAP

Tracking and Reporting were the second most common stewardship CMS deficiencies cited among nursing homes from 2018-2019



Note: These categories are not mutually exclusive; citations could be classified into one or more categories.

Slide Courtesy of CDC, Source: CMS Health Deficiencies | Provider Data Catalog

How are nursing homes currently tracking antibiotic use?

- In 2022, 99% of LTCF (n=4,898) respondents indicated having a system for tracking antimicrobial use on the NHSN annual facility survey
  - Manual AU tracking (48%)
  - EHR (31%)
  - Pharmacy Services (25%)

- In 2022, 98% of LTCFs reported having access to an electronic health record, but only a third were using the EHR for antibiotic use tracking

CDC: Antibiotic Stewardship in Long-Term Care Facilities

How are nursing homes currently tracking and reporting antibiotic use?

Results of a Statewide Survey of the Antibiotic Tracking and Reporting Inventory in Wisconsin Nursing Homes

Sally Jolles, MA, MS;[1,2] Dee Heller, RN, NHA;[1] Grace Multhauf, BS;[1] Lori Koeppel, BSN, RN, NHA, DNS-CT, DON-C;[1] Michele Gassman, MA;[3] Bikram Poudel, BPH;[1] Maddie Langenstroer, MPH;[4] Lindsay Taylor, MD, MS;[5] Kimberly Goffard MBA,HCM, RN;[5] Christinia Olivier MBA LPN;[5] Mariah Welke MPH CHES;[5] Chris Crnich MD PhD;[1,2] Jay Ford PhD[3]
1. Department of Medicine, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin 2. William S. Middleton VA Hospital, Madison, Wisconsin 3. University of Wisconsin School of Pharmacy, Madison, Wisconsin 4. Rocky Mountain Vista University, St. Ivins, Utah 5. Wisconsin Healthcare-Associated Infections (HAI) Prevention Program, Wisconsin Department of Health Services.

Infectious Disease
Department of Medicine
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

School of Pharmacy
UNIVERSITY OF WISCONSIN-MADISON

Table 2. Tools facilities use for line listing and reporting tasks

	No.	(%)
Tools used for line listing*		
Excel spreadsheet (facility-developed)	62	(57.4%)
Paper	41	(38.0%)
EHR integrated line list	24	(22.2%)
Excel spreadsheet (externally developed)	11	(10.2%)
Stand-alone software application	6	(5.6%)
Other	2	(1.9%)
Tools used for reporting		
Excel spreadsheet (facility-developed)	62	(57.4%)
EHR integrated reporting tool	30	(27.8%)
Paper (none of the above, no paper option)	17	(15.7%)
Excel spreadsheet (externally developed)	10	(9.3%)
Stand-along software application	4	(3.7%)
Other	2	(1.9%)

*32 NH used more than one tool

Data presented at 2025 SHEA Conference

How much time is devoted to tracking and reporting antibiotic use?

Results of a Statewide Survey of the Antibiotic Tracking and Reporting Inventory in Wisconsin Nursing Homes

Sally Jolles, MA, MS;[1,2] Dee Heller, RN, NHA;[1] Grace Multhauf, BS;[1] Lori Koeppel, BSN, RN, NHA, DNS-CT, DON-C;[1] Michele Gassman, MA;[3] Bikram Poudel, BPH;[1] Maddie Langenstroer, MPH;[4] Lindsay Taylor, MD, MS;[5] Kimberly Goffard MBA,HCM, RN;[5] Christinia Olivier MBA LPN;[5] Mariah Welke MPH CHES;[5] Chris Crnich MD PhD;[1,2] Jay Ford PhD[3]
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Table 4. Time devoted to line listing and reporting tasks

	Mean
Line listing (hours/week)*	
≤ 50 beds	7.8
51 – 99 beds	8.2
≥ 100 beds	14.8
All facilities	9.6
Reporting (hours/month)	
≤ 50 beds	13.7
51 – 99 beds	17.4
≥ 100 beds	23.0
All facilities	17.0

*Significant difference at $p < .001$

Data presented at 2025 SHEA Conference

What Should be Tracked?

Antibiotic Use Measures

Antibiotic Process Measures

Antibiotic Outcomes Measures

What Should be Tracked?
Antibiotic Use Measures

- Antibiotic starts per 1000 resident-days
  - Antibiotic Drug and/or Class
- Days of therapy per 1000 resident-days
  - Can separate out prophylactic courses
- Infection type per 1000 resident-days
  - Can separate out prophylactic courses
- Prescriber name
- Rx origin (ED, clinic, hospital, LTCF)

Why Per 1000 Resident Days?

- Converts the number of starts, or days of therapy to a rate
  - Account for variations in number of residents and lengths of stay
  - Allow within facility comparison over time
  - Make between facility comparison possible

Calculation:

(# of antibiotic starts in August ÷ # of resident days August) X 1000

(# of days of therapy in August÷ # of resident days August) X 1000

Drugs That Typically are NOT Counted

- Antivirals
- Topical antifungals
  - Nystatin, clotrimazole, ketoconazole
- Topical antibiotics
  - Triple antibiotic, bacitracin, mupirocin
- Antibiotic-containing eye and ear drops/ointments
  - Gentamicin, tobramycin, erythromycin
- Agents that work within GI tract or not absorbed
  - Sulfasalazine, rifaximin
  - Exceptions: vancomycin PO, fidaxomicin
- Urinary tract antiseptic/analgesic
  - Methenamine, phenazopyridine

What Should be Tracked?
Antibiotic Process Measures

- Use of clinical assessment tool (SBAR)
  - Staff members performing assessment
- Loeb criteria met
- Antibiotic Reassessment (timeout) performed
- Antibiotic selection based on guidelines
- Surveillance definition met

What Should be Tracked?
Antibiotic Outcome Measures

- Antimicrobial resistance
  - Antibiograms
- Antimicrobial-associated adverse events
- Infection rates due to pathogens of interest

Tracking Outcome Measures – *Infection Rates of Specific Organisms*

Resistant Pathogens and other Pathogens of Interest
- MRSA (methicillin-resistant *Staphylococcus aureus*)
- VRE (vancomycin-resistant enterococci)
- ESBL (extended spectrum β-lactamase) Gram negative bacilli
- CRE (carbapenem-resistant *Enterobacterales*)
- Candida auris
- *Clostridioides difficile* infections

Data can be standardized by
- Per **10,000** Resident-Days
- Per number of new admissions

Why track them?
- Direct consequences of the extent of antibiotic use AND infection control practices

Other Outcome Measures – *Adverse Drug Events (ADR)*

Rates of antibiotic-related adverse events

- *C difficile* infections
- Diarrhea, loose stools unrelated to CDI
- Rash, hives
- Fluoroquinolones: Tendon rupture, hypo/hyperglycemia, confusion, seizure, neuropathy, others

Requires careful review of clinical records to determine causality

- Naranjo adverse drug reaction probability scale
- Classify causal relationship as definite, probable, possible, doubtful

Request assistance from

- Consultant pharmacist as part of monthly drug use evaluation
- Medical director
- Specific nurse caring for resident who experienced the ADR

Example of Tool for Evaluating ADR

[Facility Logo] | Resident Label

Adverse Drug Reaction Worksheet

Evaluation Date: _____ **Evaluated By:** _____ **Date of Adverse Reaction:** _____

Suspect Medication: _____ **Dosing Regimen:** _____ **Is medication new?** ☐ Yes ☐ No

Adverse Reaction: _____

(Refer to a list of common adverse antimicrobial reactions in Table 1 on the next page)

Probability Reaction Related to Medication (from the Naranjo Probability Scale below):

☐ Definite (≥ 9) ☐ Probable (5-8) ☐ Possible (1-4) ☐ Doubtful (0)

Consequence of Adverse Reaction (check all that apply):

☐ No change-therapy continued
☐ Increased monitoring
☐ Disability
☐ Hospitalization
☐ Therapy changed to another agent
☐ Symptomatic medical treatment
☐ Permanent Damage
☐ Other (specify): _____
☐ Therapy discontinued
☐ Corrective surgical procedure
☐ Delayed discharge

Reviewer: _____ **Date:** _____

Naranjo Adverse Drug Reaction Probability Scale (with modifications)

The following scale is used to assess the likelihood a particular adverse reaction is related to a medication. Answer each of the 10 questions, calculate total score, and determine if an adverse drug reaction is Definitely, Probably, Possibly, or unlikely related to the drug in question. *(Interpretation of the probability classification can be found in Table 2 on the next page)*

Question	Yes	No	Do Not Know	Score
1. Are there previous CONCLUSIVE reports on this reaction?	+1	0	0	
2. Did the adverse reaction appear after the suspected drug was administered?	+2	−1	0	
3. Did the adverse reaction improve when the drug was discontinued or a specific antagonist given?	+1	0	0	
4. Did the adverse reaction reappear when the drug was readministered?	+2	−1	0	
5. Are there alternative causes (other than the suspect drug) that could have caused the reaction?	−1	+2	0	
6. Did the reaction reappear when a placebo was given?	−1	+1	0	
7. Was the drug detected in blood or other fluids in concentrations known to be toxic?	+1	0	0	
8. Was the reaction more severe when dose was increased or less severe when dose was decreased?	+1	0	0	
9. Did the patient have a similar reaction to the same or similar drugs in any previous exposure?	+1	0	0	
10. Was the adverse reaction confirmed by any objective evidence?	+1	0	0	
	Total Score			

Table 1. List of Common Adverse Antimicrobial Reactions*

Drug Class	Class Member	Common Adverse Reaction
Penicillins +/- Beta-Lactamase inhibitors	Ampicillin, Ampicillin-Sulbactam, Amoxicillin, Amoxicillin-Clavulanate, Cloxacillin, Dicloxacillin, Nafcillin, Oxacillin, Penicillin, Piperacillin-Tazobactam	Nausea, vomiting, diarrhea, *C difficile* infection, allergic reactions (including rash, hemolytic anemia), elevated serum creatinine, bone marrow suppression with long-term use, phlebitis with IV therapy
Cephalosporins +/- Beta-Lactamase inhibitors	Cefaclor, Cefazolin, Cefdinir, Cefditoren, Cefepime, Cefixime, Cefotetan, Cefoxitin, Cefpodoxime, Cefprozil, Ceftaroline, Ceftazidime, Ceftazidime-Avibactam, Ceftibuten, Ceftolozane-Tazobactam, Ceftriaxone, Cefuroxime, Cephadroxil, Cephalexin	Nausea, vomiting diarrhea, *C difficile* infection, allergic reactions (including rash, serum sickness), altered mental status
Carbapenems	Doripenem, Ertapenem, Imipenem-Cilastatin, Meropenem	Nausea, vomiting, diarrhea, *C difficile* infection, seizure
Fluoroquinolones	Ciprofloxacin, Delafloxacin Levofloxacin, Moxifloxacin	Disorientation, delirium, agitation, seizure, hypo- or hyper-glycemia, peripheral neuropathy, tendon rupture, QT prolongation, nausea, vomiting, *C difficile* infection, increased in liver function tests, aortic dissection
Macrolides	Azithromycin, Clarithromycin, Erythromycin	Nausea, vomiting, elevation in liver function tests, reversible tinnitus or deafness, taste alteration, phlebitis with IV therapy
Tetracyclines	Doxycycline, Minocycline, Tetracycline	Nausea, vomiting, sunburn, esophageal ulcer, phlebitis with IV therapy, teeth discoloration
Sulfonamides	Sulfamethoxazole-Trimethoprim	Allergic reactions (rash, hives, drug fever, Steven-Johnson Syndrome), headache, sunburn, hyperkalemia, worsen renal functions, bone marrow suppression, hemolytic anemia, hypoglycemia (especially with sulfonylureas)
Glycopeptides	Telavancin, Vancomycin IV	Redman syndrome (flushing, itching, hypotension), worsened renal functions
Others	Clindamycin, Metronidazole, Nitrofurantoin	All: Nausea, vomiting; Clindamycin: diarrhea, *C difficile* infection, taste alteration; Metronidazole: disulfiram reaction after alcohol (flushing, dyspnea), taste alteration, peripheral neuropathy; confusion, Nitrofurantoin: interstitial pneumonitis especially with chronic use, hemolytic anemia

* The above list does not include all antimicrobials or all adverse drug reactions. Consult drug references and published literature for additional information if an adverse drug reaction not listed above is suspected.

Table 2. Interpretation of Probability Categories

Category	Score Range	Interpretation
Definite	≥ 9	Reaction 1) followed a reasonable temporal sequence after a drug or in which a toxic drug level had been established in body fluids or tissues; 2) followed a recognized response to the suspected drug; and 3) was confirmed by withdrawal but not by exposure to the drug
Probably	5 – 8	Reaction 1) followed a reasonable temporal sequence after a drug; 2) followed a recognized response to the suspected drug; 3) was confirmed by withdrawal but not by exposure to the drug; 4) could not be reasonably explained by the known characteristics of the patient's clinical state
Possible	1 – 4	Reaction 1) followed a temporal sequence after a drug; 2) possibly followed a recognized pattern to the suspected drug; 3) could be explained by characteristics of the patient's disease
Doubtful	0	Reaction was likely related to factors other than a drug

Reference

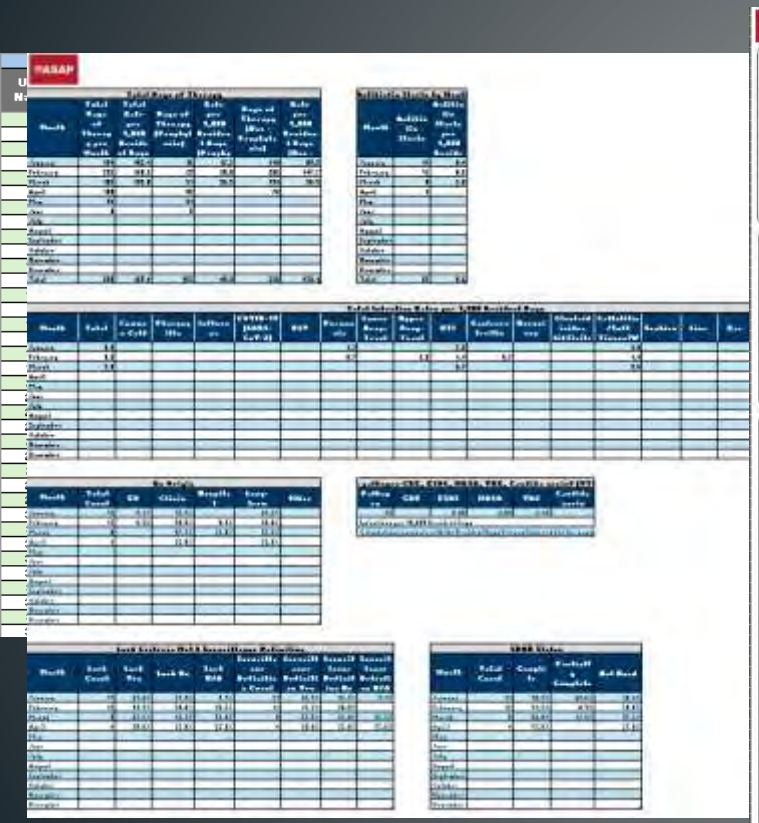
Naranjo CA, *et al.* A method for estimating the probability of adverse drug reactions. Clin Pharmacol Ther 1981;30:239-45.

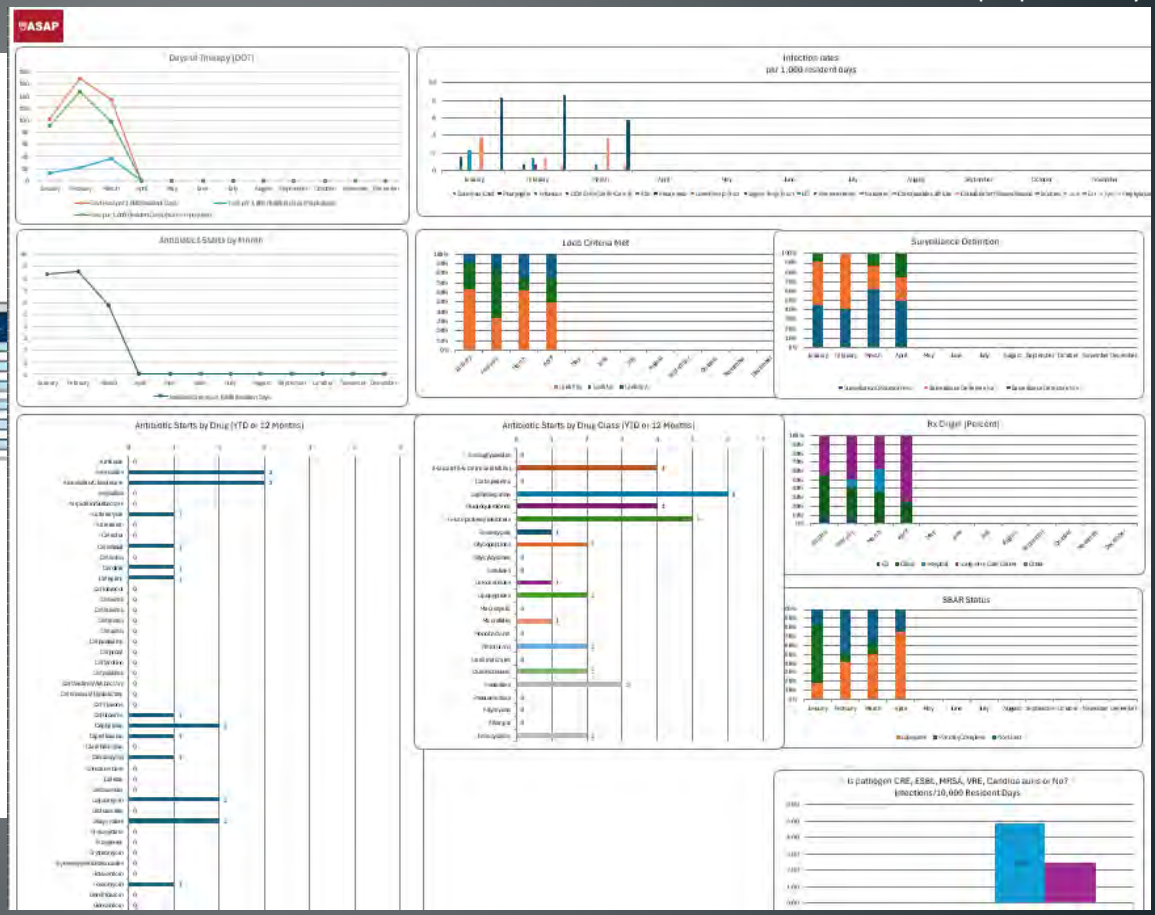
https://asap.nebraskamed.com/long-term-care/tools-templates-long-term-care/

Demonstration of Nebraska ASAP Infection and Antibiotic Tracking Tool

Refer to pages 35–37 in the Workbook

Note: Fictitious data for illustration purposes only





[Tools and Templates for Long Term Care - ASAP]

Reporting Data

Reporting Antimicrobial Stewardship Data Activities and Outcomes

CDC recommends reporting tracked data to:

- Clinical providers
- Nursing staff

Optional: selective data to residents/families

What good is it if no one knows about it!

- Data can increase buy-in
- Resistance rate may deter use
- Rate of inappropriate UA/culture may improve use of assessment tool
- Justify your time and efforts in the facility

Reporting Antimicrobial Stewardship Activities and Outcomes

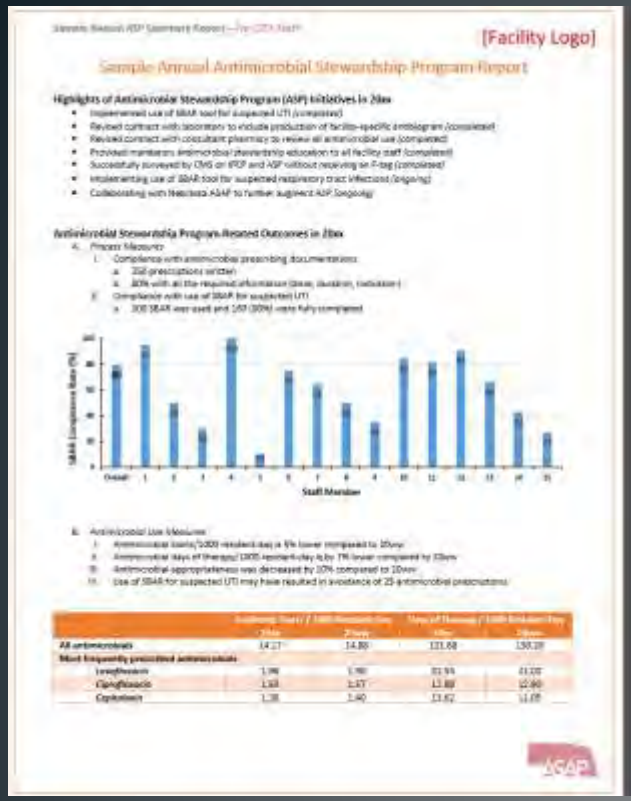
What to report

- Antibiotic use data (starts, DOT)
- Rates of specific infections
- Interventions (actions) made and any outcomes
- Compliance to policy (met criteria before starting antibiotics)
- Outlier data

How to report

- Use existing system
  - Newsletter, QAPI report, posters, prescriber letters
- Frequency varies based on type of information
  - Annually for antibiogram, antibiotic spending
  - Quarterly, semi-annually, or annually for other info such as intervention outcomes

Report Out Templates

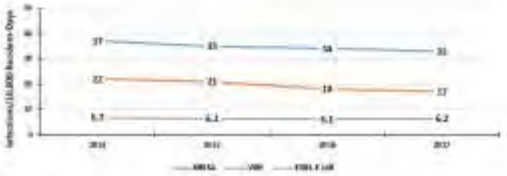

[Facility Logo]

Sample Annual Antimicrobial Stewardship Program Report

Highlights of Antimicrobial Stewardship Program (ASP) Initiatives in 20xx

- Implemented use of SBAR tool for suspected UTI (completed)
- Revised contract with laboratory to include production of facility-specific antibiogram (completed)
- Revised contract with consultant pharmacy to review all antimicrobial use (completed)
- Provided mandatory antimicrobial stewardship education to all facility staff (completed)
- Successfully surveyed by CMS on tRDP and ASP without receiving an F-tag (completed)
- Implementing use of SBAR tool for suspected respiratory tract infections (ongoing)
- Collaborating with Nebraska ASAP to further augment ASP (ongoing)

Antimicrobial Stewardship Program-Related Outcomes in 20xx



Proposed ASP Activities for 20yy

- Continue implementation of SBAR for suspected respiratory tract infections
- Continue collaboration with Nebraska ASAP with live and direct videoconferencing during ASP meetings
- Improve completion rate for UTI SBAR to 85% or more
- Track compliance rate for respiratory tract infection SBAR once implementation has been completed
- Reduce antimicrobial prescriptions with missing required documentation to 10% or lower
- Decrease fluoroquinolone use by 10% (either starts or days of therapy/1000 resident days)

Provider Feedback Letter Templates

Receiving therapy UTI duration 2024

Receiving therapy, not meeting clinical criteria, catheterized 2024

Receiving therapy, not meeting microbiologic criteria, or non-susceptible organism, catheterized 2024

Receiving therapy, not meeting microbiologic criteria, or non-susceptible organism, uncatheterized 2024

Receiving therapy, not meeting clinical criteria, uncatheterized 2024

Therapy completed, not meeting clinical criteria, catheterized 2024

Therapy completed, not meeting clinical criteria, uncatheterized 2024

Therapy completed, not meeting microbiologic criteria, catheterized 2024

Therapy completed, not meeting microbiologic criteria, uncatheterized 2024

Therapy completed, UTI duration 2024

Tools and Templates for Long Term Care - ASAP

Demonstration of Nebraska ASAP Infection and Antibiotic Tracking Tool –

Charts and Tables for Reporting

Dan German

Turning Reported Data Into Action

Low compliance with prescription documentation

- Provider education
- Policy to enforce or reinforce compliance
- If verbal order, implement process to obtain all required information

Low compliance with assessment / SBAR tool use

- Nursing staff education
- One-on-one feedback
- Evaluate ease-of-use of tools

High rates of infections

- Discuss with Infection Preventionist
- Examine infection control practices
- Review urinary catheter cares, wound cares, peri cares, etc.

Slide credit: Alex Neukirch, PharmD Consultant Pharmacist, Consonus Pharmacy

High rates of hospitalization

- Examine reasons: infectious vs. non-infectious causes
- If infectious:
  - Review antibiotic request, med administration procedures
  - Review empiric antibiotic use
  - Review adverse event rates

High resistance rates for certain antibiotics

- Review use of the antibiotic in question
  - Remove antibiotic from any facility guidelines

High rates of use in certain classes of antibiotics

- Antibiotic classes may become a target for improvement (e.g., fluoroquinolones)
- Antibiotic agents used for the treatment of specific infections (e.g., *C. difficile* or UTIs)

Location of antibiotic initiation

- Prescriber education
- Encourage antibiotic reassessments/timeouts
- Engage referring hospitals and emergency departments

Slide credit: Alex Neukirch, PharmD
Consultant Pharmacist, Consonus Pharmacy

High Frequency of antibiotic starts not meeting criteria

- Nursing education on tools
- Prescriber education on appropriate criteria
- Medical director involvement if necessary

Duration of therapy longer than necessary

- Prescriber education
- Facility treatment guidelines
- Implement antibiotic time-out tool
- Medical director involvement if necessary

High rate of bug-drug mismatch

- Prescriber education on antibiogram
- Facility treatment guidelines

Slide credit: Alex Neukirch, PharmD
Consultant Pharmacist, Consonus Pharmacy

Benchmarking Antibiotic Use Data in Long-Term Care

Antibiotic Use Rates in Long-Term Care

- Antibiotic orders from electronic health records in over 1,600 nursing homes in 2016
  - 54% of residents received at least one antibiotic order
    - Prescribing rate: 81 DOT/1,000 Resident Days
  - Significant variability in antibiotic use rates by facility
    - Facilities with more short-stay residents have higher antibiotic use rates

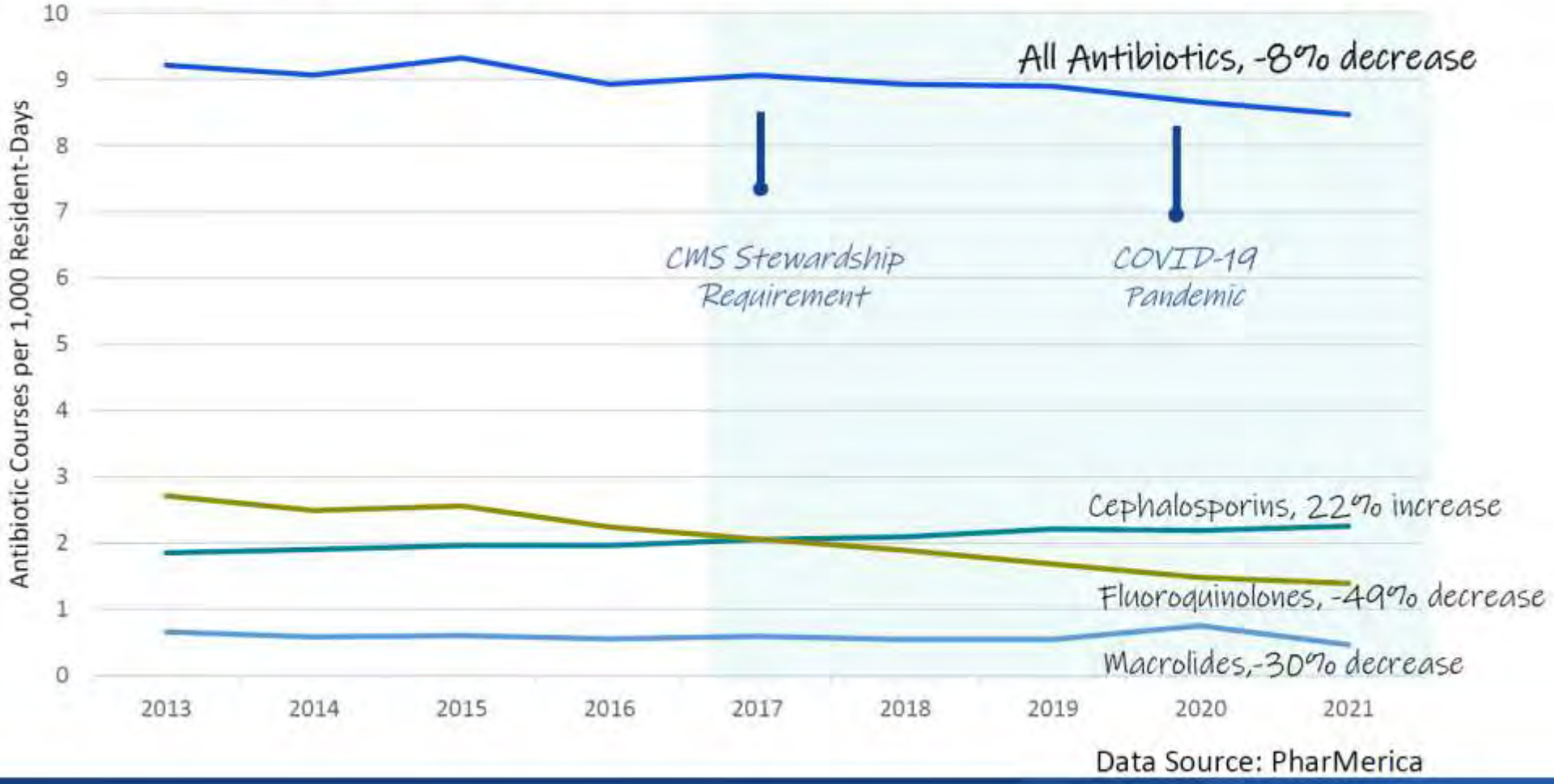
Facility-level Rates	Overall	Facilities with ≥75% Short-Stay Residents	Facilities with <75% Short-Stay Residents
DOT/1,000 Resident Days, Median (IQR)	81 (43-140)	90	38

Kabbani S, Wang SW, Ditz LL, et al. Description of antibiotic use variability among US nursing homes using electronic health record data. Antimicrobial Stewardship & Healthcare Epidemiology. 2021;1(1):e58. doi:10.1017/ash.2021.207

https://www.cambridge.org/core/journals/antimicrobial-stewardship-and-healthcare-epidemiology/article/description-of-antibiotic-use-variability-among-us-nursing-homes-using-electronic-health-record-data/68769AAD1D0DD906257C4BF180AE7CE7

LTC Pharmacy Dispensing Data to Track Antibiotic Use

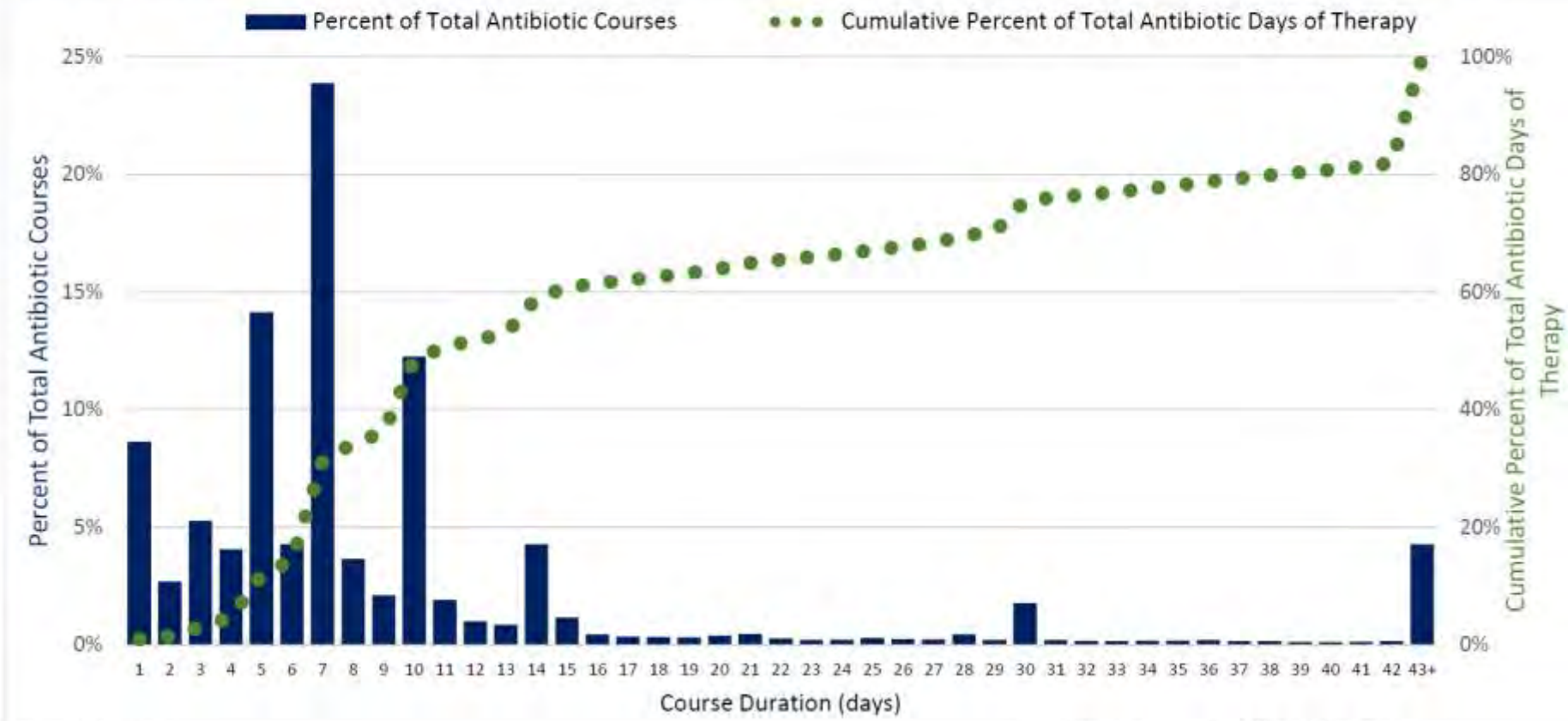
Decreases in Antibiotic Use Rates in LTC Facilities, 2013-2021



Description of national antibiotic prescribing rates in U.S. long-term care facilities, 2013–2021 | ASHE

LTC Pharmacy Dispensing Data to Track Antibiotic Use

18% of antibiotic DOTs were contributed by courses longer than 42 days.



Gouin et al., ASHE 2024

Data Source: PharMerica

[Description of national antibiotic prescribing rates in U.S. long-term care facilities, 2013–2021 | ASHE]

ASAP

Antibiotic Use Collaborative Database for Nebraska LTCF

- An opportunity is available for Nebraska LTCF to collaborate with antimicrobial stewardship experts through the Nebraska ASAP program
- The aim of the Nebraska ASAP LTCF Antibiotic Use Tracking Collaborative is to provide participating LTCFs with both **facility-specific** and **benchmarked** antibiotic use information to guide their initiatives
- There are currently 39 LTCF enrolled in the database

How to Participate

Step 1:

ASAP LTC AU Database

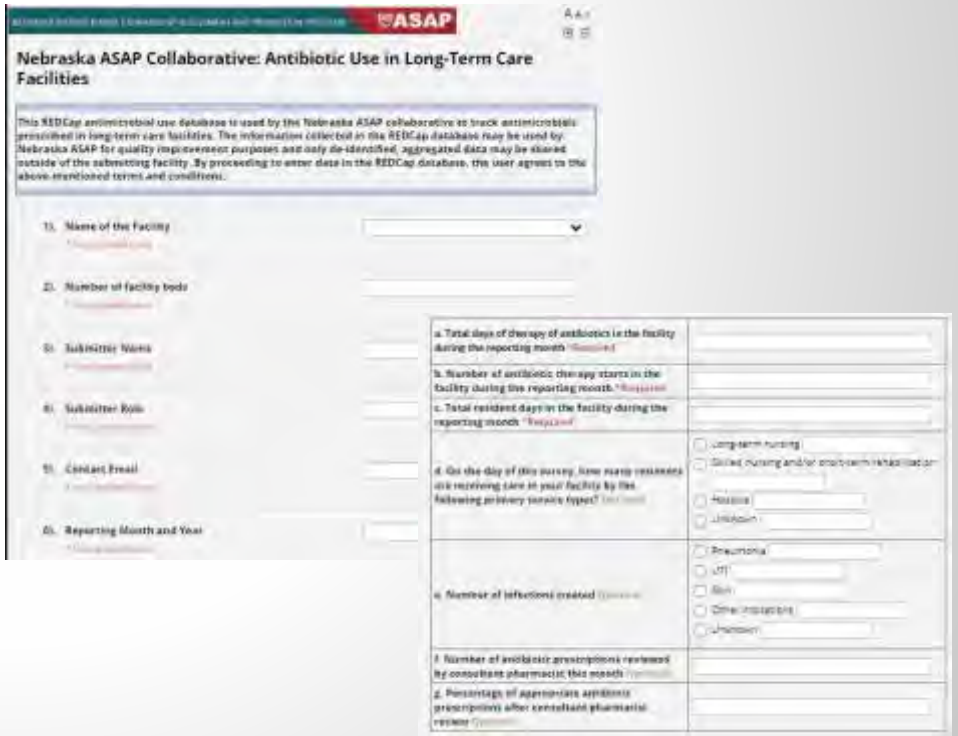
Commitment Letter

Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP) Long-Term Care Facility Antibiotic Use Tracking Collaborative Commitment Letter

Step 2:

Nebraska ASAP will email you a link each month to enter 3 data points.

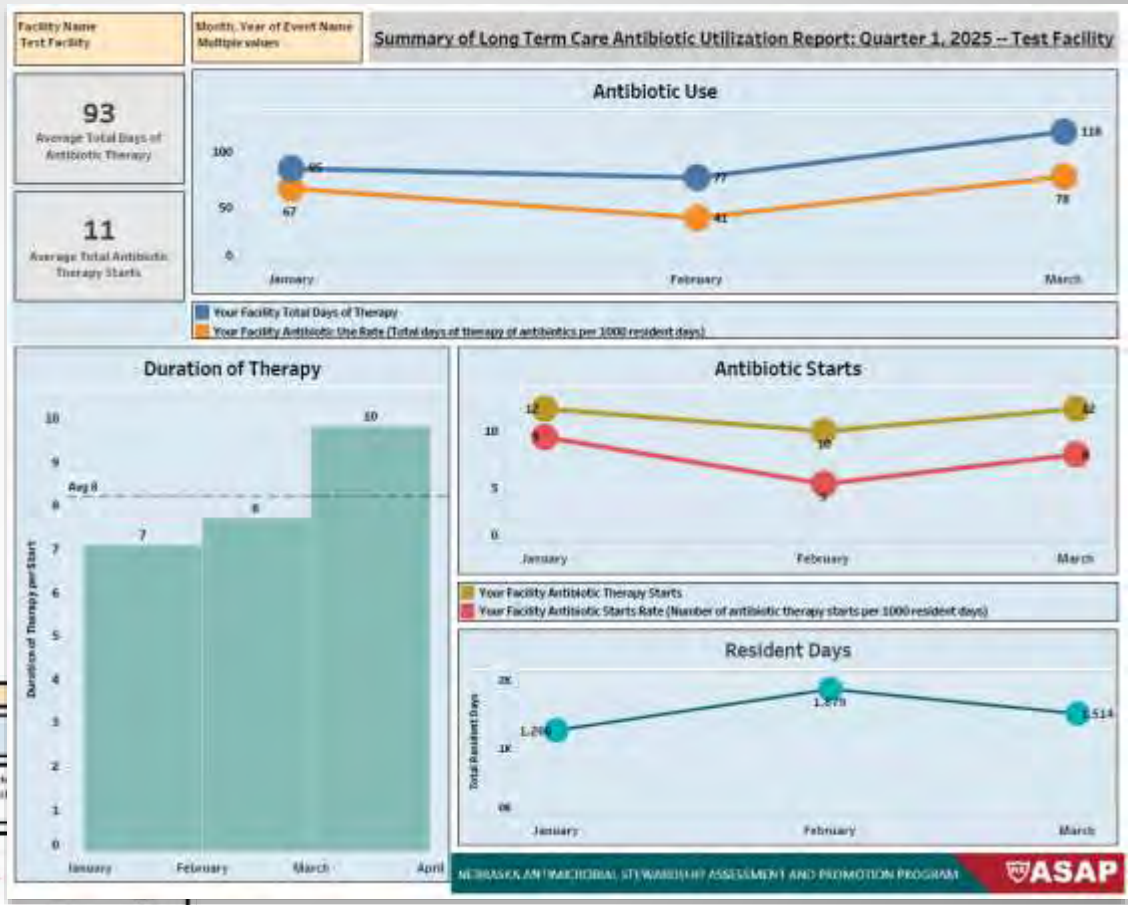
- **Total days of antibiotic therapy**
- **Number of antibiotic starts**
- **Total resident days**

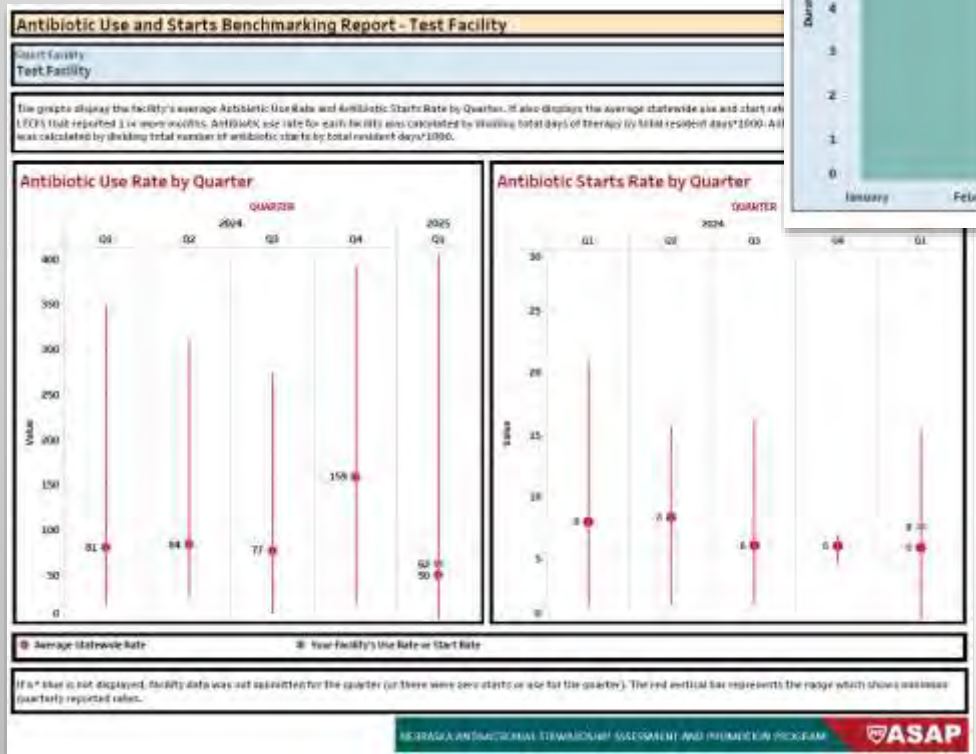


Nebraska ASAP Collaborative: Antibiotic Use in Long-Term Care Facilities

Sample LTC Antibiotic Use report:

Facility Level Data – Page 1



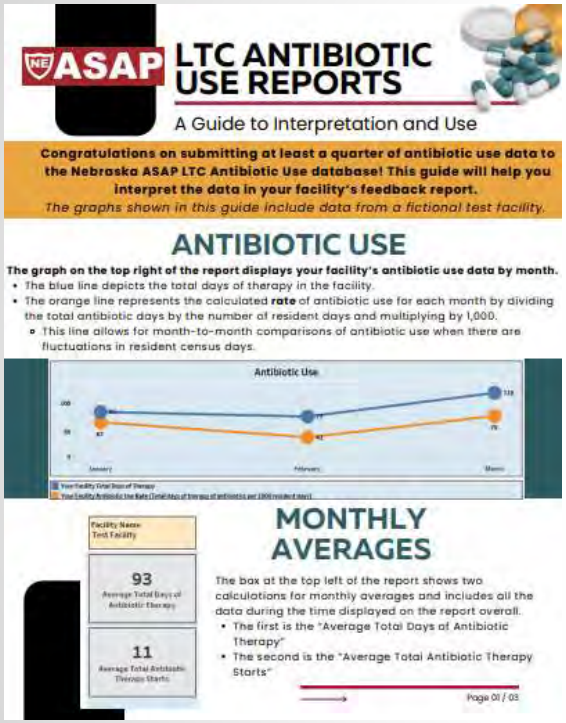


Collaborative Comparative Data – Page 2

ASAP

ASAP will provide:

- ✓ Report interpretation guide
- ✓ Access to an ID physician/pharmacist for assistance



ASAP LTC ANTIBIOTIC USE REPORTS

A Guide to Interpretation and Use

Congratulations on submitting at least a quarter of antibiotic use data to the Nebraska ASAP LTC Antibiotic Use database! This guide will help you interpret the data in your facility's feedback report.

The graphs shown in this guide include data from a fictional test facility.

ANTIBIOTIC USE

The graph on the top right of the report displays your facility's antibiotic use data by month.

- The blue line depicts the total days of therapy in the facility.
- The orange line represents the calculated **rate** of antibiotic use for each month by dividing the total antibiotic days by the number of resident days and multiplying by 1,000.
  - This line allows for month-to-month comparisons of antibiotic use when there are fluctuations in resident census days.

Antibiotic Use

MONTHLY AVERAGES

Facility Name: Test Facility

93

11

The box at the top left of the report shows two calculations for monthly averages and includes all the data during the time displayed on the report overall.

- The first is the "Average Total Days of Antibiotic Therapy"
- The second is the "Average Total Antibiotic Therapy Starts"

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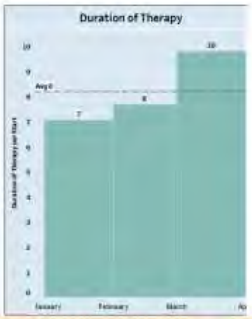

Duration of Therapy

DURATION OF THERAPY

The bar chart at the lower left shows the average duration of therapy for each month. This is calculated by dividing the total number of antibiotic days submitted by the number of antibiotic starts.

The line on the chart shows the average for the entire timeframe included in the report. In this example, the facility had an average duration of therapy of 8 days over the first quarter of 2025. (Numbers are being rounded, so you may notice the dashed line or the bar in the chart are exactly marking 8 on the Y axis.)

The graph in the middle right of the report displays your facility's antibiotic start data by month.

- The gold line depicts the total number of antibiotic starts each month in the facility.
- The red line represents the calculated **rate** of antibiotic starts for each month by dividing the total antibiotic starts by the number of resident days and multiplying by 1,000.
  - This line allows for month-to-month comparisons of antibiotic starts when there are fluctuations in resident census days.

ANTIBIOTIC STARTS

Antibiotic Starts

RESIDENT DAYS

The line graph at the lower right displays the number of resident days for each month.

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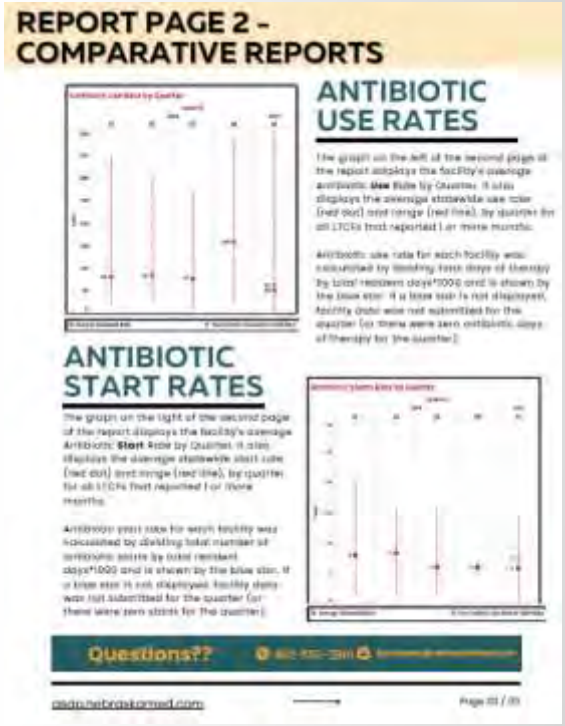

REPORT PAGE 2 - COMPARATIVE REPORTS

ANTIBIOTIC USE RATES

ANTIBIOTIC START RATES

Questions??

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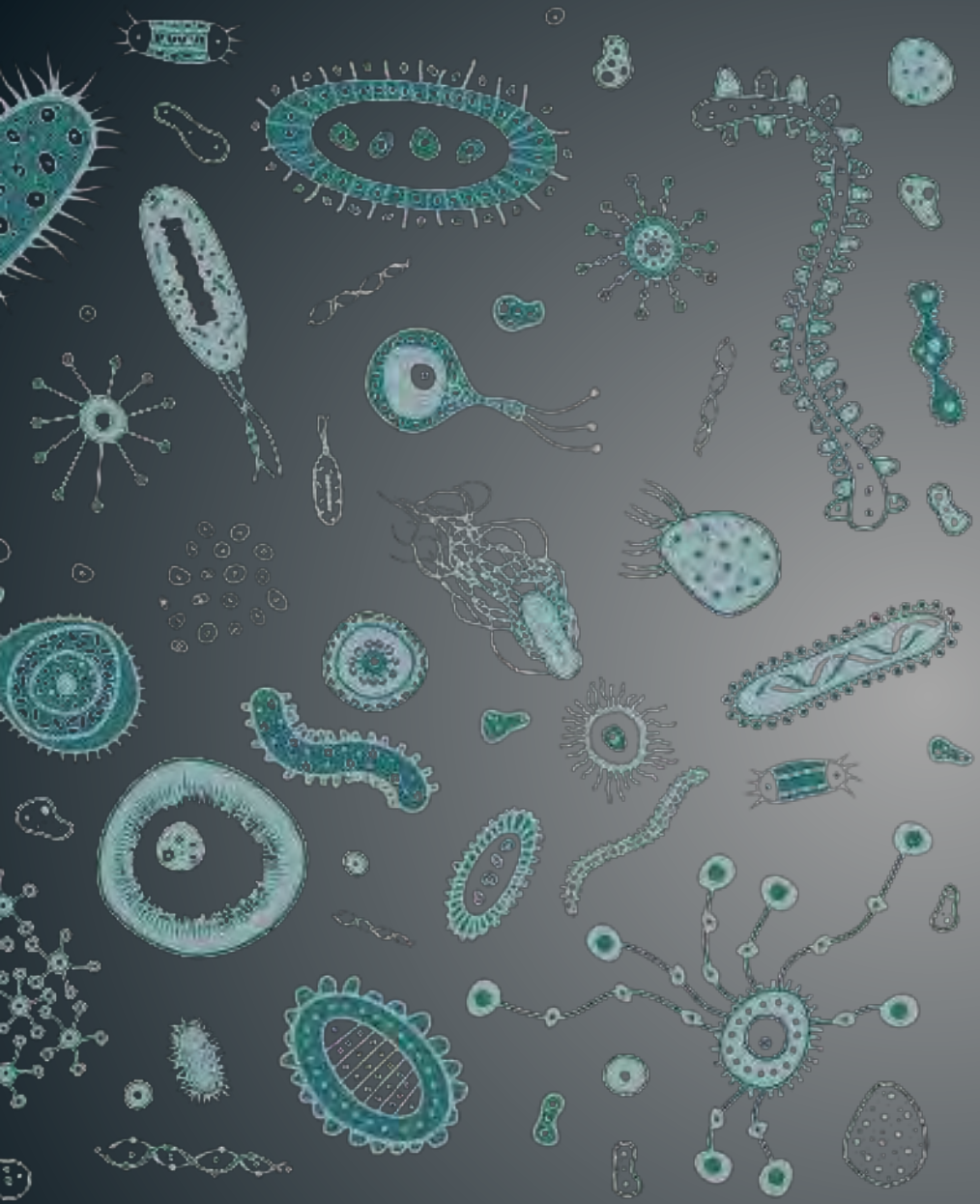

Thank you!

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