pennsylvania
DEPARTMENT OF HEALTH
BUREAU OF EPIDEMIOLOGY

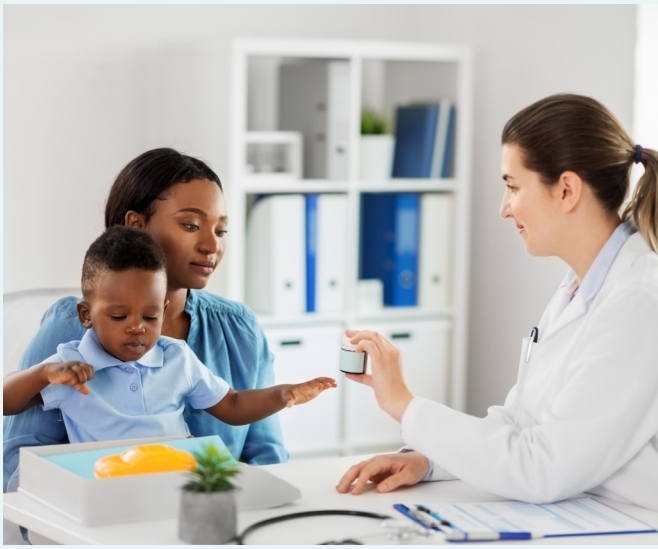
THE STEWARD

2024 QUARTER 2

Quarterly Newsletter of the Division of Healthcare Associated Infection Prevention

Identification of High Antibiotic Prescribers: An Analysis of CMS Medicare Part D Data

By: Qaiser Jahan, Pharm.D, MPH



The evaluation of antibiotic prescribing patterns among healthcare providers can be used to inform antibiotic stewardship initiatives that seek to improve prescribing. Judicious antibiotic prescribing is encouraged to preserve antibiotic efficacy, minimize adverse events in patients, and limit the development and spread of organisms that are resistant to antibiotics. (CDC, 2019)
(Read more on Page 2)

A Window into *Candida auris* Public Health Response

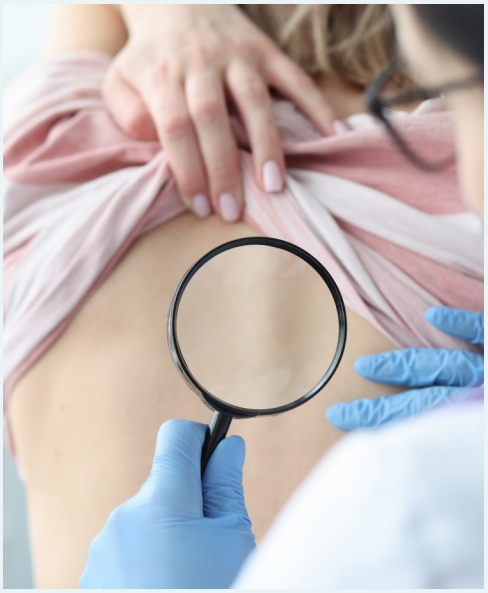
By: Jenna Sinkevitch, MSPH, CIC

Most of you already know about *Candida auris*, the multidrug-resistant fungus causing severe infections in healthcare settings, but the public health efforts that go into responding to cases of *C. auris* can give a wider understanding of this pathogen. Let's walk through the steps of a new *C. auris* investigation from the Pennsylvania Department of Health's (PA DOH) perspective.

(Read more on Page 3)

Antimicrobial Prescribing Patterns and Pathogen Identification in Pennsylvania Nursing Homes, 2021-2022

By: William Phillips, MPH



Pennsylvania nursing homes are mandated to report healthcare-associated infections (HAIs) to the Patient Safety Authority via the Pennsylvania Patient Safety Reporting System (PA-PSRS) (Patient Safety Authority, 2024). We used R software to analyze PA-PSRS data from 2021 and 2022 to examine the characteristics of antimicrobial prescribing patterns and pathogen identification within Pennsylvania nursing homes (R Core Team, 2024).

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Identification of High Antibiotic Prescribers in Pennsylvania: An Analysis of CMS Medicare Part D Data

By: Qaiser Jahan, Pharm.D, MPH

As part of these efforts, we analyzed publicly available Medicare Part D claims data from 2020 and 2021 that were provided by the Centers for Medicare and Medicaid Services (CDC, 2019, 2020). We examined outpatient antibiotic prescribing in Pennsylvania and evaluated the characteristics of prescribers using R statistical software version 4.3.1. (R Core Team, 2024). Individuals who prescribed fewer than eleven antibiotic prescriptions annually, medical specialties with fewer than 100 prescribers, and advanced practice providers with no documented setting of practice were excluded from analysis. Related medical specialties were combined. Antibiotic prescribing practices were compared in rural and urban areas based on Rural-Urban Commuting Area (RUCA) codes from the United States Department of Agriculture. (Economic Research Services, 2023)

In both 2020 and 2021, dentistry had the highest antibiotic prescribing percentage (Table 1). Oral and maxillofacial surgery, plastic and reconstructive surgery, emergency medicine and infectious disease were among the top five medical specialties with highest percentage of their total Medicare Part D claims coming from antibiotics in both years. Four of the top five medical specialties displayed higher antibiotic prescribing percentages in rural areas when compared to urban areas for both years (Figure 1).

For both 2020 and 2021, 77% of prescriptions from rural dentists were written for antibiotics and 66% of prescriptions from urban dentists were written for antibiotics. Antibiotic prescribing percentages were similar between prescriber genders for both years.

This analysis is restricted in scope to Medicare Part D claims only. The data includes only prescriptions written for individuals who are eligible for Medicare and choose to enroll in the optional Medicare Part D coverage.

Table 1. Top five medical specialties with the highest antibiotic prescribing percentages
Pennsylvania, 2020 & 2021

SPECIALTY	2020	2021
Dentistry	67 %	67 %
Oral and Maxillofacial Surgery	43 %	43 %
Plastic and Reconstructive Surgery	37 %	35 %
Emergency Medicine	24 %	25 %
Infectious Disease	23 %	27 %

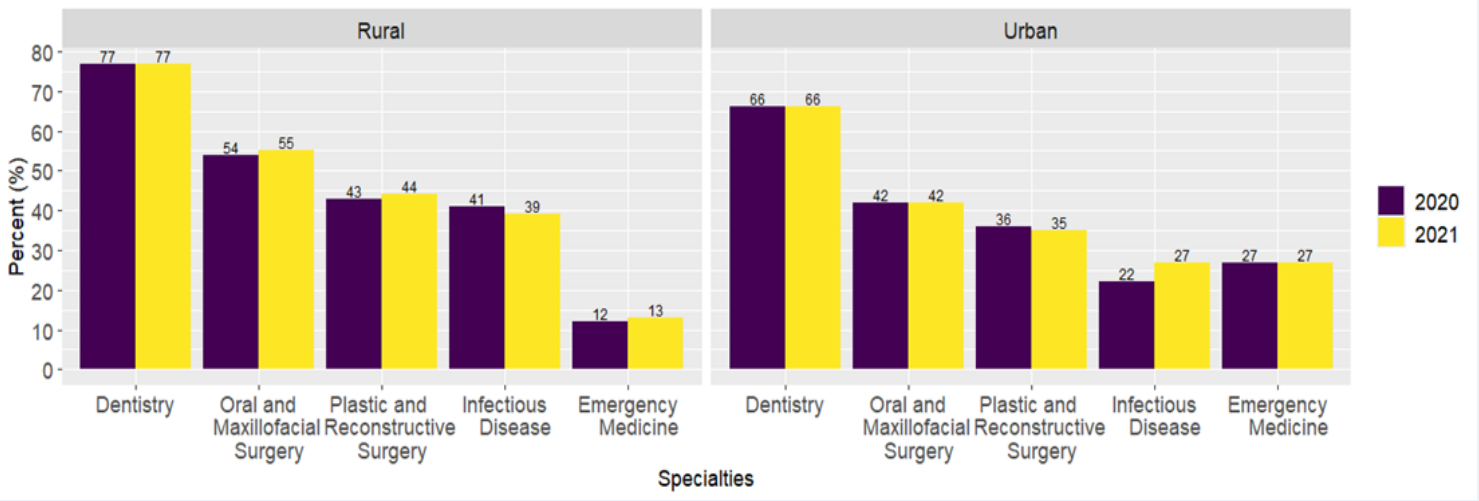

Figure 1. Antibiotic prescribing percentages for the top five medical specialties, stratified by rural and urban settings | Pennsylvania, 2020 & 2021

A Window into *Candida auris* Public Health Response

By: Jenna Sinkevitch, MSPH, CIC

Imagine you are a healthcare-associated infection (HAI) outbreak epidemiologist in the Bureau of Epidemiology at the Pennsylvania Department of Health (PA DOH).

You have just received notification of a *C. auris* infection in a skilled nursing facility. Luckily, PA DOH has a process to follow for responding to cases (Figure 1).

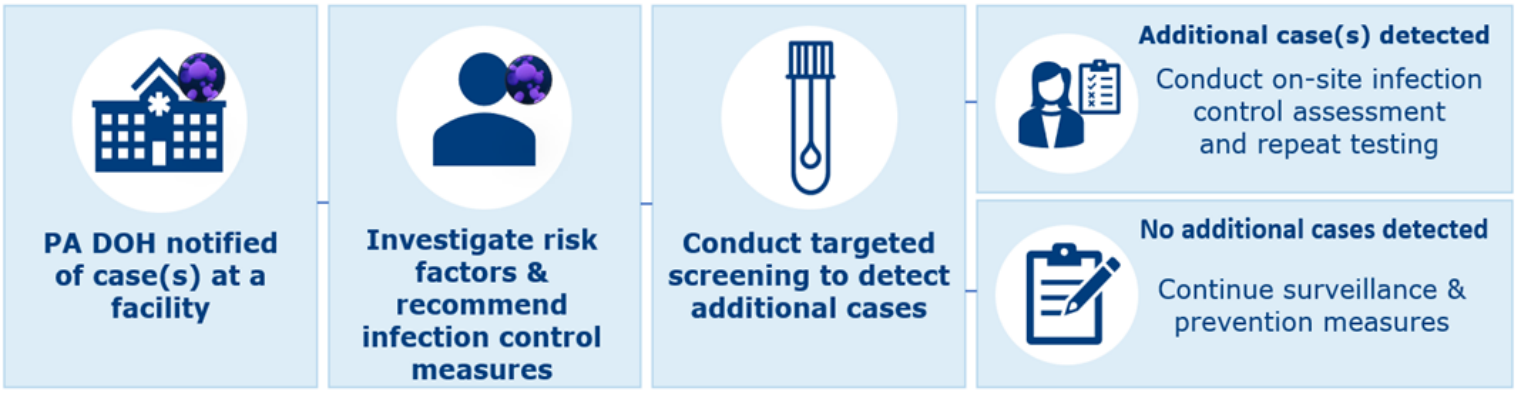

Figure 1. Process of PA DOH's *Candida auris* response

Your first step is to gather information on the case-resident and the facility where they are residing. There are crucial epidemiologic details to investigate, including:

- **Close contacts** – Does the case-resident have a roommate or share a bathroom?
- **Healthcare history** – Has the resident been admitted to other facilities?
- **Medical conditions** – Does the case-resident have any invasive devices or wounds?
- **Travel history** – Did the case-resident have recent out-of-state or international travel?
- **Cleaning** – Is the facility using a disinfectant known to kill *C. auris* (i.e., **List P**)?
- **Transmission-based precautions** – Is the facility using the proper precautions?

You speak with the facility's infection preventionist (IP) and offer several resources on responding to cases of *C. auris*, including the PA DOH Healthcare Facility Toolkit.

You discover the case-resident is sharing a room with one other resident. The floor they are on is a high-risk unit because most residents on that floor have invasive devices or wounds, including the case-resident. You suggest placing the case-resident in a private room, but this is not possible because the unit is full.

This is a common barrier, so you emphasize the proper use of Enhanced Barrier Precautions, making sure gloves, gowns, and alcohol-based hand rub are readily available, and reinforcing hand hygiene among staff. Due to the high acuity of the residents, you recommend screening everyone on the unit for *C. auris* colonization.

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A Window into *Candida auris* Public Health Response

(Continued from page 3)

It is your responsibility to coordinate screening between the facility and the laboratory. You reach out to the state public health laboratory (Bureau of Laboratories or BOL) to request the swabs and schedule the date of screening. BOL will send all the supplies the facility needs for screening and shipping the specimens back to the laboratory for testing, at no cost to the facility.

The results are back, and you discover two colonized cases of *C. auris*: the roommate of the case-resident and a resident across the hall. Due to the hardy nature of *C. auris*, you want to conduct an on-site assessment at the facility to help them identify any gaps in infection control. Your observations are based on the key pillars of infection control (Figure 2) and utilize standard assessment forms whenever possible.

Figure 2. Key pillars of *C. auris* infection control

- **Infection control policies**
- **Hand hygiene** (Tool)
- **Environmental cleaning** (Tool)
- **Personal protective equipment**
- **Wound care** (Tool)
- **Respiratory care**

Once you identify the gaps in infection control at the facility, you send them a letter outlining your observations and giving recommendations to improve each gap, with resources from leading organizations in the field. Additionally, you may suggest the facility reach out to PA Project Firstline to request on-site infection control training for free.

In the long-term, you may recommend a wider or repeat screening at the facility if you suspect transmission. The IP works with staff of all disciplines to provide education on the key pillars of infection control and implement policies and procedures that will ensure the residents' safety.

You and the rest of the HAI team at PA DOH remain available to help the facility with any resources, questions, and screenings they need, and to support any future responses.

You may contact the PA DOH Multidrug-resistant Organism (MDRO) Prevention Team at **DHHAI@pa.gov** to provide ongoing assessment, training, or screening if the facility remains high risk for *C. auris* transmission or introduction. Communication and coordination among the different components of the PA DOH HAI team, the facility, and BOL are critical to the success of *C. auris* outbreak response.

Antimicrobial Prescribing Patterns and Pathogen Identification in Pennsylvania Nursing Homes, 2021-2022

By: William Phillips, MPH

Antibiotic prescribing was evaluated for each HAI for both 2021 and 2022 (Figure 1). In both years, cephalexin was the most frequently prescribed antibiotic for skin and soft tissue infections (SSTIs), while nitrofurantoin was the most frequently prescribed for urinary tract infections (UTIs). Levofloxacin was the most commonly prescribed antibiotic for respiratory tract infections (RTIs) in both years. Vancomycin was the most commonly prescribed antibiotic for gastrointestinal system infections (GIs) and central line-associated bloodstream infections (CLABSIs) in both years.

Among the pathogens identified for each HAI, *Escherichia coli* was the most frequently isolated pathogen for UTIs, and *Pseudomonas aeruginosa* was the most frequently isolated pathogen for RTIs in both years (Figure 2). Methicillin-resistant *Staphylococcus aureus* was the most common pathogen associated with CLABSIs in 2021, whereas *Pseudomonas aeruginosa* was the most common pathogen associated with CLABSIs in 2022.

Of all antimicrobial agent treatments recorded in 2021, 16.0% (N = 2,610) had an identified pathogen. In 2022, 16.3% (N = 2,868) of all recorded antimicrobial treatments had an identified pathogen. This analysis shows trends in antibiotic prescribing and pathogen identification associated with HAIs in nursing homes, informing antibiotic stewardship and infection control measures.

For more information on healthcare-associated infections in long-term care settings from the Pennsylvania Patient Safety Authority, please refer to their 2021 (Kepner et al., 2022) and 2022 reports (Kepner et al., 2022).

Figure 1. Most frequently prescribed antimicrobial agents by infection type among nursing homes in Pennsylvania, PA-PSRS, 2021-2022 (N = 18,232)

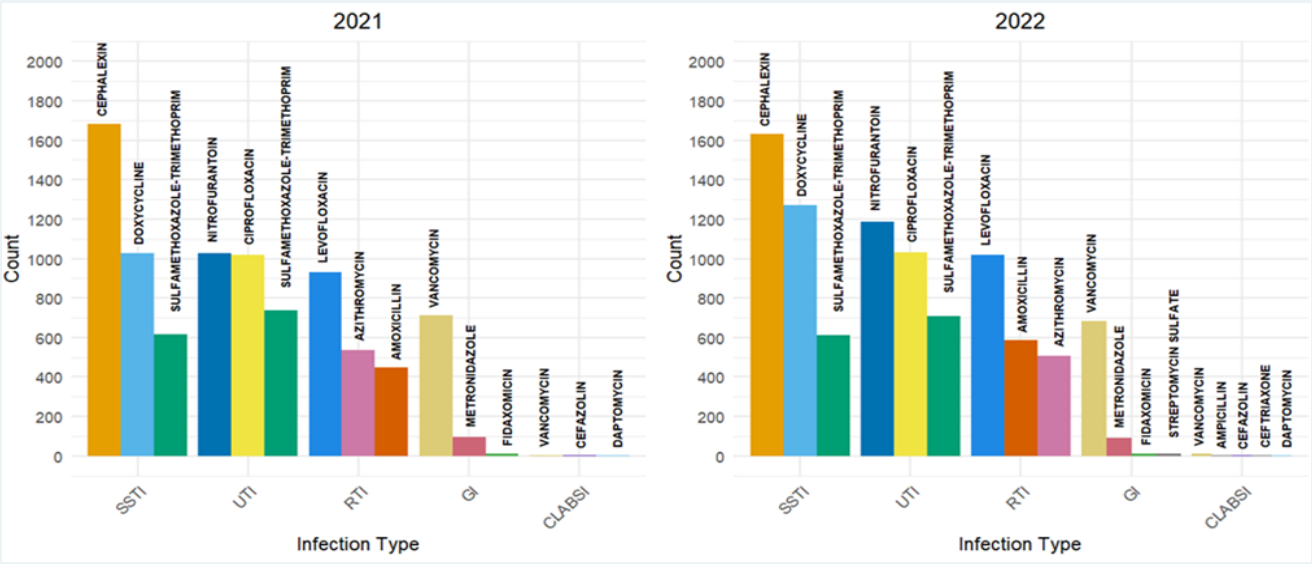
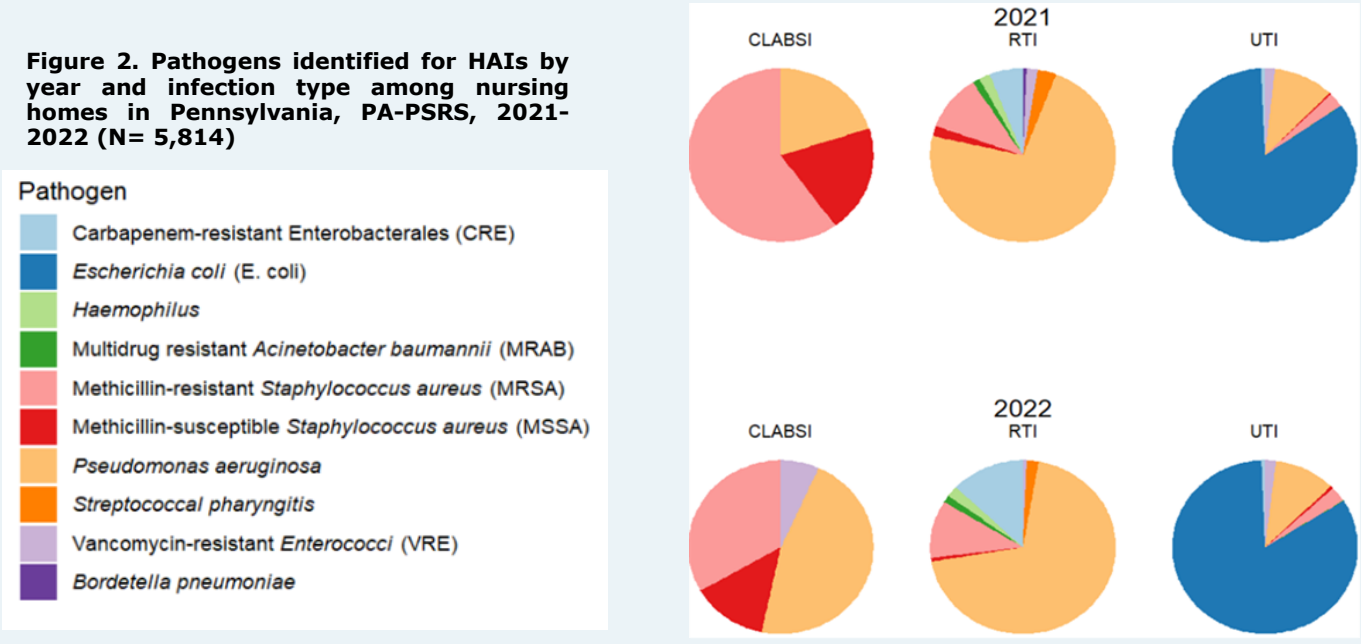


Figure 2. Pathogens identified for HAIs by year and infection type among nursing homes in Pennsylvania, PA-PSRS, 2021-2022 (N= 5,814)



News You Can Use

No-Cost Infection Prevention Resources for Skilled Nursing Facilities

Association for Professionals in Infection Control and Epidemiology (APIC) Consulting Services is offering a no-cost initiative funded by the Pennsylvania Department of Health to improve infection prevention and control (IPC) capacities and competency in skilled nursing facilities (SNFs) throughout the Commonwealth of Pennsylvania.

The initiative aims to equip SNF staff with the necessary skills, knowledge, and resources to effectively establish and maintain a comprehensive IPC program, including a respiratory protection program (RPP), a required component to maintain regulatory compliance. The RPP training course will cover key components such as training on proper respirator use, fit testing to ensure an adequate seal, medical evaluations to ensure workers can safely wear respirators, and policies/procedures for use, maintenance, and storage of respirators.

This no-cost initiative provides the following:

- Online, self-paced Respiratory Protection Program Training
- One-year APIC National Membership
- Online, self-paced Long-Term Care Infection Preventionist Essentials Training course

2020 and 2021 HAI REPORTS AVAILABLE ONLINE

The 2020 and 2021 HAI Reports from the Division of Healthcare Associated Infection Prevention are now available to view online. HAI reports contain summary measures for several CDC defined healthcare associated infections from a variety of hospitals.

This September, remember:

Infection Prevention is Sepsis Prevention!™

KEY POINTS

⇒ Sepsis is the body's extreme response to an infection. It is a life-threatening medical emergency.

⇒ Anyone can get an infection, and almost any infection can lead to sepsis.

CDC's *Get Ahead of Sepsis* educational effort helps educate consumers and healthcare providers about the importance of early recognition and timely treatment of sepsis, reassessment of antibiotic needs and prevention of infections.

National Health Observances

Month of July
Group B Strep Awareness Month

Month of September
Sepsis Awareness Month

September 13th
World Sepsis Day

September/October
Fungal Disease Awareness Week

Quarterly Data Update

Antimicrobial Resistant Organisms Reported in Pennsylvania

Carbapenemase	Quarter 1 - 2024 (01/01/2024 – 03/31/2024)				
	CRE	CRAB	CRPA	No Organism*	Total by Mechanism
KPC	6	0	1	0	7
NDM	7	0	0	0	7
IMP	0	0	0	0	0
OXA-like	2	15	0	0	17
VIM	0	0	1	0	1
Carbapenemase detected by phenotype, no genotype detected	6	1	0	0	7
Total by Organism	21	16	2	0	39

	Clinical	Colonized	Total
Candida auris	6	15	21

***Organisms not tested for during point prevalence survey screening**

Abbreviations:
CRE=Carbapenem-resistant Enterobacterales
CRAB=Carbapenem-resistant *Acinetobacter baumannii*
CRPA=Carbapenem-resistant *Pseudomonas aeruginosa.*
Learn more about carbapenemases and CRE at:
CDC CRE Technical Information

*Data include all counties in PA except for Philadelphia. The counts were captured through voluntary reporting by health care facilities and laboratories, including the PA Bureau of Laboratories. Philadelphia's surveillance data is available at https://hip.phila.gov/data-reports-statistics/healthcare-associated-infections.

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