

NORTHERN HEALTH

ANTIMICROBIAL STEWARDSHIP

ANNUAL REPORT
2022 -2023



northern health
the northern way of caring

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Northern Health’s Antimicrobial Stewardship (AMS) Program is continually striving to meet the needs of our various facilities and patient populations being managed at these facilities. We are working towards improvements in antimicrobial prescribing and ultimately patient care.

Sharing this report with interested healthcare providers is as important as creation of the report itself. With the vast geographical size of our health authority comes the constant challenge of finding effective ways to distribute information and other program related communications. We will be utilizing several avenues to distribute this report and apologize for any duplications. If you are interested in providing feedback on distribution methods for this information or on the information contain therein, please feel free to contact the Program Coordinator (see [contact information on page 28](#)).

We are constantly seeking engagement at the site level and request participation from site leadership. If you are a site or team lead you will see monthly reminders in your inbox for completion of the Required Organizational Practice (ROP) checklists/audits for priority ROPs. Antimicrobial Stewardship (AMS) checklists will be included in the October email. The purpose of this checklist is to assess compliance with the AMS ROP to benefit our patients and families with regards to management of their infections. Our AMS program can only grow, expand, and better support our sites in becoming compliant if we are able to engage with each site; these checklists help us identify and connect with sites that require assistance.

Only when we work together can we truly improve the use of antimicrobials within Northern Health.

EXECUTIVE SUMMARY

BEST PRACTICES

There is ongoing work to develop and revise clinical tools, protocols, and order sets. Items completed and actively being developed/revised include:

Clinical tools, standards, and policies

- Firstline Northern Health (NH) guideline library expansion
- Supporting development of penicillin allergy de-labeling services for NH
- Creation of nursing algorithm for assessment of UTI in medically stable elderly patients

Education initiatives

- Creation of learning hub module: Antimicrobial Stewardship (AMS) – Required Organizational Practice (ROP)
- Medical resident orientation presentation – Intro to AMS (July 2022)
- Physician engagement session: AMS metrics (Sept 2022)

- Medical resident academic session: Antimicrobial Review for Prescribers (Jan 2023)
- BVDH Quality Assurance Committee – Review of antimicrobial use and outpatient IV (Feb 2023)

Order set development

- IV Antimicrobial Therapy for Outpatients reviewed and revised – published in July 2022
- Penicillin Allergy De-labeling Clinic Orders (UHNBC) – created and published Feb 2023
- SaferCare Project – Powerplan content creation:
 - Diabetic Foot Infection
 - Gram positive bacteremia/Staph aureus bacteremia
 - Skin and Soft Tissue Infection/Cellulitis
 - Necrotizing Fasciitis/Fournier’s Gangrene (empiric and specific)

ANTIMICROBIAL USAGE METRICS

Antimicrobial utilization, measured in defined daily dose (DDD) per 1000 patient-days, is calculated to track the utilization trend over time. The DDD is the assumed average adult maintenance dose per day for a drug used for its main indication. The conversion of drug utilization to this standardized measurement allows for comparisons to be made across different antibiotic classes and facilities. Our current year compared to 2021/22 showed reduction in antimicrobial usage throughout Northern Health collectively. Highlighted by reductions in the Health Service Delivery Areas (HSDAs) of UHNBC and the Northeast, which had increased antimicrobial usage in the 2021/22 fiscal year. This reduction was anticipated as the effects of the COVID-19 pandemic on hospitalizations tapered down. However, the Northern Interior (excluding UHNBC) is showing a further increase in antimicrobial use compared to the 2021-22 fiscal year, which will need to be explored at the specific drug level.

CLINICAL SERVICE/AUDIT AND FEEDBACK

The A&F clinical service and evaluation efforts are focused on:

- Optimizing empiric therapies
- Targeting therapy based on additional diagnostic information
- Optimizing antimicrobial dosing and treatment durations
- Converting intravenous (IV) antimicrobials to oral formulations when appropriate to prevent the complications associated with IV agents
- Providing education to prescribers on the clinical practice guidelines for the treatment of infections
- Promoting consultation of infectious disease specialist when necessary

BEST PRACTICES

CLINICAL TOOLS, STANDARDS, POLICIES, AND FORMS

All-staff antimicrobial stewardship webpage on MyNH and NH Physicians website

Northern Health (NH) staff can quickly and easily gain access to information about the NH Antimicrobial Stewardship (AMS) program as well as any relevant clinical practice standards, clinical memos or bulletins, annual reports, and other online resources from the [MyNH Antimicrobial Stewardship Sharepoint](#). NH prescribers can also access this information on the [NH Physicians webpage](#). Under Physicians Resources > Clinical Resources, the Antimicrobial Stewardship link is at the top of the list.

Firstline Electronic Library

Firstline is an electronic library that can be customized to deliver local antimicrobial stewardship and infectious disease resources within any health system. It is available both as a mobile application or via web browser. There is a [how-to guide](#) available on the [NH Physicians webpage](#). This means that NH prescribers, pharmacists and nurses are now able to access NH supported guidelines and antimicrobial/pathogen information easily and quickly from their mobile devices and computers. Firstline can be downloaded for free and Northern

Health can be found in the locations list. Since the NH library went live in September 2021 our guideline library has increased by 10 new guidelines. The active user counts over the past fiscal year increased to on average 40 unique users per day. Figures 1 and 2 show the most frequently viewed guidelines and antimicrobial monographs respectively.

Previously created clinical tool pocket cards (Empiric Treatment Guidelines for Common Infections in Adults and Dosing of Antimicrobials in Renal Dysfunction) will no longer be updated via print/pdf files. Information and guidance with regards to these topics will continue to be found in the Firstline NH library. There is now access to pediatric dosing information for antimicrobials, directly connected to the guidance from BC Children's hospital library and accessible through our NH drug monographs.

Penicillin Allergy De-labeling Clinic

Dr. Sharla Olsen and Dr. Irina Sainchuk, supported by the AMS Program Coordinator/Lead pharmacist as well as other hospital pharmacists, are now accepting patient referrals to the new Penicillin Allergy De-Labeling Clinic at UHNBC. From an antimicrobial stewardship perspective, the advantages of penicillin de-labeling greatly outweigh the risks. Penicillins are inexpensive antibiotics that can be used to narrow antibiotic spectrum, resulting in less adverse events such as *C. difficile* infections which can cause patient harm as well as an increased length of hospital stay.

At this time, the following outpatients are eligible to be referred to the clinic:

- Adults (16 years +)
- Pregnant patients

The clinic team will be exploring expanded eligibility criteria in the future.

Who can refer patients to the penicillin allergy de-labeling clinic?

Family physicians, specialists, nurse practitioners, midwives and dentists.

Where is the clinic located and when will it operate?

The clinic is located on the 5th floor of UHNBC and will operate monthly on Thursday afternoons between 1pm and 4pm.

What is the emergency preparation plan in case of an anaphylactic reaction?

The clinic has oral antihistamines, two anaphylaxis kits, and a protocol to respond to any reaction. In the event of an anaphylactic reaction, we would also call a Code Blue requiring the response of the rapid response team within UHNBC.

Clinical algorithm: Assessment of UTI in medically stable institutionalized elderly patients

One of the common struggles we face as antibiotic stewards is assessing patients who are prescribed antibiotics because something has grown in a urine culture. Often these cultures are collected to diagnose a UTI, but a UTI is a clinical diagnosis NOT a lab diagnosis. Unfortunately, there is misinformation among nurses and many prescribers that lead to belief in common myths and inappropriate cultures being collected. The result being inappropriate antibiotic prescriptions.







In response to a site-specific request to have Northern Health specific guidance regarding urinary tract infections in the elderly patient population, an algorithm was developed with input from several interested parties. This algorithm can be ordered directly from [DocumentSource](#). Our clinical pharmacists supporting long term care across NH have already been involved previously as initial intention was for that population. However, after gaining further feedback from the AMS Committee it was slightly adapted to be more inclusive to the hospitalized, medically stable, elderly population.

What is the purpose of this guidance and education? To re-frame historical beliefs and to ensure safer care for our patients/clients. Unnecessary urine cultures can lead to prescribers feeling a need to treat (in absence of symptoms) and therefore unnecessary antimicrobial exposure.

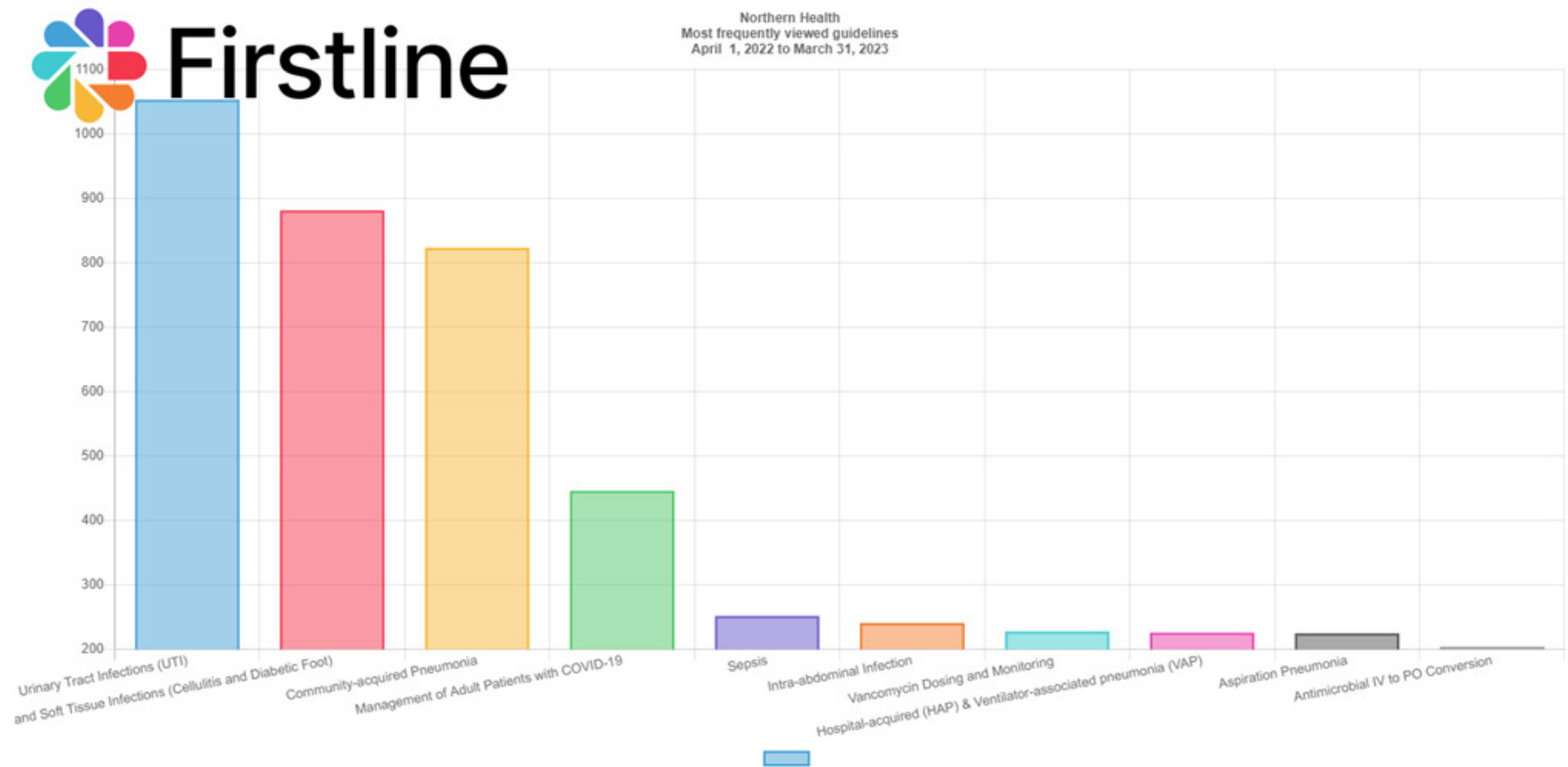
Table 1: Practice Points

PRACTICE POINTS		
1.	Asymptomatic bacteriuria is bacteria recovered from urine samples in a person without signs and symptoms associated with a urinary tract infection (UTI)	It is a colonization state NOT infection. Routine urine dips are NOT recommended.
2.	Asymptomatic bacteriuria and pyuria are more common in people greater than 65 years; incidence is higher in institutionalized patients regardless of the presence of an indwelling catheter.	Dipsticks positive for leukocytes and nitrates DO NOT indicate infection; urine dips can be misleading and are not recommended in the elderly institutionalized population. Routine urine dips are NOT recommended.
3.	Asymptomatic bacteriuria is NOT associated with long term negative outcomes.	Routine urine dips are NOT recommended.
4.	Due to the possibility of colonization of the urine with bacteria, UTI in the elderly institutionalized population is a clinical diagnosis (based on signs and symptoms), NOT a lab diagnosis.	Routine urine dips are NOT recommended.
5.	100% of catheterized LTC residents will be colonized in their urine and test positive for leukocytes without present infection	Routine urine dips are NOT recommended.

Table 2: Examples of common myths

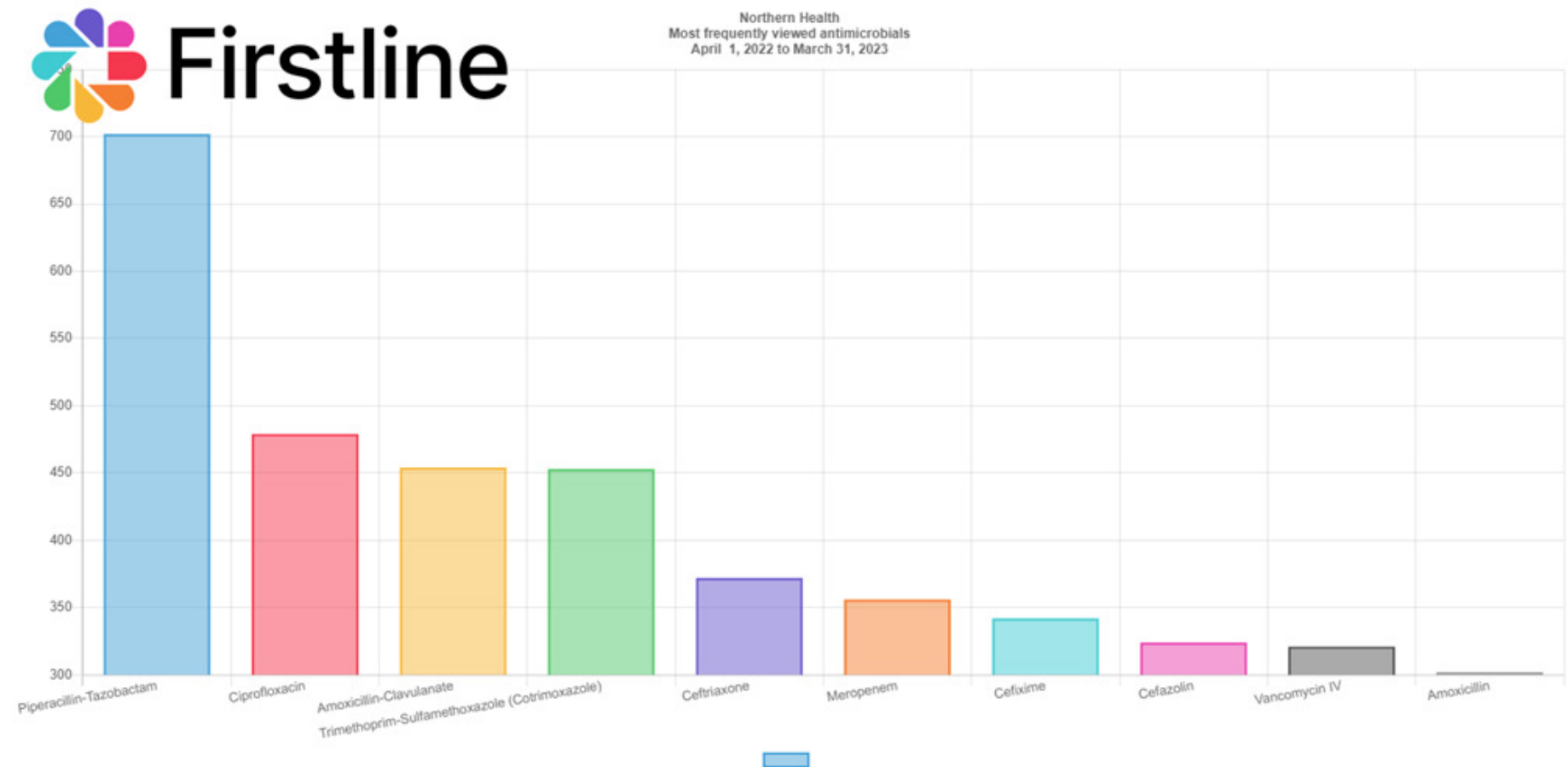
MYTHS	FACTS
<p> Urine is cloudy and smells therefore patient has a UTI.</p>	<p> Visual inspection and smell are unreliable indicators and usually dependent on resident’s hydration status, diet, medications, and concentration of urea in the urine.</p>
<p> Falls or change in mental status (including confusion or “feeling off”) in the elderly indicate UTI.</p>	<p> A fall or change in mental status in the elderly without any other signs and symptoms of infection should be assessed for other causes. Once all other possibilities (e.g. dehydration, new medications/ drug interactions, sleep disturbances, sensory deprivation, trauma, hypoxia, hypoglycemia and other infections) are excluded a UTI may be considered.</p>
<p> You need to repeat urine cultures after treatment.</p>	<p> There is no reason to re-culture urine after treatment unless the patient is not improving clinically. Bacteriuria can occur after effective therapy (colonization) and is not a reason to prolong therapy in an asymptomatic patient.</p>

Firstline Figure 1: Most frequently viewed guidelines



Data source and graph prepared by: Firstline analytics dashboard.

Firstline Figure 2: Most frequently viewed antimicrobials



Data source and graph prepared by: Firstline analytics dashboard.

EDUCATION INITIATIVES

NEW Learning Hub Module : Antimicrobial Stewardship (AMS) – Required Organizational Practice (ROP)

The intention of this learning hub module is to provide Northern Health (NH) clinicians, pharmacists, and nurses with an overview of the Antimicrobial Stewardship (AMS) program in NH and AMS principles that can be practiced in patient care. It is important that our NH staff are aware of the various required organizational practices (including AMS) to ensure safe quality of care for our patients and clients everyday.

Learning objectives

At the end of the session learners will be able to:

- Define Antimicrobial Stewardship (AMS)
- Explain the importance of AMS practices for patient care
- Describe the components of the NH AMS program
- Know who the AMS program leads are
- Describe 5 ways healthcare professionals can incorporate AMS practices into their daily work routine

Components of the module include:

- AMS program overview
- resource review: Firstline, antibiogram, MyNH AMS page
- incorporating AMS into Practice
- allergy histories
- adverse reactions
- IV to PO step down
- limiting urine cultures (asymptomatic bacteriuria) – using content from AMMI Canada ‘symptom free pee let it be’ campaign
- proper wound culture collection and assessment
- Quiz to test knowledge at completion of the module

Education presentations

The AMS program leads were approached to provide some education and program awareness to a few different audiences. Our leads are appreciative of these requests and are appreciative of engagement from any area/site within NH. Examples of sessions provided over the past fiscal year:

- Medical Resident Orientation presentation – Intro to AMS (July 2022)
- NH Physician Quality Improvement (PQI) Education Session - Discussion and Review of AMS metrics (Sept 2022)
- Medical Resident Academic Half-day session: Antimicrobial Review for Prescribers (Jan 2023)
- BVDH Quality Assurance Committee – Review of antimicrobial use and outpatient IV (Feb 2023)

ORDER SET DEVELOPMENT

IV Antimicrobial Therapy for Outpatients reviewed and revised – published in July 2022

As part of the regularly scheduled cycle for reviewing order sets already in circulation to ensure they remain up to date with regards to best practices. The AMS committee

reviewed and updated the regional order set for Outpatient IV Antimicrobial Therapy. Changes include providing prompts and criteria for PICC line placement, clarification around indications of cefazolin + probenecid versus ceftriaxone and options for MRSA coverage including suggestions for oral therapy considerations.

Penicillin Allergy De-labeling Clinic orders (UHNBC) – created and published Feb 2023

With the opening of the new Penicillin Allergy De-Labeling Clinic at UHNBC, an order set to help guide/document both oral and skin testing protocols was developed based off of protocols used at BC Women's Hospital de-labeling clinic.

SaferCare Project – Power Plan clinical content

SaferCare is NH's 10-year major clinical quality improvement and digital transformation initiative. The purpose of this initiative is to:

- To increase patient safety and effectiveness of care while digitally enabling clinical processes, practices, and documentation
- To facilitate all Northerners to actively engage in their digital health information and support online health services

- To improve staff and provider experience by advancing the use and functionality of our Cerner electronic health record (EHR) by implementing full electronic documentation and ordering

The initial stage (first 5 years) will encompass, replacing variable hospital paper charts with consistent electronic documentation and ordering in NH's Cerner EHR (CPOE = computerized provider order entry). Order sets which currently exist in paper will now be referred to as Power Plans in the electronic system.

New topics that have been contributed to by the AMS committee as of March 2023:

- Diabetic Foot Infection
- Gram Positive Bacteremia/Staph aureus bacteremia
- Skin and Soft Tissue Infection/Cellulitis
- Necrotizing Fasciitis/Fournier's Gangrene (empiric and specific)

Audit and feedback (A&F) is an evidence-based practice of reviewing a patient's medical chart and diagnostic test results and engaging with prescribers to collaboratively optimize antimicrobial therapies. This practice involves the selection of the most appropriate, narrowest spectrum agent based on clinical status, indication, allergies, culture results, potential drug interactions and adverse effects, considering current clinical practice guidelines.

CLINICAL SERVICE (PROSPECTIVE AUDIT AND FEEDBACK)

The A&F clinical service and evaluation efforts are focused on:

- Optimizing empiric therapies
- Targeting therapy based on additional diagnostic information
- Optimizing antimicrobial dosing and treatment durations
- Converting intravenous (IV) antimicrobials to oral formulations when appropriate to prevent the complications associated with IV agents
- Providing education to prescribers on the clinical practice guidelines for the treatment of infections
- Promoting consultation of infectious disease specialist when necessary

AUDIT AND FEEDBACK RECOMMENDATIONS AND RESOLUTION RATES

In September 2021, it was decided that an alternative model for tracking drug therapy problems (DTPs) would be implemented to lessen the time required by pharmacists to perform this data entry. This change involved only tracking activities carried out by the clinical pharmacists' group during

pre-determined two-week intervals. These two-week intervals were performed once every 3-month quarter resulting in a total 8-week reporting period for the fiscal year. The data collection was simplified further by removing some of the granular information resulting in higher level data for AMS DTPs. Moving forward this report will no longer contain DTP category information such as necessary, effective, safety and adherence. We will continue to be able to compare the total number of AMS DTPs to the total number of DTPs captured and compare this data between fiscal years. However, the data from 2021/22 fiscal year starts in June 2021 (when this process change began), therefore, only encompassing data from three-quarters of a fiscal year instead of the usual four-quarters (Table 3). This of course resulted in a lower number of total DTPs and AMS DTPs, which is expected based on one less quarterly reporting period. We are still able to see a consistent pattern of the percentage of AMS DTPs resolved. With 19% of all DTPs resolved in 2022/23 being AMS DTPs and 20% in 2021/22.

The change in how DTP metrics are tracked and entered has resulted in some limitations in how specific we can breakdown and interpret data. This will be an area of discussion with clinical pharmacy services going forward as a categorical breakdown of DTP metric data can help to target specific areas related to AMS. Nevertheless, the contributions and efforts of our clinical pharmacists to the AMS program and stewardship can not be understated, and we are appreciative and grateful for all their efforts.



Table 3: Antimicrobial Drug Therapy Problem (DTP) Types Resolved in FY 2022/23

DRUG THERAPY PROBLEMS BY FISCAL YEAR			
	Resolved AMS DTPs	%AMS DTPs	DTP_Count
FY2021/22	1,029	20.22%	5,089
FY2022/23	1,244	19.15%	6,495

Note: FY2021/22 is incomplete as data collection changed during this time.

Starting calendar year 2022, DTPs are captured accurately during blitzes, quarterly 2-week periods.

OUTCOME AND PROCESS MEASURES

ANTIMICROBIAL UTILIZATION AND COSTS ACROSS NH

Antimicrobial utilization, measured in defined daily dose (DDD) per 1000 patient-days, is calculated to track the utilization trend over time. The DDD is the assumed average adult maintenance dose per day for a drug used for its main indication. The conversion of drug utilization amount to DDD units is performed to standardize utilization of different classes of antimicrobials, allowing comparisons to be made across different facilities or patient groups (excluding pediatric populations). Table 4 is a summary of the change in usage of all antimicrobials (antibiotics, antifungals, and antivirals) compared across fiscal years. Our current year compared to 2021/22 shows reductions in antimicrobial usage throughout Northern Health collectively (Table 4). However, you can see a modest increase in the Northern Interior (excluding UHNBC) and Northwest Health Service Delivery Areas (HSDAs). Also, notable is a decrease in antimicrobial utilization in the Northeast HSDA after two consecutive fiscal year periods of increased usage. Much of this decrease in the Northeast can be contributed to the decrease in the usage of azithromycin, ceftriaxone, and doxycycline, which coincides with the decrease of COVID-19 hospitalizations throughout the health authority (Figure 3). Which coincides with the decrease of COVID-19 hospitalizations throughout the health authority. The Northeast HSDA specifically had lower vaccination

rates compared to the other HSDAs. The decrease in overall antimicrobial utilization in the Northeast can also be attributed to the increased support and recruitment of clinical pharmacists. Clinical pharmacists have promoted stewardship in the Northeast by advocating the use of order sets and clinical tools like Firstline, as well as collaborating with prescribers leading to more targeted therapy and decreased use of broad spectrum agents.

To investigate which drugs are contributing to the increases in the Northwest and Northern Interior (excluding UHNBC) we have divided the information from Table 4 further to show individual drug usage. We can then compare to usage in each HSDA (Figures 3 to 6). For ease of assessment, we have pulled out target IV agents that have historically and anecdotally been agents of high use (e.g., ceftriaxone, piperacillin-tazobactam) and or require case by case assessment (e.g., daptomycin). When analyzing the data to explain the increase in antimicrobial utilization in the Northern Interior (excluding UHNBC) there are modest increases in the usage of carbapenems, ceftriaxone and vancomycin. However, much of the increase is due to a significant uptake in the utilization of doxycycline (Figure 4). Some of the increase in doxycycline can be explained by a decrease in azithromycin use. Doxycycline is the alternative to azithromycin for atypical bacterial coverage in respiratory infections. However, that only partially explains this dramatic increase in utilization. Doxycycline, besides use in respiratory infections like community acquired pneumonia (CAP) is used in skin and

soft tissue infections (SSTIs) including MRSA. It is highly unlikely that there was a substantial increase in doxycycline use for SSTIs. Another possibility is the use of doxycycline for the treatment of sexually transmitted infections. Over the last few years there has been a dramatic rise in the cases of syphilis throughout the province of British Columbia. The drug of choice for treatment of syphilis is penicillin. However, the alternative for penicillin allergic patients is doxycycline. Overall, further review of data collection and follow-up will be required to corroborate the data.

When analyzing and interpreting the data for the Northwest there is no outlier or class of antimicrobials driving a major uptake in use (Figure 5). As reported in Table 4, the increase in the Northwest just like the Northern Interior is between 0 to 10%. For the Northwest it would be reasonable to assume that the increase in antimicrobial utilization is marginal compared to the fiscal year of 2021/22. Of note, the use of daptomycin has been reduced significantly and marginally for carbapenems, ceftriaxone and vancomycin. The use of azithromycin, cefazolin, micafungin and piperacillin/tazobactam increased slightly compared to the previous year.

UHNBC, the largest hospital and acute care site within Northern Health continues to show consistent data from previous years. Once again overall antimicrobial usage for UHNBC is down from the 2021/22 fiscal year. The resources that UHNBC possesses over the other HSDAs can not be ignored. The biggest resource being clinical staff such as physicians, specialist physicians, dedicated interprofessional teams, teaching units, nursing and clinical pharmacists facilitates resolution of DTPs and advocating stewardship principles and policies at a much broader level.

Table 4: Total antimicrobial utilization year to year comparison (DDD/1000 patient days)

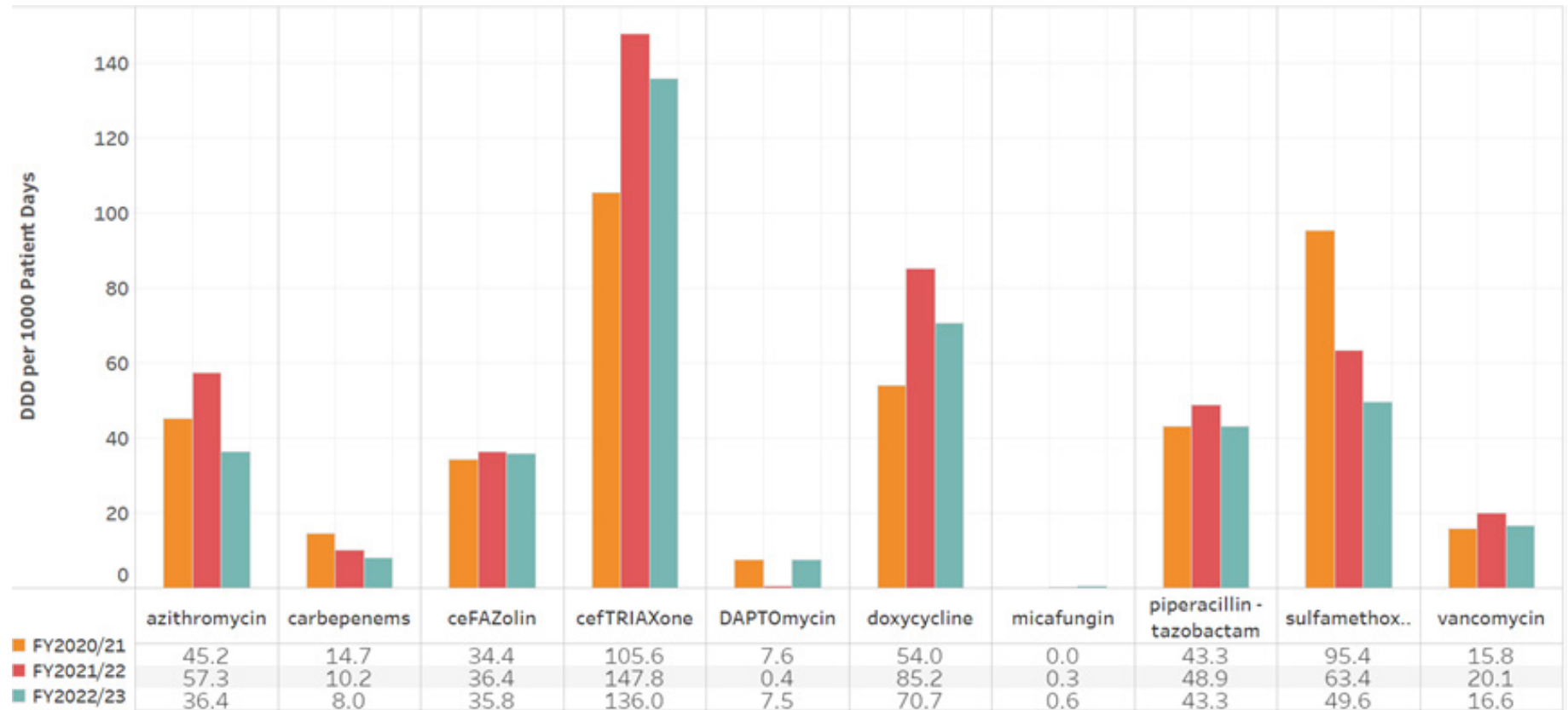
HSDA Grouping	FY2021/22 compared to FY2020/21	FY2022/23 compared to FY2021/22
Northeast	↑	↓
Northern Interior (Excluding UHNBC)	↑	↑
Northwest	↓	↑
UHNBC	↓	↓
Northern Health	↓	↓

↓ Decrease from Previous Year
 ↑ Between 0% and 10% Increase from Previous Year
 ↑ Greater than 10% increase from Previous Year

Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

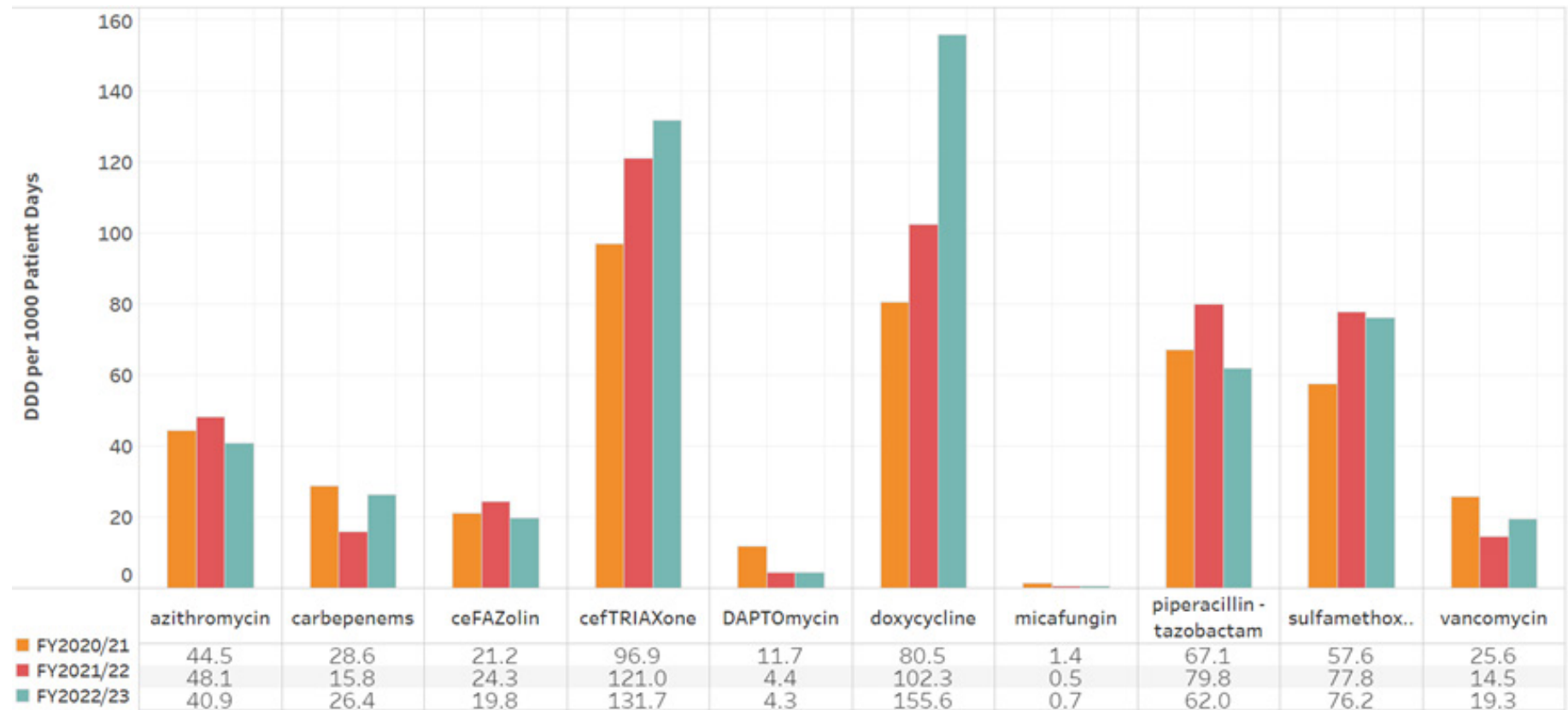
Figure 3: Targeted antimicrobial utilization for Northeast (DDD/1000 inpatient days)



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

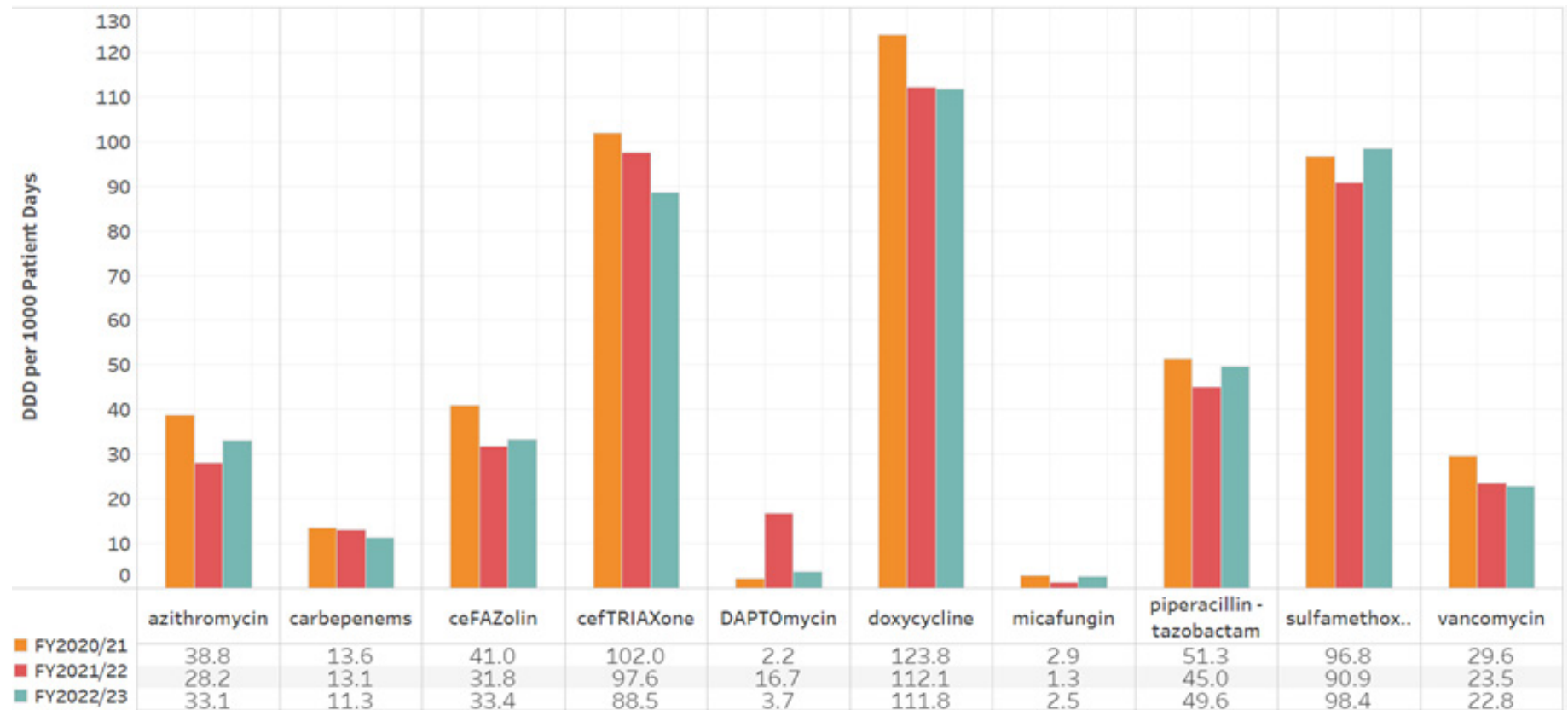
Figure 4: Targeted antimicrobial utilization for Northern Interior [excluding UHNBC] (DDD/1000 inpatient days)



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

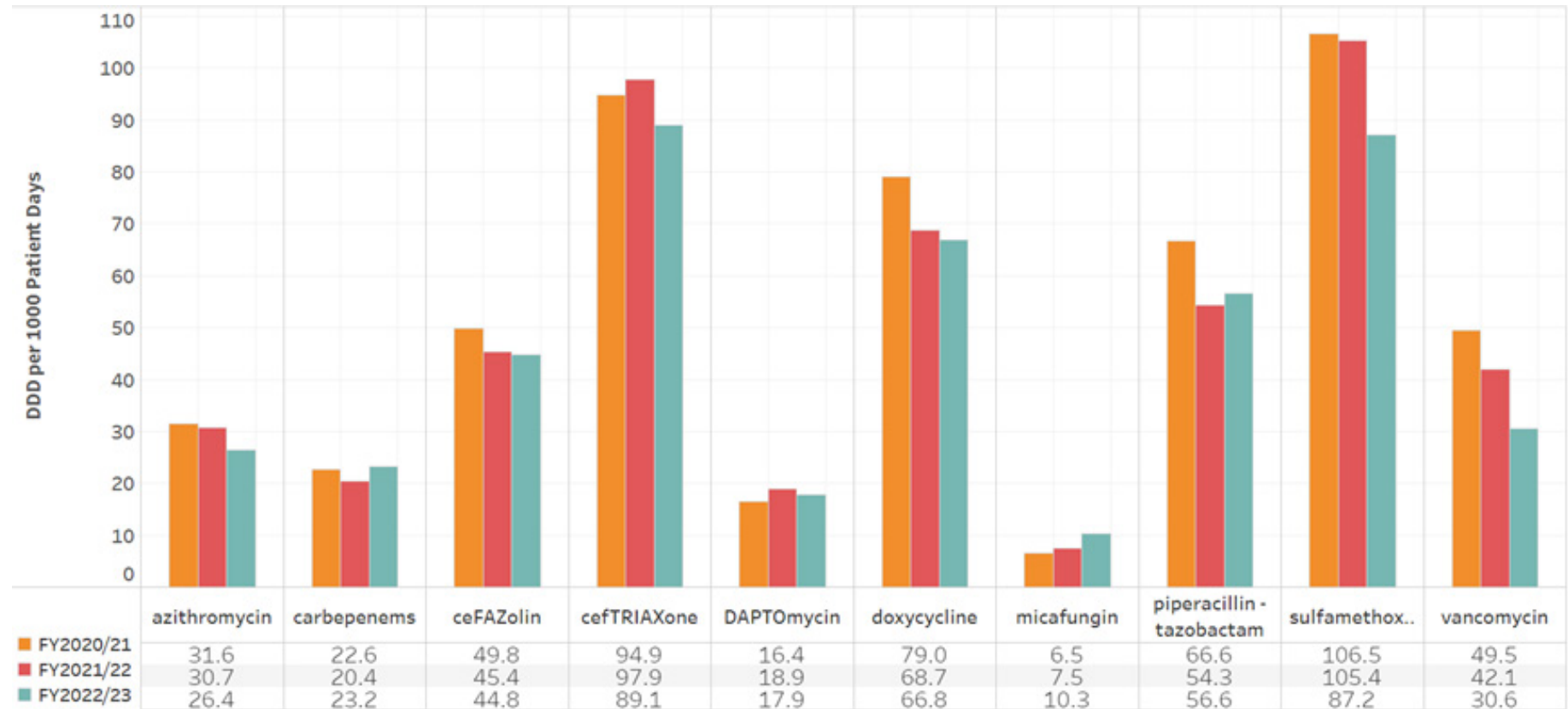
Figure 5: Targeted antimicrobial utilization for Northwest (DDD/1000 inpatient days)



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

Figure 6: Targeted antimicrobial utilization for UHNBC (DDD/1000 inpatient days)



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

HIGH BIOEQUIVALENT ANTIMICROBIALS

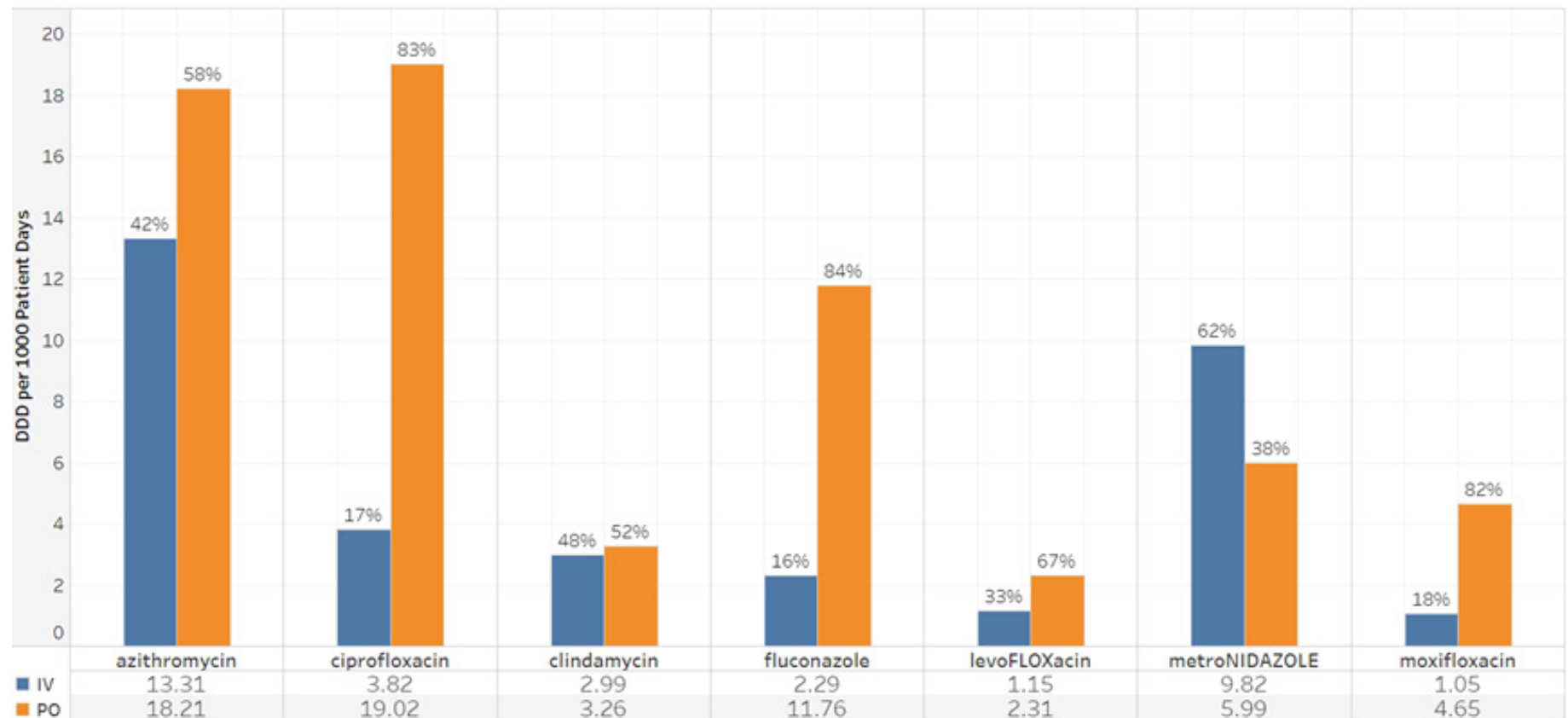
Timely conversion from intravenous (IV) to oral (PO) antimicrobial therapy is effective for a variety of infections, especially for agents with high bioavailability (the fraction of unchanged drug that is absorbed and reaches the systemic circulation). Conversion from IV to PO antimicrobials in select patients results in cost savings for the facility, as well as positive clinical outcomes such as shortened hospital stay, reduced risk of line-related infections and adverse events and no IV related mobility restrictions for patients. There is a group of antimicrobials where the oral formulation is equally potent compared to the IV formulation; this group is referred to as high bioequivalent antimicrobials.

A selection of these high bioequivalent targeted antimicrobials is compared per HSDA using the DDD per 1000 patient-days (Figures 7 to 11). From a stewardship perspective the goal is to see a preference for use of oral agents from this group of therapies. Although, this is true for most agents in all HSDAs there appears to be a preference for IV metronidazole in all HSDAs. Metronidazole is 100% bioavailable therefore if the gastrointestinal (GI) tract is functioning there is very little need for the IV formulation in most cases. The one setting that might contribute to preference of IV versus oral route for metronidazole is peri-operative situations where patients are NPO either due to impending surgery, obstruction, or bowel rest post-operatively. There is still the potential that IV route is used longer than necessary either due to being

prescribed in addition to other IV antimicrobials (e.g., cefazolin or ceftriaxone) or missed opportunities for oral conversion post-operatively. Alternatively, there are likely cases where post-operatively the IV metronidazole is just stopped rather than stepped down to oral or the oral step down is a different agent altogether (e.g., cefazolin IV and metronidazole IV changed to amoxicillin-clavulanate orally) which would still be achieving stewardship goals. Also, of note is increased use of IV clindamycin for all Northern Health (Figure 7), which is mainly driven by increased use at UHNBC which went from 35% last year to 55% this year (Figure 11). On a positive note, the use of oral azithromycin, ciprofloxacin, and fluconazole continues to be stable if not slightly improved since last fiscal year. However, it should be noted that the Northeast saw a rise in the use of IV azithromycin, levofloxacin and moxifloxacin compared to last fiscal year (Figure 8).

Overall, the data for high oral bioequivalent antimicrobials illustrates that work needs to be done throughout all the HSDAs to educate, advocate and implement IV to PO step down therapy when clinically appropriate. The positive clinical outcomes as mentioned earlier and their associated savings to healthcare costs are reason enough to continue to stress the importance of highly bioequivalent antimicrobials.

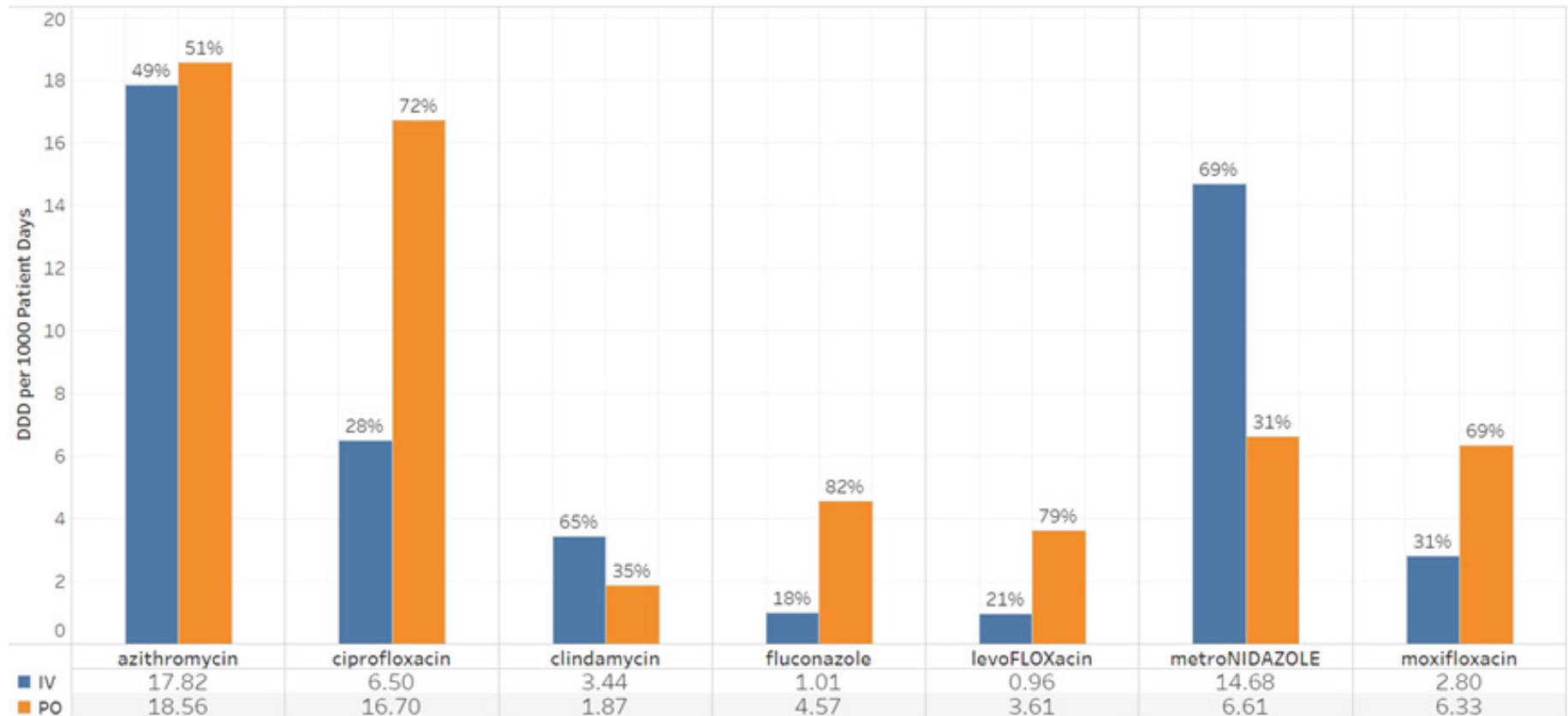
Figure 7: High Bioequivalent Antimicrobials IV versus Oral for all NH (DDD/1000 inpatient days), FY 2022/23



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

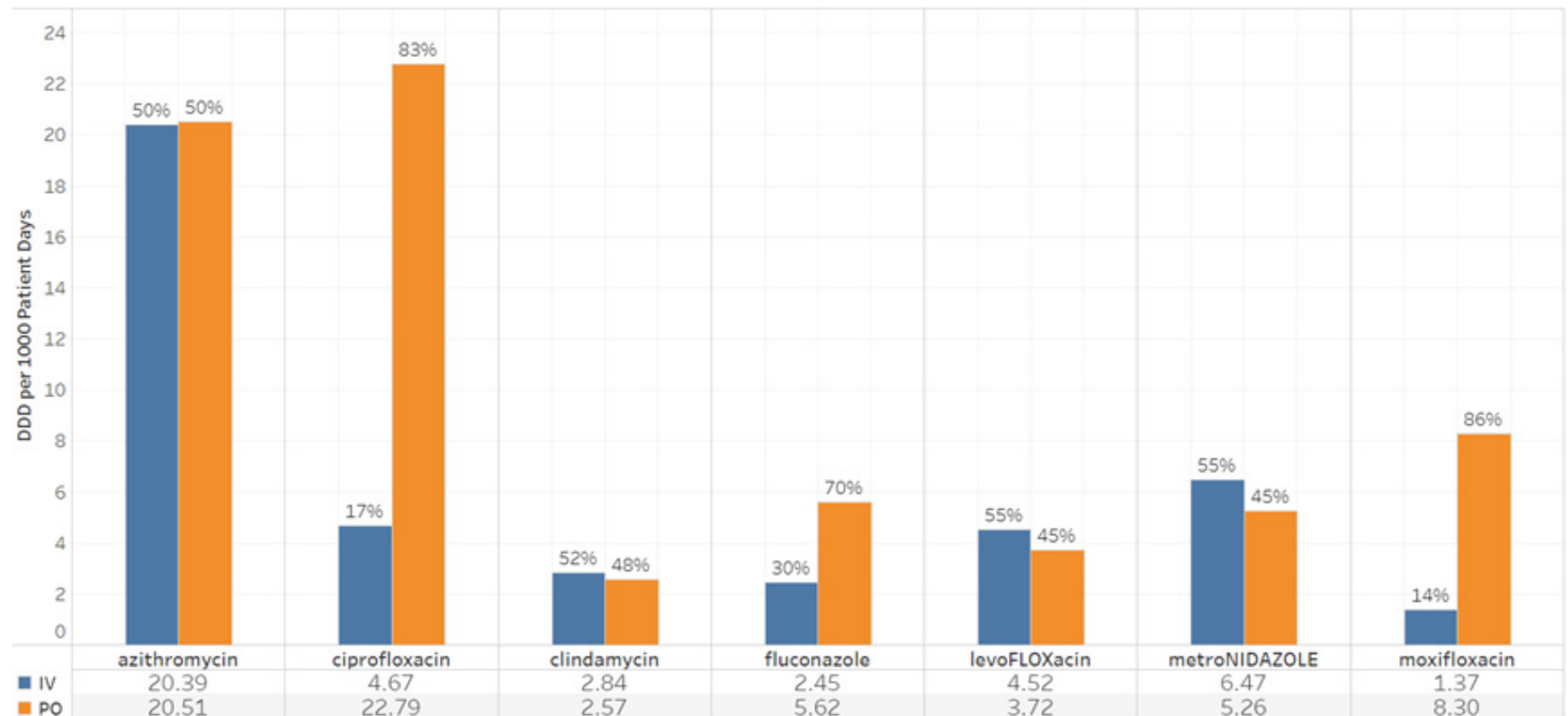
Figure 8: High Bioequivalent Antimicrobials IV versus Oral for Northeast (DDD/1000 inpatient days), FY 2022/23



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

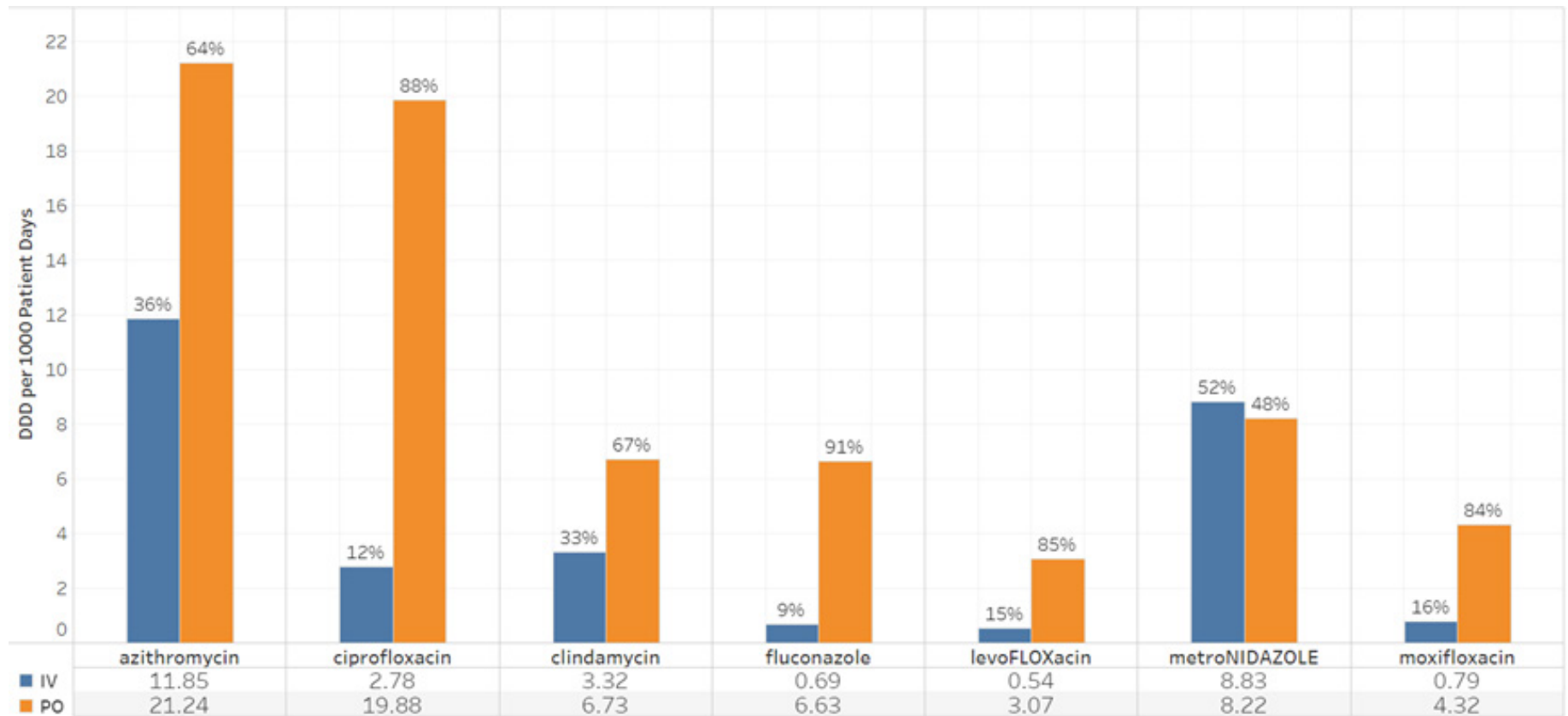
Figure 9: High Bioequivalent Antimicrobials IV versus Oral for Northern Interior [excluding UHNBC] (DDD/1000 inpatient days), FY 2022/23



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

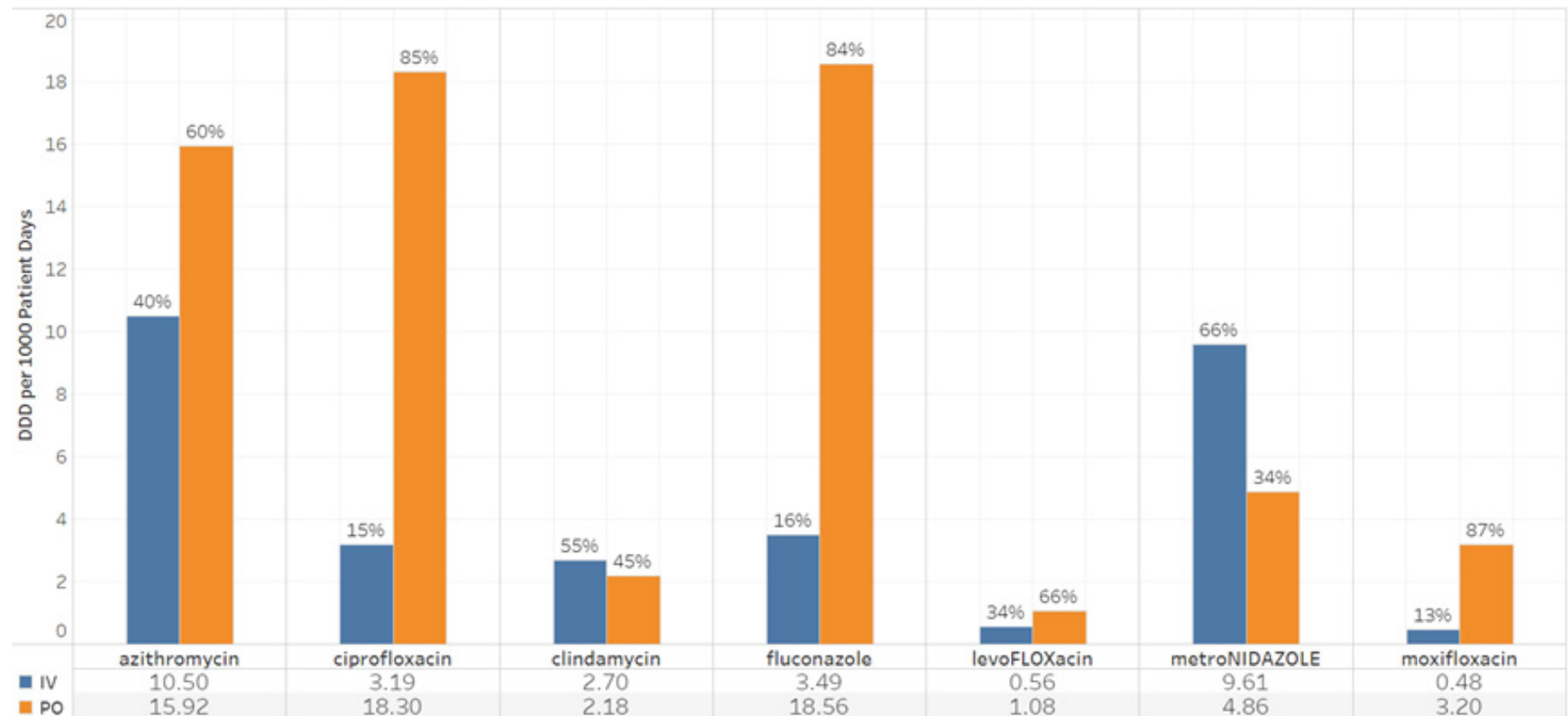
Figure 10: High Bioequivalent Antimicrobials IV versus Oral for Northwest (DDD/1000 inpatient days), FY 2022/23



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

Figure 11: High Bioequivalent Antimicrobials IV versus Oral for UHNBC (DDD/1000 inpatient days), FY 2022/23



Data source: Cerner - Product dispense and supply chain.

Graph prepared by: Clinical outcomes analyst for medication management.

ANTIMICROBIAL COSTS

The total drug cost per inpatient day for the 2022/23 fiscal year saw a 9.3% decrease from the 2021/22 fiscal year (Figure 12). The antimicrobial cost per inpatient day saw a modest 3% reduction compared to the 2021/22 fiscal year. This decrease was not as dramatic as the 18% decrease in antimicrobial costs that was shown in the 2021/22 fiscal year. This is mostly reflective of the continued decrease in hospitalizations related to COVID-19 which peaked in the 2020/21 fiscal year, which coincided with the start of the pandemic. The overall proportion of antimicrobial cost was only 14.4% of the total drug costs. This number is only up slightly from 13.4% in the 2021/22 fiscal year. Based on the data and trend from the last two fiscal years we expect a plateau in the numbers for the total drug cost per inpatient day and antimicrobial cost per inpatient day for the upcoming 2023/24 fiscal year.

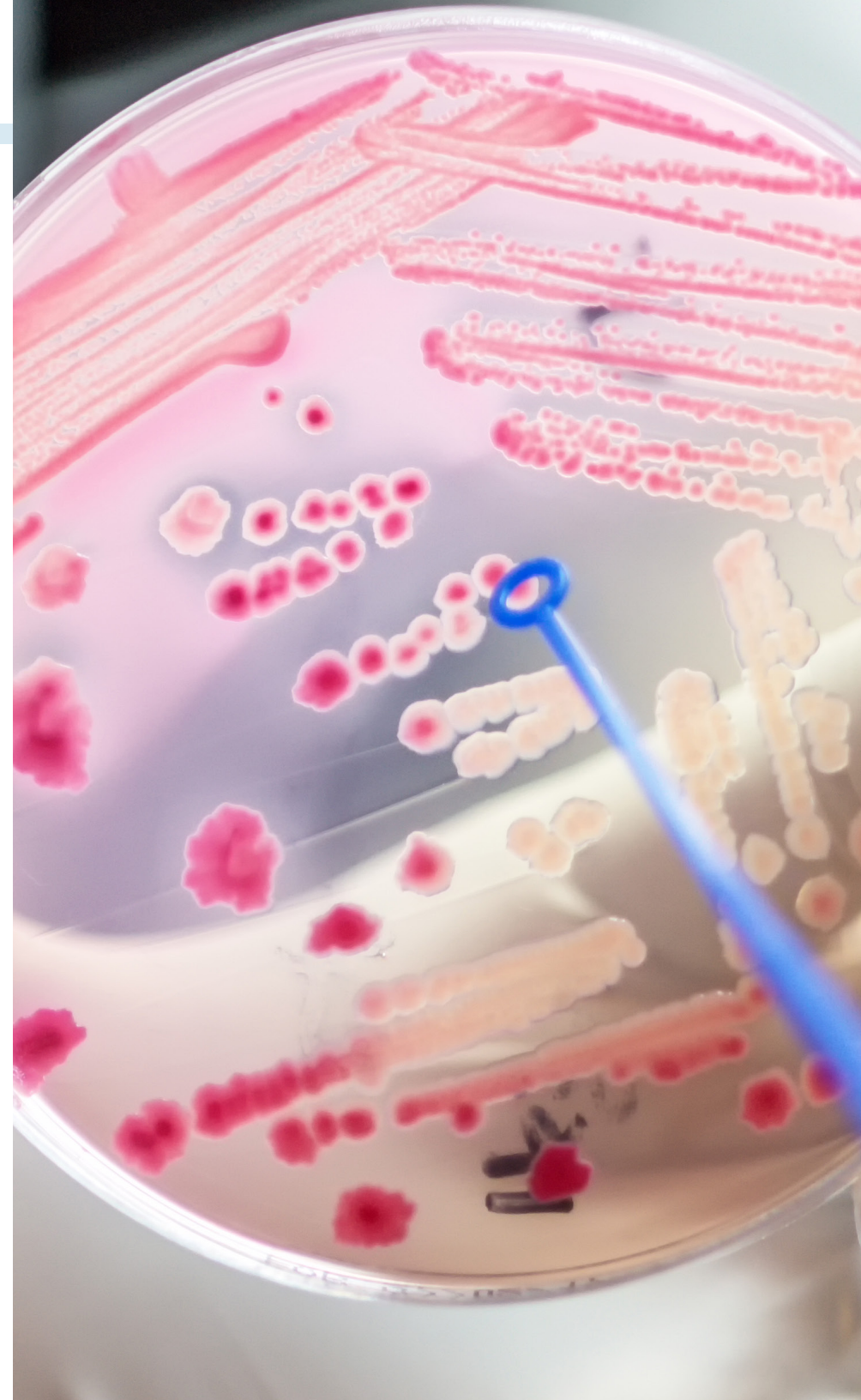
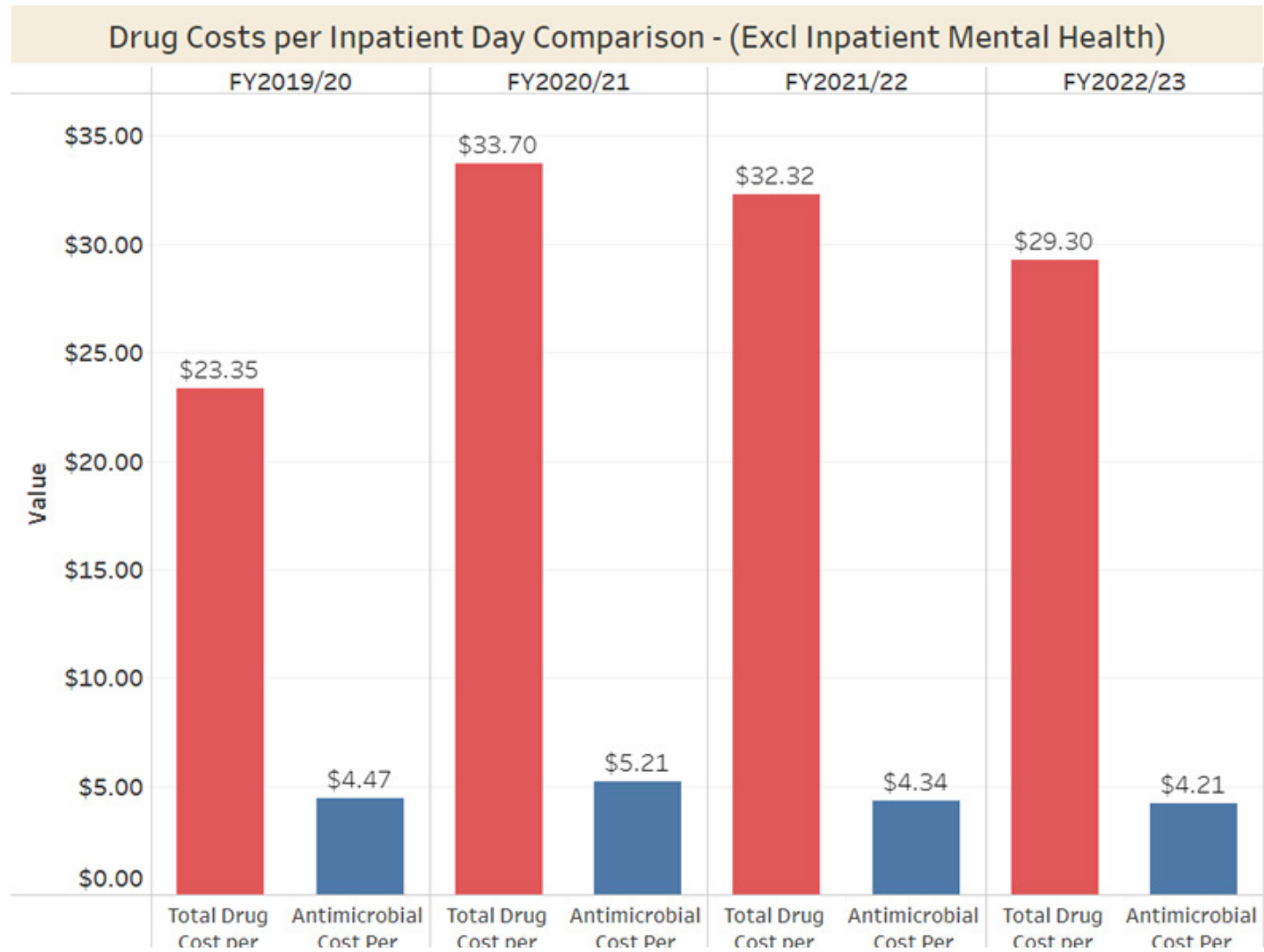


Figure 12: Drug Costs per Inpatient Day Total vs. Antimicrobials



Data source: Cerner database.

Graph prepared by: Clinical outcomes analyst for medication management.

ANTIMICROBIAL STEWARDSHIP PROGRAM TEAM MEMBERS

PROGRAM COORDINATOR (PHARMACIST LEAD)

- Alicia Rahier (on leave until January 2025)
- Sumeet Hayer (Interim AMS Program Coordinator)

AMS PROGRAM/ INFECTION PREVENTION AND CONTROL MEDICAL LEAD

- Abu Hamour (NH Infectious Diseases Specialist)

CONTACT

Sumeet Hayer
Interim NH AMS Program Coordinator
University Hospital of Northern BC

Email: sumeet.hayer@northernhealth.ca

Cell: 250-614-9678

Phone: 250-645-8663

AMS SUBCOMMITTEE MEMBERS

- Barb Falkner (Professional Practice Lead Pharmacist)
- Barret Barr (Clinical Pharmacy Specialist - NI)
- Carey-Anne Lawson (IT - CIS Pharmacist)
- Allissa King (Quality Resource Technologist Microbiology)
- Debora Giese (CIC - Certified Infection Control - NW)
- Gordon Ling (Clinical Pharmacist - NW)
- Tracy Moraes (Clinical Pharmacist - NW)
- Valerie Weber (Clinical Pharmacist - NE)
- Ryan Doerksen (Medication Use Management Pharmacist)
- Juanita Kerbrat (Coordinator, Infection Control RN - NE)
- Kyla Bertschi (Clinical Pharmacy Specialist - NI)
- Rachel Henri (Clinical Nurse Educator, Medicine - NI)
- Marilyn Ringdal (Clinical Nurse Educator - Wound, Ostomy and Continence - NI)
- Sandra Vestvik (Chief of Staff MD, BVDH - NW)



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