Saskatchewan Health Authority

Antimicrobial Stewardship Program

2023 Annual Report

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Executive Summary

The 2023 Annual Report of the Saskatchewan Health Authority (SHA) Antimicrobial Stewardship Program (ASP) highlights significant progress in combating antimicrobial resistance (AMR) through education, intervention, and policy development. This report marks the first comprehensive, annual activity summary since the ASP's inception in 2016.

KEY ACHIEVEMENTS IN 2023

Educational and Awareness Activities

- Delivered 96 educational presentations to healthcare providers, students, and the public.
- Hosted six webinar sessions, with over 215 live attendees and 182 recorded views.
- Created a learning module on AMR for SHA's MyLearning platform.
- Reached over 1,295 monthly users on the Firstline app, providing guidance for antimicrobial use.

Interventional Activities

- Conducted 395 in-patient antimicrobial reviews resulting in interventions, ensuring appropriate use and reducing unnecessary prescriptions.
- Launched a penicillin allergy de-labeling tool, assessing 30 patients and successfully removing incorrect allergy labels.
- Introduced procalcitonin testing in intensive care units to improve antibiotic discontinuation.
- Collaborated on provincial surveillance for urinary tract infections in long-term care facilities, supporting data-driven interventions.

Policy and Advisory Committee Work

- Reinstated the Regina ASP Advisory Council to support antimicrobial stewardship (AMS) initiatives.
- Assisted in developing the Antimicrobial Advisory Subcommittee under the Drugs and Therapeutics Committee.
- Engaged with the Pan-Canadian Action Plan on AMR, contributing to national strategies.

Public Awareness and Advocacy

- Led World AMR Awareness Week efforts in Saskatchewan, lighting landmarks in blue and engaging with healthcare leaders.
- Published an opinion piece on AMR awareness on Healthing.ca.
- Continued efforts to integrate AMS education into nursing curricula.

CHALLENGES AND FUTURE DIRECTIONS

- Restricted social media engagement.
- Need for an official mandate requiring antimicrobial indications with prescriptions.
- Improving timely and ongoing access to data sources.
- Improving outreach to primary healthcare clinics to enhance AMS efforts.
- Expanding antibiogram development to better tailor antibiotic prescribing.

Through these initiatives, the SHA ASP continues to strengthen AMS efforts, reduce inappropriate antibiotic use, and combat AMR to improve public health outcomes.

Introduction

The growing threat of antimicrobial resistance (AMR) poses dire consequences for human, animal, and environmental health. The Council of Canadian Academies has predicted that increasing AMR rates in Canada could lead to 140,000 preventable deaths and more than $120 billion in lost gross domestic product by the year 2050[1]. Active and effective antimicrobial stewardship programs (ASPs) are a critical component of the efforts required to combat AMR. In fact, the Public Health Agency of Canada (PHAC) has included "stewardship" as one of the five pillars in the Pan-Canadian Action Plan on AMR (PCAP)[2]. In Saskatchewan, the Saskatchewan Health Authority (SHA) ASP strives to meet the goals outlined in the PCAP to ensure we are doing our part to tackle this global problem.

This report is the first comprehensive, annual activity report produced for the SHA ASP. While metrics are only reported for the 2023 calendar year, it should be noted that this report builds on seven years of activities since the inception of the program in June 2016.

Program activities are broadly separated into three categories: educational and awareness activities, interventional activities, and advisory committees and policy development. While they are thematically separated, there is often overlap between these categories for individual activities, depending on the intended outcomes. That is to say, an educational activity may be part of an interventional activity aimed at producing a behavior change among prescribers, and in fact, this is often the case.

If you have questions, comments, or concerns about any of the content of this report, please email antimicrobial.stewardship@saskhealthauthority.ca for more information.

Time Frame

This report covers antimicrobial stewardship (AMS) activities and interventions occurring between January 1, 2023 and December 31, 2023 for the SHA ASP.

SHA ASP Staff Complement

In 2023, the SHA ASP staff consisted of two 1.0 full-time equivalent (FTE) AMS pharmacists and one 0.6 FTE research scientist. The ASP was directly supported by a team of clinicians, analysts, and administrative staff within the Stewardship and Clinical Appropriateness Department. Further project-specific support was provided by individuals and groups both internal and external to the SHA.

The SHA ASP would like to thank all contributors, collaborators, partners, colleagues, students, residents, and other interest holders, both locally and nationally, who participated in and supported the work described herein. The achievements of this program to date would not have been possible without the assistance of this large group of individuals and allied organizations.

Educational and Awareness Activities

The general goals of these activities were to promote awareness of the threat of AMR and provide education on how AMS addresses this threat. Additionally, education for healthcare providers often focused on improving antimicrobial use (AMU) for specific indications in line with best practice. Education and awareness activities were provided to healthcare providers, trainees/students, administrators, health

system collaborators, and the general public. These activities contribute to creating the culture change required to address AMR as a global population.

PRESENTATIONS

*Educational Presentations: **96***

In general, presentations were approximately one hour long and focused on a specific topic, tailored to the audience. More specific information on the presentations is expanded upon in the following eight sub-categories described below.

In addition to the updates outlined below, the ASP has a standing (pre-recorded) presentation that is provided for each cohort of the general clinical orientation for nursing staff and a standing virtual meeting to introduce newly hired, Regina-area physicians to the ASP as part of their orientation.

Approximately 1 education session was presented or hosted every 3 working days.

*Elementary and High School Presentations: **26***

These included presentations at six different schools in Regina: Campbell Collegiate, Campus Regina Public, Huda School, Martin Collegiate, Miller High School, and St. Mary Elementary. The majority of presentations (69%, 18/26) were for high school students (Health Science 20 and Biology 30) and included a general introduction to the concepts of AMR and AMS along with a review of case studies highlighting decision making around antibiotic prescribing. The remaining presentations (31%, 8/26) were aimed at kindergarten and Science 9 and 10 classes and focused on careers in AMS. The number of attendees varied by class, but most often were in the range of 20-30 students. The success of this educational endeavour was built over years of connecting with science teachers in Regina. These presentations have all been delivered in-person since gathering restrictions eased following the COVID-19 pandemic.

*Nursing Student Presentations: **2***

These included presentations to nursing students attending Saskatchewan Polytechnic. An in-person presentation was provided to a licensed practical nursing class in Regina and a virtual presentation was provided to a class in Carlton Trail. The content of the presentation focused on appropriate testing and management of urinary tract infections (UTIs) and asymptomatic bacteriuria. The number of attendees varied by class from 10-20 students.

There was less uptake for presentations in 2023 compared to our initial education campaign in 2022 which included five presentations to bachelor of science in nursing, licensed practical nursing, and registered psychiatric nursing classes at Cumberland College, Dumont Technical Institute, Saskatchewan Polytechnic, and Carlton Trial (in-person presentations for Regina sites and virtual for those outside Regina). It was during the 2022 campaign that we identified barriers to nursing trainees receiving the right information about symptoms of UTIs and when to order urine cultures. Barriers included incorrect information being presented in textbooks or taught in class and the power imbalance present when nurse trainees are working with experienced nurses during their practicums whose practice may not be aligned with the most recent evidence. To the date of this publication, we have been unable to make progress on addressing the issue of updating textbooks.

Pharmacy Student Presentations: 6

These included in-person, three-hour education sessions for fourth year pharmacy students while on their hospital rotations. For these sessions, students prepared and presented on common bacterial pathogens that cause infections in humans and important considerations in microbiology. The facilitators would outline steps in assessing antimicrobial therapy and review a patient case applying the learned content.

Long-Term Care Presentations: 26

These included virtual and in-person presentations to long-term care (LTC) leadership, staff, residents, and resident families at sites across the province. Topics focused on general AMS principles and appropriate testing and management of UTIs and asymptomatic bacteriuria. In-person presentations occurred at sites in Moosomin (Southeast Integrated Care Centre), Regina (six Home Care Networks, Brightwater Senior Living of Captial Crossing, Regina Pioneer Village, and Sunset Extendicare), and Saskatoon (Parkridge Centre, Samaritan Place, Sherbrooke Community Centre, and St. Ann's Senior Citizens' Village). Virtual presentations were provided to LTC leadership including the LTC Directors of Care provincial group and the Integrated Northern Health LTC group. Group size varied based on the audience from a handful of attendees to several dozen.

General Clinical Education Presentations: 23

These included local and provincial presentations, either virtual or in-person, on a variety of topics to a variety of audiences. Topics included general AMS principles, appropriate testing and management of UTIs and asymptomatic bacteriuria, penicillin allergy de-labelling, syphilis treatment, procalcitonin (PCT) use in intensive care units (ICUs), using the Firstline app, community-acquired pneumonia management, fungal infections, and sexually transmitted and blood-borne infections. Audiences included primary care clinics (physicians, pharmacists, nurse practitioners), internationally trained family physicians, hospital nursing staff, medical residents, family physicians, ICU clinicians, orthopedic surgeons, pharmacists, emergency physicians, infection prevention and control (IPAC) staff, urgent care clinic staff and administrators, and medical imaging technologists. Audience sizes ranged widely, depending on the presentation and forum, from a handful of attendees to hundreds. Ten presentations (43%, 10/23) were provincial in scope, another nine (39%, 9/23) were delivered in Regina, and the remaining four (17%, 4/23) were in Moose Jaw.

Education Rounds Webinars: 6

In general, these 45 minute, virtual webinars alternated each month between ASP-related and other topics, with some months exempted due to cancellations. All webinars were recorded and posted to a playlist on the Stewardship and Clinical Appropriateness YouTube channel. More than 215 attendees viewed the presentations live, an average of 31 attendees per webinar. In total, there were 182 views of these videos on the YouTube channel by the end of 2023 (259 views as of September 13, 2024).

Speakers/topics included:

- Public Health Ontario / Burden of AMR in Ontario **(12 views; published February 2023)**
- Global Strategy Lab / Addressing AMR is Key to Pandemic Preparedness **(50 views; published April 2023)**
- BCCDC / The Business Case for Community AMS: Efforts in BC **(32 views; published June 2023)**

- University of Regina / The Gut Microbiota and Healthy Aging **(34 views; published August 2023)**
- SHA / Penicillin Allergies and a Risk Assessment De-labelling Tool **(28 views; published October 2023)**
- Saskatchewan Ministry of Agriculture / AMS in Canadian Agriculture: Yes, We Do That Too **(9 views; published December 2023)**

Infectious Diseases Journal Club: 3

Regina AMS pharmacists initiated a bi-monthly infectious diseases (ID) journal club where ID pharmacists, physicians, and microbiologists from both Regina and Saskatoon, as well as clinical pharmacists across the province, were invited to participate. Newly published papers that were potentially practice changing were presented to the group followed by open discussions.

Pediatric Respiratory Tract Infections – Special Topic Presentations: 4

The ASP partnered with Dr. Rupesh Chawla, a pediatric infectious diseases physician from Jim Pattison's Children's Hospital, to create four presentations aimed at primary care providers. The goal was to provide more information about management of pediatric respiratory tract infections (RTIs), a topic often requested by primary healthcare (PHC) providers. Three short videos were created and shared with PHC groups (*e.g.*, Regina-area family physician leads) in the province, and a live "Ask Us Anything" webinar was held during World AMR Awareness Week (WAAW; playlist). The short videos and live webinar had a combined 87 views on our YouTube channel by the end of 2023 (169 views as of September 13, 2024).

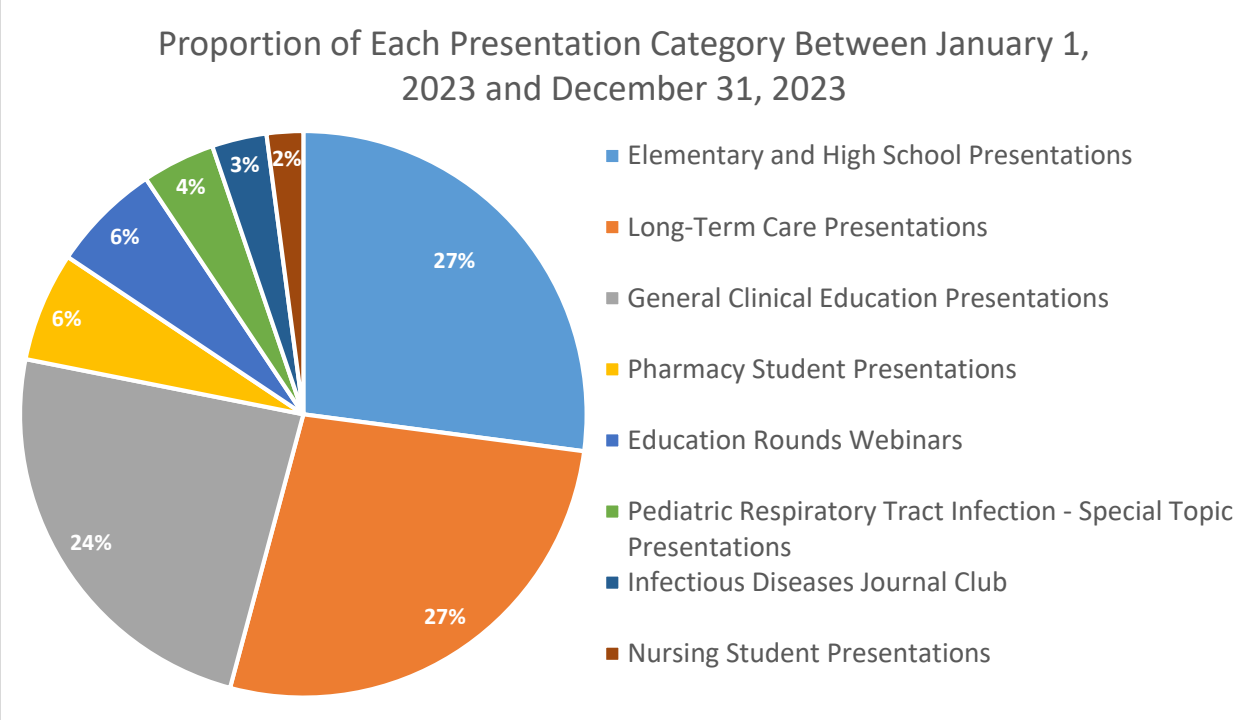


Figure 1 – Proportion of Each Presentation Category Between January 1, 2023 and December 31, 2023. The majority of presentations (78%, 77/96) were for elementary and high schools, LTC, and general clinical education.

ADDITIONAL EDUCATIONAL ACTIVITIES AND CONTENT

Student and Resident Mentorship: ***3 pharmacy students, 4 pharmacy residents***

Throughout the year, the ASP hosted pharmacy students and residents as part of their training. Students and residents were engaged in clinical AMS work, data collection to inform AMS efforts, research projects, and creating educational content for the ASP, such as the "Case of the Month" for Firstline and various other educational posters and handouts. Students were with the ASP for four weeks and residents were on rotation for three to four weeks. Pharmacy resident research projects take place over one year. Student and resident contributions to the ASP are vital to achieving our goals.

In recognition of the quality of the preceptorship provided in 2023, the ASP pharmacists, Melissa Kucey and Kristin Schmidt, received the Canadian Society of Healthcare-Systems Pharmacy Saskatchewan Branch "Preceptor of the Year" award for the Regina-area residency program.

Informational Posters: ***3***

Three informational posters were created: one aimed to provide general awareness of AMR and AMS (to be posted in clinic waiting rooms or other areas for the general public to view), another provided information on intravenous (IV) amoxicillin-clavulanate (an antibiotic which was added to the SHA hospital formulary in 2023), and the third was designed as part of the pediatric RTI special topic described above and provided information on pediatric dosing of amoxicillin and amoxicillin-clavulanate. All documents were made available on the ASP website.

Prior to 2023, there were five other documents already available on the ASP website, including both adult and pediatric versions of the viral prescription pad (described below), a guideline document for durations of therapy for common infections, COVID-19 pneumonia guidelines, and a ceftriaxone dosing handout.

ASP Website: ***1254 total views****

The ASP website was continuously monitored and updated to ensure that content was current and accurate. The website consists of four linked webpages:

- a patient/public-facing page with general AMS information **(493 views)***
- an education and research page that outlines and links to our educational and awareness efforts as well as a list of our journal publications **(119 views)***
- an about us page with contact information for Regina and Saskatoon-based AMS experts **(197 views)***
- a provider-facing page with information on AMS-related tools and resources available to clinicians **(445 views)***

*Due to recent updates for the software that is used to gather website views, these data are only available from July 2023 onward (*i.e.*, July 1, 2023 – December 31, 2023). Thus, reported website views are approximately half of what would be expected for the full 2023 calendar year.

Publications: ***1***

There was one publication in 2023: an opinion piece co-authored by ASP members and collaborators from across Canada and published on Healthing.ca on November 16, 2023. The purpose of this publication was to promote awareness of AMR and AMS and the upcoming WAAW.

Prior to 2023, there were nine AMS-related, peer-reviewed journal publications that included ASP members as co-authors with 82 total citations as of September 20, 2024:

9 AMS-related, peer-reviewed journal publications have been cited a total of 82 times as of September 2024.

- Vanstone JR, Azizian AR, Berry W, Carr T, Falastein P, Mise T-R, Patel S, Sarker KK, Yasinian M, and Groot G. Identifying Barriers and Enablers to Vaccine uptake from Immunizers and Individuals Receiving a COVID-19 Vaccine in Saskatchewan. *The Open Public Health Journal* (2022) 15: e187494452208012. Published 2022 Oct 31. doi: 10.2174/18749445-v15-e2208012 **(citations as of September 20, 2024: 2)**
- Khaketla M, Carr T, Ndubuka N, Quinn BG, Reeder B, Sarker KK, Addae A, Ali A, Groot G, Sari N, Vanstone J, Hartness CJ, and Zayed R. Community and Public Health Responses to a COVID-19 Outbreak in North-west Saskatchewan: Challenges, Successes and Lessons Learned. *International Journal of Indigenous Health* (2022) 17(1): 73-86. Published 2022 Jul 5. https://doi.org/10.32799/ijih.v17i1.36703 **(citations as of September 20, 2024: 3)**
- Vanstone JR, Patel S, Berry W, Degelman ML, Hanson C, Phillips C, and Parker R. Using audit and feedback to encourage primary healthcare prescribers to record indications for antimicrobial prescriptions: a quality improvement initiative. *BMJ Open Quality* (2022) (11):e001760. Published 2022 Mar 10. http://dx.doi.org/10.1136/bmjoq-2021-001760 **(citations as of September 20, 2024: 2)**
- Azizian AR, Carr T, Muhajarine N, Verall T, Hartness C, Vanstone JR, Yasinian M, Skrapek C, Andreas B, Farthing G, and Groot G. Developing a patient-oriented realist evaluation for COVID-19 vaccine implementation in Saskatchewan: a methodologic framework. *Canadian Medical Association Journal* (2021) 9(4): E1034-E1039. Published 2021 Nov 23. https://doi.org/10.9778/cmajo.2021004 **(citations as of September 20, 2024: 3)**
- Groot G, Baer S, Badea A, Dalidowicz M, Yasinian M, Ali A, Carr T, Reeder B, COVID-19 Evidence Support Team (CEST). Developing a rapid evidence response to COVID-19: The collaborative approach of Saskatchewan, Canada. *Learning Health Systems* (2021): e10280. Published 2021 Jun 22. https://doi.org/10.1002/lrh2.10280 **(citations as of September 20, 2024: 8)**
- Wade-Cummings M, Mailman JF, Degelman, ML, Phillips C, Vanstone JR. Identification of Staphylococci by Polymerase Chain Reaction Directly from a Positive Blood Culture and Effect on Patient Care. *Canadian Journal of Hospital Pharmacy* (2021) 74(1):43-9. Published 2021 Jan 15. doi:10.4212/cjhp.v74i1.3039 **(citations as of September 20, 2024: 3)**
- Lee C, Jafari M, Brownbridge R, Phillips C, Vanstone JR. The viral prescription pad - a mixed methods study to determine the need for and utility of an educational tool for antimicrobial stewardship in primary health care. *BMC Family Practice* (2020) 21(1):42. Published 2020 Feb 22. doi:10.1186/s12875-020-01114-z **(citations as of September 20, 2024: 25)**

- Pflanzner S, Phillips C, Mailman J, Vanstone JR. AMS in the ICU: empiric therapy and adherence to guidelines for pneumonia. *BMJ Open Quality* (2019) 8(2):e000554. Published 2019 Apr 24. doi:10.1136/bmjoq-2018-000554 **(citations as of September 20, 2024: 4)**
- Lee C, Phillips C, Vanstone JR. Educational intervention to reduce treatment of asymptomatic bacteriuria in long-term care. *BMJ Open Quality* (2018) 7(4):e000483. Published 2018 Dec 1. doi:10.1136/bmjoq-2018-000483 **(citations as of September 20, 2024: 32)**

*Conferences Attended**: 1***

Members of the SHA ASP attended and presented at the Saskatchewan Family Medicine Conference in September 2024. A presentation was provided at a pre-conference workshop giving an overview of the importance of AMS and AMR as well as outlining appropriate UTI management and penicillin allergy de-labeling. The ASP also hosted a booth at the conference where we promoted AMS awareness and provided AMS-related tools to conference attendees.

Firstline App

The Firstline app provides antibiograms, clinical guidelines, antimicrobial information, and educational opportunities for healthcare providers across Saskatchewan. In 2023, there was an average of 1295 users each month (monthly users are defined as unique individuals who have accessed the app in a given month). Figure 2 shows the 2023 data broken down by month and by the platform used to access the app. Aggregate monthly users are also broken down by clinical role and location in Figures 3 and 4.

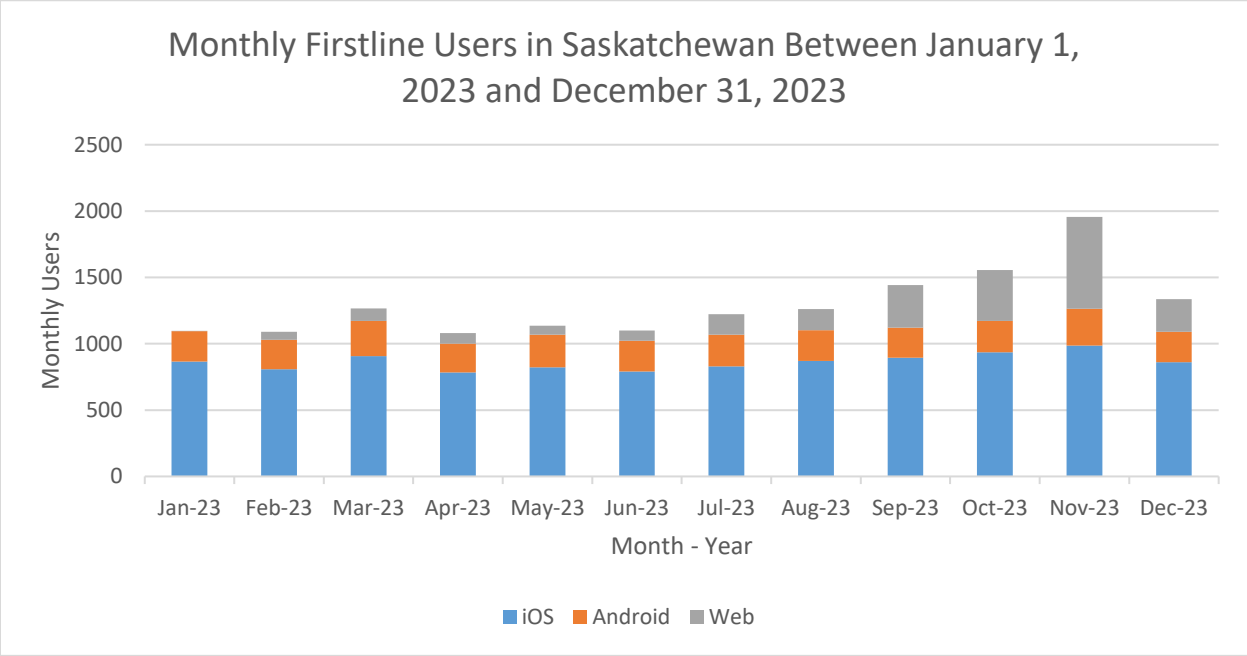


Figure 2 – Monthly Firstline Users in Saskatchewan Between January 1, 2023 and December 31, 2023. There was an average of 1295 Firstline users each month in 2023. The majority of users accessed Firstline through iOS devices. The peak of users in November 2023 corresponds with WAAW and heightened activities hosted on Firstline (*e.g.*, trivia).

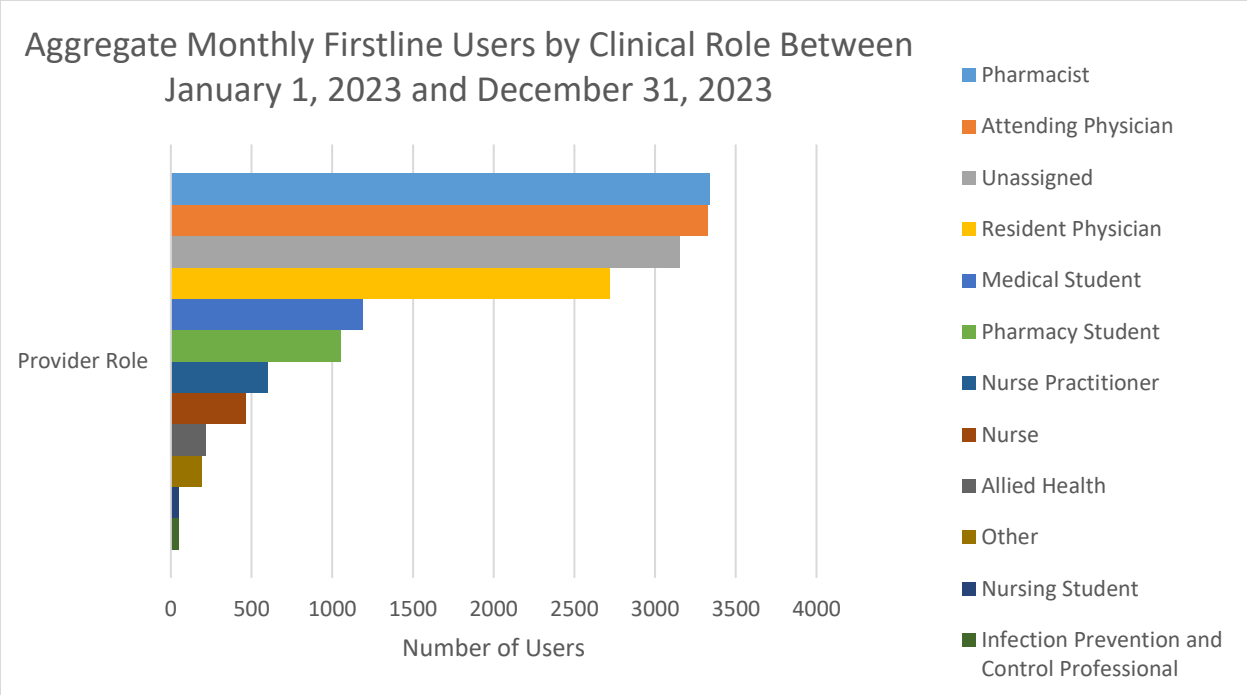


Figure 3 – Aggregate Monthly Firstline Users by Clinical Role between January 1, 2023 and December 31, 2023. Pharmacists, attending physicians, and resident physicians accounted for approximately 57% (9381/16,332) of the aggregate monthly users.

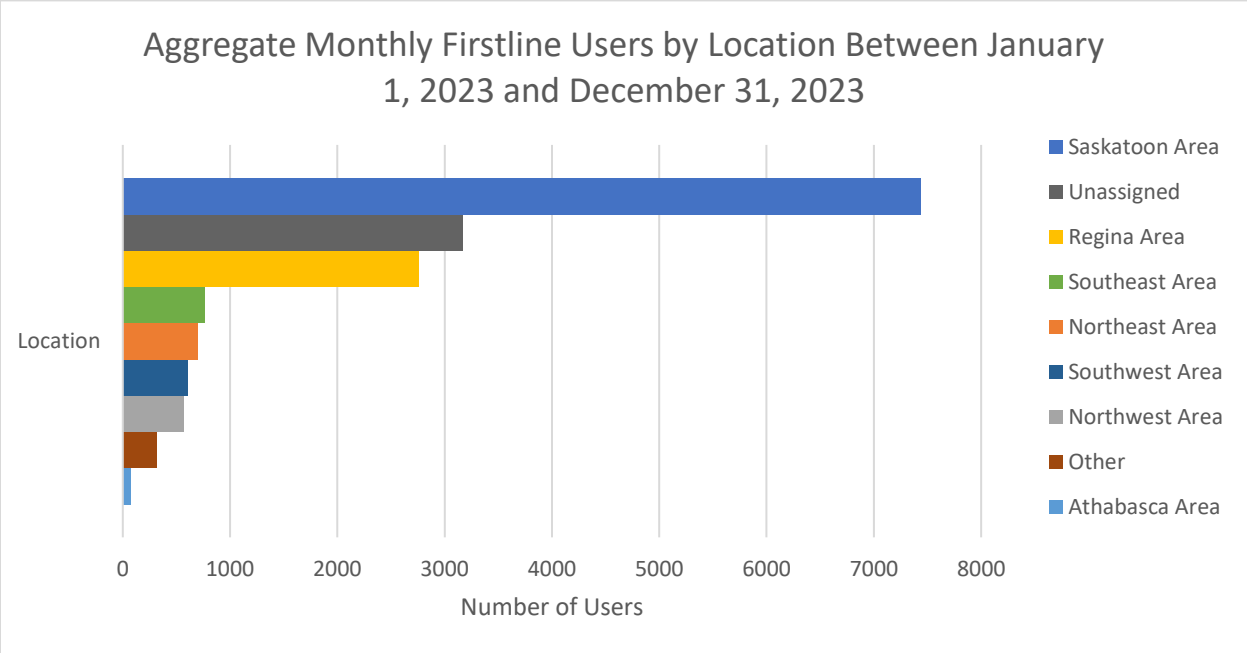


Figure 4 – Aggregate Monthly Firstline Users by Location Between January 1, 2023 and December 31, 2023. Saskatoon and Regina areas accounted for approximately 62% (10,196/16,385) of the aggregate monthly users.

In total, 41 different guidelines were accessed a total of 29,695 times in 2023. The top ten most frequently viewed guidelines are shown in Figure 5.

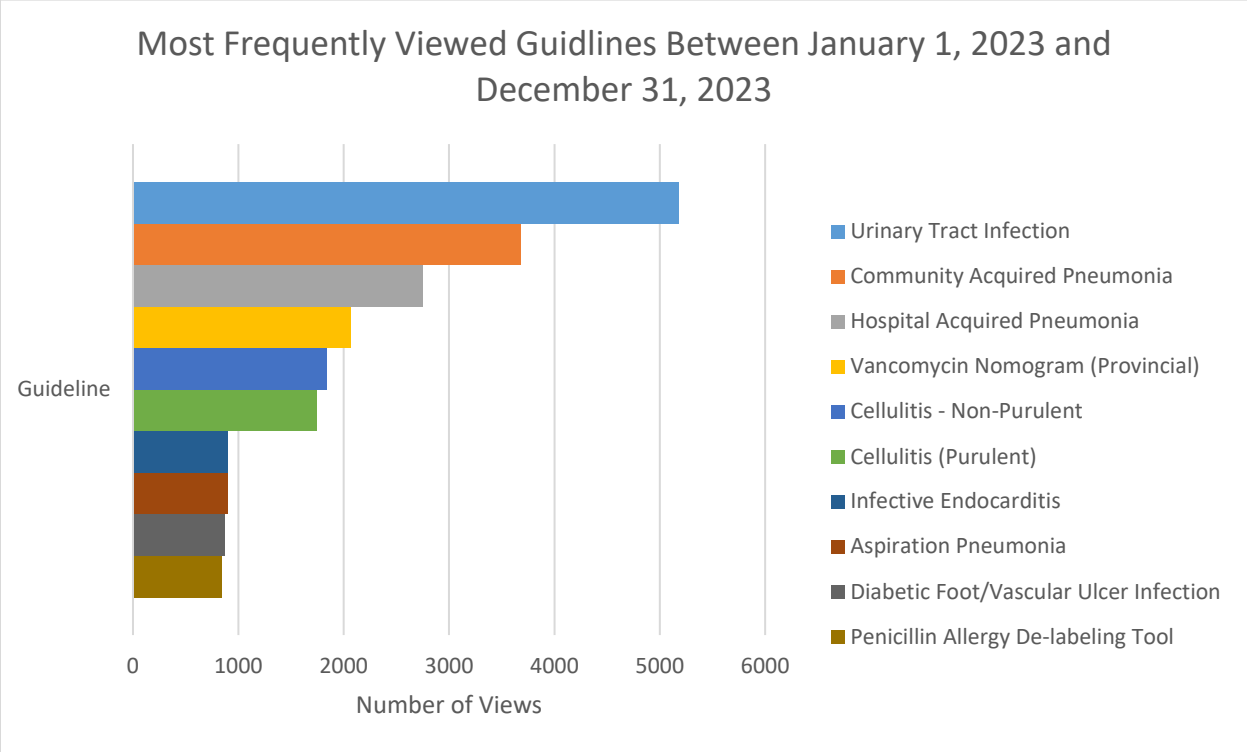


Figure 5 – Most Frequently Viewed Guidelines Between January 1, 2023 and December 31, 2023. The top ten most frequently viewed guidelines are shown in descending order of the number of views. These ten guidelines accounted for approximately 70% (20,742/29,695) of the total number of guideline views.

A penicillin allergy de-labeling tool was adopted from a Firstline instance in British Columbia and was added to the SHA Firstline instance (discussed in more detail below). This began an ongoing provincial initiative to de-label penicillin allergies, which included presentations and educational content (discussed above) to help with promotion and uptake of the tool in clinical practice. The de-labeling tool was accessed 837 times, the educational video on our YouTube channel received 80 views (posted on May 18, 2023), and 38 assessments (30 in Regina, eight in Saskatoon) were captured in the Research Electronic Database Capture (REDCap) tool that was set up for clinical data collection on March 17, 2023 (more information below). The REDCap tool does not account for penicillin allergy assessments that may have occurred outside of Regina and Saskatoon or in other healthcare settings (*e.g.*, PHC, LTC).

We published four Case of the Month case studies in collaboration with the ID pharmacist in Saskatoon. The purpose of these activities is to provide clinical practice pearls to providers on specific, antimicrobial-related topics. There were a combined 568 views of the four Cases of the Month.

*Provincial AMS Network Meetings: **5***

These one hour, bi-monthly meetings provide an opportunity for interest holders and collaborators across organizations and the province to connect, share and discuss AMS-related activities going on in their local areas or organizations, and receive updates on activities from the SHA ASP. The invitee list includes the

members of the ASP and people involved in AMS-related work from across the province, representatives of the Saskatchewan Ministries of Health and Agriculture, patient partners, universities, and SHA IPAC, pharmacy, ID, laboratory, and administration.

World AMR Awareness Week: **November 18-24**

The World Health Organization (WHO) promotes an annual, global awareness week focused on AMR. Members of the ASP are engaged with a national network (AMR Aware Canada) that meets in the months leading up to WAAW to share information about awareness initiatives being planned at sites across the country and to focus efforts on national WAAW activities. One of the major WAAW activities is the #GoBlue campaign that encourages local landmarks across Canada to light up in blue during WAAW. There are also social media campaigns, virtual backgrounds for video conferences, and people are encouraged to wear light blue during the week.

In Saskatchewan, Regina City Hall, the Moose Jaw Clock Tower, the Peter Mackinnon Building at the University of Saskatchewan, and a federal government building in Saskatoon all lit up in blue on November 24, 2023. The ASP team hosted an information booth at the main entrance of the Regina General Hospital on November 24, 2023. A University of Saskatchewan pharmacy student provided WAAW-themed cookies and informational handouts to passers-by throughout the morning to raise awareness of the threat of AMR and the need for increased AMS efforts (see Appendix 1 for more information). As a special presentation for WAAW, the "Ask Us Anything" webinar focusing on management of pediatric respiratory tract infections (described above) was held during the week.

As a lead up to the WAAW, a letter was drafted by the ASP and signed by 19 AMS interest holders from across Saskatchewan, including physicians, pharmacists, medical microbiologists, and researchers. The letter was emailed to all sitting Members of the Legislative Assembly in the Saskatchewan Legislative Assembly on November 8, 2023, with content outlining the need for political engagement and action on AMR, and including information about WAAW. Members of the ASP also co-authored an opinion-piece with collaborators from across Canada which was published on Healthing.ca on November 16, 2023 to promote awareness of AMR and AMS and the upcoming WAAW.

Stewardship and Clinical Appropriateness 5 Min Update: **11**

The Stewardship and Clinical Appropriateness Department distributes a monthly newsletter via email to update readers on ASP (and Opioid Stewardship Program) activities, as well as to advertise the upcoming Education Rounds webinars. The email distribution list includes members of our ASP and people involved in AMS-related work from across the province, representatives of the Saskatchewan Ministries of Health

and Agriculture, patient partners, universities, and SHA IPAC, pharmacy, ID, laboratory, and administration.

The ASP updates included the following topics:

- IV amoxicillin/clavulanate update
- a review of a *Journal of the American Medical Association* (JAMA) article that highlighted the efficacy of ASPs[3]
- an antibiogram update
- a primer on penicillin allergies and the Drop the Label movement
- an introduction to the Canadian Antimicrobial Innovation Coalition
- a review of an article from the US Veterans Affairs system showing that AMS activities can be supported through telehealth[4]
- an introduction to the Choosing Wisely Canada STARS program
- a review of another JAMA article that highlighted new evidence that doesn't support previous warnings of increased aortic aneurysms associated with fluoroquinolone use[5]
- an opportunity for non-regulated healthcare workers in LTC to participate in a PHAC survey
- a call for action to engage in WAAW activities
- a review of WAAW activities

*MyLearning Modules: **1***

In order to provide more opportunities for education about AMR and AMS within the SHA, the ASP created an education module using the SHA's MyLearning platform. The first module we created was a general introduction to the concepts of AMR and AMS. It was developed in 2023 but the module wasn't broadly available until January 9, 2024. The content can be accessed by searching for "antimicrobial stewardship" in the MyConnection/MyLearning platform.

*Brightspace Learning Modules: **1***

As detailed above, the ASP provided education to a number of nursing classes on AMR, the importance of AMS, and management of UTIs and asymptomatic bacteriuria. At the request of faculty members we created a learning module that could be incorporated into their curriculum. The educational module was shared with instructors at both Dumont Technical Institute and Saskatchewan Polytechnic.

Interventional Activities

The general goals of these activities were to create the policy and/or behavioural changes required to address AMR as well as provide direct patient care. These activities may engage healthcare workers, administrators, AMS interest holders, and/or the general public to drive actions and/or policies which create more rational and appropriate AMU.

ASP Pharmacist Consults

The ASP pharmacists provide an adjunct ID and AMS consult service for Regina-area hospitals and acute care facilities across the province. The two pharmacists alternate clinical service weeks to maintain ongoing coverage. Consults and patient audits include reviewing antimicrobial treatment for patients on wards at Regina General and Pasqua Hospitals which do not have dedicated pharmacy services, infectious

diseases consult support, reviewing patients with positive blood cultures, and antimicrobial consult services for clinicians throughout Saskatchewan.

Antimicrobial review data described below were captured between February 3, 2023 and December 31, 2023. Data are self-recorded by the ASP pharmacists in a REDCap tool and are likely an underestimation of the total number of interventions as they are not always reliably recorded due to competing priorities in daily work or for reviews that do not require intervention.

The ASP pharmacists performed 395 documented antimicrobial reviews over the 260 working days in 2023. This accounts for 1.5 reviews per working day and includes more than 202 unique patients (plus 113 blank patient identifiers in the data set). The majority of patients that were reviewed were located at the Regina General and Pasqua Hospitals (82.3% combined). Patients outside of Regina represented 13.9% of the reviews, almost half of which were in Yorkton. Table 1 shows the distribution of patient reviews by location. Additionally, the ASP pharmacists answer 10-20 questions received by WebEx messaging, phone calls, or text messages each week which are not captured in the REDCap tool.

Approximately 2 AMU interventions were performed each working day.

Table 1. Distribution of Patient Location for Antimicrobial Reviews by ASP Pharmacists (February 3, 2023 to December 31, 2023).

Patient Location	Count (N=395)	%
Regina General Hospital	235	59.5%
Pasqua Hospital	90	22.8%
Patient Outside of Regina	55	13.9%
Outpatient	11	2.8%
Wascana Rehabilitation Centre	4	1.0%
Patient Location Outside Regina	**Count (N=55)**	**%**
Yorkton	24	43.6%
Moose Jaw	8	14.5%
Swift Current	7	12.7%
Melville	7	12.7%
Fort Qu'Appelle	3	5.5%
Canora	2	3.6%
Arcola	1	1.8%
Assiniboia	1	1.8%
Esterhazy	1	1.8%
Indian Head	1	1.8%

Antimicrobial reviews are broken down into seven categories, with almost half being accounted for between stewardship consults and new ID consults. The distribution of the types of antimicrobial reviews is shown in Table 2.

Table 2. Distribution of ASP Pharmacist Antimicrobial Review Types (February 3, 2023 to December 31, 2023).

Type of Review	Count (N=395)	%
Stewardship Consult	97	24.6%
New Infectious Diseases Consult	82	20.8%
Follow-up Review (for Infectious Diseases Consult)	72	18.2%
Stewardship Audit	57	14.4%
Staphylococcus aureus Bacteremia Audit	44	11.1%
Positive Blood Culture Audit (Non-*Staphylococcus aureus* Bacteremia)	42	10.6%
Follow-up Review (for Stewardship Consult)	1	0.3%

The most common antibiotic reviewed was vancomycin, accounting for one-in-five of all antimicrobials reviewed. The most common indication for an antibiotic that was reviewed was for bacteremia, accounting for nearly half of all indications. The top ten antibiotics and indications reviewed are shown in Table 3.

Table 3. Distribution of the Top Ten Antimicrobials and Indications Reviewed by ASP Pharmacists (February 3, 2023 to December 31, 2023).

Antimicrobial Reviewed	Count (N=395)	%
Vancomycin	79	20.0%
Cefazolin	49	12.4%
Piperacillin/Tazobactam	48	12.2%
Ceftriaxone	38	9.6%
No Antimicrobial	24	6.1%
Meropenem	19	4.8%
Ciprofloxacin	17	4.3%
Daptomycin	13	3.3%
Metronidazole	11	2.8%
Caspofungin	10	2.5%
Indication Reviewed	**Count (N=394)**	**%**
Bacteremia	174	44.2%
Other Indication	25	6.3%
Pneumonia - Hospital Acquired (HAP)	14	3.6%
Osteomyelitis	13	3.3%
Prosthetic Joint Infection	13	3.3%
Abscess - Intra-abdominal	12	3.0%
Pneumonia - Community Acquired (CAP)	12	3.0%
Sepsis	12	3.0%
Other Skin/Soft Tissue Infection	11	2.8%
Septic Arthritis	9	2.3%

In total, 83.3% of all interventions suggested by the ASP pharmacists were accepted by consulting or attending clinicians. As expected, interventions that increased AMU (*e.g.*, increasing dose and/or duration, broadening spectrum of coverage, or adding antimicrobials) had a higher acceptance rate than interventions intended to reduce AMU (*e.g.*, decreasing dose and/or duration, IV/PO stepdown, narrowing spectrum of coverage, or stopping antimicrobials); 97.1% versus 82.5% respectively. Table 4 provides the distribution of acceptance rates for ASP pharmacist-suggested interventions for antimicrobial reviews.

Table 4. Distribution of Acceptance Rates for ASP Pharmacist-Suggested Interventions for Antimicrobial Reviews (February 3, 2023 to December 31, 2023).

Suggested Intervention	Count	Accepted	% Accepted
Dose Optimization (Increase)	18	18	100.0%
Broadening Antibiotic Spectrum	5	5	100.0%
Duration Optimization (Increase)	36	35	97.2%
Adding Antimicrobial	45	43	95.6%
Dose Optimization (Decrease)	11	10	90.9%
IV/PO Stepdown	20	18	90.0%
Change in Antimicrobial Due to Adverse Effect	7	6	85.7%
Antibiotic Unnecessary/Stopped	90	75	83.3%
Duration Optimization (Decrease)	28	22	78.6%
Infectious Diseases Consult Recommended	14	11	78.6%
Narrowing Antibiotic Spectrum	34	26	76.5%
Drug-Bug Mismatch	15	0*	0.0%
Total	**323**	**269**	**83.3%**

*It is unlikely that none of the drug-bug mismatch interventions were accepted; the data collection tool was not capturing follow-up for those patients in 2023 (this has been addressed as of March 2025). If all 15 drug-bug mismatch interventions were accepted, the total acceptance rate for all interventions would have been 87.9% (284/323).

Random Antimicrobial Audits by Pharmacy Students

One of the learning activities for pharmacy students who complete their rotations with the ASP is to conduct random audits of inpatients with active antimicrobial orders. Antimicrobial orders are retrieved from the inpatient pharmacy database at the beginning of the day and students review a random selection of active inpatient charts to assess a number of aspects of AMU. This activity serves as both a learning opportunity for students (who learn more about appropriate antimicrobial treatment) as well as a surveillance activity for the ASP (providing information about opportunities for AMU improvement within inpatient facilities).

For the three students who worked with the ASP between January 1, 2023 and December 31, 2023, 314 audits were conducted on antimicrobial orders within inpatient facilities. Over 70% (221/314) of the audits were conducted at Regina General Hospital with the remaining 30% (93/314) occurring at Wascana Rehabilitation Centre.

The most common antimicrobial reviewed by students was ceftriaxone and lower UTIs were the most common indication. Table 5 shows the distribution of the top ten antimicrobials and indications for pharmacy student random antimicrobial audits.

Table 5. Distribution of the Top Ten Antimicrobials and Indications Randomly Reviewed by Pharmacy Students (January 1, 2023 to December 31, 2023).

Antimicrobial Reviewed	Count (N=314)	%
Ceftriaxone	49	15.6%
Cefazolin	31	9.9%
Vancomycin	26	8.3%
Cephalexin	23	7.3%
Piperacillin/Tazobactam	22	7.0%
Amoxicillin/Clavulanate	18	5.7%
Ciprofloxacin	18	5.7%
Metronidazole	16	5.1%
Nitrofurantoin Macrocrystal (Macrobid)	16	5.1%
Sulfamethoxazole/Trimethoprim (Septra)	11	3.5%
Indication Reviewed	**Count (N=314)**	**%**
Urinary Tract Infection (UTI) - Cystitis (Lower)	46	14.6%
Blank	38	12.1%
Pneumonia - Community Acquired (CAP)	32	10.2%
Other	29	9.2%
Cellulitis	21	6.7%
Bacteremia	16	5.1%
Surgical Prophylaxis	15	4.8%
Sepsis	10	3.2%
Surgical Site Infection	10	3.2%
Asymptomatic Bacteriuria	7	2.2%

One intervention the ASP has been promoting is the benefits of including an indication with antimicrobial orders to ensure all clinicians have a clear understanding of why the antimicrobial was ordered. Random student audits in 2023 determined that nearly 75% (234/314) of the antimicrobial orders they reviewed did not have an indication documented with the original order. They did find that approximately 63% (196/314) of antimicrobial orders had an indication documented somewhere in the patient's chart (albeit not with the original order), or they were able to deduce the indication from information elsewhere in the patient's chart. However, at least 11% (37/314) of antimicrobial orders (a further 81 of the 314 reviews had blanks in the data set for this metric) had no indication documented, nor was the student able to deduce the reason for the antimicrobial order. This indicates that improving documentation of indications with antimicrobial orders is still a work in progress within inpatient facilities in Regina.

In addition to reviewing the indications for antimicrobial orders, the pharmacy student random antimicrobial audits also assessed the appropriateness of AMU based on the indication, dose, duration,

and whether the patient was eligible for IV to PO stepdown. From the 2023 data, 16% of antibiotic orders were not indicated for the patient, 10% of orders had an incorrect dose, 24% of orders had an incorrect duration of treatment, and 13% of orders were eligible for IV to PO stepdown. Each of these represents an opportunity for continued improvement in AMU within acute and LTC facilities. Table 6 provides more details for each of these categories of appropriateness of AMU.

Table 6. Measures of Appropriateness of Antimicrobial Use of Antimicrobials Randomly Reviewed by Pharmacy Students (January 1, 2023 to December 31, 2023).

Was the Antibiotic Indicated?	Count (N=314)	%
Yes	226	72.0%
No	51	16.2%
Unknown	37	11.8%
Was the Dose Correct?	**Count (N=314)**	**%**
Yes	245	78.0%
Blank	38	12.1%
No	31	9.9%
Was the Duration Correct?	**Count (N=314)**	**%**
Yes	142	45.2%
No	74	23.6%
Not Indicated By Prescriber	60	19.1%
Blank	38	12.1%
Eligible for IV/PO Stepdown?	**Count (N=314)**	**%**
Blank	162	51.6%
No	110	35.0%
Yes	42	13.4%

Including Indications with Antimicrobial Prescriptions in PHC

In 2020, the SHA ASP began a monthly audit and feedback activity with a group of PHC clinics in the Regina area. Feedback was provided to prescribers regarding the proportion of their antimicrobial prescriptions with a documented indication with the goal of increasing the number of indications. This provides both more complete information for patients and other healthcare providers involved in the patient's care, as well as more granular information and better data for future AMS interventions. More details on this work are available in a publication from 2022[6].

Throughout 2023, monthly data updates (audit and feedback) continued to be distributed to prescribers via email. Prescribers were encouraged to reach out to the ASP with any questions and to receive their identification number to review their personal prescribing data. We also encouraged clinics to provide us opportunities to meet with prescribers in person to discuss their data and possible behaviour change initiatives. As expected, for a multitude of reasons, there was very little uptake on these offers.

Introducing Procalcitonin Testing to Regina ICUs

In October 2023, the ASP team launched a PCT protocol within Regina ICUs to guide antibiotic discontinuation and help reduce AMU. This work began in 2022 as PCT testing was not previously available in the Regina General Hospital laboratory. There was an abundance of evidence suggesting that PCT levels in the blood can indicate the likelihood of bacterial infection (or not) and that PCT levels can be used to safely guide discontinuation of antibiotics in critically ill patients and reduce AMU. Thus, the PCT protocol was proposed to interest holders as an AMS intervention in the ICU. Once interest holders were in agreement with the protocol, work continued with the microbiology and biochemistry departments to create a briefing note for executive leadership that requested the initiation of PCT testing at the Regina General Hospital laboratory. After receiving approval, PCT testing supplies were ordered and calibration and validation subsequently took place to ensure the test worked properly. Numerous meetings, huddles, and education sessions to ICU physician groups, pharmacists, nursing, and administrative staff took place to ensure teams were aware of the availability of the new diagnostic test and how it could be used to guide patient care. Pharmacy students were also engaged in the work and helped create posters promoting the new test and protocol available in ICU. After the launch of the new PCT protocol in October, data collection began and continues as an ongoing project incorporated into clinical care.

ICU Collaborative Work

In October 2023, the ASP began discussions with the Critical Care Pharmacy Specialist in Regina to determine ways to better collaborate and improve AMS-related initiatives in ICUs in Regina and across Saskatchewan. These discussions expanded on the work that began with the initiation of PCT testing in Regina ICUs (described above) and have resulted in a standing meeting with the Critical Care Pharmacy Specialist to collaborate on the implementation of AMS-related research and quality improvement projects.

Penicillin Allergy De-labelling

On December 6, 2022, the ASP launched a penicillin allergy de-labelling tool on the Firstline app. This tool was adopted from a group in British Columbia who created it as a way to help alleviate pressure on allergists to perform penicillin allergy testing on low-risk patients. The tool is safe to use in all healthcare settings and has even been used by our pharmacy students to de-label patients while in hospital.

In order to add the penicillin allergy de-labelling tool to the Firstline app, the ASP team met with immunologists and infectious diseases physicians to review the content within the tool and receive their endorsement to publish it provincially. Revisions to the management of anaphylaxis and patient outcomes forms were incorporated. Once final revisions were complete, the ASP team worked with Firstline to add the tool to the SHA instance. Numerous presentations subsequently occurred promoting the tool and providing education around penicillin allergies and the importance of de-labelling allergies.

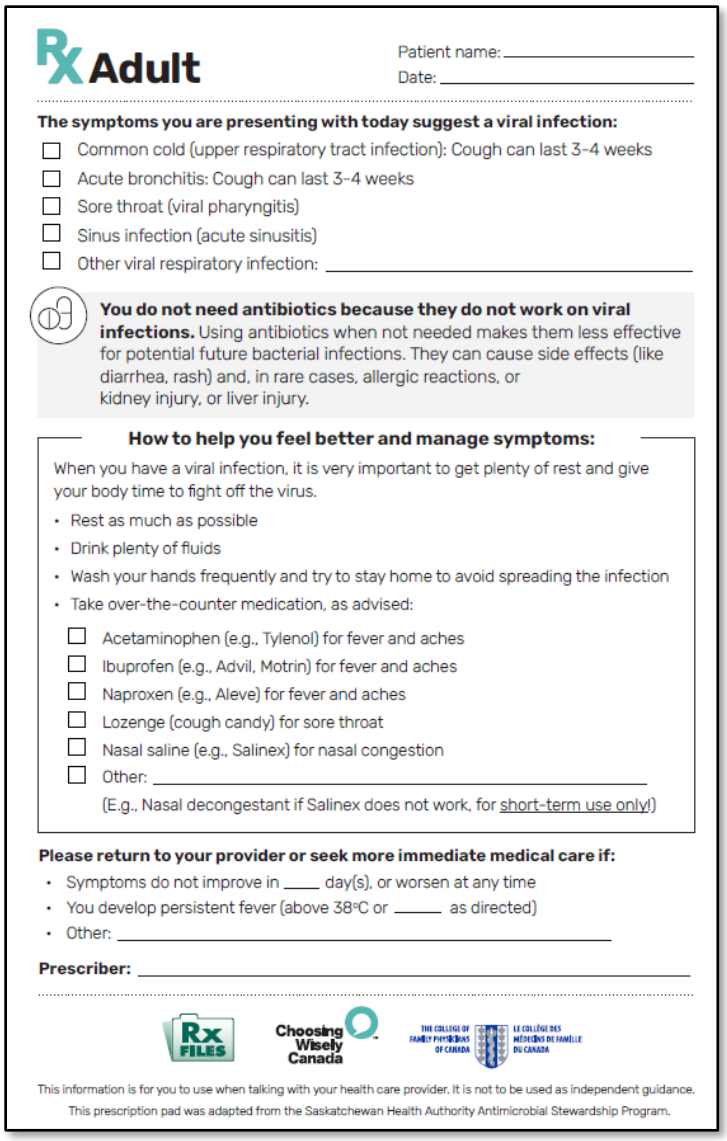
On March 17, 2023, we began collecting data in REDCap for penicillin allergy assessments performed on inpatients by the ASP pharmacists, pharmacy students, or ID physicians in Regina (an addition was added to the tool to include Saskatoon sites, as well). There were 30 assessments completed in 2023, all at the Regina General Hospital. The REDCap tool does not account for penicillin allergy assessments that may have occurred outside of Regina and Saskatoon, or in other healthcare settings (*e.g.*, PHC, LTC). Pharmacy students completed half of the assessments and 63% (19/30) of the patients assessed were deemed to be

at very low risk for a true penicillin allergy. Nine patients had their penicillin allergy de-labelled based on their history alone and five were de-labelled following an amoxicillin test dose challenge. Five patients deemed to be at very low risk for a penicillin allergy were not de-labelled: one was discharged prior to completion of the process and the other four patients (or their family) declined to remove the allergy label. The data are outlined in Table 7 below.

Table 7. Penicillin Allergy Assessments and De-labelling Outcomes (March 17, 2023 to December 31, 2023).

Assessor	**Count (N=30)**	**%**
Pharmacy Student	15	50.0%
ASP Pharmacist	13	43.3%
ID/ASP Physician	2	6.7%
Assessment	**Count (N=30)**	**%**
Very Low Risk for Penicillin Allergy	19	63.3%
Possible Allergy*	10	33.3%
Other*	1	3.3%
Outcomes for Patients With "Very Low Risk for Penicillin Allergy"	**Count (N=19)**	**%**
Patient De-labelled Based on History Alone	9	47.4%
Patient Tolerated Amoxicillin Test Dose Challenge and was De-labelled	5	26.3%
Patient was Not De-labelled for Other Reason:	5	26.3%
Patient/Family Declined	*4*	-
Discharged Prior to Completing the Process	*1*	-

*All patients identified as having a possible allergy or "other" were not de-labelled in hospital, as per the algorithm.



Rx Adult

Patient name: _____
Date: _____

The symptoms you are presenting with today suggest a viral infection:

- ☐ Common cold (upper respiratory tract infection): Cough can last 3-4 weeks
- ☐ Acute bronchitis: Cough can last 3-4 weeks
- ☐ Sore throat (viral pharyngitis)
- ☐ Sinus infection (acute sinusitis)
- ☐ Other viral respiratory infection: _____

You do not need antibiotics because they do not work on viral infections. Using antibiotics when not needed makes them less effective for potential future bacterial infections. They can cause side effects (like diarrhea, rash) and, in rare cases, allergic reactions, or kidney injury, or liver injury.

How to help you feel better and manage symptoms:

When you have a viral infection, it is very important to get plenty of rest and give your body time to fight off the virus.

- Rest as much as possible
- Drink plenty of fluids
- Wash your hands frequently and try to stay home to avoid spreading the infection
- Take over-the-counter medication, as advised:
  - ☐ Acetaminophen (e.g., Tylenol) for fever and aches
  - ☐ Ibuprofen (e.g., Advil, Motrin) for fever and aches
  - ☐ Naproxen (e.g., Aleve) for fever and aches
  - ☐ Lozenge (cough candy) for sore throat
  - ☐ Nasal saline (e.g., Salinex) for nasal congestion
  - ☐ Other: _____
    (E.g., Nasal decongestant if Salinex does not work, for short-term use only!)

Please return to your provider or seek more immediate medical care if:

- Symptoms do not improve in ____ day(s), or worsen at any time
- You develop persistent fever (above 38°C or _____ as directed)
- Other: _____

Prescriber: _____

Rx FILES · Choosing Wisely Canada · The College of Family Physicians of Canada · Le Collège des médecins de famille du Canada

This information is for you to use when talking with your health care provider. It is not to be used as independent guidance.
This prescription pad was adapted from the Saskatchewan Health Authority Antimicrobial Stewardship Program.

Viral Prescriptions

In 2016, the SHA ASP (at that time, the Regina Qu'Appelle Health Region ASP) developed a viral prescription – a document intended for use at the point of care, particularly in outpatient settings (*e.g.*, PHC and emergency departments), to help reduce unnecessary use of antibiotics when managing upper respiratory tract infections. An article on the development and utility of this tool was published in 2020[7]. The viral prescription was adopted and adapted by both RxFiles and Choosing Wisely Canada, who have translated it into other languages and made a pediatric version available. In addition to being available online with instructions on how to embed these tools into common electronic medical records, the SHA ASP has provided multiple print runs of physical prescription pads for PHC clinics around the province since their creation.

AMS Tools for Dentistry

In August 2023, the SHA ASP began a project with a group of four University of Saskatchewan pharmacy students for a third-year professional practice course. The course required students to engage in an interdisciplinary project over two semesters. The students were tasked with the development of a suite of tools that could be used by dentists to promote better antimicrobial stewardship in their practice. The tool development process involved discussions with the ASP and practicing dentists to support background learning and initiation of draft tools. Further development and finalization of the tools included discussion with patient partners. The final suite of tools will be presented to dentists in Saskatchewan in 2024.

Canadian Nosocomial Infection Surveillance Program Data Submission

The SHA ASP submits annual AMU data (since 2018) for both Regina General and Pasqua Hospitals to the Canadian Nosocomial Infection Surveillance Program (CNISP) as part of their national surveillance system. The data are analyzed by CNISP year-over-year and are available to submitting sites for comparison against other hospitals.

The data from 2017-2022 indicate that Regina-area hospitals have room to improve in a number of areas. Compared to other sites, we have generally higher AMU on medical, surgical, and intensive care wards,

higher use of WHO AWaRe "Watch" and "Reserve" category antimicrobials, and particularly high use of certain antimicrobials on ICU and medical wards (*e.g.*, vancomycin, piperacillin/tazobactam, ceftriaxone, and azithromycin). These data are helpful for informing, developing, and driving stewardship interventions on relevant units. Preliminary surveillance data are unable to be shared outside of the submitting institutions, as per PHAC's request.

Pharmacy Resident Research Project – Improving Antibiotic Prophylaxis Prescribing Among Orthopedic Surgeons for Patients with a β-Lactam Allergy (Ashley Hermanus, PharmD)

In May 2023, the SHA ASP submitted a research project proposal for the Regina-area pharmacy residents for their 2023-24 residency year. The project was selected and initiated in July 2023. Initial work included the finalization of the research protocol, development and submission of the research ethics board application, and development and delivery of an educational presentation to orthopedic surgeons in Regina (November 2023).

The research project was based on the finding that approximately 20% of patients labelled with a penicillin allergy, who were receiving an elective hip or knee arthroplasty in Regina, were receiving sub-optimal prophylactic antibiotic therapy. The goal of the research project was to raise awareness among orthopedic surgeons regarding the preferred antibiotic therapy for these patients (*i.e.*, cefazolin) and, using audit and feedback, to provide ongoing information and motivation to promote a change in prescribing practice.

The initial audit and feedback session was scheduled for February 2024. Further information on project outcomes will be provided in the 2024 Annual Report.

Firstline App Content Review

Following changes in staffing among provincial AMS colleagues, it was pertinent to regroup in 2023 and revisit the content in the Firstline app that had been created several years earlier. The SHA ASP, along with our colleagues in Saskatoon (Danielle Shmyr and Dr. Sarah Henni), initiated a scheduled review of all content in the SHA Firstline instance. The most commonly reviewed guidelines took priority for review of content, however, the majority of revisions and updates took place in 2024.

Provincial UTI Surveillance

Following a presentation at the fall 2022 provincial IPAC conference by one of the ASP pharmacists, the ASP team began to build a relationship with provincial SHA IPAC staff. We worked with them on the initiation of a provincial UTI surveillance document for LTC. IPAC was previously working toward launching a provincial UTI surveillance form for all LTC facilities and we were able to collaborate with them to modify the form to include further information which would help determine how frequently LTC residents were being treated for asymptomatic bacteriuria.

The surveillance form was officially launched in July 2023 with information sessions being hosted by the provincial IPAC team. Data entry was a shared responsibility between IPAC staff and staff within the Stewardship and Clinical Appropriateness Department. The ASP team, with support from other department members, created a dashboard (using Power BI), to make the provincial data set available to interest holders across the SHA (*e.g.,* IPAC staff, LTC staff, *etc.*). Data presented in the dashboard included UTI rates, rates of treatment of asymptomatic bacteriuria, and rates of contaminated samples; all data

were aggregated to the provincial level, with the ability to drill down to the Integrated Service Area and facility level ("unit level" was available but data quality issues prevented this from being useful in the dashboard). The goal of the dashboard was to make the data available to the interest holders in LTC facilities who could use it for audit and feedback purposes to help drive clinical behaviour change. In the fall of 2023, plan-do-study-act cycles were initiated by IPAC staff to revise the surveillance form based on user feedback and our team modified the data dashboard following consultation with end-users. This provincial collaboration continued into 2024.

Reducing Unnecessary Urine Cultures in LTC

In February 2023, through the collaboration with IPAC staff, the ASP was made aware of a call for LTC facilities to participate in a PHAC-led research study. The goal of the study was to provide audit and feedback to clinical staff regarding urine culture use, as well as educational engagement with resident caregivers, to reduce unnecessary urine cultures among LTC residents. The study team aimed to include ten LTC facilities across Canada.

As part of the ongoing development of a local AMS committee at a LTC facility in Regina (described below), the SHA ASP engaged with the local AMS committee to collaboratively participate in the research study. The first year of work was spent identifying data sources and working through the contracts and data sharing agreements required to participate in the study. A second facility in Saskatoon also agreed to participate in the study; the intervention and data collection for both sites began in 2024. Our engagement in this study will provide over $18,000 in compensation for SHA staff time.

Antibiograms

The Regina-area antibiogram is updated annually and added to Firstline as well as being posted on the SHA Library website. The ASP collaborates with the Regina General Hospital Microbiology Department to produce and finalize the antibiogram each year. Laboratory data are collected for the previous calendar year and collated to produce the updated antibiogram. When available and if staff time permits, the antibiogram may be disaggregated into specific patient populations to provide further clinical relevance.

Except for the Saskatoon Area, antibiogram production for other areas in the province is supported by the ASP pharmacists and Regina General Hospital Microbiology staff when possible. The ASP team also provides communication to let clinicians know when antibiograms are updated.

Advisory Committees and Policy Development

These activities include engagement with various committees, representing local, provincial, and national interests, to help promote AMS efforts, advocate for appropriate AMS resources, and advise on policy development and implementation.

Regina ASP Advisory Council

In accordance with Accreditation Canada requirements and to support AMS efforts in Regina, a local advisory council for the SHA ASP was reinstated in September 2023 after a hiatus brought about by the COVID-19 pandemic. Initial membership included the ASP team, as well as representatives from the Microbiology, ID, and Pharmacy Departments. The council began meeting quarterly to discuss activities

and issues related to the ASP, including research and quality improvement projects, antibiograms and resistance trends, antimicrobial susceptibility testing, and educational opportunities.

AMS Committee Development in LTC

In 2022, two LTC facilities in SK received an Accreditation Canada survey for the AMS Required Organizational Practice (ROP). Both facilities had unmet criteria, particularly around the lack of an active AMS committee. Throughout the spring and summer of 2023, the SHA ASP worked with both facilities to better understand their needs, help define their committee structure and role, and develop a terms of reference to begin their work to meet the Accreditation Canada ROP. Further to this, in December 2023, our team was able to spend a full day with one of the facilities in Saskatoon to assist with strategic planning for their AMS initiatives and education for their staff and residents/resident families.

Pan-Canadian Action Plan on AMR

Members of the SHA ASP participated in a number of meetings and provided feedback on draft documents as the PCAP was finalized for publication in early 2023. Meetings were held with national interest holders from each province and territory; our team was invited to attend, review, and advise by the Saskatchewan Ministry of Health, Surgical Services and Patient Safety Branch (which currently holds the AMS portfolio in the Ministry). The PCAP was published on June 22, 2023[2].

Development and Initiation of the Antimicrobial Advisory Subcommittee

In 2022, the SHA Drugs and Therapeutics Committee initiated the development of the Antimicrobial Advisory Subcommittee (AmAS) and the SHA ASP was invited to participate in this process. Throughout 2022 and the first half of 2023, the SHA ASP worked with interest holders to help define the terms of reference and scope of work for the subcommittee. In September 2023, the first of the ongoing, bi-monthly meetings was held.

The first effort undertaken by the AmAS was to develop a provincial restricted antimicrobial policy. Many meetings were held with ID experts and clinicians throughout the province to determine which antimicrobials required restrictions and criteria to consider with the use of several antimicrobial gents. There were several iterations and revisions of the policy and this work did not become finalized until 2024.

Opportunities for Growth

Gaps and barriers to effective AMS that arose in 2023 are described below.

In November 2023, social media restrictions prevented an active social media campaign during WAAW. This limited the reach that we were able to achieve with awareness activities, both within the SHA and among the public. It would be ideal to have a more active social media presence in the future to ensure these outreach activities are as effective as possible.

An ongoing opportunity for enhancing AMS work across the SHA would be to address the lack of an official SHA mandate to include indications with antimicrobial prescriptions. This would provide a directive for all prescribers to ensure that they are including this vital information with their antimicrobial orders, which promotes patient safety and better information for data users. Similar mandates have already been adopted by health systems around the world.

The lack of resources for laboratory staff limiting their ability to create a fully developed antibiogram has limited our access to an antibiogram that only represents data for all patients as an aggregate (for Regina and several other areas within the province). This means that clinicians lack detailed information that may be relevant for empiric prescribing for specific patient populations. Work on a national level (AMRNet, led by the Canadian Network for Public Health Intelligence) was intended to ease the burden of antibiogram creation on local laboratories, however, this has yet to come to fruition.

In addition to resourcing for antibiogram data access, limited resourcing for our colleagues in the Digital Health portfolio has created ongoing challenges to timely access to other laboratory data that are used to drive policy, research, and quality improvement projects in AMS. This has meant that policy decisions have been made, for example with respect to antimicrobial restrictions, without basing these decisions on a full and complete data set. Data access barriers have also created stress for researchers and students involved in AMS-related research and quality improvement projects and has led to workarounds being created within the system to access data or modify projects to work within the limitations of accessible data.

A final ongoing challenge has been engagement with PHC clinics. This began with the onset of the COVID-19 pandemic, which limited our ability to visit clinicians in person. However, as the pandemic has waned, we have not been able to re-establish regular in-person visits with PHC clinics in Regina and the surrounding area. This has limited the effectiveness of our PHC interventions.

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Abbreviations

ASP – antimicrobial stewardship program
AmAS – Antimicrobial Advisory Subcommittee of the Drugs and Therapeutics Committee
AMS – antimicrobial stewardship
AMR – antimicrobial resistance
AMU – antimicrobial use
AWaRe – Access, Watch, Reserve (WHO classification of antimicrobials)
BCCDC – British Columbia Center for Disease Control
CNISP – Canadian Nosocomial Infection Surveillance Program
FTE – full-time equivalent
ICU – intensive care unit
ID – infectious diseases
IPAC – infection prevention and control
IV – intravenous
JAMA – *Journal of the American Medical Association*
LTC – long-term care
PCAP – Pan-Canadian Acton Plan on AMR
PCT – procalcitonin
PHAC – Public Health Agency of Canada
PHC – primary healthcare
PO – *per os* (by mouth)
REDCap – Research Electronic Database Capture
ROP – required organizational practice
RTI – respiratory tract infection
SHA – Saskatchewan Health Authority
STARS – Students and Trainees Advocating for Resource Stewardship
UTI – urinary tract infection
WAAW – World AMR Awareness Week
WHO – World Health Organization

Appendices

Appendix 1 – WAAW Review from the Stewardship and Clinical Appropriateness 5 Min Update – Issue 48 (November 2023)

November 2023 ISSUE #48

Stewardship and Clinical Appropriateness Special Edition 10 Minute Update

Saskatchewan Health Authority

Antimicrobial Stewardship Program

Phone: 306-766-3520 | E-mail: antimicrobial.stewardship@saskhealthauthority.ca WEBSITE

WAAW 2023

Friday, November 24th wrapped up another World Antimicrobial Resistance Awareness Week (WAAW). I am always excited to see the annual increase in engagement with this awareness week across Canada. Each year we've seen more sites participating in the Go Blue event, where landmarks and monuments across Canada light up in blue, marking the last day of the week. This includes buildings like the CN Tower in Toronto and even Niagara Falls, in partnership with the US!

In Saskatchewan this year, we had 4 sites participating: Regina City Hall, the Moose Jaw Clock Tower, the Peter Mackinnon Building at the University of Saskatchewan campus, and one of the federal buildings in Saskatoon. Some less renowned buildings were also lit up in blue, including my own home!

There are always many (too many!) webinars available to attend, hosted by both local and national organizations. It is inspiring to watch these sessions and see the good work being done in human, animal, and environmental health with respect to promoting policies and action toward antimicrobial stewardship and tackling antimicrobial resistance. Topics this year ranged across the spectrum of human healthcare, including acute, primary, and long-term care. Organizations including Choosing Wisely Canada, Public Health Ontario, Quality of Care Newfoundland, the Public Health Agency of Canada, the Global Strategy Lab, and our own SHA Antimicrobial Stewardship Program all hosted webinars this year.

Lastly, our team was able to host a booth this year in the main entrance hall of Regina General Hospital. We are thankful to Keren Emekeme, a U of S pharmacy student who was working with us during this year's WAAW, for her steadfast commitment to being an antimicrobial ambassador and spending November 24th raising awareness among both employees and the public.

I hope everyone had an informative and productive week raising awareness about this globally important issue. If you have ideas for next year or stories you'd like to share, please send them to us!

-Jason Vanstone, PhD