# 2024/25
# Annual Report

## Community Antimicrobial Stewardship Program

BC Centre for Disease Control
Provincial Health Services Authority

Supported by the Province of British Columbia

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# Executive summary

In 2024/25 the Community Antimicrobial Stewardship program continues to work collaboratively with partners across the province to reduce unnecessary antibiotic prescribing and combat the development of resistant bacteria.

### Activities

- Two media campaigns in Fall 2024 and Spring 2024 featuring newly filmed conversations were distributed via various media channels across the province.
- The program's online presence continued to grow through the Antibiotic Wise website, social media accounts, and new prescriber-focused pages on the BCCDC website.
- 5,634 individuals were provided education through the Do Bugs Need Drugs? program.
- Collaborative partnership with Kids Boost Immunity continued with 679 students participating and 3,196 vaccines earned.
- 2,213 health care professionals received antimicrobial resistance continuing education.
- The Bugs & Drugs reference guide was accessed more than 200,000 times by BC practitioners.
- The CAS team led the organizing of the 2024 Western Canada One Health Antimicrobial Stewardship Conference in Vancouver.

### Outcomes

- After two years of increased antibiotic prescribing following the dip in the COVID-19 pandemic, the overall antibiotic prescription rate in the province was similar to 2023.
- Following a record high in 2021, the dental prescription rate continued to fall, down 6% since 2021.
- Antimicrobial resistance trends of bacteria to specific antibiotics continues to be tracked and reported publicly across B.C. on the program's Antimicrobial Resistance Dashboard.
- Four research papers and one knowledge translation article were published
- The Frontiers in Allergy special research topic on asthma and antibiotics was completed and 14 articles were successful in being published.

### Impacts

- The prescription rate of clindamycin is down 67% since 2010. The prescription rate for ciprofloxacin decreased 69% in this same period.
- The median days of therapy for nurse practitioners reduced by one day to five days in 2024, with all other professions remaining the same as 2023.
- Prescribing for RTIs remained steady in 2024, following two years of increases.
- Prescribing for UTI in the elderly continued to decline, down 27.5% since 2014.

# Introduction

Antibiotics continue to be an essential treatment for infections and supporting modern medical procedures, but developing resistance through misuse threatens to undermine their effectiveness. For 20 years the Community Antimicrobial Stewardship program at the BCCDC has aimed to protect antibiotic effectiveness by promoting responsible use among healthcare providers and the public. This multi-faceted program has grown in scope since 2005 but continues to be a trusted source of information on the appropriate and prudent use of antibiotics. The 2024/25 year saw the program continue to build relationships and work collaboratively with partners from across the province to tackle this urgent global health threat.

## 3 key program messages

### Prevent illness

Washing your hands, staying up-to-date with routine immunizations and staying home when you are sick are the best ways to prevent the spread of illness.

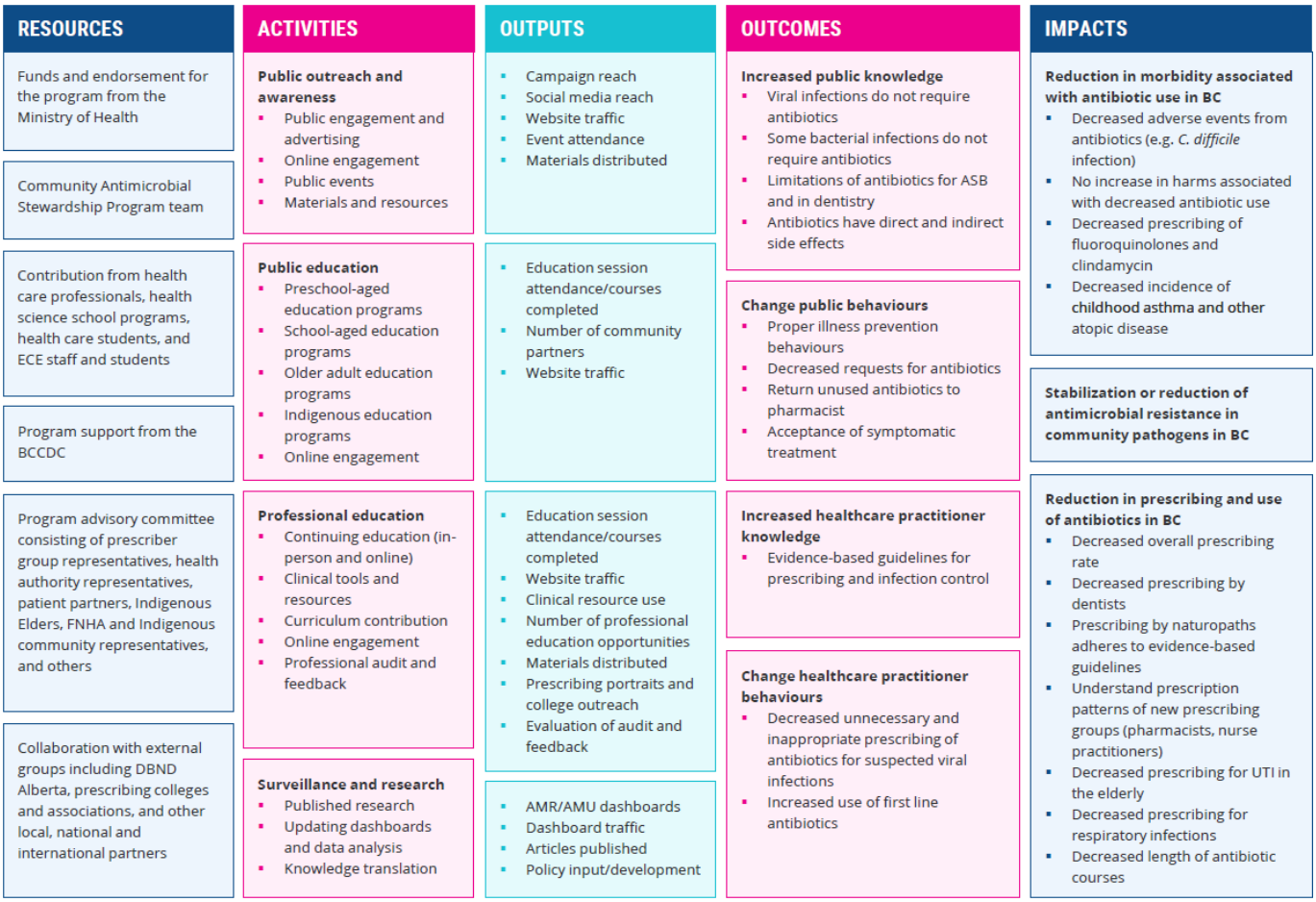
### Know that not all bugs are created equal

Antibiotics work against bacteria, but not against viruses.

### Use antibiotics wisely

Bacteria can become resistant to antibiotics if not used appropriately.

# Program logic model




The program logic model depicts the different components of the overall program as well as how they contribute to a decrease in antibiotic resistance in B.C. through public and professional education and an increase in proper antibiotic prescribing practices. The model is used in the planning, implementation, and evaluation of the program. The model is dynamic and changes as the program develops. An update on the progress of logic model impacts is included in the Impacts section of this report.

# Program team


*Squamish Elder Christine Baker with members of the CAS team*

| | |
|---|---|
| **Dr. David Patrick** | Medical Epidemiology Lead |
| **Dr. Edith Blondel-Hill** | Medical Director, Do Bugs Need Drugs? |
| **Nick Smith** | Project Manager |
| **Kate O'Connor** | Nurse Educator |
| **Dr. Hannah Lishman** | Senior Scientist |
| **Erica Chuang** | Epidemiologist |
| **Lynsey Hamilton** | Knowledge Translation Specialist |
| **Gayatri Datar** | Project Coordinator |

The team would like to recognize the contributions of Dr. Fawziah Lalji, Dr. Säde Stenlund and students Kezia Kesson and Aida Mendez-Piña in 2024/25, as well as the guidance provided by Squamish Elder Christine Baker (TlatlaKwot).

*A film screening hosted by the CAS team at the BCCDC office*

# Activities

# Public outreach

## 2024 World AMR Awareness Week

A number of initiatives marked World AMR Awareness Week 2024, running from November 18th to 25th:

- The week coincided with the Fall media campaign (see page 9 and 10).
- **Five landmarks** across the province took part in the annual Go Blue for AMR campaign.
- An **article was published on the BCCDC** website with behind-the-scenes details of the program's media campaign and the importance of World AMR Awareness Week.

*Top: The front fountain of the BC Legislature goes blue for AMR*
*Bottom: Marking World AMR Awareness Week with an article on the BCCDC website*

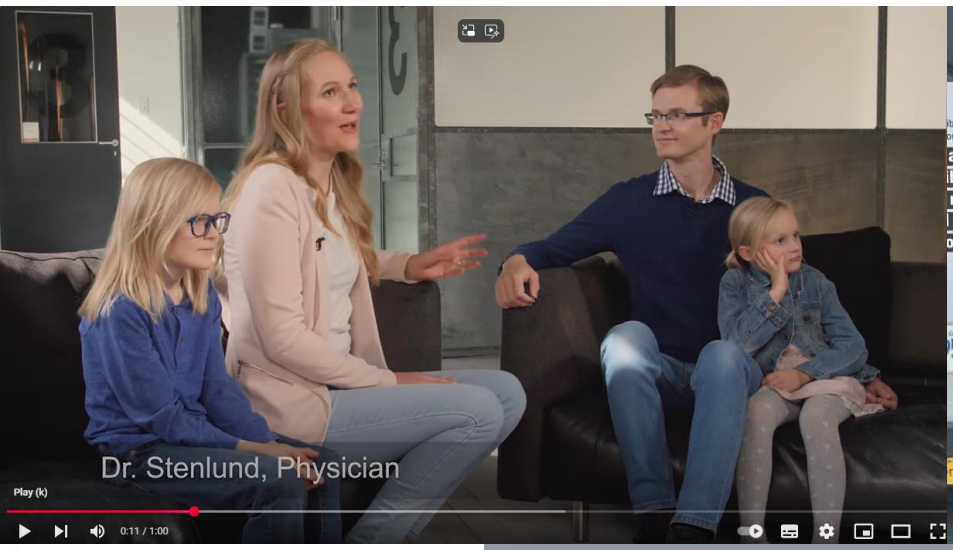
# 2024/25 media campaign[1]

A group of BC residents, featuring both patients and prescribers, were invited to talk about antibiotics in 2024. From these conversations, a variety of short videos and other ads were created for the 2024/25 media campaign. Numerous media channels were utilized to deliver ads in English, Chinese and Punjabi. A first phase ran from October 28th to December 23rd, 2024, and a second phase from March 27th to May 8th, 2025.

## English campaign

The English language campaign ran video advertising on broadcast TV and YouTube, online ads via the Google Display Network, out-of-home advertising on digital screens, bus shelters and bus exteriors, as well as a **sponsored content article with Postmedia**.

The campaign garnered **1.4 million impressions** in phase 1 and **891,000 impressions** in phase 2 of the campaign.






## Chinese campaign

Campaign videos were subtitled in Simplified and Traditional Chinese for use on YouTube for the Chinese campaign. Banner ads also ran on Chinese language websites via Sunflower Media. The campaign garnered **668,000 impressions** in phase 1 and **566,000 impressions** in phase 2.



## Punjabi campaign

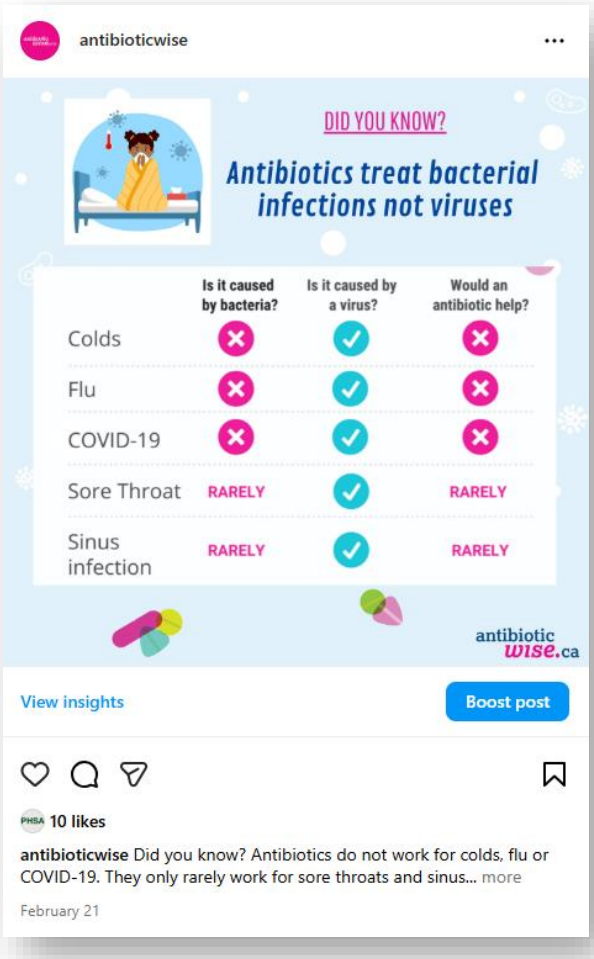
The Punjabi campaign also used subtitled videos on YouTube and banner ads on Punjabi language websites. The campaign garnered **563,000 impressions** in phase 1 and **641,000 impressions** in phase 2.


## Farsi ads

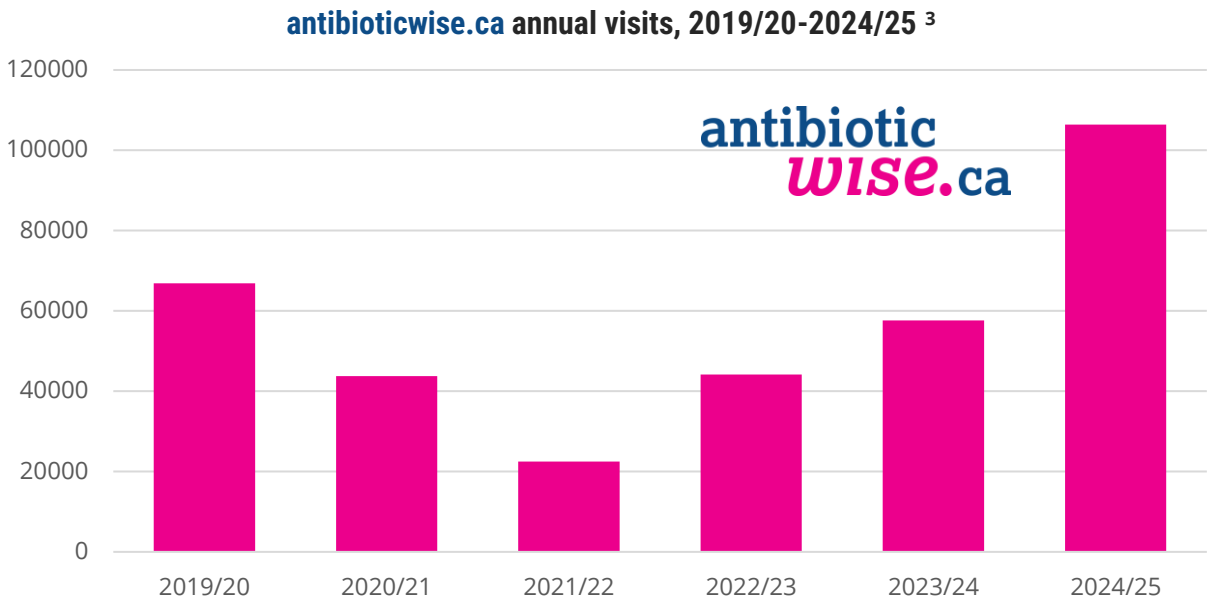
Phase 2 of the campaign also featured some ads translated to Farsi for the first time with a total of **219,000 impressions.**

# Social media[2]

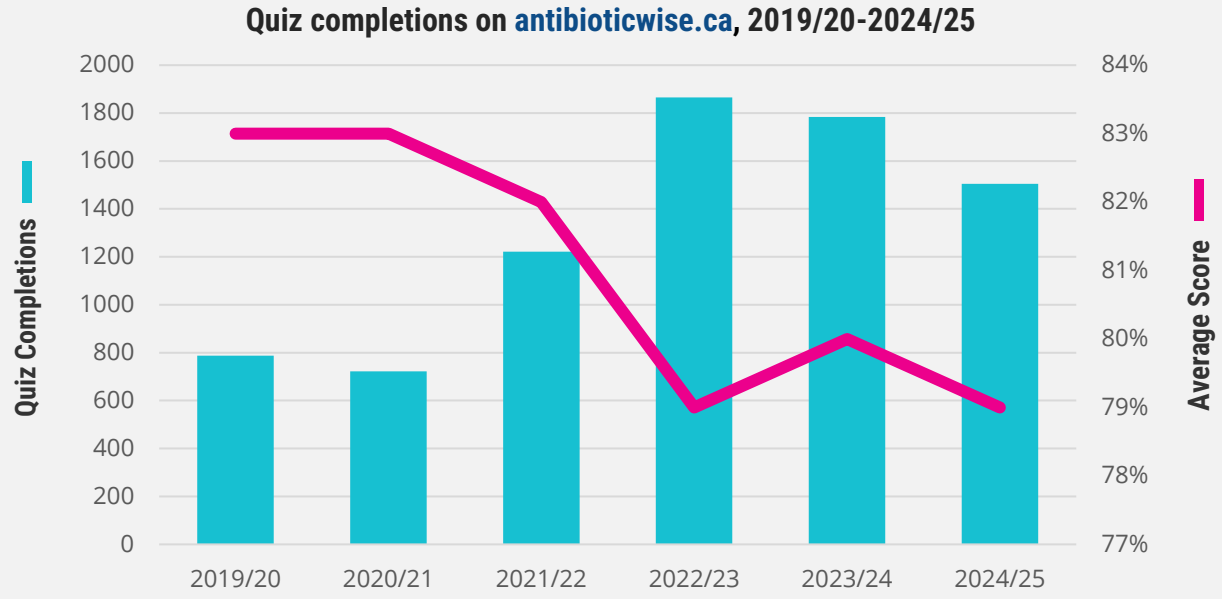
| | @AntibioticWise | /AntibioticWise | @AntibioticWise |
|---|---|---|---|
| Total followers | 1,075 | 269 | 575 |
| New followers | -19 | 5 | 24 |
| Change in followers | -2% | +2% | +4% |
| Post impressions | 15,167 | 159,165 | 13,700 |




# Antibiotic Wise website




Visits to the Antibiotic Wise website rose 45% in 2024/25, surpassing 100,000 visitors. The Quiz page was the most visited page due to multiple online media campaign ads directing to it. The Chinese- and Punjabi-language pages combined saw more than 17,000 visitors this year.



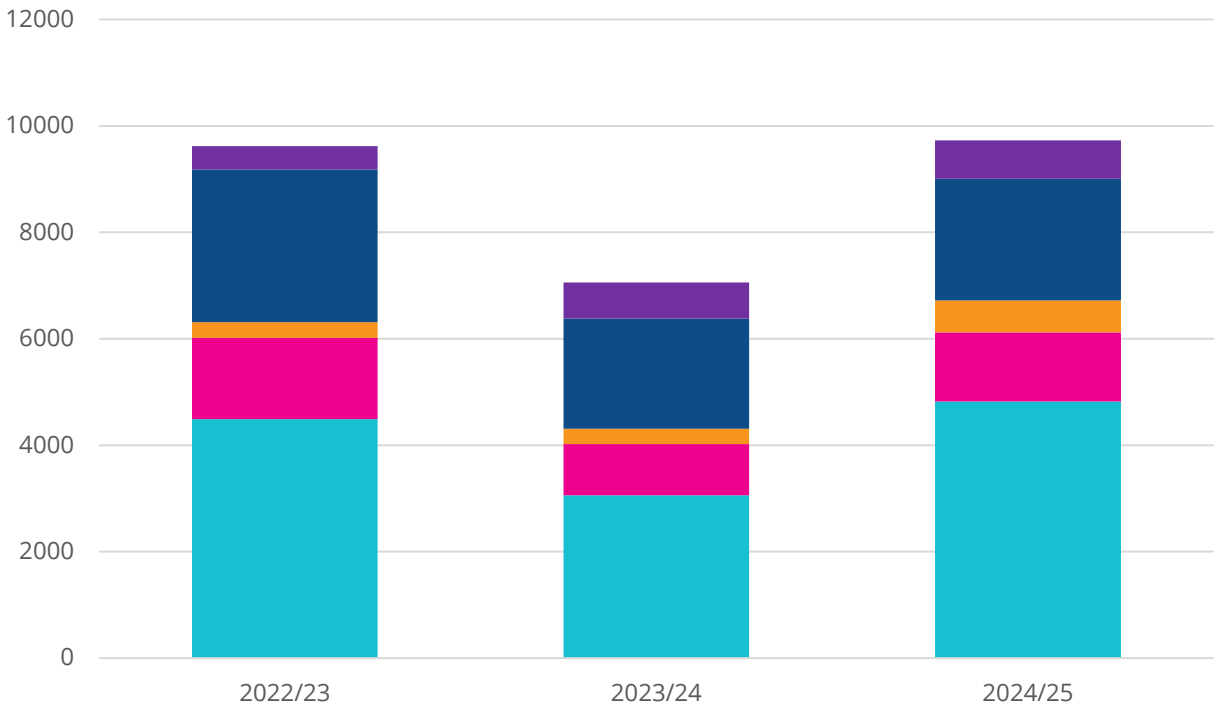

Completions and average score on the Antibiotic Wise quiz both dipped downward in 2024/25.

# BCCDC website

The BCCDC website contains several individual program pages with antimicrobial stewardship information. The intended audience of these pages are healthcare practitioners and intends to provide information to support appropriate antimicrobial prescribing.

The Antimicrobial Stewardship for Healthcare Professionals page was developed in conjunction with the Provincial Antimicrobial Clinical Experts (PACE) group and acts as the home for best practice guidelines, toolkits and other resources created by PACE.

**Annual visits to select BCCDC pages, 2022/23-2024/25** [3]




Community Antimicrobial Stewardship
www.bccdc.ca/our-services/programs/community-antimicrobial-stewardship

Antimicrobial Stewardship for Healthcare Professionals
www.bccdc.ca/health-professionals/clinical-resources/antimicrobial-stewardship

Antimicrobial Stewardship in Dentistry
www.bccdc.ca/health-professionals/clinical-resources/antimicrobial-stewardship/dental-antimicrobial-stewardship

Antimicrobial Utilization Dashboard
www.bccdc.ca/health-professionals/data-reports/antimicrobial-resistance-utilization/antimicrobial-utilization-dashboard

Antimicrobial Resistance Dashboard
www.bccdc.ca/health-professionals/data-reports/antimicrobial-resistance-utilization/antimicrobial-resistance-dashboard

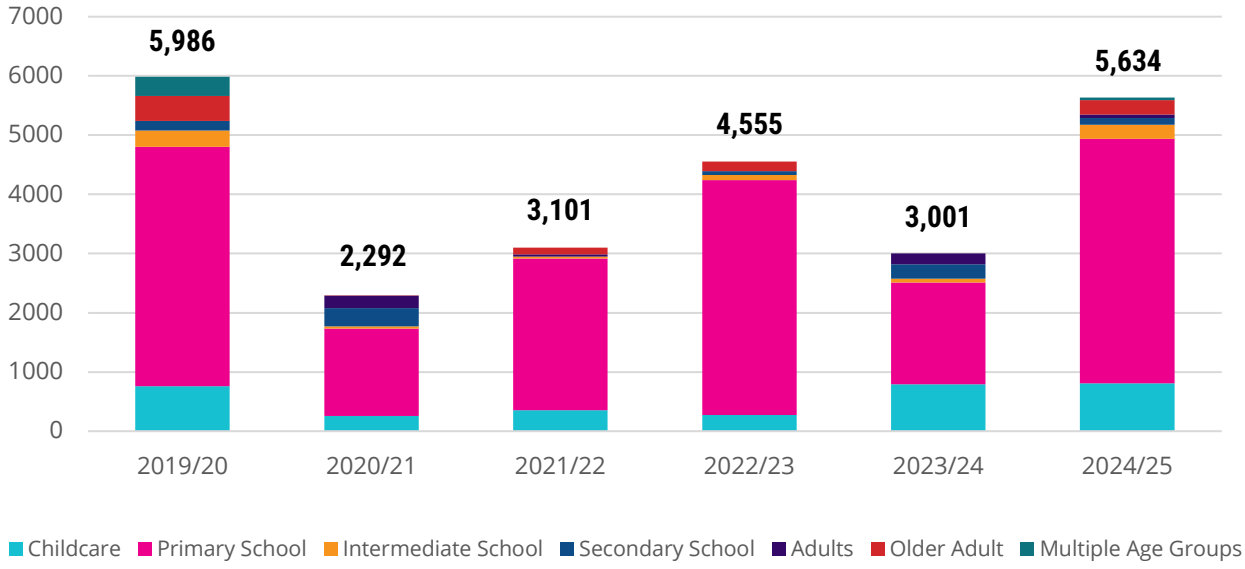
# Public education

## Do Bugs Need Drugs?

The program's Do Bugs Need Drugs teaching program features curricula focused on handwashing, illness prevention, germs and antibiotics for groups ranging from child care age children to older adults living in care.

In 2025 the team has launched a new curriculum and teaching kit for older adults. The curriculum has been tested in assisted living facilities and will be promoted for use by post-secondary school partners this fall.

**Number of individuals taught *Do Bugs Need Drugs?* curriculum**




Public education numbers increased to over 5,000 individuals taught for the first time since 2019/20.

**158,519**

people across B.C. have been taught the Do Bugs Need Drugs? curriculum since 2005

*Kate O'Connor speaking to a class of nursing students*

# Teaching kit distribution

New teaching kits were launched in 2021 and distributed to classrooms and childcares across the province for use alongside DBND lesson plans. The number of kits distributed continues to decline as most established partners have switched to the new curriculum. Older adult kits will be distributed starting in 2025/26.

Number of kits distributed 2024/25

| Handwashing Kit | Child Care Kit | Elementary School Kit |
|---|---|---|
| **20** | **57** | **26** |

# Kids Boost Immunity

Kids Boost Immunity (KBI) is an online learning resource linked with science and social studies school curricula that provides an opportunity for students to earn vaccines for children in need through UNICEF. The CAS program has partnered with KBI for antibiotic resistance content since 2017.

## 2024/25 Kids Boost Immunity stats [4]

**679** users completing AMR content

**4,078** quizzes completed

**39,993** total questions answered

**72.2%** questions answered correctly

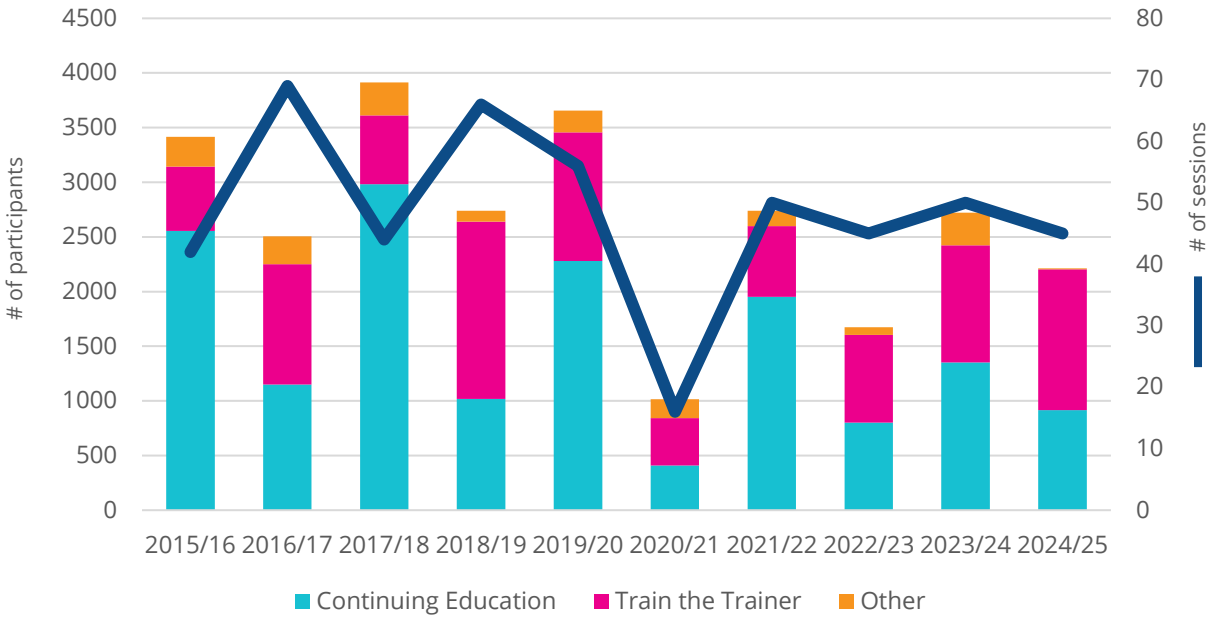
**3,196** total vaccines earned

# Professional education

## Education sessions

Professional education sessions provide training for healthcare professionals and students to teach the DBND education curriculum, as well as continuing education for professionals on the program's main messages, including CME events, and conference posters and presentations.

**Number of professional education sessions and participants, 2019/20-2024/25**




Participation in professional education sessions rose decreased slightly in 2024/25 to 2,213, but the number of sessions offered remained steady with recent years (45).

## Continuing education course

**2024/25 CE learners**

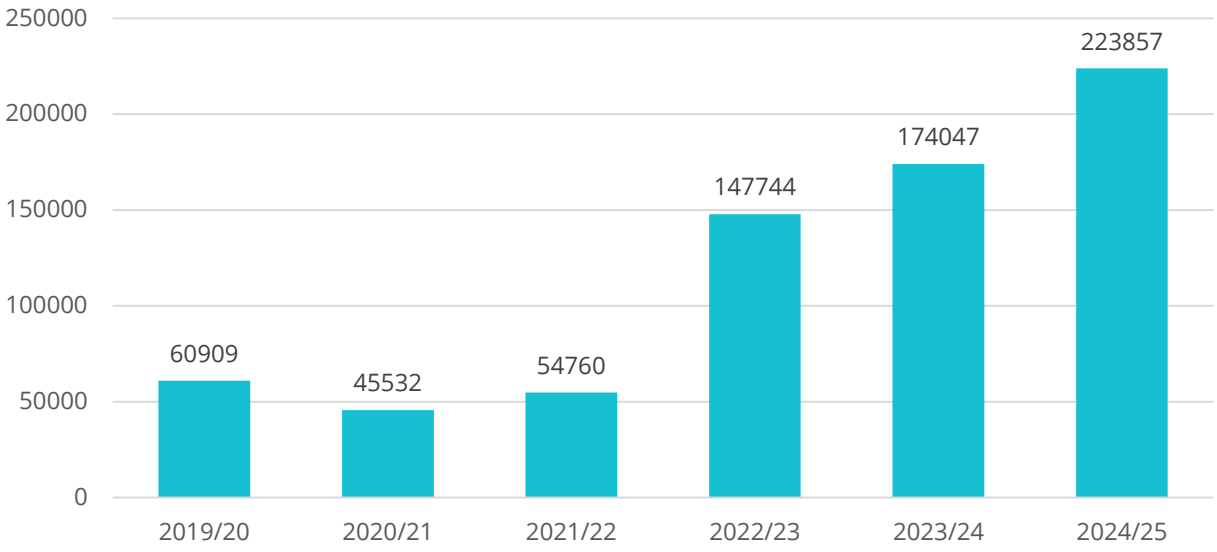
| | |
|---|---|
| Registered | **151** |
| Completed | **70** |

The *Community Antimicrobial Stewardship Continuing Education* course saw a 27% decrease in registrations and 18% decrease in completions in 2024/25 compared to previous years. Work is currently underway to refresh and modernize the course, with an anticipated launch in summer 2025.

# Bugs & Drugs reference guide


Use of the Bugs & Drugs Antimicrobial Reference Guide continued to grow in 2024/25 with **223,857 unique sessions** in BC, **up 28%** over 2023/24. The website was accessed from 119 different communities across the province. This only includes website data from BC, as mobile app data is unavailable.

**Total sessions on [www.bugsanddrugs.org](http://www.bugsanddrugs.org), 2019/20-2024/25** [5]




The Bugs & Drugs reference guide is available online at **[www.bugsanddrugs.org](http://www.bugsanddrugs.org)**, as an app on the **Apple App Store** and **Google Play**, and via the **Pathways BC Directory**.

# One Health conference [6]

The CAS team along with colleagues at the BCCDC organized the 2024 edition of the Western Canada One Health Antimicrobial Stewardship Conference, held October 3rd and 4th in Vancouver. The conference brought together colleagues from the human, animal and environmental health sectors to collaboratively address antimicrobial resistance.

### CAS program presentations at the conference

**Antibiotic use in infancy and atopic diseases: Is childhood asthma preventable through good antibiotic stewardship?**
Presented by Dr. Hannah Lishman

**Partner engagement in community antimicrobial stewardship**
Presented by Kate O'Connor

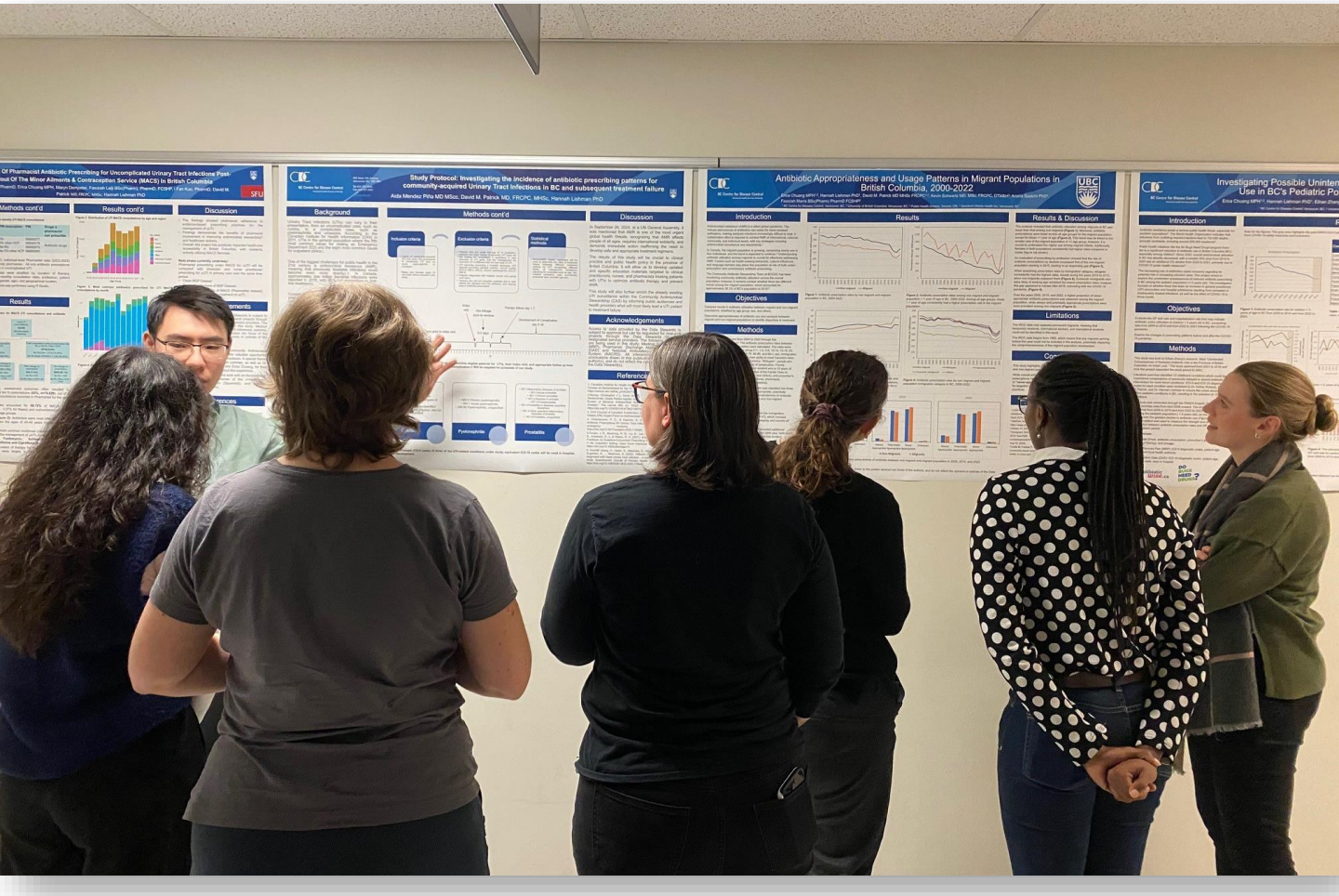
**91** attendees

**20** oral presentations

**22** poster presentations

**1** World Café knowledge exchange session

*Musqueam knowledge keeper Alec Dan opening the conference*



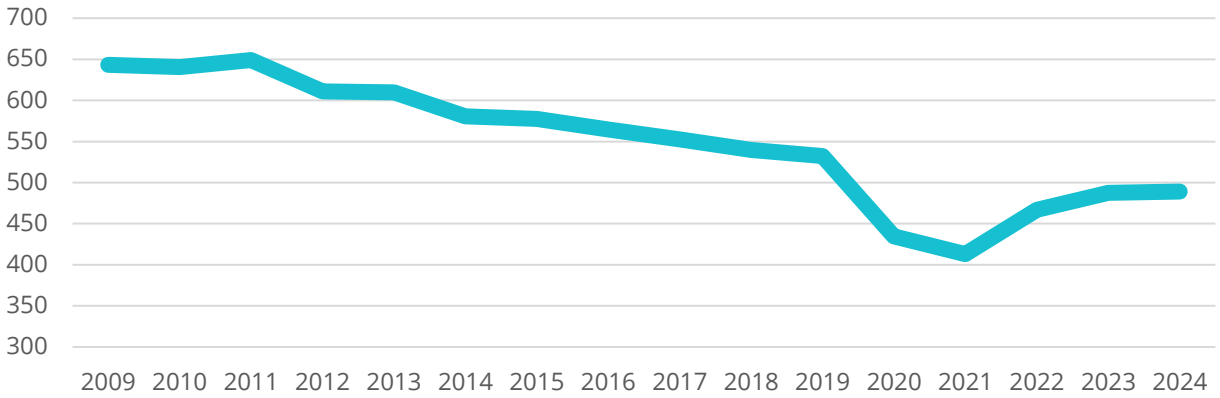

*CAS team posters at 2024 BCCDC Research Week*

# Outcomes

# Antimicrobial utilization

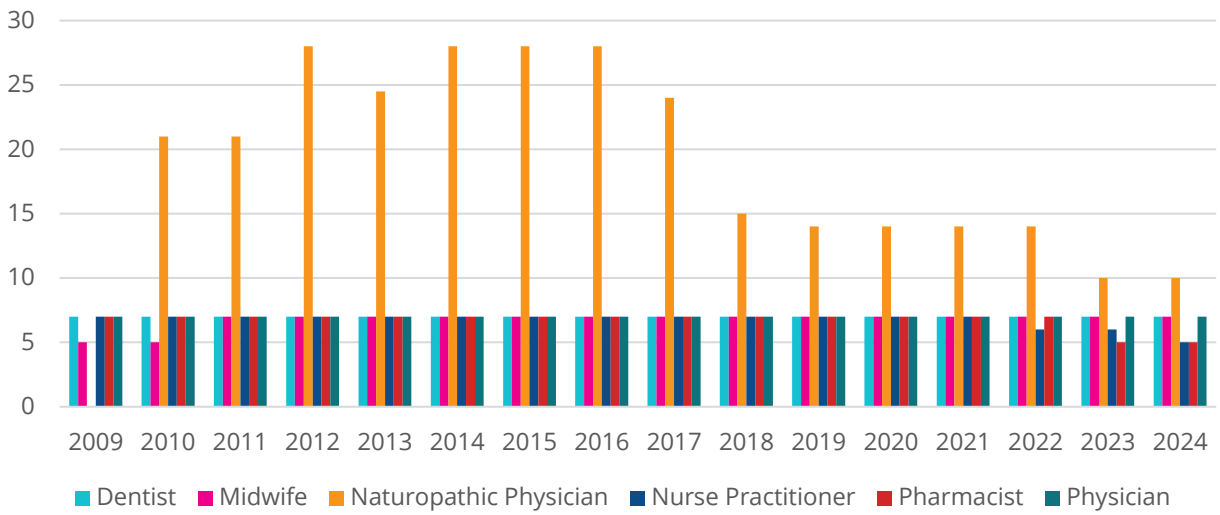
**Detailed prescribing data for B.C. can be found on the Antimicrobial Utilization Dashboard on the BCCDC website** [7]

**Overall B.C. antibiotic prescription rate/1000 population/year, 2009-2024**[8]




The overall antibiotic prescribing rate remained steady between 2023 and 2024 and is **8% lower** than pre-pandemic levels.

**Median days of antibiotic therapy, select professions, 2009-2024**[8]




The median length of nurse practitioner prescriptions decreased from 6 days to 5 days in 2024. All other professions remained steady with median dose of 5 days for pharmacists, 7 days for physicians, dentists and midwives, and 10 days for naturopathic physicians.

**Change in prescribing rate from 2023 to 2024 by profession**[8]

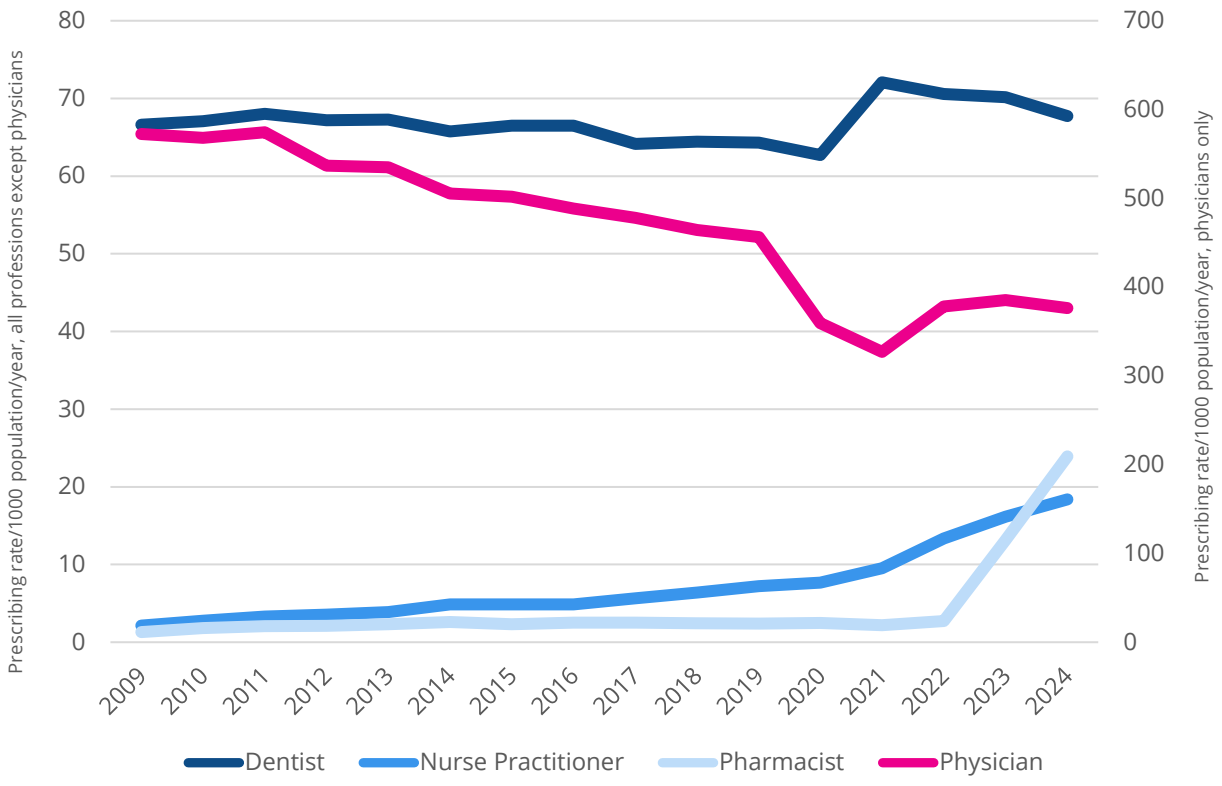
| | |
|---|---|
| Dentist | **-3%** |
| Midwife | **-3%** |
| Naturopathic Physician | **-1%** |
| Nurse Practitioner | **+14%** |
| Optometrist | **+21%** |
| Pharmacist | **+82%** |
| Physician | **-2%** |
| Podiatrist | **-9%** |

Physician prescribing decreased slightly in 2024 and remains 17% lower than pre-pandemic levels.

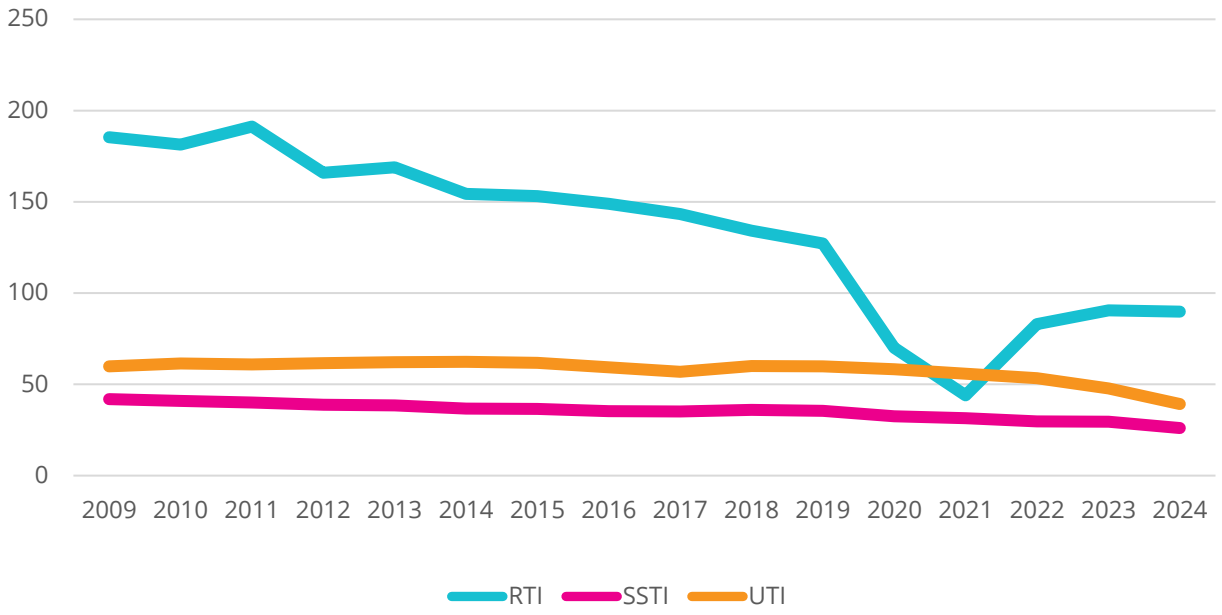
Following large increases since the pandemic, dental prescribing has begun to decline once again, and is now at a similar level as 2011.

Nurse practitioner and pharmacist prescribing continue to increase, driven by a growing number of nurse practitioners in the province and the continued roll out of the Minor Ailments and Contraception Service (MACS) program for pharmacists.

**Antibiotic prescription rate by select profession, 2009-2024**[8]

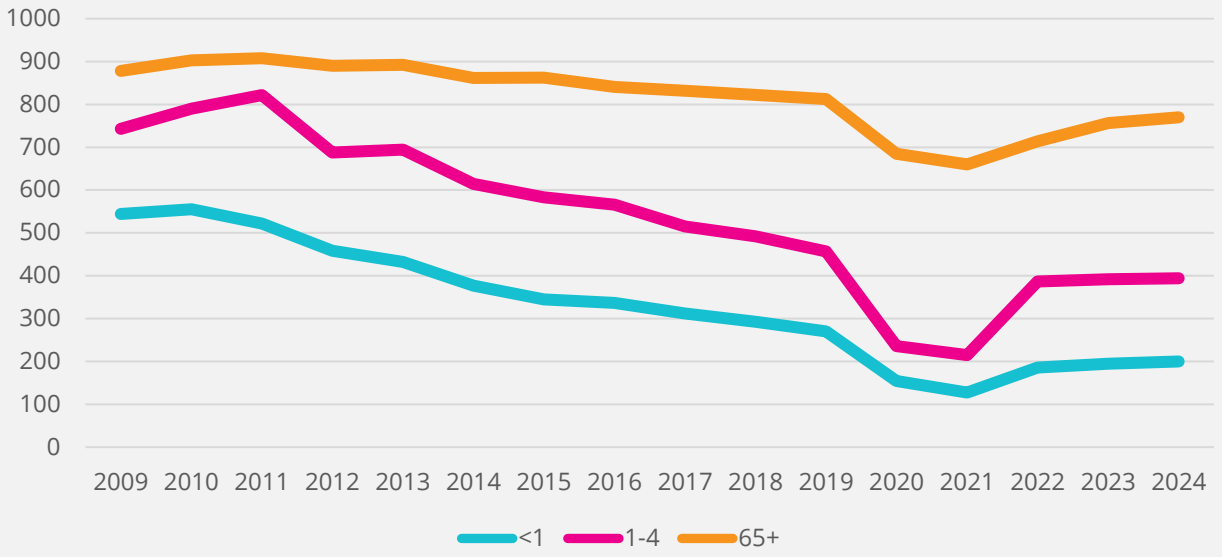


## Prescription rate/1000 population/year for RTI, UTI and SSTI, 2009-2024 [8,9]




Prescribing for respiratory infections stabilized in 2024 following two years of increases following the pandemic. Skin and soft tissue infections and UTI prescribing continue to decline, **decreasing 12% and 18%** respectively compared to 2023.

## Prescribing rate/1000 population/year for select age strata, 2009-2024 [8]

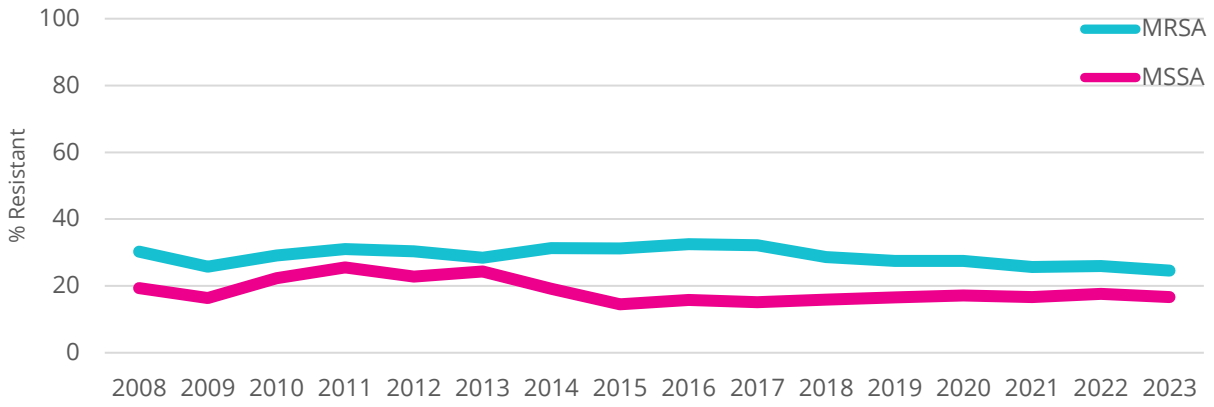



Prescribing in children <1 and 1-4 years of age, and adults over 65 remained very steady in 2024, and prescribing in all three age groups continue to be below pre-pandemic levels.

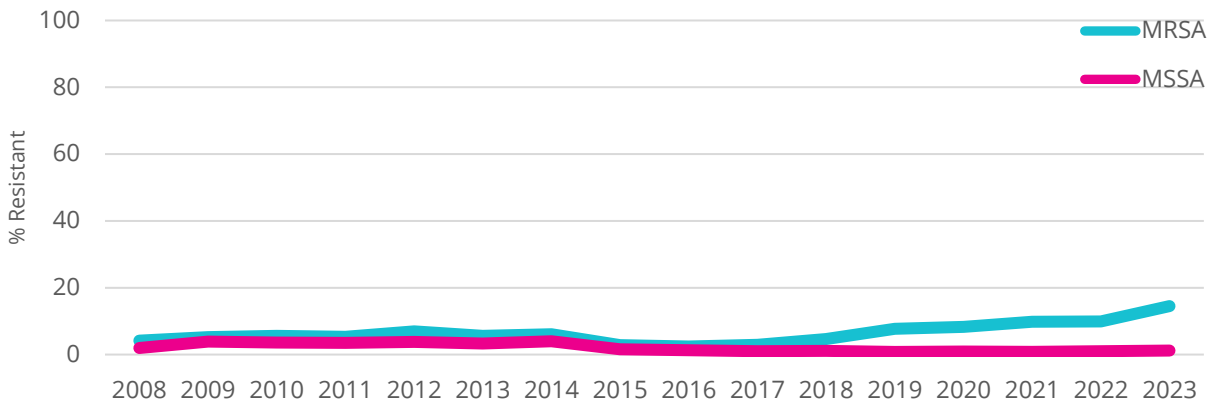
# Antimicrobial resistance

**Detailed resistance data for B.C. can be found on the Antimicrobial Resistance Dashboard on the BCCDC website** [10]

### Staphylococcus aureus and MRSA resistance to clindamycin [11]



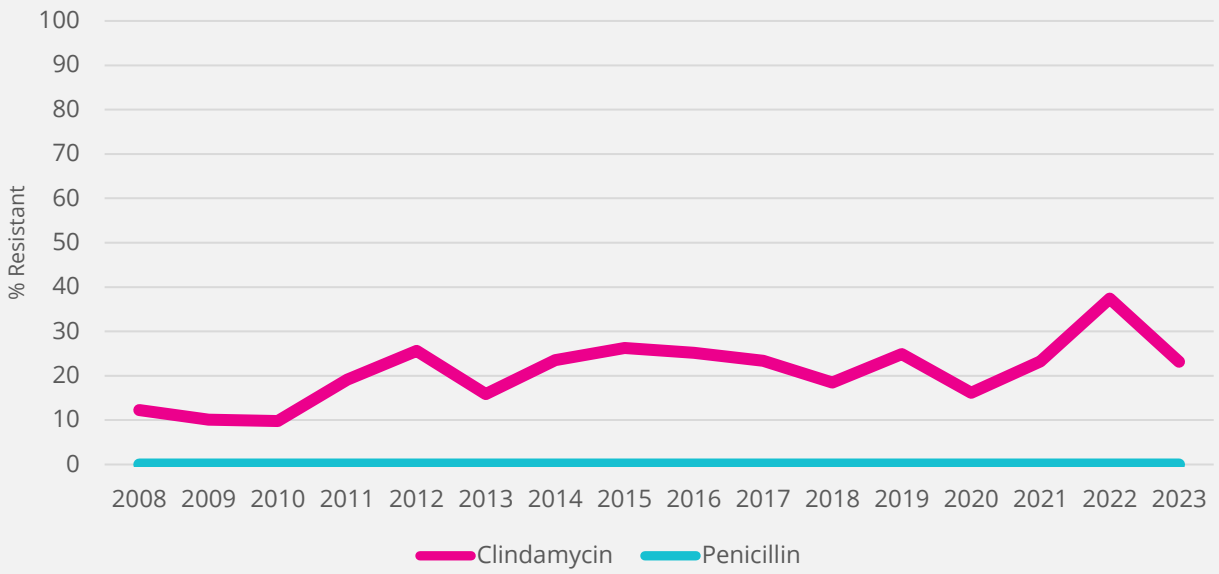

### Staphylococcus aureus and MRSA resistance to trimethoprim-sulfamethoxazole [11]




MRSA and MSSA resistance to clindamycin has remained steady since 2017. MRSA resistance to trimethoprim-sulfamethoxazole continues to increase, reaching 14.5% in 2023.

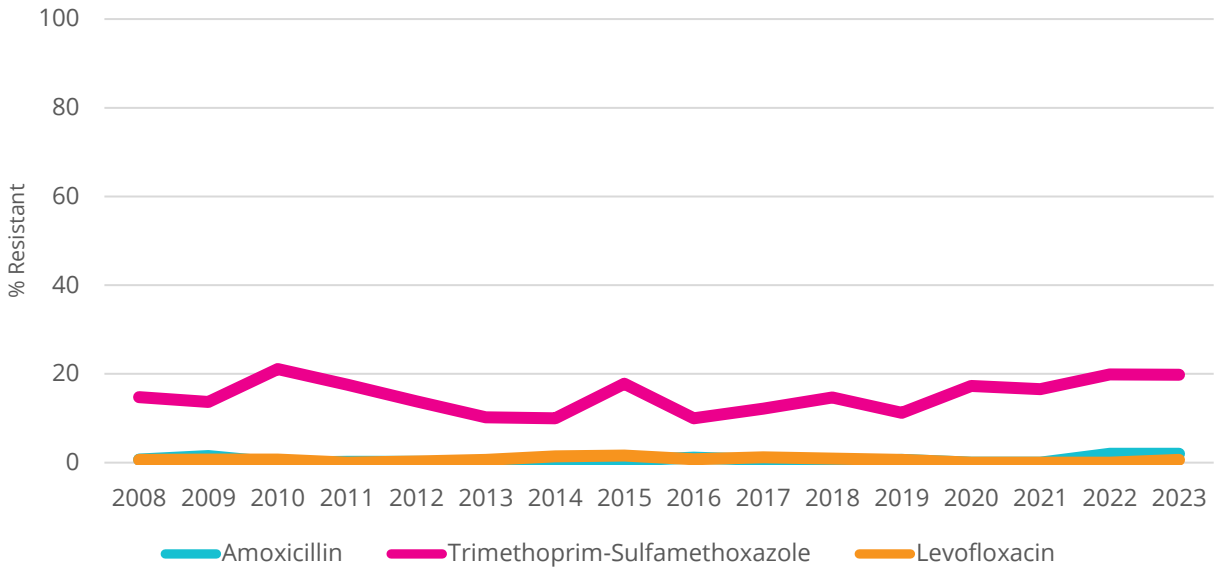
**17.7% of all *staphylococcus aureus* isolates tested in BC in 2023 were methicillin-resistant (MRSA), a similar proportion as seen over the past seven years.**

## Invasive *Streptococcus pyogenes* resistance to clindamycin and penicillin [11]




Invasive Group A Streptococcus (iGAS) resistance to clindamycin decreased to 23% in 2023 following a couple years of increasing resistance. GAS continues to be highly susceptible to penicillin.

## *Streptococcus pneumoniae* resistance to select antibiotics [11]




*Streptococcus pneumoniae* continues to be highly susceptible to levofloxacin and amoxicillin. Resistance to trimethoprim-sulfamethoxazole remained stable around 20% in 2023.

# Research

## Published research

**Testing different message styles about unnecessary antibiotics using an online platform**
Stenlund S, Appelt KC, Ruby MB, Smith N, Lishman H, Patrick DM
*Antibiotics, 2024 July*

**Dental antibiotic use in British Columbia from 1996 to 2023: Are we backsliding?**
Stenlund S, Huynh J, Pau C, Chuang E, Lishman H, Patrick DM
*Journal of the American Dental Association, 2025 January*

**ICD-10 codes to identify adverse drug events associated with antibiotics in administrative data**
Lishman H, Cragg A, Chuang E, Zou C, Marra F, Grant J, Patrick DM, Hohl CM
*Antibiotics, 2025 March*

**Pragmatic randomised trial assessing the impact of peer comparison and therapeutic recommendations, including repetition, on antibiotic prescribing patterns of family physicians across British Columbia for uncomplicated lower urinary tract infections**
Carney G, Maclure M, Patrick DM, Otte J, Ambasta A, Thompson W, Dormuth C
*BMJ Quality & Safety, 2025 April*

## Published knowledge translation

**Physicians are key to reducing unnecessary dental antibiotic prescribing**
Patrick DM, O'Connor K, Blondell-Hill E, Hamilton LJ, Lalji F, Lishman H, Pau C, Smith N
*BC Medical Journal, 2025 March*

# Frontiers research topic

The CAS program led the development of a special research topic with Frontiers in Allergy, bringing together a team of editors to review articles on the emerging theme of **Preventing Childhood Asthma: The Neglected Impact of Existing Public Health Interventions**. The topic closed this year with a total of 14 accepted articles from around the globe, including multiple pieces from the CAS team. An e-book volume will now be published including all articles. To date, the topic has more than **20,000 views** and **6,000 article downloads**.

### CAS program publications in the series

**Association between antibiotic usage during infancy and asthma incidence among children: a population-level ecological study in British Columbia, Canada**
Mamun A, Zou C, Lishman H, Stenlund S, Xie M, Chuang E, Patrick DM

**Impact analysis of infant antibiotic exposure on the burden of asthma: a simulation modeling study**
Lee TY, Petkau J, Saatchi A, Marra F, Turvey SE, Lishman H, Patrick DM, Cragg JJ, Johnson KM, Sadatsafavi M

**Editorial: Preventing Childhood Asthma -The Neglected Impact of Existing Public Health Interventions**
Patrick DM, Turvey SE, Azad MB, Zimmermann P, Dramowski A, Lishman H

*Screenshot of the research topic webpage*

# Impacts

The Community Antimicrobial Stewardship program's logic model outlines a number of measurable indicators of change representing the intended outcomes of the program's activities. While direct causation for these impacts cannot be attributed to the program, these achievements reinforce the value of the program's initiatives. An overview of the progress made on current impacts is listed in the table below.

| Impact Measure | Description |
|---|---|
| **Reduction in morbidity associated with antibiotic use in B.C.** | |
| Decreased adverse events from antibiotics (e.g. *C. difficile* infection) | In 2024 53% of all antibiotic prescriptions in BC were beta-lactams, same as the previous year.<br>Ciprofloxacin prescribing for UTI made up just 15% of antibiotic prescribing for UTI in 2024, level with 2022 and 2023.<br>Fosfomycin continues to increase, up slightly to 9.3% of UTI prescribing in 2024. Nitrofurantoin prescribing for UTI continues to decrease, down to 32% of UTI prescriptions in 2024. |
| Decreased unnecessary prescribing of fluoroquinolones and clindamycin | Since 2010, the prescription rate/1000 population/year has decreased 67% for clindamycin and 69% for ciprofloxacin. From 2022 to 2024, 26% and 10% reductions were seen, respectively. These antibiotics are associated with increased risks of adverse events (including *C. difficile*). |
| No increase in harms associated with decreased antibiotic use | A recent analysis of antibiotic prescribing trends for 13 childhood conditions which could be considered complications of delayed or absent antibiotic intervention found an association between the decline in antibiotic use and an increase in GP visits for a number of conditions. However, these did not lead to higher hospitalization rates. The percentage of antibiotic prescriptions after GP visits for each condition remained stable pre- and post-pandemic, except for one. Further monitoring is required, and plans are underway for a cohort study to better understand the relationship between reduced antibiotic prescribing and the potential for complications from untreated bacterial infections. |
| **Stabilization or reduction of antimicrobial resistance in community pathogens in B.C.**<br>*See Outcomes – Antimicrobial Resistance (pages 23-24)* | |

| Reduction in prescribing and use of antibiotics in B.C. | |
|---|---|
| Decreased overall prescribing rate | In 2024, the overall community prescription rate/1000 population/year remained level with 2023, following two years of steady increase. The prescription rate remains 8% lower than pre-pandemic year (2019) and has declined 24% since 2009. |
| Decreased prescribing by dentists | The dental prescribing rate declined for the third straight year, following a large increase immediately following the COVID-19 pandemic. Prescribing is down 6% since 2021, and is now similar to the dental prescribing rate in 2011. |
| Prescribing by naturopaths adheres to evidence-based guidelines | Naturopathic physician prescribing remained steady in 2024, with both the prescription rate and median days of therapy remaining the same as 2023. The length of NP prescriptions remains higher than other professions, but is down to a median of 10 days compared with a high of 28 days in 2016. |
| Decreased prescribing for UTI in older adults | Prescribing for urinary tract infections in those aged 65+ decreased 12% from 2023 to 2024. Overall—since peaking in 2014—UTI prescribing in adults over 65 has decreased 27.5%. |
| Decreased prescribing for respiratory infections | Following two years of increases, antibiotic prescribing for RTIs decreased slightly (<1%) in 2024. Prescribing for RTIs remains 29% lower than pre-pandemic (2019). |
| Decreased length of antibiotic courses | Overall median duration of therapy (all professions) has held steady at 7 days since 2003. |

*Funding for the asthma and antibiotics research project from TB Vets, secured by the Pacific Public Health Foundation*

# Conclusions

The BCCDC's Community Antimicrobial Stewardship program has been a model for community stewardship programs around the world for 20 years. The program has played a key role in engaging with and educating children, adults, and healthcare professionals, steadily expanding its reach throughout the province. Public awareness has grown through a combination of traditional media and targeted social media efforts, while close collaboration with healthcare professionals has helped improve antibiotic prescribing practices. Despite the impact of the COVID-19 pandemic, meaningful strides have been made in curbing unnecessary antibiotic use throughout the province.

The program's initiatives have resulted in significant cost savings and contributed to long-term improvements in addressing antimicrobial resistance in British Columbia. Continual evaluation is underway to further optimize the program's reach and reduce inappropriate prescribing. Insights from current metrics will inform the future development of the initiative, with the goal of strengthening antibiotic stewardship, combatting resistance and improving overall health outcomes.

*The 2024 Fall campaign featured in Vancouver*

# References


1 BCCDC Community Antimicrobial Stewardship 2024 Media Campaign Report. Be the Change Group. February 10, 2025.

2 Hootsuite Analytics Report. Accessed May 7, 2025.

3 Google Analytics Report. Accessed May 7, 2025.

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*Aida Mendez-Piña at the Sch'awatn Health Forum*


# Acknowledgements

The Community Antimicrobial Stewardship team would like to thank the following partners for their continued support of the program:

- Do Bugs Need Drugs? program team and executive committee in Alberta
- Nursing students, early childhood education students, pharmacy students and medical students involved in teaching the DBND curriculum
- B.C. Government
- Regional health authorities and the First Nations Health Authority
- The Community Antimicrobial Stewardship Advisory Committee members
- LifeLabs Medical Laboratory Services and PharmaNet for providing vital data for this report

The Community Antimicrobial Stewardship program at the BCCDC is made possible by funding from the Ministry of Health – Pharmaceutical, Laboratory & Blood Services Division.

**The following community partners have been essential in providing the Do Bugs Need Drugs? educational curriculum:**


*All inferences, opinions, and conclusions drawn in this material are those of the author(s), and do not reflect the opinions or policies of the Data Steward(s).*