RESPIPLUS™ PRESENTS

JANUARY 2025

PROTECTING VULNERABLE CANADIANS: OVERCOMING BARRIERS TO PNEUMOCOCCAL VACCINATION IN ADULTS AT HIGH-RISK

RESPIPLUS

PROTECTING VULNERABLE CANADIANS: OVERCOMING BARRIERS TO PNEUMOCOCCAL VACCINATION IN ADULTS AT HIGH-RISK

JANUARY 2025

The contents of this report are not to be used as guidelines and should not influence any patient treatment plans. The following is based on the opinions of the expert panel members and organizations who have an interest in pneumococcal disease. It is for informational purposes only. It is not intended to provide medical or professional advice. Medical advice should be sought-after from a qualified health care professional for any questions. Reliance on any information disclaimed in this report is solely at your own risk. We do not assume any responsibility or legal liability for the accuracy, completeness, timeliness or quality of any information in this report.

The Pneumococcal Disease Initiative and creation of this report was made possible by a sponsorship from Merck Canada Inc.

This report is available on the website www.chroniclungdiseases.com

TABLE OF CONTENTS

ABOUT THE REPORT

The Pneumococcal Vaccination Report is a comprehensive report overseen by a panel of clinicians, public health experts, organizations and patient advocates specializing in pneumococcal disease and adult vaccination. Prepared and published by RESPIPLUS, a non-profit organization with over 20 years of expertise in advancing respiratory health and immunization education, this report synthesizes findings from national surveys and interviews with healthcare professionals and patients. The report identifies barriers to vaccination and provides actionable strategies to improve pneumococcal immunization rates across Canada.

This initiative was made possible through a non-restrictive educational grant from Merck Canada Inc.

OUR TEAM OF EXPERTS

Panel, collaborating organizations, professionals and RESPIPLUS team members

SCIENTIFIC PANEL

Alan Kaplan, MD, CCFP(EM), FCFP, CPC(HC) | Family Physician | Chair, Family Physician Airway Group of Canada
Angel Chu, Infectious Disease
Ron Grossman, Respirologist
Ajit Johal, BSP, RPh, BCPP, CTH
Simon Lessard, Pharm.D, MBA, CRE, CTE, FOPQ

Collaborating Professionals and Organizations

Arushan Arulnamby, Policy Analyst | National Institute on Ageing
Dr. Rob Hauptman, Secretary and Treasurer | Family Physician Airway Group of Canada
Trent Litzenbergen, Vice President, Mission Integration | Lung Saskatchewan
Henry Roberts, Executive Committee Member | COPD Canada
Riley Sanders, Public Affairs Manager | Lung Health Foundation
Jessica Sit, RRT, CRE, Manager Evidence to Practice | Lung Health Foundation

RESPIPLUS Team

Maria Sedeno | Executive Director
Katrina Metz | Consultant

Lung Health Foundation:

A Canadian organization dedicated to improving lung health through research, education, and advocacy.

Family Physician Airway Group of Canada:

A network of primary care physicians specializing in airway diseases, providing education and clinical guidance.

Lung Saskatchewan:

A provincial organization focused on lung health advocacy, support services, and education in Saskatchewan.

COPD Canada:

A patient-centered group providing resources, support, and advocacy for individuals living with Chronic Obstructive Pulmonary Disease.

National Institute on Ageing:

A Canadian institute promoting healthy ageing through research, policy development, and education.

EXECUTIVE SUMMARY

Pneumococcal disease continues to be a major public health issue in Canada, particularly for vulnerable populations such as older adults, individuals with chronic illnesses, and immunocompromised persons. Despite the availability of effective vaccines, significant gaps in vaccination rates persist, mainly due to barriers related to education, access, and healthcare professional recommendations. This white paper report produced by RESPIPLUS with a group of Scientific Experts summarizes key findings from a national survey and interviews with healthcare professionals (HCP) and Canadian organizations to identify the factors affecting pneumococcal vaccination uptake and propose strategies to address these challenges.

The survey and interviews revealed that while most healthcare professionals are aware of pneumococcal disease and its risks, there are critical gaps in up-to-date knowledge regarding vaccination guidelines. Approximately 60% of HCPs reported they were familiar with pneumococcal vaccination, but only a small percentage were well-versed in national immunization recommendations. Additionally, healthcare providers noted that vaccine fatigue, patient hesitancy, and concerns about vaccine safety continue to affect patient willingness to be vaccinated.

A major barrier identified was the inconsistent recommendation of pneumococcal vaccines during routine healthcare visits. Only 58% of patients reported receiving a direct recommendation from their healthcare provider, despite physician advice being a key driver for vaccination. Accessibility challenges, including limited hours for vaccination services and logistical barriers such as cost and transportation, and ever-changing vaccines were also highlighted as significant obstacles to higher vaccination rates.

This report recommends a multi-faceted approach to improve pneumococcal vaccination rates. Key recommendations include enhancing education for both healthcare providers and patients, improving access to vaccination services by expanding hours and locations, and utilizing digital tools for reminders and vaccination tracking. Encouraging more frequent and proactive discussions about pneumococcal vaccination between healthcare providers and patients is essential to close the existing gaps. The objective of this report is to address these issues, so that we can increase pneumococcal vaccination rates at the national level, reduce the incidence of serious infections, and protect at-risk populations more effectively.

BACKGROUND

The key objective of RESPIPLUS' initiative is to inform the development of educational materials and targeted interventions to enhance vaccination efforts. By collecting insights from HCPs and patients alike, the survey aims to identify gaps in knowledge, perceived barriers to vaccination, and current vaccination practices. The ultimate goal is to use the findings to raise awareness and increase educational outreach regarding pneumococcal vaccination in Canada.

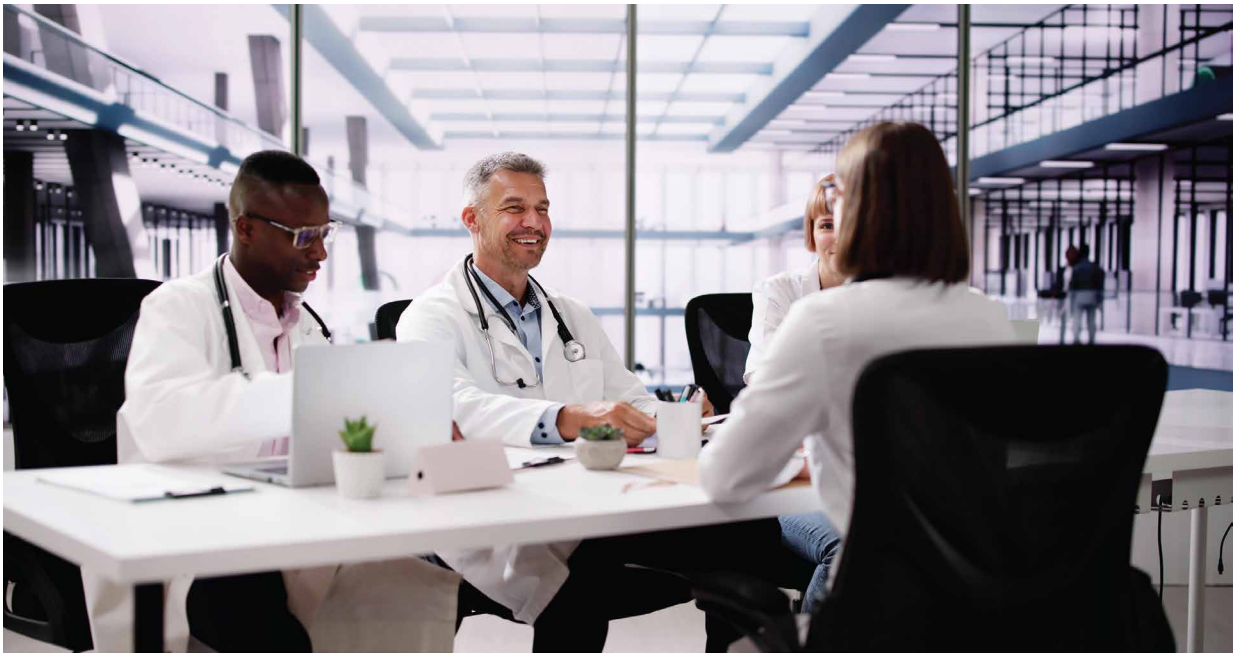
This report is critical for several reasons. First, it is well-documented that awareness and understanding of pneumococcal disease among both healthcare providers and patients remain suboptimal. Healthcare providers may lack the up-to-date knowledge required to effectively communicate the importance of pneumococcal vaccination, and they may face logistical barriers that hinder vaccine promotion and delivery. Second, barriers such as misconceptions about the disease, vaccine safety concerns, and limited accessibility to vaccination services contribute to lower-than-expected immunization rates among at risk patients. There are also funding issues for these vaccines across Canada. Understanding these issues at a national level through a comprehensive survey is a necessary step in addressing these care gaps.

The report will also play a crucial role in informing future education and outreach strategies. By gathering input directly from HCPs across Canada, we can tailor recommendations and educational materials that speak directly to their needs, improving their ability to communicate the benefits of pneumococcal vaccination to patients. Moreover, the insights from this report will help to identify systemic barriers in accessing vaccines, allowing for the development of more efficient, patient-friendly vaccination services.

To develop effective solutions, a multi-faceted approach is required. RESPIPLUS' national survey explored several key areas:

- **Awareness and Knowledge of Pneumococcal Disease and Vaccination:** Understanding the level of familiarity that HCPs and patients have with pneumococcal disease, its health impacts, and the different vaccines available will highlight gaps in education.
- **Perceived Barriers to Vaccination:** Identifying the factors that HCPs believe hinder vaccination, such as patient hesitation or system inefficiencies, will allow us to propose practical solutions.
- **Vaccination Practices and Recommendations:** Insights into the current practices of HCPs, including how often they recommend pneumococcal vaccines and their personal attitudes towards vaccination, will help inform more targeted interventions.
- **Accessibility and Convenience of Vaccination Services:** Evaluating logistical challenges, such as the availability of vaccines and ease of access for patients, will be key to improving overall vaccine uptake.

RESPIPLUS' investigation addresses these areas through targeted data collection and interviews with HCPs and collaborating organizations. This report will serve as a foundational tool to bridge the care gaps in pneumococcal vaccination in Canada. The findings will not only promote greater awareness but also equip HCPs with the knowledge and resources they need to advocate for and administer pneumococcal vaccines more effectively.



METHODOLOGY OF THIS INVESTIGATION

The methodology for this white paper involved a comprehensive approach combining both quantitative and qualitative research methods to gather insights from expert healthcare professionals in the field and organizations across Canada. The study included a national online survey that was available between August and September 2024 and interviews designed to explore the barriers, practices, and perceptions surrounding pneumococcal vaccination.

1. **Online Survey Design and Distribution:** The survey was distributed to healthcare professionals, including general practitioners, specialists, pharmacists, nurses, and healthcare administrators, as well as patients via RESPIPLUS +20,000 members. The survey collected data on key areas such as healthcare professionals' awareness of pneumococcal disease, their familiarity with vaccination guidelines, and their current practices in recommending and administering vaccines. Respondents also provided insights into perceived barriers, including patient hesitancy, vaccine fatigue, and logistical challenges such as cost and access to vaccination services.

2. **Interviews with Expert Healthcare Professionals in the Field and Organizations:** In addition to the survey, in-depth interviews were conducted with a subset of expert healthcare professionals and organizational leaders. These interviews aimed to gather more detailed qualitative data on the specific challenges faced in promoting pneumococcal vaccination. Interview participants provided perspectives on systemic barriers, such as the lack of public awareness campaigns, the burden of recommending multiple vaccines, and issues related to healthcare infrastructure that hinder vaccine distribution.

3. **Data Analysis:** The data collected from the survey and interviews were analyzed to identify trends, gaps in knowledge, and the main barriers to improving vaccination rates. Quantitative survey data were analyzed using statistical methods, while qualitative data from the interviews were coded to identify common themes and actionable insights.

The combination of survey data and interview findings provided a comprehensive understanding of the factors influencing pneumococcal vaccination in Canada. The results of this research form the foundation for the recommendations in this white paper, aimed at improving education, access, and vaccine advocacy across the healthcare system.

THE IMPORTANCE OF PNEUMOCOCCAL VACCINATION FOR HIGH-RISK PATIENTS

Pneumococcal disease is a significant public health concern, particularly for high-risk populations. Caused by the bacterium Streptococcus pneumoniae, this infection can lead to serious illnesses such as pneumonia, meningitis, and bacteremia. Among these, invasive pneumococcal disease (IPD) (when the bacteria invade parts of the body that are normally free from germs, such as the blood or the central nervous system) poses the greatest threat to vulnerable groups, such as the elderly, individuals with chronic illnesses, and immunocompromised persons. Pneumococcal vaccination is one of the most effective tools to prevent these diseases and mitigate the substantial burden they impose on public health systems. Moreover, the sequelae of pneumococcal infections often extend beyond acute illness. These can include long-term cognitive decline, cardiovascular complications, prolonged disability, and loss of independence, particularly among older adults. Highlighting these broader impacts underscores the critical importance of preventive measures, such as vaccination.[1,2]

Prevalence of Pneumococcal Disease in High-Risk Populations in Canada

In Canada, pneumococcal disease remains a pressing issue for high-risk populations. Although incidence rates have declined significantly due to vaccination programs, certain groups remain disproportionately affected. These include “healthy” adults aged 65 and older, people with chronic medical conditions (such as diabetes, heart disease, and lung disease), individuals who are immunocompromised, and Indigenous communities. According to recent reports, the incidence of IPD and mortality rates among individuals aged 65 years and older was approximately 22 cases per 100,000 the highest in Canada.

[1] Orihuela, C. et al. (2021). Consequences of Pneumonia in Older adults. In: Gu, D., Dupre, M.E. (eds) Encyclopedia of Gerontology and Population Ageing. Springer, Cham.
[2] Kruckow, K.L., Zhao, K., Bowdish, D.M. et al. Acute organ injury and long-term sequelae of severe pneumococcal infections. Pneumonia 15, 5 (2023).
[3] Government of Canada. Invasive Pneumococcal Disease (IPD) Surveillance in Canada, 2021-2022. Retrieved from https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2024-50/issue-5-may-2024/invasive-pneumococcal-disease-surveillance-2021-2022.html

The incidence of pneumococcal disease also rises among individuals with chronic health conditions that compromise immune function. For example, those with chronic heart, liver, and lung diseases face an elevated risk of developing pneumonia or IPD, leading to higher hospitalization and mortality rates. Indigenous communities, especially in remote or northern areas, also show higher rates of infection, attributed to disparities in healthcare access, crowded living conditions, and higher rates of chronic diseases.[4]

Despite the availability of effective vaccines, gaps in vaccine coverage persist, particularly in high-risk populations. For instance, while childhood immunization rates in Canada are relatively high, the coverage among older adults lags behind, with some studies indicating that less than 50% of eligible seniors are vaccinated against pneumococcal disease. This under-vaccination leaves a large portion of the population vulnerable to severe illness, hospitalizations, and death.[5]

Public Health and Healthcare Costs: The Impact of Improved Vaccination Rates

Increasing pneumococcal vaccination rates among high-risk groups could significantly improve public health outcomes and reduce healthcare costs. Pneumococcal disease, especially in its invasive form, is costly to treat due to extended hospital stays, intensive care requirements, and the potential for long-term rehabilitation in severe cases like meningitis or bacteremia. Vaccination is also critical in addressing the rising burden of comorbidities, particularly cardiovascular events that are increasingly associated with pneumococcal infections. In Canada, direct healthcare costs for treating pneumococcal infections are estimated to be substantial, especially considering the ageing population. Hospitalization costs alone for IPD are high, with estimates suggesting that costs could exceed $20,000 per patient for severe cases.[6]

Improving pneumococcal vaccination rates could prevent thousands of cases of pneumonia and IPD annually. This would not only reduce the direct burden on the healthcare system in terms of hospital admissions and medical treatment but also lead to indirect savings through decreased morbidity, mortality, and long-term care needs. Furthermore, reducing the incidence of severe pneumococcal disease would alleviate pressure on healthcare systems during times of heightened demand, such as influenza season or pandemics, when respiratory infections tend to surge.

[4] Chartrand, C., et al. (2024). Pneumococcal Disease in Indigenous Communities and High-Risk Populations in Canada. BMC Health Services Research. Retrieved from https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-024-11400-6
[5] Government of Canada. Adult National Immunization Coverage Survey (2023): Results. Retrieved from https://www.canada.ca/en/public-health/services/immunization-vaccines/vaccination-coverage/adult-national-immunization-coverage-survey-2023-results.html
[6] Wallace, S., & Cooke, A. (2019). Healthcare Costs of Invasive Pneumococcal Disease in Canada. Canadian Family Physician. Retrieved from https://www.cfp.ca/content/65/9/625

From a broader public health perspective, increasing vaccine uptake would also contribute to herd immunity, lowering transmission rates and protecting individuals who cannot receive the vaccine due to medical reasons. Additionally, as antibiotic resistance continues to rise, preventing bacterial infections like pneumococcal disease through vaccination becomes even more crucial. A higher vaccination rate could lead to fewer infections and, consequently, fewer antibiotics prescribed, which is critical considering a fair number of strep pneumoniae bacterium are multidrug resistant and immensely difficult to treat.[3]

VACCINES APPROVED IN CANADA AS OF NOVEMBER 2024

Serotypes in Canada

Serotypes, defined as distinct variations within a species, play a vital role in public health, particularly concerning vaccine-preventable diseases. In Canada, the ongoing surveillance and understanding of serotype variations are crucial for optimizing vaccination strategies against pathogens such as Streptococcus pneumoniae.

Recent studies indicate that the serotype landscape of pneumococcal disease continues to evolve. As of 2024, at least 100 different serotypes of S. pneumoniae have been classified, with notable shifts in prevalence observed over recent years. A 23-valent pneumococcal polysaccharide vaccine (Pneu-P-23) and a 13-valent pneumococcal conjugate vaccine (Pneu-C-13), have been widely used in Canadian adult immunization programs. Both include a range of serotypes that contribute to the disease burden. However, emerging data suggest an increase in vaccine and non-vaccine serotypes, particularly serotypes 3, 7F, and 19A, which have been increasingly associated with invasive pneumococcal disease (IPD).[3]

In Canada, Serotype 3 remains a significant cause of pneumonia, leading to high hospitalization rates. A recent study from Health Canada indicated a 25% increase in IPD caused by serotype 3 since 2020, underscoring the necessity for vigilant monitoring of serotype trends and their impact on health outcomes.[7] Moreover, the emergence of antibiotic-resistant serotypes is a growing concern.

A newly introduced vaccine in Canada, Pneu-C-21 (Capvaxive®), provides protection against 21 pneumococcal serotypes, including those associated with drug resistance and recent disease prevalence in Canada in adults. Unlike previous vaccines, it is tailored to target serotypes currently implicated in both invasive pneumococcal disease and non-vaccine serotypes emerging due to evolution and resistance patterns. Notably, Capvaxive includes serotypes not found in Pneu-C- 20, addressing critical public health needs.[8]

[7] Government of Canada. Canadian Immunization Guide: Part 4 - Active Vaccines, Pneumococcal Vaccine. Retrieved from https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-16-pneumococcal-vaccine.html
[8] Merck Canada. Health Canada Approves Capvaxive, July 16, 2024. Retrieved from https://www.merck.ca/en/newsroom/health-canada-approves-capvaxive/

Approved Vaccines for Adults

Several pneumococcal vaccines are currently approved by Health Canada to protect against severe disease, which includes infections like pneumonia, meningitis, and bloodstream infections caused by Streptococcus pneumoniae. These vaccines are essential for preventing invasive pneumococcal disease (IPD), especially among high-risk populations, such as the elderly and individuals with certain medical conditions.

Pneumococcal Conjugate Vaccines (Pneu-C)

1. **Capvaxive (Pneu-C-21):** Approved by Health Canada in 2024, it is the newly approved conjugate vaccine in Canada that offers protection against 21 strains of pneumococcal bacteria. It provides 80% disease coverage[9], making it a highly effective option for reducing pneumococcal disease burden. This vaccine is designed to enhance immune response, especially in older adults and individuals with certain underlying health conditions such as heart or lung disease. Capvaxive. Merck – Product Monograph - Canada – July 15, 2024.
2. **Prevnar 20 (Pneu-C-20):** Approved by Health Canada in 2022, this vaccine protects against 20 pneumococcal strains. It offers 58% disease coverage[9]. It's recommended for use in adults, including those aged 65 and above and younger adults at increased risk due to medical conditions. Prevnar 20. Pfizer - Product Monograph Canada. Pfizer, Nov 16, 2023
3. **Prevnar 13 (Pneu-C-13):** Approved by Health Canada in 2009, this vaccine covers 13 strains of S. pneumoniae and is commonly used in pediatric immunization schedules as well as for adults at higher risk. It is also recommended for adults aged 65 and over, and those with immunocompromising conditions. Prevnar 13. Pfizer - Product Monograph Canada. Pfizer, July 16, 2024.
4. **Vaxneuvance (Pneu-C-15):** Approved by Health Canada in 2021, this 15-valent conjugate vaccine offers protection against additional serotypes beyond those in Pneu-C-13. It is particularly useful for children and high-risk adults. Vaxneuvance. Merck - Product Monograph Canada – June 26, 2024.

Pneumococcal Polysaccharide Vaccine (Pneu-P-23)

5. **Pneumovax 23:** A polysaccharide vaccine that covers 23 strains and is recommended for older adults and individuals with certain health conditions, such as chronic heart or lung diseases. The initial authorization was in 1978. Pneumovax 23. Merck - Product Monograph – Canada – Mar 21, 2024.

Public health programs continue to evolve to include these vaccines in routine immunization schedules, particularly for young children and adults at high risk of severe disease.

Refer to **Appendix 1 - Provincial and territorial schedules for Pneumococcal Vaccination.**

[9] Griffith, A., Golden, A. R., Lefebvre, B., McGeer, A., Tyrrell, G. J., Zhanel, G. G., ... & Martin, I. (2024). CCDR 50th Anniversary: Invasive pneumococcal disease surveillance in Canada, 2021–2022. Canada Communicable Disease Report, 50(5), 121. Retrieved from https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report.html

GUIDELINES

National Advisory Committee on Immunization (NACI)

The National Advisory Committee on Immunization (NACI) plays a pivotal role in shaping Canada's immunization policies and practices. NACI's latest guidelines underscore the importance of monitoring serotype prevalence in guiding vaccine recommendations. They advocate for a dynamic approach to vaccination that is responsive to changing serotype profiles, particularly concerning pneumococcal and meningococcal vaccines.

NACI recommends routine surveillance of serotype distribution to inform vaccination strategies continually. This includes adjusting vaccination schedules and exploring the necessity for booster doses based on serotype prevalence. Their guidelines also emphasize the importance of vaccination for high-risk groups and healthcare workers, adapting recommendations as new serotypes emerge or as vaccine effectiveness wanes over time.

On November 15, 2024, the Public Health Agency of Canada (PHAC) released the "National Advisory Committee on Immunization's (NACI) - Recommendations on the use of pneumococcal vaccines in adults", including the new Pneu-C-21. This guidance is based on current evidence and NACI expert opinion. See Appendix 2 for a summary of the most updated NACI recommendations.[9]

Chronic Disease Societies

In addition to NACI, various organizations targeting chronic diseases offer further insights into managing pneumococcal disease serotypes, manifestations and vaccination.

Chronic Disease Society	Overview
Global Initiative for Chronic Obstructive Lung Disease (GOLD)	GOLD has published guidelines regarding the interplay between COPD and respiratory infections. GOLD emphasizes the significance of vaccinating COPD patients against common respiratory pathogens, including specific serotypes of Streptococcus pneumoniae. Their recommendations support vaccination not only as a preventative measure but also as part of an overall care plan to improve patient outcomes.
Global Initiative for Asthma (GINA)	GINA also recognize the potential impact of respiratory infections, particularly those caused by distinct serotypes, on asthma exacerbations. They recommend that asthma patients be educated regarding their risks and the importance of vaccination as a preventive strategy against infections that may lead to asthma complications.
European Society of Cardiology (ESC) and European Respiratory Society (ERS)	The ESC/ERS guidelines endorse vaccination for PH patients. As a general health measure, it is recommended that patients with PH be vaccinated against influenza, Streptococcus pneumoniae, and SARS-CoV-2.

[10] An Advisory Committee Statement (ACS) National Advisory Committee on Immunization (NACI) Recommendations on the use of pneumococcal vaccines in adults, including PNEU-C-21

CURRENT ISSUES AND BARRIERS IN CANADA

This section summarizes insights from interviews with Canadian healthcare organizations and experts on barriers to pneumococcal vaccination (June/July 2024). It highlights issues such as low public awareness, logistical challenges, and inconsistent healthcare recommendations that impact high-risk populations, including older adults and individuals with chronic lung conditions. Insights from both organizations and expert panelists offer a comprehensive view of these obstacles and suggest pathways to improve vaccine access and education.

Organizations interviewed:

- COPD Canada (FPAGC)
- Family Physician Airways Group of Canada
- Lung Saskatchewan
- National Institute on Ageing (NIA)
- Lung Health Foundation (LHF)

Awareness & Knowledge

Across Canada, a significant barrier to pneumococcal vaccination is a low level of awareness and understanding among high-risk populations, particularly older adults and individuals with chronic respiratory conditions. Many adults remain unaware of the specific risks associated with pneumococcal disease and the benefits of vaccination, leading to underutilization of this preventive measure. As Dr. Ron Grossman, a Respirologist from Ontario, explained, *"The immune system starts to weaken after fifty,"* emphasizing the importance of vaccination to mitigate age-related vulnerability. Organizations like COPD Canada also raised concerns, pointing out that those who do not actively engage in their healthcare may not even know about the risks of pneumococcal disease. These knowledge gaps create a widespread lack of urgency for vaccination among those who would benefit the most.

The most common reason for older adults not getting the vaccine is simply thinking it is not necessary.

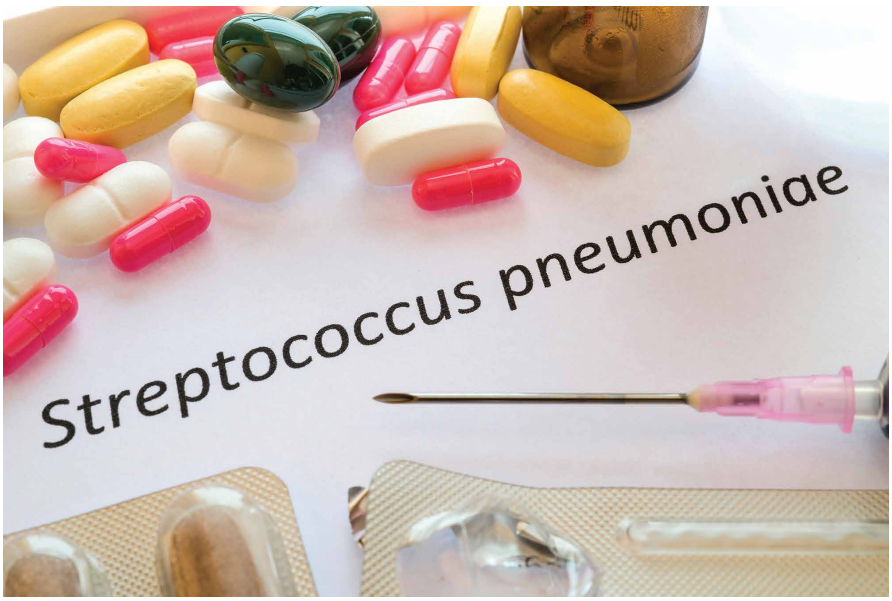
Arushan Arulnamby from NIA

The larger group who don't engage in their health or don't have a diagnosis remain unaware of pneumococcal risks.

Henry Roberts from COPD Canada

Most patients know what "pneumonia" is, but not specifically bacterial causes of pneumococcal disease, which can be mitigated with vaccination.

Ajit Johal a pharmacist from British Columbia



Perceived Barriers

Cost

Financial constraints and inconsistent vaccine coverage across provinces are major barriers to vaccination access. While the pneumococcal vaccine is relatively affordable compared to other vaccines, Trent Litzenbergen from Lung Saskatchewan noted that *"in some places, people pay out-of-pocket while others don't."* This inconsistency in coverage places a financial burden on those without insurance, deterring some individuals, especially low-income groups, from seeking vaccination.

Dr. Grossman highlighted this affordability issue, despite the vaccine's projected cost being approximately $140-150. It is worth noting that in Canada, whether a vaccine is publicly funded (free for people) depends on a process called "tendering." This means that the government decides which vaccines to buy and offer through public programs. For this to happen, healthcare providers and provincial health decision-makers need to speak up and push for more vaccine options to be considered and included in these decisions. Without this advocacy, newer or better vaccines might not be made available to the public for free.

Vaccine co-administration

Another barrier is the concern around providing multiple vaccines in a single visit, especially as high-risk populations will be the same target population needing flu, COVID-19, and RSV vaccines (to mention only a few). Some people feel apprehensive about taking multiple vaccines at once, even when healthcare providers assure them of its safety. Dr. Angel Chu, an infectious disease expert from Alberta, pointed out, *"People are nervous when they're asked to take multiple vaccines at once,"* leading to hesitancy and reduced uptake.

Vaccine Fatigue

Vaccine fatigue has become increasingly relevant, with many Canadians feeling overwhelmed by the frequency and number of vaccine recommendations. Jessica Sit from the Lung Health Foundation noted, *"There's just too many vaccines being pushed at once, which leads people to tune out entirely."* This phenomenon, partly a lingering effect of the COVID-19 pandemic, has reduced enthusiasm for additional vaccinations. Panelists observed that fatigue mainly affects vaccines perceived as similar, like COVID-19 and flu, though newer vaccines such as RSV may still be well-received.

People are tired of the mental load of managing multiple vaccine schedules.

H. Roberts from COPD Canada

Current Practices: Lack of Recommendation by Healthcare Providers

A recurring issue identified by both organizations and experts is the limited role healthcare providers play in promoting pneumococcal vaccination. Many general practitioners and specialists do not consistently recommend pneumococcal vaccination, particularly to high-risk groups like the elderly or those with chronic respiratory conditions. Dr. Alan Kaplan, a family physician from Ontario, noted, *"If a doctor is wishy-washy, a patient is less likely to go for it."* He emphasized that strong, clear recommendations from healthcare providers significantly increase the likelihood of patients following through.

Another critical gap lies in the lack of guidance in hospitals regarding vaccinations. Patients admitted with vaccine-preventable diseases often leave the hospital (if they recover) without receiving the necessary vaccines to prevent future hospitalizations. This is a missed opportunity to leverage the hospital setting as a key touchpoint for vaccination interventions, particularly for those at high risk of severe outcomes.

Although some pharmacists actively encourage vaccinations, many patients perceive pharmacy visits as purely transactional, leading to missed opportunities for important health conversations.

> Primary care doctors have so much on their plate that vaccines for things like pneumococcal disease often fall off the radar.
>
> **Dr. Rob Hauptman from the FPAGC**

Accessibility and Convenience

The logistics of vaccine accessibility further hinder uptake, especially in rural or underserved areas. Limited availability of vaccines in small clinics due to storage and staffing challenges often requires patients to travel to larger centers, which can be a significant obstacle for older patients or those with mobility issues. Jessica Sit from the Lung Health Foundation highlighted that *"limited staffing and the requirement for special storage make in-house vaccination challenging"* in rural clinics. Transportation issues and scheduling conflicts compound these barriers, especially for those without reliable support systems. Additionally, language and cultural barriers prevent effective healthcare communication, limiting access for diverse populations.

> We still rely on self-reported surveys for vaccination data, which leads to underreporting and limits our understanding of gaps in care.
>
> **A. Arulnamby from NIA**

> If a senior can't easily get to a clinic or pharmacy, they are unlikely to get vaccinated.
>
> **Dr. Angel Chu**

Recommendations

Education: Increasing Awareness Among Patients and Providers

Both organizations and panelists emphasized the need for educational initiatives targeting both the public and healthcare providers. A focused public health campaign could help clarify the risks of pneumococcal disease and underscore the vaccine's role in preventing severe illness among vulnerable populations. Dr. Kaplan advocated for this type of campaign, suggesting it should be *"as clear as the messaging about flu vaccines."* Increased education for healthcare providers, particularly general practitioners and specialists, would further empower them to deliver consistent, clear information on pneumococcal vaccination.

In addition to education, a public-private partnership should be recommended to encourage vaccine acceptance. Health care professionals, industry, and government must work together to improve public health, presenting a unified front to build trust and emphasize the importance of vaccination. Transparent, visible advocacy from these groups can normalize vaccination and reinforce its role as a critical public health intervention.

> Doctors need more support to consistently recommend pneumococcal vaccines.
>
> **Simon Lessard, pharmacist, Québec.**

> There should be public health drives for vaccinations, just like we see for blood donations.
>
> **H. Roberts from COPD Canada**

> Consistent and clear messaging about the necessity of the pneumococcal vaccine for older adults is needed.
>
> **A. Arulnamby from NIA**

Guidelines: Integrating NACI and PIQ Recommendations

A recurring recommendation from both organizations and experts was to improve the consistency of vaccination guidelines by fully integrating the recommendations of the National Advisory Committee on Immunization (NACI) and, where applicable (in Quebec), PIQ (Immunization Program Planning Committee). While guidelines from NACI exist, adherence varies across provinces, creating a fragmented approach to pneumococcal vaccination. T. Litzenbergen from Lung Saskatchewan suggested that *"uniform implementation across provinces could reduce disparities in care."* Panelist Ajit Johal added that disease-specific guidelines would provide healthcare providers with tailored recommendations, supporting more consistent advocacy for pneumococcal vaccination among high-risk groups.

Vaccine tendering plays a critical role in enabling the implementation of NACI recommendations within public health budgets. Advocacy from HCPs for including newer vaccines, such as Pneu-C-21, in tenders is essential to ensure equitable access for high-risk populations and align with evidence-based guidelines.

A comprehensive national respiratory health strategy would allow immunization practices to be consistently updated across Canada and that funding for such a strategy could ensure equal vaccine access for all high-risk groups.

The Lung Health Foundation (LHF)

Most of these organizations already recommend pneumococcal vaccination, but implementation could be stronger.

Dr. Ron Grossman

Logistics: Implementing Vaccine Reminders and Tracking Technology

Improving logistical systems for vaccination reminders and tracking could boost uptake by making the vaccination process easier for patients and providers alike. Technological tools, such as reminder systems for vaccination schedules, would help patients stay on track with necessary doses, reducing missed appointments or unneeded doses. S. Lessard, mentioned that *"our pharmacy uses reminder systems to track vaccine schedules,"* emphasizing that these tools, if standardized across healthcare settings, could make a significant difference. Additionally, a unified, accessible vaccination record could improve continuity of care, allowing patients and healthcare providers to monitor vaccination history accurately.

There should be support for the adoption of a national immunization card in electronic format, rather than provincial cards. A standardized system across Canada would align with the concept of portability—a core principle of Canadian healthcare—and provide consistency for patients and providers. Such a system could also serve as a valuable resource for researchers, enabling them to explore vaccine adherence and acceptability more effectively.

Riley Sanders from the Lung Health Foundation advocated for *"a more accessible, unified provincial immunization record,"* which could ensure that vaccinations are up-to-date and prevent redundancies.

There should be a clear and shared vaccine record accessible to all healthcare providers.

T. Litzenbergen from Lung Saskatchewan

Having a more accessible, unified provincial immunization record would streamline the process and help people keep track of their vaccinations.

R. Sanders from LHF

Expanding Access Through Public Health Campaigns and Support Systems

Increasing accessibility requires concerted efforts through public health campaigns, financial support, and community partnerships. A national respiratory health strategy, advocated by organizations like the Lung Health Foundation, could support provincial initiatives and provide free vaccines (by advocating for a tender with procurement Canada) for high-risk groups, alleviating financial barriers. To succeed, coordination of provincial payment schemes with national guidelines is a must. Expanding access points for vaccination outside primary care clinics, such as through community centers or local organizations, could make vaccines more accessible, particularly for groups facing cultural or language barriers. S. Lessard suggested that *"working with community centers, churches, and local organizations could reach diverse populations more effectively."* By broadening the locations and support systems available for vaccinations, high-risk individuals would have greater and more equitable access to pneumococcal immunization across Canada.

A federally supported agreement could fund province-wide initiatives, which would provide vaccines for high-risk populations without cost.

Lung Health Foundation (LHF)

Expanding vaccine availability in community settings and making immunization more accessible outside of primary care clinics could be suggestion.

T. Litzenbergen from Lung Saskatchewan

SUMMARY OF THE RESULTS OF THE ONLINE SURVEYS – SUMMER 2024

With the leadership of the Scientific Committee, RESPIPLUS developed 2 online surveys about pneumococcal vaccination directed to: 1) Patients and 2) Healthcare professionals. These surveys were available between August and September 2024 and were distributed mainly via the 20,000 members of RESPIPLUS' community. Other organizations also provided support in the distribution of these surveys, such as COPD Canada and the Family Physician Airways Group of Canada. **The full details of the survey results can be found on Appendix 3 (Patients) and 4 (Healthcare professionals). We have also collected and analysed recommendations by both of these groups – See Appendix 5.**

For patients, the survey received 246 responses, with 97% identifying as patients (240 qualifying answers). Predominantly, respondents were aged 65 and older (89%) and primarily resided in Ontario (40%) and Quebec (29%). Most participants lived in urban and suburban areas, accounting for 75% of all respondents, which reflects that the majority of respondents came from the COPD Canada and RESPIPLUS communities. A high percentage of these individuals reported having COPD (85%), followed by asthma (20%) and heart disease (15%), with only 20% identifying as immunocompromised.

Among healthcare professionals, the survey collected 139 responses, with 104 qualifying as healthcare providers. A substantial proportion of these professionals were based in Quebec (45%) and Ontario (26%). Registered nurses represented the largest group (31%), followed by general practitioners (11%). This group was notably experienced, with 63% reporting over 20 years in practice. The majority worked in community centers, primarily located in urban (57%) and suburban (40%) settings.

Current Issues/Barriers in Canada

In terms of **awareness and knowledge**, patients in this cohort demonstrated a high level of awareness, which speaks about their background as mainly touched by COPD and senior adults. Around 80% recognized that they were at risk for pneumococcal infection, primarily due to their age and chronic conditions. Healthcare professionals also showed a strong awareness, with 93% identifying themselves as familiar or very familiar with pneumonia and its risks to vulnerable populations.

Regarding **perceived barriers, cost** was a significant concern for healthcare professionals, with 62% indicating that it posed a major barrier to vaccination. However, only 26% of patients perceived cost as a prohibitive factor. The issue of **co-administration**—whether patients felt overwhelmed by receiving multiple vaccines simultaneously—was generally not a concern for patients, with 53% expressing no concern at all. Healthcare professionals reflected a similar stance, with 61% reporting no concern about co-administration. However, there was a notable difference in attitudes toward **vaccine fatigue**, or feeling overwhelmed by the number of vaccines recommended. While 48% of patients reported no concern at all about vaccine fatigue, healthcare professionals expressed a different perspective, with 25% showing a great deal of concern regarding this issue. HCPs properly identified the highest barrier for patients to be vaccinated is their lack of awareness (4.3 out of 5).

There were also discrepancies in **current practices**. While 68% of high-risk patients reported that their doctor or pharmacist had ever (at least once) recommended pneumococcal vaccination, only 10% stated that vaccination was discussed at every visit, and 36% indicated it was rarely or never brought up. In contrast, 45% of healthcare professionals said they recommended pneumococcal vaccination at every visit if patients were not up-to-date, with an additional 23% suggesting it when co-administering other vaccines.

When it comes to **accessibility and convenience**, 65% of patients found vaccination services to be very convenient, with 80% stating they were likely or very likely to follow healthcare provider recommendations. The majority of patients (68%) reported getting vaccinated at pharmacies. Patients also identified long wait times (24%) as an additional barrier. Healthcare professionals, however, were slightly less confident in the convenience of services, with 47% rating them as somewhat or very convenient.

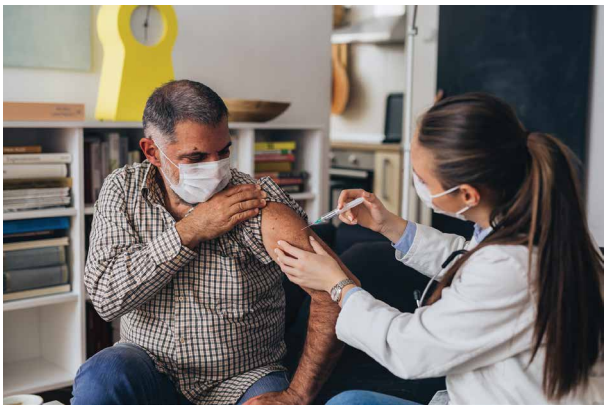
Recommendations

Education emerged as a critical need. Patients expressed a preference for obtaining information about pneumococcal vaccines through websites and online articles (63%), followed by discussions with healthcare providers (57%). Healthcare professionals, on the other hand, noted that vaccination was minimally covered during professional schooling, with most of their knowledge coming from continuing education. Indeed, 93% of healthcare providers stated that they had acquired their vaccination knowledge from webinars or lectures. In terms of "what would motivate the patients the most to get a vaccine?" doctor recommendations and concerns about their health were ranked the highest (both factors came at 4.7 out of 5). HCPs identified increased patient education as the most important strategy to increase vaccination rates (4.7 out of 5).

In terms of **logistics**, both patients and providers agreed that regular vaccine reminders, not limited to the fall season, would support adherence to vaccination schedules. Regarding technology for tracking vaccinations, healthcare professionals primarily used electronic health records (65%) and provincial or territorial health record systems (36%). Conversely, many patients relied on paper vaccination cards (35%) and personal calendars (30%) to track their vaccinations. Only 20% of patients reported having access to a provincial or territorial health record system. Both groups agreed that improved technology for tracking vaccinations and year-round reminders would help them stay up to date.

Additional recommendations from the results emphasized the importance of expanding **accessibility**. Some respondents suggested enabling more healthcare providers, such as community clinicians, to administer vaccinations during home visits or through community centers. **Public funding and cost reduction** were also recurrent recommendations, with many advocating for more government support to reduce out-of-pocket expenses for high-risk individuals.

Finally, healthcare professionals highlighted the need for clearer communication on vaccine options and booster schedules, which would help them better inform and guide their patients. HCPs chose web-based training programs as the most important strategy to help them in their efforts to increase pneumococcal vaccination (4.6 out of 5).



FINAL RECOMMENDATIONS FOR PNEUMOCOCCAL VACCINATION IN CANADA

This summary outlines recommendations to improve pneumococcal vaccination in Canada, focusing on education and logistical improvements as derived from surveys and interviews with healthcare providers (HCPs) and patients.

1. Education: Raising Awareness Among Patients and Professionals

Patient Education

Public awareness of pneumococcal disease is low, particularly outside high-risk groups. Targeted public health campaigns are essential to educate Canadians about the risks of pneumococcal infections and the protective benefits of vaccination. Vulnerable groups, such as older adults and individuals with chronic conditions, require clear communication about their risk levels. Campaigns should use diverse, accessible channels, including social media and community health centers, and offer culturally sensitive messaging in multiple languages to reach Canada's diverse population.

Healthcare Provider Education

Healthcare providers significantly influence patient vaccination decisions; thus, they must be well-informed about pneumococcal disease, available vaccines, and the latest guidelines. Educational efforts should focus on the epidemiology of pneumococcal disease and vaccine schedules, particularly for high-risk groups, such as immunocompromised patients and those with chronic diseases. Ongoing education through workshops, online modules, and CME-linked training can empower providers to confidently recommend pneumococcal vaccines.

2. Logistics: Improving Access and Tracking Mechanisms

Year-Round Vaccine Reminders

Vaccination schedules often include a mix of seasonal vaccines, such as influenza, COVID-19, and RSV, alongside year-round vaccines, like pneumococcal, shingles, and hepatitis vaccines. However, pneumococcal vaccination campaigns frequently align with flu season, which can limit outreach to this specific timeframe. Expanding vaccination reminders to emphasize year-round opportunities—integrated into routine healthcare visits such as annual checkups, chronic disease management consultations, or preventive care initiatives—could significantly improve vaccination rates.

To bolster this effort, enhanced public reminders tailored to both seasonal and year-round vaccinations can be disseminated through pharmacies, community health centers, and digital health systems (e.g., automated text/email reminders). These tools can raise awareness of available vaccines throughout the year, ensuring broader protection and higher vaccination uptake among diverse populations.

Enhanced Tracking Technology

Fragmented health records impede effective vaccination tracking, especially for adults. A national electronic health record (EHR) system integrated with provincial databases would allow providers to access a patient's vaccination history in real time, minimizing missed opportunities and duplicate vaccinations. Public health officials could also use such data to monitor vaccination rates and target outreach efforts.

Patient-held vaccination cards, commonly used in pediatric care, could be promoted for adults as well to help them track their vaccinations.

We should properly utilize the existing technology. The CANImmunize app is free and available in iOS and Android platform. It will help patients to keep track of their vaccines, by sending them notifications. To download: https://www.canimmunize.ca/en/promotion

CONCLUSION

In conclusion, improving pneumococcal vaccination rates and disease prevention in Canada requires a multi-faceted approach that addresses both educational barriers and logistical challenges, and publicly funded accessibility to more and better vaccines. Patients and healthcare providers need greater awareness of pneumococcal disease, its risk factors, and the importance of vaccination, particularly for high-risk populations. Education efforts should be continuous and tailored to the specific needs and concerns of different demographic groups. At the same time, logistical improvements, such as expanding vaccine reminders beyond the fall season and enhancing vaccination tracking systems, are essential to increase vaccine coverage and ensure that individuals are fully protected with the best vaccines possible.

Implementing these recommendations could significantly improve pneumococcal vaccination uptake in Canada by fostering greater awareness among patients and HCPs and addressing logistical barriers in vaccination access and tracking. The ultimate objective is to significantly reduce the burden of pneumococcal disease and protect its population from this potentially life-threatening infection.

ADDITIONAL RESOURCES

1. Immunize Canada - Pocket Guide for Immunizers – Pneumococcal Vaccination – (Feb 24, 2023)
2. CanImmunize – https://www.canimmunize.ca/en/promotion

3. Bowdish, D.M.E. (2019). As One of Canada's Top Killers, Why Isn't Pneumonia Taken More Seriously? Retrieved from https://www.bowdish.ca/lab/2019/11/02/white-paper-as-one-of-canadas-top-killers-why-isnt-pneumonia-taken-more-seriously-with-ryersons-institute-of-aging/

4. National Institute on Ageing. (n.d.). A Guide to Vaccines for Older Canadians Pamphlet. Retrieved from https://www.niageing.ca/reports

5. Vaccines for Older Canadians Webinar. Retrieved from https://www.niageing.ca/reports

6. Public Health Agency of Canada (PHAC). (2023). Adult National Immunization Coverage Survey: 2023 Results. Retrieved from https://www.canada.ca/en/public-health/services/immunization-vaccines/vaccination-coverage/adult-national-immunization-coverage-survey-2023-results.htm

APPENDICES

Appendix 1:
Provincial and Territorial Schedules for Pneumococcal Vaccination

Appendix 2:
Summary of the Most Updated NACI Recommendations (November 15, 2024)

Appendix 3:
Current Gaps in Pneumonia Vaccination for Adults – A Survey of Patients

Appendix 4:
Current Gaps in Pneumococcal Vaccination for Adults – A Survey of Healthcare Professionals

Appendix 5:
Recommendations and Insights from Patients and Healthcare Professional

APPENDIX 1 - PROVINCIAL AND TERRITORIAL SCHEDULES FOR PNEUMOCOCCAL VACCINATION

This table lists the sources for provincial approvals and recommendations for Adult Pneumococcal vaccination. Since this information is regularly updated, please consult the source for latest information about availability and coverage.

As of latest retrieval (November 18, 2024), the only province listing Pneu-C-21* in their recommendations was Quebec.

Province or territory	Source	Latest update
Alberta	https://myhealth.alberta.ca/Topic/Immunization/pages/pneumococcal.aspx	Retrieved Nov 2024
British Columbia	https://www.healthlinkbc.ca/sites/default/files/documents/immunization-adults-seniors-high-risk.pdf	Jan, 2023
Manitoba	https://www.manitoba.ca/health/publichealth/diseases/docs/hcp-pneumococcal-vaccines-faq.pdf	Jul 2024
New Brunswick	https://www2.gnb.ca/content/gnb/en/corporate/promo/vaccines-and-immunization/pneumococcal.html	Jun 2024
Newfoundland and Labrador	https://www.gov.nl.ca/hcs/files/publichealth-cdc-s2-routine-imztn-schedules.pdf	Nov 2019
Northwest Territories	https://www.hss.gov.nt.ca/sites/hss/files/immunization-schedule-general-public.pdf	Oct 2024
Northwest Territories	https://www.hss.gov.nt.ca/sites/hss/files/immunization-schedule-general-public.pdf	Oct 2024
Nova Scotia	https://novascotia.ca/dhw/CDPC/documents/Pneumococcal_Immunization_Information_for_Health_Care_Professionals.pdf	Sep 2024

Province or territory	Source	Latest update
Nunavut	https://www.gov.nu.ca/sites/default/files/documents/2021-10/nu_routine_adult_schedule_19dec2017.pdf	Dec 2017
Ontario	https://www.ontario.ca/files/2024-07/moh-hcp-fact-sheet-pneumococcal-vaccine-65-and-older-en-2024-11-15.pdf	Jun 2024
Prince Edward Island	https://www.princeedwardisland.ca/en/information/health-and-wellness/adult-immunizations	Sep 18, 2024
Quebec	https://www.msss.gouv.qc.ca/professionnels/vaccination/piq-vaccins/pneu-c-vaccin-conjugue-contre-le-pneumocoque/	Oct 1, 2024
Saskatchewan	https://www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services/when-to-get-immunized	Aug 2024
Yukon	https://yukonimmunization.ca/get-immunized/immunization-schedules	Retrieved Nov 2024

*Pneu-C-20 and Pneu-C-21 are both approved for use in Canada, offering protection against pneumococcal disease. Pneu-C-20 is widely available across most provinces and has been funded by many provincial governments as a replacement for the previous Pneu-C-13 and Pneu-P-23 vaccines. However, not all provinces have made funding decisions, and Pneu-C-21, despite its approval and recent recommendation by NACI (November 15, 2024), is currently not funded in any province in Canada. The availability of Pneu-C-21 may vary, as its introduction into public immunization programs has yet to be established.

Pneu-C-21 provides coverage for additional pneumococcal serotypes compared to Pneu-C-20, potentially broadening protection. Nevertheless, funding limitations and evolving provincial policies mean its implementation is still uncertain. To ensure access to the most up-to-date information, individuals and healthcare professionals are encouraged to monitor ongoing provincial decisions and consult local health authorities regarding vaccine availability and funding.

APPENDIX 2 - SUMMARY OF THE MOST UPDATED NACI RECOMMENDATIONS (NOVEMBER 15, 2024)

NACI recommendations for Adult Pneumococcal Vaccination [1]

Overview

On November 15, 2024, the Public Health Agency of Canada (PHAC) published updated recommendations from the National Advisory Committee on Immunization (NACI) regarding the use of pneumococcal vaccines in adults. These guidelines, informed by current evidence and expert opinion, address the need to improve vaccination coverage among Canadian adults, which remains below the 80% national target set for 2025.

Invasive pneumococcal disease (IPD) poses significant health risks, including severe complications and high mortality rates. Despite existing vaccination programs, many eligible Canadians remain unvaccinated, representing missed opportunities for effective infection prevention. Immunization is emphasized as a critical strategy to mitigate these risks and improve public health outcomes.

Health Canada approved a new vaccine, Pneu-C-21 (CAPVAXIVE®, Merck), on July 15, 2024, for adults aged 18 and older. This vaccine provides protection against 21 serotypes of Streptococcus pneumoniae and offers additional cross-protection against two serotypes, expanding options for IPD prevention in adults.

Following a review of the evidence of pneumococcal vaccines, including Pneu-C-21, NACI makes the following strong recommendations for public health program level decision-making:

- **Adult pneumococcal immunization programs in Canada should include at least one of Pneu-C-20 or Pneu-C-21.**
- **One dose of either Pneu-C-20 or Pneu-C-21, regardless of pneumococcal vaccination history with Pneu-C-13, Pneu-C-15 or Pneu-P-23, should be given to:**
  - **Adults 65 years of age and older**
  - **Adults under 65 years of age at increased risk of IPD**
  - Medical risk factors and certain social, behavioural and environmental conditions can increase the risk of severe IPD illness in adults. A full list of risk conditions can be found within the NACI statement, along with specific recommendations for hematopoietic stem cell transplant recipients.
- NACI will continue to review emerging evidence and update guidance as needed.

Strong recommendation:

1. NACI recommends that adult pneumococcal immunization programs in Canada should include at least one of Pneu-C-20 or Pneu-C-21*

2. NACI recommends that one dose of either Pneu-C-20 or Pneu-C-21**, regardless of pneumococcal vaccination history with Pneu-C-13, Pneu-C-15 or Pneu-P-23, should be given to:
   - Adults 65 years of age and older
   - Adults under 65 years of age at increased risk of IPD.

3. NACI recommends that both Pneu-C-20 and Pneu-C-21 should be offered to adults 18 years of age or older who received a hematopoietic stem cell transplant (HSCT) after consultation with the transplant specialist.

*A cost-effectiveness analysis revealed Pneu-C-21 to be dominant vs Pneu-C-20 for Canadians aged 65+ years.
**Pneu-C-21 is recommended in parity with Pneu-C-20 for Canadian adults; however, according to Canadian epidemiology, Pneu-C-21 is more advantageous in terms of disease coverage for those aged 65+ years.

Reference:

1. An Advisory Committee Statement (ACS) National Advisory Committee on Immunization (NACI) - Recommendations on the use of pneumococcal vaccines in adults, including PNEU-C-21.

APPENDIX 3 – CURRENT GAPS FOR PNEUMONIA VACCINATION FOR ADULTS - A SURVEY FOR PATIENTS

QUESTIONS

Q1. Which group do you belong to?

Answer Choices	n = 246	Results
Patient	240	97,56%
Family Member	4	1,63%
Caregiver	0	0,00%
Other	2	0,81%

Q2. What is your age group?

Answer Choices	n = 246	Results
Under 18	0	0,00%
18-34	0	0,00%
35-49	2	0,81%
50-64	23	9,35%
65 and older	221	89,84%

Q3. In which province/territory?

Answer Choices	n = 240	Results
Alberta	15	6.25%
British Columbia	36	15%
Manitoba	4	1.67%
New Brunswick	3	1.25%
Newfoundland and Labrador	1	0.42%
Nova Scotia	5	2.08%
Ontario	97	40.42%
Prince Edward Island	2	0.83%
Quebec	71	29.58%
Saskatchewan	5	2.08%
Northwest Territories	0	0,00%
Nunavut	0	0,00%
Yukon	1	0.42%

Q4. In which area do you live?

Answer Choices	n = 240	Results
Rural: Countryside or village (<1,000 residents)	38	15.83%
Suburb/Borough of a city (1,000-99,000 residents)	83	34.58%
Urban: City or town center (>100,000 residents)	119	49.58%

Q5. Do you have any chronic diseases? (Select ALL that apply)

Answer Choices	n = 240	Results
None	2	0.83%
Asthma	48	20.00%
Chronic Kidney Disease	6	2.50%
Chronic Liver Disease	4	1.67%
Chronic Obstructive Pulmonary Disease (COPD)	205	85.42%
Heart Disease	37	15.42%
Inflammatory Bowel Disease (ulcerative colitis or Crohn's Disease)	7	2.92%
Diabetes	33	13.75%
Other	58	24.17%

Q6. Has your doctor mentioned that you are immunocompromised? (e.g. you have HIV, are under cancer treatments, you have you received an organ transplant, you have an autoimmune disorder such as rheumatoid arthritis, Crohn's disease or ulcerative colitis, you are on chronic steroid therapy, or you are using a biologic therapy)

Answer Choices	n = 240	Results
No	188	78.33%
Prefer not to respond	5	2.08%
Yes (please specify)	47	19.58%

Q7. Pneumonia is defined as an infection of the lungs. This infection can be caused by viruses and/or bacteria. How familiar are you with the potential causes of pneumonia, particularly bacteria such as pneumococcal infections?

Answer Choices	n = 239	Results
Very familiar	58	24.27%
Familiar	95	39.75%
Not very familiar	68	28.45%
Not familiar at all	18	7.53%

Q8. Do you know that certain groups of people are at higher risk for serious lung infections caused by bacteria?

Answer Choices	n = 239	Results
Yes	197	82.43%
No	23	9.62%
Not sure	19	7.95%

Q9. Which groups do you think are at higher risk for these infections? (Select ALL that apply)

Answer Choices	n = 239	Results
Young children <5 years old	110	46.03%
Older adults +65 years old	208	87.03%
Individuals with chronic medical conditions	207	86.61%
Immunocompromised individuals	181	75.73%
Individuals with lifestyle risk factors (smoking, history of alcohol abuse)	147	61.51%
Not sure	9	3.77%
Other (please specify)	3	1.26%

Q10. Do you believe YOU are at risk for a pneumococcal infection?

Answer Choices	n = 239	Results
Yes	193	80.75%
No	20	8.37%
Not sure	26	10.88%

Q11. Why do you believe you are NOT at risk? (Select ALL that apply) - *Only for those who answered NO at Q10*

Answer Choices	n = 20	Results
I am too young to get really sick	0	0,00%
I live a healthy lifestyle	9	45.00%
I believe I would recover well if I got infected	2	10.00%
I have not been advised by my healthcare provider that I am at risk	4	20.00%
Other	11	55.00%

Q12. Have you already received a vaccine to prevent serious lung infections caused by bacteria such as a pneumococcal vaccine?

Answer Choices	n = 239	Results
Yes	193	80.75%
No	32	13.39$
I don't remember	14	5.86%

Q13. Which one? (Select ALL applicable) - *Only if answered YES to Q12*

Answer Choices	n = 191	Results
Prevnar 13	54	28.27%
Prevnar 20	29	15.18%
Pneumovax 23	43	22.51%
Vaxneuvance	0	0,00%
I don’t remember	90	47.12%
Other	18	9.42%

Q14. When? (if multiple vaccines, respond for the most recent)-*Only if answered YES to Q12*

Answer Choices	n = 191	Results
within the last 12 months	61	34.94%
within the last 5 years	95	49.74%
more than 5 years ago	29	15.18%
I don’t remember	6	3.14%

Q15. What are the main reasons you have NOT received a vaccine to prevent serious lung infections caused by bacteria? (Select ALL that apply) - *if answered NO to Q12*

Answer Choices	n = 31	Results
Lack of awareness (I didn't know about these vaccines)	10	32.26%
Concerns about vaccine safety and/or side effects	7	22.58%
Doubts about vaccine effectiveness	2	6.45%
I am not at risk of this disease	1	3.23%
Cost of the vaccine	6	19.35%
Difficulty accessing vaccination services	4	12.90%
Not recommended by healthcare provider	8	25.81%
Other	4	12.90%

Q16. Are you concerned about receiving multiple vaccines at the same time (e.g. influenza, COVID-19 and Pneumococcal vaccines)?

Answer Choices	n = 210	Results
A great deal	19	9.05%
A lot	27	12.86%
A little	51	24.29%
Not at all	113	53.81%

Q17. Do you feel overwhelmed by the number of vaccines recommended by your healthcare provider (e.g. influenza, COVID-19, Pneumococcal, Shingles, RSV…)?

Answer Choices	n = 210	Results
A great deal	14	6.67%
A lot	29	13.81%
A little	66	31.43%
Not at all	101	48.10%

Q18. Has your healthcare provider (e.g. your doctor or pharmacist) ever recommended for you to take a vaccine to prevent serious lung infections caused by bacteria?

Answer Choices	n = 210	Results
Yes	143	68.10%
No	46	21.90%
Not sure	21	10.00%

Q19. How often do you discuss vaccinations with your healthcare provider (e.g. your doctor or pharmacist)?

Answer Choices	n = 210	Results
At every visit	21	10.00%
Only during annual check-ups	49	23.33%
When I get other vaccines, such as the flu or covid-19	64	30.48%
Rarely	64	30.48%
Never	12	5.71%

Q20. How likely are you to follow your healthcare provider's recommendation regarding vaccinations?

Answer Choices	n = 210	Results
Very likely	168	80.00%
Somewhat likely	34	16.19%
Not very likely	4	1.90%
Not likely at all	4	1.90%

Q21. What would motivate you to get a pneumococcal vaccine? (please rate each option) - *on a scale of 1 - 5 (5 being most motivating)*

Answer Choices	Weighted Average
Doctor or Pharmacist recommendation	4,7
Convenience of vaccination location	3,9
Personal research	3,4
Advice from family or friends	2,6
Public health campaigns	3,6
Employer requirement or incentive	2,2
Free or low-cost vaccination	3,9
Concerns about my health (e.g. contracting pneumonia)	4,7
Availability of information about vaccine benefits	4,1

Q22. Where do you usually go to get vaccinated? (Select ALL that apply)

Answer Choices	n = 210	Results
With my family doctor	78	37.14%
At the pharmacy	144	68.57%
At my public health unit	72	34.29%
With my nurse practitioner	11	5.24%
At a walk-in clinic	19	9.05%
Other	16	7.62%

Q23. How convenient is it for you to access vaccination services?

Answer Choices	n = 210	Results
Very convenient	137	65.24%
Somewhat convenient	61	29.05%
Not very convenient	9	4.29%
Not convenient at all	3	1.43%

Q24. What factors make it difficult for you to get vaccinated? (Select ALL that apply)

Answer Choices	n = 210	Results
Distance to vaccination site	36	17.14%
Limited hours of operation	42	20.00%
Long wait times	51	24.29%
Lack of transportation	22	10.48%
Cost	55	26.19%
Other (please specify)	86	40.95%

Q25. Which method do you use to keep track of your vaccinations? (Select ALL that apply)

Answer Choices	n = 210	Results
Paper vaccination record/card	74	35.24%
Digital health app (e.g., CANImmunize, MyChart)	26	12.38%
Provincial or territorial health record system (e.g., MyHealth Records in Alberta, MyHealthNB in New Brunswick, My Healthgateway in BC)	42	20.00%
Reminders from my healthcare provider	51	24.29%
Personal calendar or planner	63	30.00%
I do not keep track of my vaccinations	44	20.95%
Other (please specify)	13	6.19%

Q26. Would vaccine reminders throughout the year (not just in the fall) help you remember to get vaccinated (e.g. for influenza, for other infectious diseases, etc.)?

Answer Choices	n = 210	Results
A great deal	84	40.00%
A lot	66	31.43%
A little	44	20.95%
Not at all	16	7.62%

Q27. Do you think better technology to track vaccinations would help you stay up-to-date with your vaccinations?

Answer Choices	n = 210	Results
A great deal	95	45.24%
A lot	62	29.52%
A little	38	18.10%
Not at all	15	7.14%

Q28. What format would you prefer for receiving information about pneumococcal vaccines? (Select ALL that apply)

Answer Choices	n = 210	Results
Brochures or pamphlets	65	30.95%
Websites or online articles	133	63.33%
Discussions with healthcare providers	120	57.14%
Educational videos	21	10.00%
Workshops or seminars	7	3.33%
Other	13	6.19%

APPENDIX 4 – CURRENT GAPS FOR PNEUMOCOCCAL VACCINATION FOR ADULTS - A SURVEY FOR HEALTHCARE PROFESSIONALS

QUESTIONS

Q1. Are you a health care professional practicing in Canada for an adult clientele?

Answer Choices	Number of Responses (n)	Results
Yes	104	74.82%
No	35	25.18%

Q2. In which province/territory?

Answer Choices	n = 102	Results
Alberta	10	9.80%
British Columbia	4	3.92%
Manitoba	5	4.90%
New Brunswick	2	1.96%
Newfoundland and Labrador	2	1.96%
Nova Scotia	0	0.00%
Ontario	27	26.47%
Prince Edward Island	2	1.96%
Quebec	46	45.10%
Saskatchewan	4	3.92%
Northwest Territories	0	0.00%
Nunavut	0	0.00%
Yukon	0	0.00%

Q3. What type of healthcare professional are you? (You can select more than one, if applicable)

Answer Choices	n = 102	Results
General Practitioner	11	10,78%
Specialist Physician (please specify in Other)	2	1,96%
Nurse Practitioner	2	1,96%
Registered Nurse	32	31,37%
Pharmacist	4	3,92%
Other	53	51,96%

Q4. Number of years of practice.

Answer Choices	n = 102	Results
<10	16	15,69%
10-20	21	20,59%
>20	65	63,73%

Q5. What type of practice do you belong to?

Answer Choices	n = 102	Results
Solo	8	7.84%
Group	8	7.84%
Academic	1	0.98%
Hospital	27	26.47%
Community	41	40.20%
Other	17	16.67%

Q6. Practice setting

Answer Choices	n = 102	Results
Isolated (<1000 residents)	3	2,94%
Suburb/Borough of a city (1000-99000 residents)	40	39,22%
Urban (>100000 residents)	59	57,84%
Other	0	0,00%

Q7. How familiar are you with serious lung infections caused by bacteria, such as pneumococcal infections?

Answer Choices	n = 93	Results
Very familiar	45	48,39%
Familiar	41	44,09%
Not very familiar	7	7.53%
Not familiar at all	0	0.00%

Q8. Which of the following populations do you believe should be considered at HIGH RISK for pneumococcal infections and disease? (select ALL that apply)

Answer Choices	n = 93	Results
Young children <5 years old	60	64.52%
Older adults +65 years old	91	97.85%
Individuals with chronic medical conditions (such as chronic renal disease, chronic liver disease, neurological disorders, etc.)	93	100%
Immunocompromised individuals	93	100%
Indigenous populations	59	63.44%
Residents in long term care facilities	86	92.47%
Individuals with lifestyle risk factors (smoking, history of alcohol abuse)	73	78.49%
Individuals living with Diabetes	71	76.34%
Other	5	5.38%

Q9. How important do you believe pneumococcal vaccination is for the following groups? - on a scale of 1-5 (5 being the most important)

Answer Choices	Weighted Average
Older adults +65 yrs old	4,7
Patients with chronic diseases (e.g. COPD, Diabetes, heart disease)	4,9
Immunocompromised individuals (e.g.. HIV/AIDS patients, cancer patients, organ transplant recipients)	4,9
Smokers	4,1
People with a history of alcohol abuse	3,7

Q10. Thinking about your patients, rate the importance of these barriers to pneumococcal vaccination - on a scale of 1-5 (5 being the most important)

Answer Choices	Weighted Average
Lack of patient awareness	4,3
Concerns about vaccine safety	3,9
Doubts about vaccine effectiveness	3,9
Fears of side effects	3,8
Cost of the vaccine	3,9
Difficulty accessing vaccination services	3,4
Low perceived risk of Pneumonia	3,7

Q11. Are you concerned about the issue of co-administering different vaccines (e.g. pneumococcal vaccine with flu vaccine, etc.)?

Answer Choices	n = 93	Results
A great deal	3	3,23%
A lot	8	8,60%
A little	25	26,88%
Not at all	57	61,29%

Q12. Do you think vaccine fatigue (e.g. patients feeling overwhelmed by the number of vaccines recommended) can negatively affect pneumococcal vaccination rates?

Answer Choices	n = 93	Results
A great deal	24	25,81%
A lot	35	37,63%
A little	30	32,26%
Not at all	4	4,30%

Q13. If you're a healthcare professional, based on the jurisdiction of your province, what role can you actively play in pneumococcal vaccination: (select ALL that apply)

Answer Choices	n = 90	Results
Prescribe the vaccines	21	23,33%
Administer the vaccines	49	54,44%
Recommend the vaccines	86	95,56%
Update the provincial or territorial health record systems	22	24,44%
Other	9	10,00%

Q14. How often do you recommend pneumococcal vaccination to your adult patients?

Answer Choices	n = 90	Results
At every visit, if they are not up to date	41	45,56%
Only during annual check-ups	8	8,89%
When administering/recommending other vaccines (such as influenza and COVID-19 vaccines)	21	23,33%
Only if the patient is at high risk	11	12,22%
Only if the patient asks about it	1	1,11%
Rarely	3	3,33%
Never	2	2,22%
N/A	3	3,33%

Q15. What factors influence your decision to recommend pneumococcal vaccination? (Select ALL that apply)

Answer Choices	n = 90	Results
Patient's age	77	85,56%
Patient's medical history	79	87,78%
Patient's immunization history	60	66,67%
Patient's risk factors (e.g., chronic diseases, smoking)	81	90,00%
Guidelines from health authorities (e.g., NACI)	56	62,22%
Public coverage (free vaccine)	66	73,33%
Vaccines mechanism of action	10	11,11%
Vaccine formulation (types and number of strain included)	14	15,56%
Recommendations from colleagues (e.g. at a CME event)	25	27,78%
N/A	3	3,33%
Other (please specify)	4	4,44%

Q16. Are national vaccination recommendations (e.g. NACI) readily available to you?

Answer Choices	n = 90	Results
Yes	63	70,00%
No	27	30,00%

Q17. How likely are you to follow national or provincial guidelines from health authorities (such as NACI) when recommending pneumococcal vaccination?

Answer Choices	n = 90	Results
Very likely	55	61,11%
Likely	29	32,22%
Unlikely	6	6,67%
Very unlikely	0	0,00%

Q18. How convenient is it for your patients to access vaccination services?

Answer Choices	n = 86	Results
Very convenient	30	34,88%
Somewhat convenient	41	47,67%
Not very convenient	12	13,95%
Not convenient at all	3	3,49%

Q19. What factors make it difficult for your patients to get vaccinated? (Select ALL that apply)

Answer Choices	n = 86	Results
Distance to vaccination site	31	36,05%
Limited hours of operation	19	22,09%
Long wait times	13	15,12%
Lack of transportation	51	59,30%
Cost	54	62,79%
Limited scope of practice (cannot prescribe vaccines)	20	23,26%
Other	20	23,26%

Q20. What methods do you use to keep track of your patients' vaccinations? (Select ALL that apply)

Answer Choices	n = 86	Results
Electronic health records (EHR)	56	65,12%
Paper records	14	16,28%
Digital health apps (e.g., CANImmunize)	8	9,30%
Provincial or territorial health record systems	31	36,05%
Reminders for follow-up visits	13	15,12%
Other	20	23,26%

Q21. Would better technology to track vaccinations help improve vaccination rates?

Answer Choices	n = 86	Results
Very likely	42	48,84%
Likely	32	37,21%
Unlikely	12	13,95%
Very unlikely	0	0,00%

Q22. Would more frequent vaccine reminders (e.g. throughout the year, not just in the fall) be beneficial for increasing vaccination rates?

Answer Choices	n = 86	Results
Very likely	30	34,88%
Likely	40	46,51%
Unlikely	16	18,60%
Very unlikely	0	0,00%

Q23. Have you previously had training or education about pneumococcal vaccination?

Answer Choices	n = 86	Results
Yes	63	73,26%
No	23	26,74%

Q24. Where? (Select ALL that apply)

Answer Choices	n = 63	Results
Professional school training	9	14,29%
Specialist training program	10	15,87%
Continuing education program (webinar, lecture, etc.)	59	93,65%
Other	7	11,11%

Q25. When was the last time you had training on pneumococcal immunization guidelines?

Answer Choices	n = 63	Results
Within the last 6 months	12	19,05%
6-12 months ago	16	25,40%
1-2 years ago	22	34,92%
> 2 years ago	11	17,46%
I don't know	2	3,17%
Never	0	0,00%

Q26. How would you rate your level of awareness of the NACI guidelines "Canadian Immunization guideline: Pneumococcal Vaccine"?

Answer Choices	n = 63	Results
Very familiar (I refer to these guidelines on a regular basis)	11	17.46%
Familiar	33	52.38%
Not so familiar	17	26.98%
Not familiar at all	2	3.17%

Q27. How do you become aware of updates to the NACI recommendations on pneumococcal vaccination? (Select ALL that apply)

Answer Choices	n = 63	Results
Official publications and websites	28	44,44%
Through your professional organization or association (if applicable)	26	41,27%
Professional journals and medical literature	18	28,57%
Healthcare Institution Communications	14	22,22%
Online databases and resources (podcasts, webinars)	23	36,51%
Subscription to email alerts and newsletters	21	33,33%
Conferences and symposiums	29	46,03%
Representatives from industry (e.g. MSLs)	16	25,40%
Other (please specify)	6	9,52%

Q28. Which areas/elements would be most useful for you regarding patient management and pneumococcal vaccination? (Select ALL that apply)

Answer Choices	n = 86	Results
Guidance on the importance of vaccination	54	62,79%
Guidance on how to navigate the healthcare system to receive the best vaccination services	38	44,19%
Information on what to do if patients have concerns about side effects	54	62,79%
Information on maintaining a vaccination schedule	53	61,63%
Other	16	18,60%

Q29. What would be your preferences for future learning activities? (Select ALL that apply)

Answer Choices	n = 86	Results
In-person meetings	22	25,58%
Conferences	37	43,02%
Podcasts	20	23,26%
Webinars	75	87,21%
Other	6	6,98%

Q30. How important would it be for you to receive professional credits in order to participate in a training program?

Answer Choices	n = 86	Results
Very important, I would only take the training program if it offers me professional credits	17	19,77%
Important	34	39,53%
Somewhat important	14	16,28%
Not important, I would take this training program even if credits were not offered	21	24,42%

Q31. How useful would you find each of the following strategies to help you with pneumococcal vaccination? - on a scale of 1-5 (5 being the most useful)

Answer Choices	Weighted Average
Better access to current recommended clinical guidelines and resources	4,5
More clear guidelines and algorithms	4,5
Dedicated guidelines for primary care	4,3
More “classical” CME sessions on this topic	3,8
Web-based training program for healthcare professionals	4,6

Q32. Rate the usefulness of these potential strategies for improving pneumococcal vaccination rates among adults in Canada - on a scale of 1-5 (5 being the most useful)

Answer Choices	Weighted Average
Increased patient education on the importance of pneumococcal vaccination	4,7
Enhanced training for healthcare providers on pneumococcal vaccination guidelines	4,5
Improved access to vaccination services (e.g., extended hours, mobile clinics)	4,1
Better integration of vaccination reminders in digital health tools	4,4
Policies to reduce the cost of pneumococcal vaccines	4,5
Community outreach programs to raise awareness	4,4
Vaccine reminders could be beneficial at any time of the year, not just in the fall	4,2
The need for better technology to track vaccinations	4,2

APPENDIX 5 – RECOMMENDATIONS AND INSIGHTS FROM PATIENTS AND HEALTHCARE PROFESSIONALS

We present here an analysis of open-ended questions and quotes from both patients and healthcare professionals.

PATIENTS - "Do you have any additional comments or suggestions regarding vaccinations to prevent serious lung infections caused by bacteria?"

Out of 240 qualifying survey participants, 72 (30%) provided additional comments. Five key themes emerged from their responses:

1. **Access to Vaccines (25 comments)** - Many respondents expressed concerns about the availability of vaccines and wished for better access through pharmacies, clinics, or centralized services.
   - "It would be great to receive all necessary vaccinations in the same place, such as my local vaccination center."
   - "I would recommend pharmacists inquiring into the vaccination status of any new patients and adding the information to the patient record."

2. **Cost and Coverage Issues (16 comments)** - Several patients expressed frustration about the cost of vaccines, with a desire for them to be more affordable or free, particularly for seniors and high-risk individuals.
   - "RSV is over $300 in Saskatchewan. Make it free for at-risk people."
   - "Vaccines should be free for seniors."

3. **Frustration with Specific Vaccines (15 comments)** - Some patients voiced issues with particular vaccines, highlighting inconsistencies in availability or challenges with accessing specific immunizations.
   - "Why is the RSV vaccine a user-pay vaccine for those of us with chronic COPD?"
   - "The clinical immunologist used Prevnar and Pneumovax vaccines to confirm my immune deficiency. I fail to recognize and mount a response to these vaccines."

4. **Need for Better Information (11 comments)** - Several participants emphasized the importance of better education about vaccinations, especially for those living with chronic conditions.
    - "More information for people living with chronic diseases that are impacted by some vaccinations."
    - "This information should be part of our BC health care record and easily accessible by me."

5. **Communication with Healthcare Providers (8 comments)** - Respondents highlighted a need for better communication from healthcare providers regarding vaccinations and the importance of meaningful conversations about them.
    - "Some vaccines are not covered or are only covered for certain groups by provincial health plans. If a doctor recommends a vaccine, it should be covered."
    - "Improved overall healthcare… decreasing telehealth doctor appointments. It seems the phone calls are getting shorter with no time for discussion."

PROFESSIONALS - Q33 - "Do you have any other suggestions to help you with pneumococcal vaccination and/or management of your patients?"

Out of the 104 qualifying survey participants, 31 (30%) provided additional comments. Five key themes emerged:

1. **Cost and Coverage (18 comments)** - Many professionals noted that the cost of vaccines is a significant barrier for patients, particularly those without extended health coverage. Suggestions were made for government funding to make vaccines more accessible.
    - "Cost is a huge factor for my patients with no extended health coverage. It would be helpful if the government covered Prevnar 20 for those > 65 years and with chronic medical conditions."
    - "Vaccines should be more accessible and less expensive so that everyone can have access to them."

2. **Need for Clarity on Vaccination Options (15 comments)** - Professionals pointed out patient confusion regarding different vaccine types (e.g., Prevnar 13, 20, 23) and the need for clearer communication on booster schedules and eligibility criteria.
    - "Clarity on the types. Current patient confusion re: prev 13, 20, 23, etc. MD's are not up to date on the differences."
    - "Clarification on boosters would be appreciated or how to navigate health care to get someone who doesn't meet the criteria for publicly funded vaccine but still wants to pay for it."

4. **Enhanced Education and Awareness (10 comments)** - Respondents suggested that increasing public awareness, through posters, media coverage, and direct patient education, could improve vaccination rates among at-risk populations.
    - "Posters for patients might help raise awareness."
    - "Increased media coverage of the vaccine describing benefits and cost."

5. **Documentation and Tracking Improvements (8 comments)** - Several professionals recommended tools and systems for tracking vaccination history and reminders within healthcare documentation, to better manage patient vaccination status.
    - "Just a portal to refer to for their vaccination history."
    - "Screening and tracking reminders in documentation templates."

The Pneumococcal Disease Initiative report was developed in coordination with a wide range of healthcare professionals and organizations with expertise and/or interest in pneumococcal vaccination.

AN INITIATIVE OF

RESPIPLUS

IN COLLABORATION WITH

NIA NATIONAL INSTITUTE ON AGEING

LUNG SASK

FAMILY PHYSICIAN airways group

lung health starts now lung health foundation

COPD CANADA WWW.COPDCANADA.INFO

The Pneumococcal Initiative and creation of this report was made possible by a sponsorship from Merck Canada Inc.

MERCK