

White Paper

# CANADA'S STRATEGY TO COMBAT HPV-RELATED CONSEQUENCES AND ELIMINATE CERVICAL CANCER

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# ACRONYMS

**AI** - Artificial Intelligence

**CIHI** - Canadian Institute for Health Information

**CIHR** - Canadian Institutes of Health Research

**GBTQ** - Gay, Bisexual, Transgender, Queer

**HCPs** - Healthcare Professionals

**HIV** - Human Immunodeficiency Virus

**HPV** - Human Papillomavirus

**LGBTQIA2S+** - Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, Intersex, Asexual, Two-Spirit, and additional identities

**MSM** – Men Who Have Sex With Men

**NGOs** - Non-Governmental Organizations

**PHAC** - Public Health Agency of Canada

**QoL**- Quality of life

**RRP**- Recurrent respiratory papillomatosis

**STI** - Sexually Transmitted Infection

## Executive Summary

This white paper presents key milestones for 2030 to ensure that Canada is on the road to eliminate cervical cancer in Canada. Canada has introduced the HPV vaccine and recently is transitioning to HPV testing two very powerful HPV prevention tools. The focus is on fostering equitable access to HPV vaccination, enhancing cervical cancer screening, and addressing knowledge gaps through inclusive professional and populational education campaigns. These strategies aim to overcome Canada's unique challenges, including disparities in access to vaccination and screening services, and the lack of public, consistent catch-up vaccination programs for those who missed school-based doses.

Innovative solutions such as self-sampling for screening, digital health tools, and culturally sensitive outreach, communication about early signs and symptoms of HPV related cancers are essential to increasing public engagement and addressing vaccine hesitancy. Tailored approaches for marginalized people, including Indigenous communities and Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, Intersex, Asexual, Two-Spirit, and additional identities (LGBTQIA2S+), immigrants and refugees individuals, are highlighted as critical to ensuring health equity. Also medically challenged populations are most at risk but neglected. Collaboration with local leaders and Non-Governmental Organizations (NGOs) is emphasized to design interventions that increase care access and inclusivity.

Global best practices and digital health innovations, like health apps and Artificial Intelligence (AI) tools, are integral to strengthening access and engagement. Expanding HPV prevention into routine healthcare and community-driven outreach will ensure equitable access, particularly for un(der)served populations. HPV's impact goes beyond cervical cancer, necessitating comprehensive efforts to reduce the broader burden of HPV-related cancers. With a collaborative sustained commitment, the elimination of cervical cancer in Canada is achievable and we can aspire for the reduction of all HPV related cancers.

## Methodology

The conclusions and recommendations proposed are based on insights from an expert panel held on October 10, 2024. The panel included 18 leading experts from across Canada representing diverse geographical regions and specialties in HPV prevention. The group included experts in gynecology, Indigenous health, infectious diseases, Human Immunodeficiency Virus (HIV), gay, bisexual, transgender, queer (GBTQ) men and other men who have sex with men (MSM) health, oncology, otolaryngology - head & neck surgery primary care, public health, and behavioural science. The latest scientific evidence, HPV vaccination efforts, and cervical screening program experiences from across Canada and internationally informed the panel discussions. Themes from expert discussions included addressing lack of free catch-up programs for those who missed vaccination in school, disparities in vaccine access, leveraging digital health innovations, and integrating HPV testing self-sampling into screening frameworks.

## Timelines and Impact

Immediate action is needed to address gaps in vaccination and screening coverage, with scalable interventions rolled out over the next five years. The implementation of these strategies will result in:

- Significantly reduce HPV-related cancer incidence and mortality
- Lower healthcare costs by minimizing the need for late-stage cancer treatment
- Improve equity in healthcare access for all Canadians

## Conclusion

This white paper calls for a collaborative, inclusive, and sustained effort to eliminate HPV-related diseases and cancers as a public health priority issue in Canada. By prioritizing prevention, education, and equitable access, Canada can set a global example in HPV-related cancer elimination.



## SUMMARY OF KEY MESSAGES

### 1. Improving Knowledge

- Elevate knowledge among healthcare professionals (HCPs) and the general public about HPV's impact, including the early signs and symptoms of HPV-related cancers and conditions like anogenital warts, as well as conditions like recurrent respiratory papillomatosis (RRP) which can affect children.
- Highlight the importance of understanding and monitoring HPV's broader impact across genders, ages, and populations, addressing common misconceptions and stigmas.
- Leverage digital health innovations, such as applications and online tools- i.e.: tracking apps, health management apps, AI and chatbot solutions, to improve tracking and engagement in vaccination and screening programs.

### 2. Strengthening Surveillance

- Establish national HPV vaccination and cervical screening registries to track and monitor outcomes, identify gaps, and guide policy decisions.
- Enhance systems to track HPV-related cancers, pre-cancers, and infections, providing data for resource allocation.

### 3. Improving Coverage and Equity in HPV Vaccination and Screening

- Integrate HPV vaccination and screening into routine healthcare visits, in hospitalized patients, mobile clinics, and non-clinical settings to reach underserved populations.
- Implement equitable catch-up vaccination programs for adolescents and young adults, focusing on accessibility through schools and community initiatives.

### 4. Addressing Structural Barriers

- Advocate for consistent funding and streamlined processes to overcome jurisdictional inconsistencies in HPV prevention.
- Highlight the cost-effectiveness of HPV prevention programs to policymakers to secure sustained investments, supported by detailed cost-effectiveness studies.

### 5. Strengthening Targeted Education and Messaging

- Equip HCPs with comprehensive training on vaccine counseling, cervical screening techniques, and managing discussions about HPV positive results, including historical infections in long-term monogamous relationships and new diagnoses.

- Develop public education campaigns that prioritize inclusivity, reframing HPV as a universal health issue or highly preventable cancers rather than a sexually transmitted infection (STI) associated with specific behaviors or demographics.
- Broaden outreach efforts to include educators, influencers, and community leaders, ensuring HPV prevention messaging reaches diverse audiences effectively.
- Emphasize the importance of moving beyond traditional gendered narratives by promoting HPV prevention as relevant to everyone, regardless of gender or age.
- Use storytelling and positive, empowering narratives to engage the public, avoiding fear-based messaging

## **6. Prioritizing Indigenous and Other Un(der)served communities, and Other Populations at High Risk of Infection**

- Tailor outreach strategies collaboratively with these groups to address systemic barriers and vaccine hesitancy among Indigenous populations, integrating cultural practices such as traditional midwifery.
- Create community-driven approaches for socially marginalized and geographically isolated populations, supported by community leaders and local organizations.

## **7. Leveraging Global Models and Innovations**

- Learn from successful models from countries like Australia, Sweden, Scotland, and Finland, where vaccination, organized screening, and catch-up programs have achieved very high coverage rates and near elimination of HPV-related diseases and cancers.
- Expand the adoption of self-sampling for HPV testing to empower individuals and address barriers like perceived pain, embarrassment/shame, and logistical challenges.

## **8. Supporting System Improvements**

- Expand access to vaccination, through task sharing, across Canada in pharmacies and by all related health care providers.
- Ensure adequate stock allocation of public health vaccines to simplify management and increase availability.
- Incorporate HPV vaccination into broader public health strategies and routine and hospital services, addressing structural barriers to care.
- Strengthen data-sharing and interoperability among healthcare systems to streamline service delivery and improve vaccination tracking.

## 9. Fostering Collaboration and Advocacy

- Facilitate collaboration among NGOs, HCPs, policymakers, and other external stakeholders to standardize HPV prevention efforts across provinces and territories.
- Partner with school systems and local educational boards to amplify HPV awareness and vaccination efforts.

## 10. Building Evidence and Accountability

- Establish coordinated national HPV vaccination and cervical screening registries to track disease from infection to cancers, coverage, monitor progress, and ensure accountability in meeting public health goals.
- Advocate for sustained funding for vaccination and screening programs by demonstrating their cost-effectiveness and impact on public health outcomes.
- Ensure continuous program evaluation frameworks are in place to measure impact and refine strategies over time.



## SHORT, MEDIUM, AND LONG-TERM GOALS

### Short-Term Goals (1-2 Years)

#### **1. Increase Awareness and Literacy on HPV Across Sectors**

##### **Action:**

- Launch a national education campaign targeting:
  - HCPs at all levels of the healthcare system
  - The general population regardless of age
  - Parents/caregivers of children eligible for school-based vaccination programs
  - Pregnant individuals
  - Individuals who are immunocompromised by treatment, transplant, HIV, chronic conditions
  - Socially vulnerable populations
    - Displaced people like immigrants, refugees, temporary workers and student
    - LGBTQIA2S+
    - Indigenous populations
    - Unhoused individuals
    - Incarcerated individuals
    - Individuals with an intellectual disability
    - Individuals with a mobility disability
- Create and distribute multilingual and culturally sensitive materials addressing HPV risks beyond cervical cancer, such as oropharyngeal cancer, and emphasizing vaccination benefits for all genders.
- Include digital tools, such as applications, bots or online portals, to increase reach and engagement.

**Stakeholders:** Public Health Agency of Canada (PHAC), provincial/territorial health departments, healthcare delivery system, NGOs, educational institutions, school boards, and religious and cultural leaders.

#### **2. Once eligible, always eligible Vaccination Programs**

##### **Action:**

- Implement a “Once eligible, always eligible” policy so that persons who were eligible but did not take the vaccine can achieve vaccine.
- Fund and promote catch-up programs that include repeat school visits, and targeting individuals who missed school-based vaccination, including young adults, socially and medically vulnerable populations .

- Collaborate with pharmacies, community health centers, dental offices, and mobile clinics to ensure equitable access or locally accessible.

**Stakeholders:** Provincial/territorial governments, all involved in the distribution of health care to Canadians such as Primary and Specialized physicians, Pharmacists, Dentists, NGOs, and school systems.

### 3. Strengthen and Expand HPV Vaccination Registry

**Action:**

- Develop a comprehensive, national HPV vaccination registry to track doses across the lifespan, including those administered by pharmacists and allied HCPs.
- Ensure interoperability between systems allowing accessible platforms for individuals and HCPs.
- Implement robust monitoring and evaluation frameworks to assess program effectiveness.

**Stakeholders:** Health Canada, Canadian Institute for Health Information (CIHI), immunization and cancer experts.

### Medium-Term Goals (3-4 Years)

#### 4. Address Vaccine Hesitancy Through Research and Community Engagement

**Action:**

- Conduct a knowledge synthesis or meta-analysis to identify existing barriers to HPV vaccination and highlight effective strategies to address vaccine hesitancy. Ensure this is grounded in a clear research question and hypothesis.
- Extract key themes and evidence-based interventions from the literature, presenting them in a practical format for Ministry of Health (MOH) staff and other decision-makers, who may not have the capacity to review peer-reviewed research.
- Collaborate with community leaders to develop trust-building campaigns, leveraging both social media and in-person engagement to foster dialogue.
- Begin exploring innovative delivery technologies to address access barriers.

**Stakeholders:** Research institutions, National Centers of Excellence (NCEs), social media platforms, private-sector partners, and trusted community leaders.

## 5. Universal Access to HPV Vaccination

### Action:

- Develop targeted screen-and-vaccinate programs.
- Empower trained HCPs like pharmacists and dentists to deliver vaccinations.

**Stakeholders:** Federal government, PHAC, provincial health authorities, professional health organizations.

## 6. Integrate HPV Vaccination and Cervical Screening Efforts

### Action:

- Align HPV vaccination campaigns with cervical screening programs.
- Strengthen community-based partnerships with local leaders and influencers to improve vaccine uptake.

**Stakeholders:** Provincial screening programs, NGOs, pharmacies, and HCPs

### Long-Term Goals (>5 Years)

## 7. Establish a Standardized Cervical Screening Program Across Canada

### Action:

- Create a unified cervical screening program with universal access to HPV primary screening and self-sampling methods. Ensure consistency across provinces and territories by fostering collaboration and coordination among jurisdictions, leveraging national leadership to align with global best practices. While health is primarily a provincial responsibility in Canada, a coordinated approach can streamline efforts, reduce disparities, and enhance the efficiency and effectiveness of cervical cancer prevention nationwide.

**Stakeholders:** Federal and provincial/territorial governments, Canadian Task Force on Preventive Health Care.

## 8. Ensure Ongoing Research on HPV-Related Diseases and Cancers

### Action:

- Fund research into HPV's role in non-cervical diseases and cancers (e.g., oropharyngeal, anal, penile) and its impact on the general population.
- Foster global collaboration to enhance research outcomes.

**Stakeholders:** Canadian Institutes of Health Research (CIHR), cancer research organizations, global health organizations.

## 9. Develop Cost-Effectiveness Models for Universal Vaccination

### Action:

- Conduct studies to demonstrate the financial benefits of universal vaccination, focusing on reduced treatment costs and long-term healthcare savings.
- Include private-sector partnerships to explore scalable delivery methods.

**Stakeholders:** Health economists, federal and provincial health ministries, policy analysts, private-sector partners.

## 10. Collaborate with Indigenous Communities for Equitable HPV Prevention

### Action:

- Partner with Indigenous leaders to design culturally integrated vaccination and screening programs that incorporate traditional knowledge and midwifery.

**Stakeholders:** Indigenous health organizations, community leaders, federal ministries for Indigenous services, and Indigenous midwifery associations.

## 11. Monitor Impact on HPV-Related Diseases and Cancers:

Throughout the implementation of these goals and over the long term, establish continuous monitoring of the impact on HPV-related diseases and associated cancers.

- Use vaccination and screening data, as well as epidemiological studies, to measure progress, identify gaps, and refine strategies for maximum effectiveness.

**Stakeholders:** Research institutions, health data agencies, federal and provincial health authorities.



## THE BURDEN OF HPV AND ITS RELATED DISEASES IN CANADA

The landscape of HPV and its associated cancers in Canada has undergone significant changes, leading to a concerning rise in the incidence of HPV-related cancers. After a 30-year decline, the incidence rate of cervical cancer has increased by 3.7% annually between 2015 and 2019, marking the first significant rise since 1984.<sup>1</sup> This alarming trend has made cervical cancer the fastest-growing cancer in Canada. Contributing factors include suboptimal vaccine cervical screening participation, particularly among younger women, inadequate follow-up after screenings, and a higher prevalence of HPV due to changing sexual practices, insufficient vaccination coverage, increased use of immunosuppressive therapies, and an aging population.

Furthermore, the burden of HPV-associated head and neck cancers has become increasingly apparent. In Canada, approximately 25% to 35% of mouth and throat cancers are linked to oral HPV infections.<sup>2</sup> Notably, the incidence rate of HPV-associated oropharyngeal cancer was over 4.5 times higher in males than in females in 2012.<sup>2</sup> In 2024, an estimated 8,100 Canadians will be diagnosed with head and neck cancer, with 2,100 deaths anticipated. Among these, 5,800 men will be diagnosed, and 1,550 will die from the disease, compared to 2,300 women diagnosed and 590 deaths. Despite the availability of effective HPV vaccines, vaccination uptake in Canada remains higher among females than males, further contributing to the gender disparity in these cancers.<sup>3</sup>

### The Broader Impact of HPV Beyond the Cervix

While cervical cancer often garners significant attention, the broader impact of HPV extends far beyond the cervix, affecting various anatomical sites and contributing to both benign and malignant conditions. Each year, approximately 3,800 new cancer cases in Canada are attributed to HPV, a number that is expected to rise to 6,600 by 2042.<sup>4</sup> Among these, anal cancer, oropharyngeal cancer, vulvar and vaginal cancers, and penile cancers pose serious health concerns. Recurrent RRP, a rare but debilitating condition caused by HPV, highlights the non-cancerous burden of the virus.

OPC, primarily linked to HPV-16,<sup>5</sup> has emerged as a leading concern, particularly among men, with incidence rates surpassing those of cervical cancer in some populations.<sup>2</sup> Similarly, anal cancer rates have been steadily increasing, disproportionately affecting individuals living with HIV and other immunocompromised groups.

AGW are associated with a significant burden of illness and costs to the Canadian healthcare system.<sup>6</sup>

Despite the availability of effective HPV vaccines, the national vaccination completion rate is only 64%, with regional coverage varying between 47% and 81%.<sup>7</sup> Moreover, it is estimated that 75% of Canadians will contract at least one HPV infection in their lifetime without vaccination.<sup>8</sup>

### The Psychological and Social Impact of HPV

The burden of HPV extends beyond health statistics, affecting individuals' social, sexual, and mental well-being. The stigma surrounding HPV and its association as an STI can lead to emotional distress, anxiety, and challenges in relationships. Research indicates that individuals diagnosed with HPV often experience heightened anxiety and depression due to fear of cancer and stigma.<sup>9,10,11</sup>

Head and neck cancer survivors often experience significant emotional distress, including depression, anxiety, and suicidal thoughts, which can negatively impact their quality of life (QoL) and survival. Despite high levels of reported mental health concerns in this population, the actual rates of clinically diagnosable mental health disorders remain uncertain.<sup>12</sup>

Moreover, in Canada there are significant gaps in the sexual health knowledge of youth, including about HPV transmission and prevention.<sup>13</sup> Misinformation and vaccine fatigue, driven by prior vaccination efforts and general public disillusionment, exacerbate challenges in increasing HPV vaccine uptake.

### Economic Burden of HPV on Canada's Healthcare System

The healthcare system faces substantial challenges related to HPV, including significant direct costs for prevention, screening, and treatment of HPV-related diseases. The estimated national annual cost associated with HPV-related cancers and diseases stands at more than \$200 million.<sup>14,15,16,17,18</sup>

Additionally, 23.4% of eligible women do not participate in regular cervical cancer screening programs, a figure that is increased in un(der)served populations: 37.8% among people in the lowest income quintile, 36.5% among new immigrants, and 27.5% for those living in rural or remote areas.<sup>19</sup> This leads to later-stage diagnoses, which require intensive treatments such as surgery, radiation, or chemotherapy, driving up healthcare costs and lowering survival rates due to delayed intervention and reduced treatment effectiveness.

### Addressing Inequities: HPV’s Impact on Communities at High Risk of Infection

HPV disproportionately affects marginalized populations, including Indigenous communities and LGBTQIA2S+ individuals.<sup>20,21</sup> Barriers such as limited healthcare access, cultural misunderstandings, stigma, and vaccine hesitancy exacerbate these disparities. Tailored interventions such as culturally sensitive education, mobile clinics, integration into other services such as women’s health and HIV initiatives, and non-clinical/community vaccination programs are essential to promote health equity. Additionally, specific strategies addressing the needs of LGBTQIA2S+ individuals and males, such as targeted education and inclusive outreach, are critical. These efforts ensure that HPV prevention and care fosters inclusivity and reduces health inequities.

### Moving Forward: Strategies for Combating HPV’s Impact

The burden of HPV and its related diseases and cancers in Canada is significant, affecting both individuals and the healthcare system alike. A comprehensive approach, including prevention, education, and targeted interventions for known high-risk populations, is crucial in addressing this pressing public health issue. Future research should focus on improving vaccination and cervical screening rates, understanding the long-term impacts of cervical screening, and designing effective public health campaigns to raise awareness and reduce stigma.



## ADVANCING HPV VACCINATION IN CANADA AS A PRIMARY PREVENTION STRATEGY

### The Critical Role of HPV Vaccination in Cancer and Disease Prevention

HPV vaccination is essential for reducing cancers linked to the virus, including cervical, anal, oropharyngeal, vulvar, vaginal, and penile cancers, as well as pre-invasive diseases, anogenital warts, and RRP. However, challenges such as vaccine hesitancy, misinformation, lack of awareness, inconsistent recommendations, and access disparities limit its impact. Canadians name lack of recommendation by their health care provider as the top barrier to HPV vaccination.<sup>22</sup>

Beyond cancer prevention, HPV vaccination offers benefits to individuals already affected by HPV-related diseases. Research shows that vaccination may reduce the risk of recurrence or progression of disease following treatment, such as surgical procedures for high-grade lesions.<sup>23</sup> For instance, adjuvant HPV vaccination has been linked to a lower risk of cervical intraepithelial neoplasia (CIN) recurrence.<sup>20</sup> Additionally, it helps protect against new HPV infections and strains not yet contracted, supporting overall health and long-term outcomes.<sup>24</sup>

### Addressing Vaccine Hesitancy and Equity Gaps

Vaccine hesitancy, fueled by safety concerns and misinformation, remains a significant obstacle. Personalized advocacy campaigns, such as those by the RRP Foundation, can potentially counter misinformation and build public trust.

Ensuring equitable access requires targeted efforts for marginalized groups, including new migrants, rural residents, and Indigenous communities. Tailored, culturally appropriate messaging fosters trust and encourages acceptance. Engaging trusted community leaders and “champions” within these populations enhances credibility and outreach effectiveness.

Expanding vaccination access through integration into healthcare settings such as hospitals, pharmacies, dentist offices, and community health centers also plays a pivotal role. Hospital and community pharmacists, underutilized in some provinces, can administer vaccines in some provinces and provide accurate information to dispel hesitancy. Flexible vaccination opportunities, such as mobile clinics and workplace programs, further reduce access disparities.



## Innovative Strategies to Boost Vaccination Rates

To improve coverage, innovative approaches include:

- **Technology-Driven Outreach:** Text message reminders and digital tools have proven effective in increasing vaccination rates in Canada and abroad.<sup>25,26</sup>
- **Flexible Delivery Channels:** Adopting a “no wrong door for HPV vaccination” approach, highlighted by Dr. Vivien Brown (expert panel member), ensures vaccines are available in diverse settings, including pharmacies, schools, community health centers, and workplaces.
- **Community Partnerships:** Collaborations with Indigenous populations, religious and local health organizations ensure culturally appropriate messaging by building trust and acceptance.
- **School-Based Programs:** Expanding and enhancing school-based vaccination campaigns with comprehensive educational materials for parents/caregivers, teachers and students remains critical. Current efforts in this area require strengthening to achieve better outcomes.

## A Path Forward

Addressing vaccine hesitancy and equity gaps requires a multifaceted approach that integrates education, community engagement, and accessible delivery systems. Inclusive messaging that highlights HPV vaccination’s role in disease and cancer prevention and its benefits beyond sexual health can reshape public perceptions and foster trust. By combining targeted outreach, community partnerships, and innovative strategies, Canada can improve vaccination coverage and reduce the burden of HPV-related diseases while ensuring equitable access for all.

## Global Best Practices as a Roadmap for Canada

Canada can learn from countries with highly successful HPV elimination strategies to help address our own vaccination challenges:

- **Australia:** Australia’s national HPV vaccination program has achieved high coverage rates through longstanding school-based campaigns, public awareness efforts, and robust catch-up programs, contributing to a significant reduction in HPV diseases and cervical cancer rates.<sup>27</sup>
- **Sweden:** Sweden has developed an accelerated national elimination strategy that includes a robust integrated combination of vaccination and organized screening programs, showing similar successes.<sup>28</sup>
- **Scotland:** Scotland has implemented a highly effective HPV vaccination program, targeting both girls and boys, which has led to significant reductions in HPV infections, as well as a decline in cervical cancer and anogenital warts. The integration of the vaccination program with regular health services has been key to its success.<sup>29</sup>

- **Finland:** Finland offers the HPV vaccine free of charge to all 10–12-year-olds, i.e., pupils in grades 5 and 6. If a child or young person has not received the HPV vaccinations in grades 5–6, they may also receive these free of charge in grades 7–9, upper secondary schools, or vocational institutions. This well-coordinated school vaccination program has contributed to a significant reduction in HPV-related diseases, including cervical cancer and anogenital warts.<sup>30</sup>

### Bridging Gaps Through Partnerships and Representation

Achieving equitable HPV prevention requires collaboration between governments, NGOs, and the private sector. NGOs, with their proximity to communities, are essential in addressing gaps in care and ensuring that strategies are locally relevant and accessible.

Stakeholder representation must also extend to individuals with lived experiences of HPV-related diseases. These voices offer critical insights into vaccine hesitancy and community-specific challenges, that ensure policies are grounded in real-world experiences.

Additionally, partnerships with external stakeholders in advancing vaccine technology and improving accessibility further strengthen prevention efforts. Collaborating with NGOs, schools, and HCPs at all levels is pivotal in creating a sustainable, equitable vaccination framework for Canada.



## ACCELERATING EFFECTIVE SECONDARY PREVENTION THROUGH SWITCHING FROM HPV NUCLEIC ACID AMPLIFICATION FOR CERVICAL SCREENING IN CANADA

### The Role of Secondary Prevention to prevent precursor to cancer

While the role of HPV vaccination is primary prevention of HPV infection, cervical screening is the cornerstone of secondary prevention of cervical cancer. Its purpose is to detect pre-invasive disease and provide treatment to prevent progression to cervical cancer. Similarly, anal screening plays a critical role in secondary prevention for at-risk populations, including MSM, individuals living with HIV, and others with a high prevalence of HPV-related anal cancer. Despite their importance, Canada's cervical and anal screening programs are underfunded and inconsistently implemented across the country. Marginalized groups and Canadians in general face significant barriers, including limited healthcare access, patient hesitancy, and systemic inequities. To reduce HPV-related cancer incidence and mortality, a unified and well-resourced national approach to cervical and anal screening programs is urgently needed to complement an effective vaccine strategy.

### Advancing Primary HPV Testing and Self-Sampling

HPV testing offers a more sensitive and accurate method for early detection of pre-cancerous cells (94.6% sensitivity) compared to traditional Pap smears (55.4%).<sup>31</sup> Effective patient education and follow-up are critical for maximizing the impact of HPV testing. Patients need clear guidance on the cervical screening process, from initial testing to follow-up care, including procedures like colposcopies. Ensuring adherence to these steps demands well-funded and organized systems, particularly during the early rounds of screening when abnormalities are more frequently detected. Public awareness campaigns and straightforward educational materials can help demystify the process, boosting patient confidence and participation.

Integrating HPV self-sampling into cervical screening programs represents a promising solution to address participation barriers, especially in rural and un(der)served areas. Self-sampling kits can be distributed through HCPs, mail-out systems, or pharmacy pick-ups, offering a more accessible, practical, and culturally adaptable alternative. By expanding access and empowering individuals to participate in screening, self-sampling can play a key role in improving overall coverage and early detection outcomes.

### Harnessing Technology for Better Screening Outcomes

Technological advancements, such as artificial intelligence (AI), are poised to revolutionize cervical screening by enhancing detection accuracy and streamlining laboratory workflows. However,

compatibility challenges between cytology triage systems and advanced technologies, as well as colposcopy protocols vary across provinces and territories, hinder progress. British Columbia's structured and standardized approach offers a model that could be scaled up nationally to address these issues.<sup>32</sup>

Modern outreach strategies also play a vital role in patient retention. Digital approaches, such as email and text message reminders integrated into electronic medical records (EMRs), will improve patient adherence to screening schedules. Integrating cervical screening reminders with adult immunization prompts offers additional opportunities to streamline care and enhance participation in both primary and secondary prevention.

### **Building a National Cervical Screening Framework**

Programmatic changes are needed to unify cervical screening efforts across Canada. Standardized protocols for cervical screening and colposcopy practices, and investment in advanced laboratory technologies like HPV testing are critical. Workforce retraining programs are essential to address the tensions created by these shifts and to ensure smooth implementation.

A national network of HPV testing laboratories could significantly bolster Canada's cervical screening capabilities. Leveraging the nucleic acid amplification testing platforms established during the COVID-19 pandemic provides a scalable foundation for primary HPV testing. Coupled with the efficiencies of Canada's single-payer healthcare system, these efforts can modernize cervical screening, improve access, and accelerate progress toward eliminating HPV-related diseases and cancers nationwide.

### Information Dissemination and Public Education

A persistent barrier to HPV prevention is public hesitancy, often fueled by misinformation, cultural stigmas, and the historical "feminization" of HPV as only a women's health issue.<sup>33</sup> This framing has led to disproportionate awareness and vaccination rates between genders, despite the growing burden of HPV-related cancers, especially oropharyngeal cancer in men. Public health campaigns must consistently adopt an inclusive approach, positioning HPV vaccination as a universal cancer prevention tool and emphasizing its importance for all genders.

Culturally sensitive, community-driven strategies are essential for reaching marginalized groups, such as Indigenous communities, where historical trauma and systemic marginalization have fostered mistrust in healthcare. Leveraging trusted individuals such as Indigenous elders, midwives, and matriarchs can help reshape attitudes and integrate prevention efforts into local practices. For example, incorporating HPV screening into midwifery care or embedding sexual health education within cultural rites of passage can create a holistic framework for prevention. Efforts should also address broader health concerns, framing HPV vaccination and regular screenings as part of a lifetime health strategy. By empowering local leaders and fostering multi-generational support systems, trust can be rebuilt, enabling greater access to vaccination and screening programs in un(der)served communities.

In the digital age, platforms like TikTok and Reddit significantly influence health perceptions, particularly among young people. These platforms often amplify misinformation and disinformation, highlighting the need for targeted, evidence-based campaigns. Public health organizations must proactively shape the narrative by releasing independent press briefings and leveraging transparent communication to foster public trust. A structured registry model, similar to that used in the U.S., could further guide targeted outreach efforts by providing data-driven insights.<sup>34</sup> Collaborating with trusted influencers, community leaders, and HCPs can amplify accurate messaging, while educating journalists will ensure consistent, fact-based narratives. Simplified messages—such as presenting HPV vaccination as a vaccine that prevents cancer—can resonate across diverse audiences and combat misinformation effectively. While these approaches have shown some effectiveness, there is a pressing need for creative and innovative strategies to address the deeply ingrained mis- and disinformation.

Tailored campaigns that consider literacy levels and cultural contexts further enhance understanding and acceptance. Strategies like storytelling, infographics, and community health events provide engaging ways to disseminate information. Targeted empirical research can identify belief and norm barriers, enabling the creation of precise intervention strategies and target lists to address specific community needs. Digital tools, such as open-source platforms for fact-checking and communication quality assessments, can strengthen outreach efforts. By combining these approaches with culturally sensitive, community-driven solutions and trusted healthcare relationships, HPV prevention initiatives can effectively promote vaccination as a safe, essential measure to protect public health.



## Conclusion

Canada stands at a critical juncture in its fight against HPV-related diseases and cancers, requiring an immediate, unified, and strategic response to achieve the goal of cervical cancer elimination. This white paper underscores the importance of a comprehensive national approach that integrates robust HPV vaccination campaigns, innovative cervical screening methods, public education, and the latest technological advancements. Central to these efforts is the need for equity in access, particularly for un(der)served and marginalized communities, whose inclusion and improved participation will determine the success of any effective prevention strategy.

The urgency of optimal HPV vaccination strategies cannot be overstated. A shift in policy is required to meet our international commitments to eradicate cervical cancer. Furthermore, achieving high vaccine coverage through school-based programs, catch-up initiatives, and partnerships with community health providers will require sustained government commitment to funding, training, and policy standardization. Furthermore, expanding vaccination efforts to reach populations with historically low uptake, including men and Indigenous communities, will ensure more comprehensive protection against HPV-related diseases and cancers.

A well-funded cervical screening program must be prioritized to ensure broad participation, with HPV testing and self-sampling serving as key components. Public education campaigns should challenge stigma and misinformation, fostering awareness of HPV's broad health impacts beyond just cervical cancer. Incorporating modern technologies such as artificial intelligence and automated systems will further enhance patient follow-up, efficiency, and accuracy in cervical screening programs.

Canada already benefits from a robust healthcare framework that many countries envy. With universal healthcare, gender-neutral school-based adolescent vaccination programs, and organized cervical screening programs available in all but one jurisdiction, Canada is well-positioned to tackle HPV-related health challenges. Despite these advantages, participation rates in both vaccination and screening remain suboptimal and, in some cases, are even decreasing. This is compounded by persistent misinformation and a lack of awareness, underscoring the urgent need for continued action. Achieving this vision requires not only addressing these barriers but also fostering collaborative leadership, embracing innovation, and maintaining an unwavering commitment to equity—ensuring that no Canadian is left behind in the fight against HPV.

1. Canadian Cancer Society. (2023). Canadian cancer statistics 2023. Retrieved from [https://cdn.cancer.ca/-/media/files/research/cancer-statistics/2023-statistics/2023\\_PDF\\_EN.pdf](https://cdn.cancer.ca/-/media/files/research/cancer-statistics/2023-statistics/2023_PDF_EN.pdf)
2. Government of Canada. (2020). Human papillomavirus and oral health. Canada Communicable Disease Report, 46(11-12). Retrieved from <https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2020-46/issue-11-12-november-5-2020/human-papillomavirus-oral-health.html>
3. Canadian Cancer Society. (n.d.). Oral cancer statistics. Retrieved from <https://cancer.ca/en/cancer-information/cancer-types/oral/statistics>
4. Canadian Partnership Against Cancer. (n.d.). HPV immunization policies. Retrieved from <https://www.partnershipagainstcancer.ca/topics/hpv-immunization-policies/>
5. James, C. D., Otoa, R. O., Youssef, A. H., et al. (2024). HPV16 genome structure analysis in oropharyngeal cancer PDXs identifies tumors with integrated and episomal genomes. *Cancer Genomics*, 18. <https://doi.org/10.1016/j.cancergen.2024.02.001>
6. Marra, F., Ogilvie, G., Colley, L., et al. (2009). Epidemiology and costs associated with genital warts in Canada. *Sexually Transmitted Infections*, 85(2), 111-115. <https://doi.org/10.1136/sti.2008.033964>
7. Perez, S. (2024). Progress and challenges in Canada's path toward the elimination of cervical cancer. *Current Oncology*, 31(10), 5850-5861. <https://doi.org/10.3390/curroncol31100435>
8. Government of Canada. (2023). National Advisory Committee on Immunization: Updated recommendations on HPV vaccines. Retrieved from <https://www.canada.ca/en/public-health/services/publications/vaccines-immunization/national-advisory-committee-immunization-updated-recommendations-hpv-vaccines.html>
9. HPV World. (n.d.). The psychosocial impact of HPV. Retrieved from <https://www.hpvworld.com/articles/the-psychosocial-impact-of-hpv/>
10. Henry, M., Arnovitz, E., Frenkiel, S., Hier, M., Zeitouni, A., Kost, K., et al. (2021). Psychosocial outcomes of HPV- and non-HPV-related head and neck cancers: A longitudinal study. *Psycho-Oncology*, 1-13. <https://doi.org/10.1002/pon.5803>
11. Henry, M., Harvey, R., Chen, L. M., Meaney, M., Nguyen, T. T. T., Kao, H.-T., et al. (2023). Genetic predisposition to depression and inflammation impacts symptom burden and survival in patients with head and neck cancer: A longitudinal study. *Journal of Affective Disorders*, 331, 149-157. <https://doi.org/10.1016/j.jad.2023.03.007> or era
12. Mäkitie, A. A., Alabi, R. O., Pulkki-Råback, L., et al. (2024). Psychological factors related to treatment outcomes in head and neck cancer. *Advances in Therapy*, 41(8), 3489–3519. <https://doi.org/10.1007/s12325-024-02945-3>
13. Action Canada for Sexual Health and Rights. (2019). State of sex education in Canada. Retrieved from [https://www.actioncanadashr.org/sites/default/files/2019-09/Action%20Canada\\_StateofSexEd\\_F%20-%20web%20version%20EN.pdf](https://www.actioncanadashr.org/sites/default/files/2019-09/Action%20Canada_StateofSexEd_F%20-%20web%20version%20EN.pdf)
14. Righolt, C. H., et al. (2018). Economic evaluations in cancer care. *Applied Health Economics and Health Policy*, 16(2), 195-205. <https://doi.org/10.1007/s10198-018-0940-5>



15. Société canadienne du cancer. (2016). Statistiques canadiennes sur le cancer 2016, Sujet particulier : Cancers associés au VPH. Retrieved from <https://www.cancer.ca/fr-ca/research/cancer-statistics-2016>
16. Kliewer, E., Marrett, L. D., & Muir, C. (2008). Cancer care in Manitoba, 2008. *Canadian Medical Association Journal*, 179(3), 261-265. <https://doi.org/10.1503/cmaj.080235>
17. Merck Canada Inc. (2020, January 16). Monographie canadienne de GARDASIL®9. Retrieved from [https://www.merck.ca/static/pdf/GARDASIL\\_9-PM\\_F.pdf](https://www.merck.ca/static/pdf/GARDASIL_9-PM_F.pdf)
18. Centre d'information sur la santé des femmes du Canada. (n.d.). HPV et cancer. Retrieved from <https://www.cwhn.ca/fr/node/40865>
19. Canadian Partnership Against Cancer. (n.d.). Cervical screening in Canada. Retrieved from <https://www.partnershipagainstcancer.ca/topics/eliminating-cervical-cancer/hpv-primary-screening-follow-up/cervical-screening-in-canada/#:~:text=In%202017%2C%20cervical%20screening%20participation,%20in%20Canada%20was%2076.6%25>
20. Henderson, R. I., Shea-Budgell, M., Healy, C., Letendre, A., Bill, L., Healy, B., Bednarczyk, R. A., Mrklas, K., Barnabe, C., Guichon, J., Bedingfield, N., MacDonald, S., Colquhoun, A., Glaze, S., Nash, T., Bell, C., Kellner, J., Richardson, R., Dixon, T., Starlight, J., ... Nelson, G. (2018). First nations people's perspectives on barriers and supports for enhancing HPV vaccination: Foundations for sustainable, community-driven strategies. *Gynecologic oncology*, 149(1), 93–100. <https://doi.org/10.1016/j.ygyno.2017.12.024>
21. Cancer Network. (n.d.). HPV and cancer. Retrieved from <https://cancer-network.org/cancer-information/hpv-and-cancer/>
22. Steben, M., Durand, N., Guichon, J. R., Greenwald, Z. R., McFaul, S., & Blake, J. A. (2019). National survey of Canadian adults on HPV: Knowledge, attitudes, and barriers to the HPV vaccine. *Journal of Obstetrics and Gynaecology Canada*, 41(8), 1125-1133.e6. <https://doi.org/10.1016/j.jogc.2019.04.016>
23. NITAG Resource Centre. (n.d.). HPV vaccination after primary treatment of HPV-related disease across different organ sites. NITAG Resource Centre. Retrieved January 22, 2025 <https://www.nitag-resource.org/resources/hpv-vaccination-after-primary-treatment-hpv-related-disease-across-different-organ-sites>
24. Centers for Disease Control and Prevention. (n.d.). HPV vaccination recommendations. U.S. Department of Health and Human Services. Retrieved January 22, 2025, from <https://www.cdc.gov/vaccines/vpd/hpv/hcp/recommendations.html>
25. MacDonald, S. E., Marfo, E., Sell, H., Assi, A., Frank-Wilson, A., Atkinson, K., Kellner, J. D., McNeil, D., Klein, K., & Svenson, L. W. (2022). Text Message Reminders to Improve Immunization Appointment Attendance in Alberta, Canada: The Childhood Immunization Reminder Project Pilot Study. *JMIR mHealth and uHealth*, 10(11), e37579. <https://doi.org/10.2196/37579>
26. Sana, F., Patel, V., Ahmed, K., & Johnson, K. (2021). Digital health interventions for cervical cancer prevention and HPV vaccination: A systematic review. *Frontiers in Digital Health*, 3, 693688. <https://doi.org/10.3389/fdgth.2021.693688>

27. HPV World. (2021, November 18). Australia on track to be the first country to achieve cervical cancer elimination. HPV World. Retrieved January 22, 2025, <https://www.hpvworld.com/articles/australia-on-track-to-be-the-first-country-to-achieve-cervical-cancer-elimination/>
28. Wemrell, M., Vicente, R. P., & Merlo, J. (2023). Mapping sociodemographic and geographical differences in human papillomavirus non-vaccination among young girls in Sweden. *Scandinavian journal of public health*, 51(2), 288–295. <https://doi.org/10.1177/14034948221075410>
29. Crawford, G., & Cuthbert, R. (2023, January 17). The impact of the human papillomavirus vaccine in Scotland: A changing landscape. *The Pharmaceutical Journal*. Retrieved January 22, 2025, from [https://pharmaceutical-journal.com/article/research/the-impact-of-the-human-papillomavirus-vaccine-in-scotland-a-changing-landscape?utm\\_](https://pharmaceutical-journal.com/article/research/the-impact-of-the-human-papillomavirus-vaccine-in-scotland-a-changing-landscape?utm_)
30. Finnish Institute for Health and Welfare. (n.d.). HPV or human papillomavirus vaccine. Finnish Institute for Health and Welfare. Retrieved January 22, 2025, from [https://thl.fi/en/topics/infectious-diseases-and-vaccinations/vaccines-a-to-z/hpv-or-human-papillomavirus-vaccine?utm\\_](https://thl.fi/en/topics/infectious-diseases-and-vaccinations/vaccines-a-to-z/hpv-or-human-papillomavirus-vaccine?utm_)
31. Biron. (n.d.). Differences between the HPV test and the Pap test. Biron. Retrieved January 22, 2025, from <https://www.biron.com/en/education-center/your-questions/differences-hpv-test-pap-test/>
32. Pataky, R. E., Izadi-Najafabadi, S., Smith, L. W., Gottschlich, A., Ionescu, D., Proctor, L., Ogilvie, G. S., & Peacock, S. (2024). Strategies to accelerate the elimination of cervical cancer in British Columbia, Canada: a modelling study. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*, 196(21), E716–E723. <https://doi.org/10.1503/cmaj.231682>
33. Daley, E. M., Vamos, C. A., Thompson, E. L., Zimet, G. D., Rosberger, Z., Merrell, L., & Kline, N. S. (2017). The feminization of HPV: How science, politics, economics, and gender norms shaped U.S. HPV vaccine implementation. *Papillomavirus Research*, 3, 142–148. <https://doi.org/10.1016/j.pvr.2017.04.004>
34. Szilagyi, P., Albertin, C., Gurfinkel, D., Beaty, B., Zhou, X., Vangala, S., Rice, J., Campbell, J. D., Whittington, M. D., Valderrama, R., Breck, A., Roth, H., Meldrum, M., Tseng, C. H., Rand, C., Humiston, S. G., Schaffer, S., & Kempe, A. (2020). Effect of State Immunization Information System Centralized Reminder and Recall on HPV Vaccination Rates. *Pediatrics*, 145(5), e20192689. <https://doi.org/10.1542/peds.2019-2689>

## Expert Panel Members

**James Bentley**, MBChB, FRCSC, Professor; Division of Gynaecologic Oncology; Department Head, Obstetrics and Gynaecology, Dalhousie University

**Vivien Brown**, MDCM, CCFP, FCFP, MSCP, Family Physician, Toronto and Assistant Professor, Department of Family and Community Medicine, University of Toronto

**Lucie Marisa Bucci**, MA, Public Health Consultant, Bucci-Hepworth Health Services Inc.

**Paolo Campisi**, MSc, MD, FRCSC, Professor, Department of Otolaryngology - Head & Neck Surgery, University of Toronto

**Alexandre Chadi**, PharmD, MSc, Adjunct clinical professor, Faculty of Pharmacy, Montreal University

**Angel Chu**, MD, FRCPC, Infectious Disease Physician, Foothills Medical Centre and Clinical Assistant Professor, University of Calgary

**Alexandre Dumont Blais**, MA, Chief Executive Officer, RÉZO

**Nancy Durand**, MDCM, FRCSC, Associate Professor, Department of Obstetrics and Gynaecology, University of Toronto

**William Fisher**, PhD, FRSC Distinguished Professor Emeritus and Adjunct Professor, Department of Psychology and Department of Obstetrics and Gynaecology, Western University

**Ojistoh Horn**, MSc, MD, Family Physician, Akwesasne Medical Clinic

**Amélie McFadyen**, MA, Chief Executive Officer, HPV Global Action

**Samantha McKinnon**, Patient Advocate

**Teresa Norris**, Founder and President, HPV Global Action

**Zeev Rosberger**, PhD, Vice-President, HPV Global Action; Senior Investigator, Lady Davis Institute for Medical Research; Associate Professor, Gerald Bronfman Department of Oncology and Departments of Psychology and Psychiatry, McGill University

**Marc Steben**, MD, Co-President, HPV Global Action, President, International Society for STD Research, Chair, Canadian Network for HPV Prevention

**Dominique Tessier**, MD, Centre hospitalier de l'université de Montréal, Clinique du Quartier Latin

**John Yaremko**, MD, FRCPC, Pediatrician, Montreal Children's Hospital, Assistant Professor, McGill University

**Anthony Zeitouni**, MD, FRCSC, Department of Otolaryngology–Head and Neck Surgery, McGill University, Department of Otolaryngology–Head and Neck Surgery, McGill University Health Centre, McGill University

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