

HPV Vaccines: Expanding the power of prevention



BC Centre for Disease Control
An agency of the Provincial Health Services Authority



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Conflicts of interest: I have no affiliation (financial or otherwise) with a commercial or other industry interest



HPV vaccines

	Quadrivalent HPV	Bivalent HPV	Nonavalent HPV
Strain coverage	6,11,16,18	16,18 Cross protection to 31, 33, 45, and 51	6/11/16/18/31/33/45/52/58
Approved indications: -sex -age -prevention of:	females 9-45 years males 9-26 years genital warts cervical cancer and CIN vulvar and vaginal IN anal cancer and IN	females 9-45 years CIN 1-3, Cervical AIS	females 9-45 years males 9-26 years genital warts cervical cancer and CIN vulvar and vaginal IN anal cancer and IN (approved to 26 yo only)
Adjuvant, route	Aluminum, IM	Aluminum+ASO4, IM	Aluminum, IM
Schedule	0,2,6 months;0+6<15 yr	0,1,6 months;0+6 or 12<15 yr	0,2,6 months; 0+6<15 yr
Efficacy (CIN 1-2)	High 90s	High 90s	High 90s
Able to prevent X% of: (based on strains causing outcome)	90% of genital warts 70% of cervical cancer 96% of anal cancer	70% of cervical cancer	90% of cervical cancer 80% of cervical precancer 75+% of vulvar, vaginal, anal cancer and precancers 90% of genital warts
Duration of protection data	>12 years	>9.4 years	>5 years

HPV vaccines: Health Canada approvals

HPV4

- Health Canada approved 2007: HPV 4-valent (6,11,16,18) for cervical cancer and genital warts
 - Initial indication 9-26 year old females; supported by NACI recommendations
 - 2008 BC program for girls in grades 6 and 9, 3 dose series (born 1994 and later; grade 9 program ran for 3 years)
 - 2014 BC: **2 dose series** for girls in grade 6 (and this is the current schedule for both sexes when starting series before 15th birthday; NACI statement 2015)
 - 2010 Health Canada indication for **males** against infection (4 strains) and warts to age 26
 - 2011 Health Canada indication for females to age 45
 - 2011 Health Canada indication against anal cancer both sexes

NACI statements are at:

<https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci.html>



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HPV vaccines: Health Canada approvals of bivalent and 9-valent

- 2010: HPV 2-valent (16,18)
 - 2012 BC catch-up program for young women to age 26 at series commencement, 3 dose series; 80,000 doses distributed
- 2015: HPV 9-valent (5 additional oncogenic strains)
 - Females to 45 (warts, cervical, vaginal, anal cancers) and males to 26 (genital warts and anal cancer)
 - 90% coverage of cervical cancer types; comparable immunogenicity and safety to HPV4-valent; swelling at injection site 48% vs 36%



BC expansions beyond grade 6 girls

- September 2015, for high risk males starting series up to age 26
- August 2016, HPV9 for HIV positive females to age 26
- September 2016, HPV9 for grade 6 girls:
 - HPV 9 valent: replaced HPV4, given in 2-dose series
 - by May 2017 HPV9 replaced all use of HPV4 in BC programs
- September 2017: HPV9 for grade 6 boys (born 2006 and later); transgender to age 26



Current BC eligibility and recommendations for HPV9 vaccine

Human Papillomavirus Vaccine [Nonavalent (types 6, 11, 16, 18, 31, 33, 45, 52, and 58)] GARDASIL®9

INDICATIONS:

- Individuals born on or after January 1, 2009
- Unimmunized or incompletely immunized females born in 1994-2009
- HIV positive individuals 9-26 years of age (inclusive) who have not received a complete series of HPV vaccine ^C
- Males 9-26 years of age (inclusive) at the time of series commencement who are: ^B
 - men who have sex with men (including those who are not yet sexually active and are questioning their sexual orientation)
 - street involved
- Males 9-18 years of age (inclusive) in the care of the Ministry of Children and Family Development (MCFD) ^B
- Males in youth custody services centres ^B
- Transgender individuals 9-26 years of age (inclusive) ^B

'Once eligible, always eligible'....for HPV vaccine until 26 yo. Using 1994 birth cohort as the oldest to have been eligible in BC, in 2017 (minus 1994) = 23 yo; in 2020 it will be 26

RECOMMENDED BY THE NATIONAL ADVISORY COMMITTEE ON IMMUNIZATION BUT NOT PROVIDED FREE IN BC:

- Women 45 years of age and younger born prior to 1994
- Males 9-26 years of age (who are not indicated above)
- Males 27 years of age and older who are men who have sex with men



Q & A documents provide additional information

8. Can HPV9 be given to a person who has started or completed a series with HPV4, to get protection against the 5 additional HPV types?

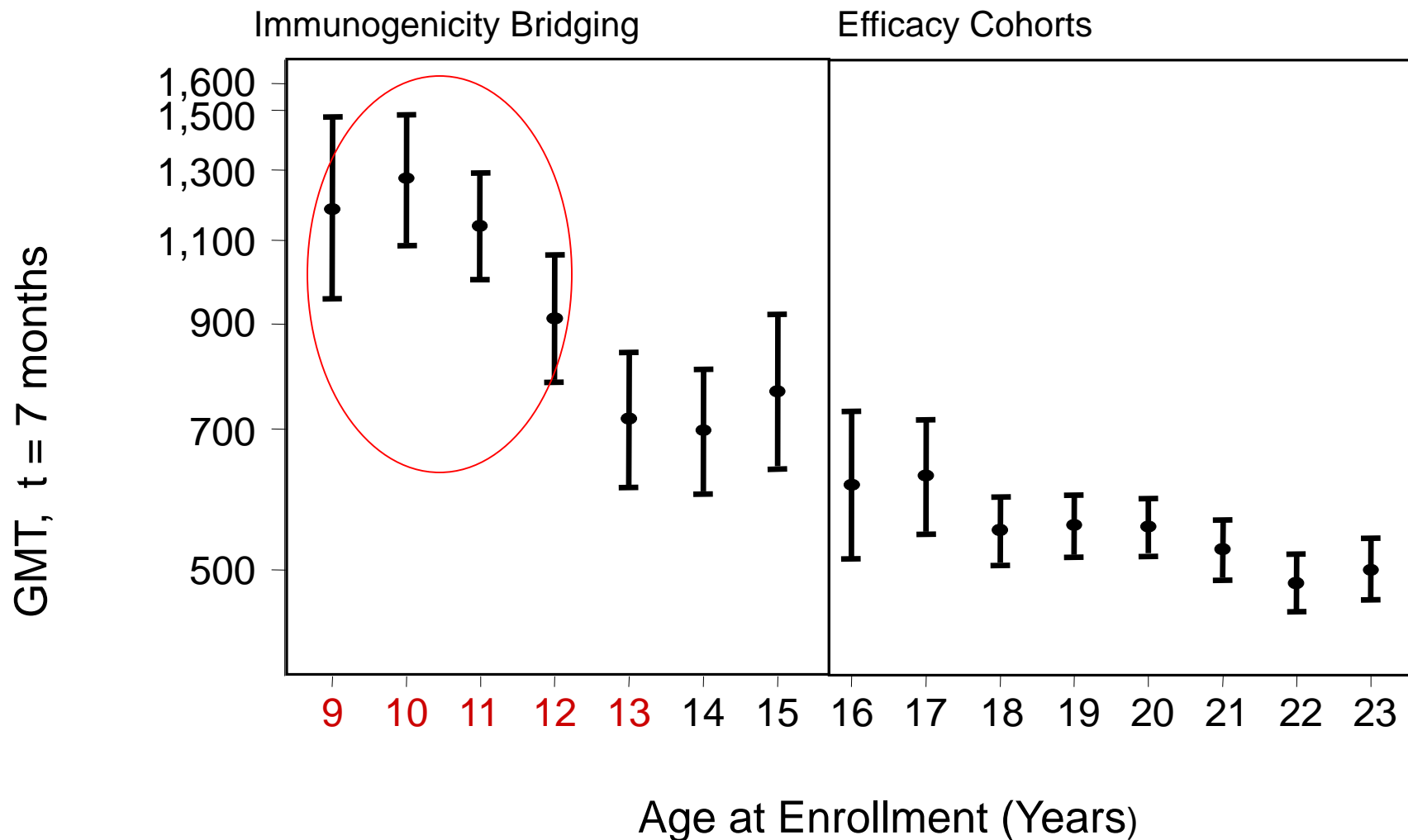
Yes, however the following points should be considered:

- At this time, HPV9 is only publicly funded in BC for girls in grade 6 starting in the 2016/17 school year, and females 9-26 years of age who are HIV positive. All other individuals will need to purchase HPV9 from a pharmacy or travel clinic.
- A complete series of HPV9 is recommended to ensure protection against the additional five HPV types.
- Available data show no serious safety concerns in persons who were vaccinated with 9-valent HPV vaccine after having received a 3-dose series of quadrivalent HPV vaccine at least 12 months earlier.³



Anti-HPV 6 antibodies by age in years

HPV4 vaccine, 3 dose series



Effectiveness of vaccine programs

- 2015 multi-country meta-analysis:
 - significant reductions in HPV infection, genital warts and cervical intraepithelial neoplasia (CIN)
 - herd protection of males and unvaccinated women in populations with sufficient coverage e.g., Australia
- BC ecological data based on Pap test results in vaccinated age cohort compared to older than vaccinated cohort
 - Comparing rates before and after introduction of the vaccine program, IRR for CIN2+ in young women 15–17 years was significantly reduced overall for all categories of cervical dysplasia, compared to 18-22 year olds
 - QUEST study fully enrolled (BC AB QU ATL) 2 vs 3 dose recipients effectiveness

Drolet Lancet ID 2015; 15:565–80

Ogilvie Int.J.Cancer 2015; 137, 1931–1937

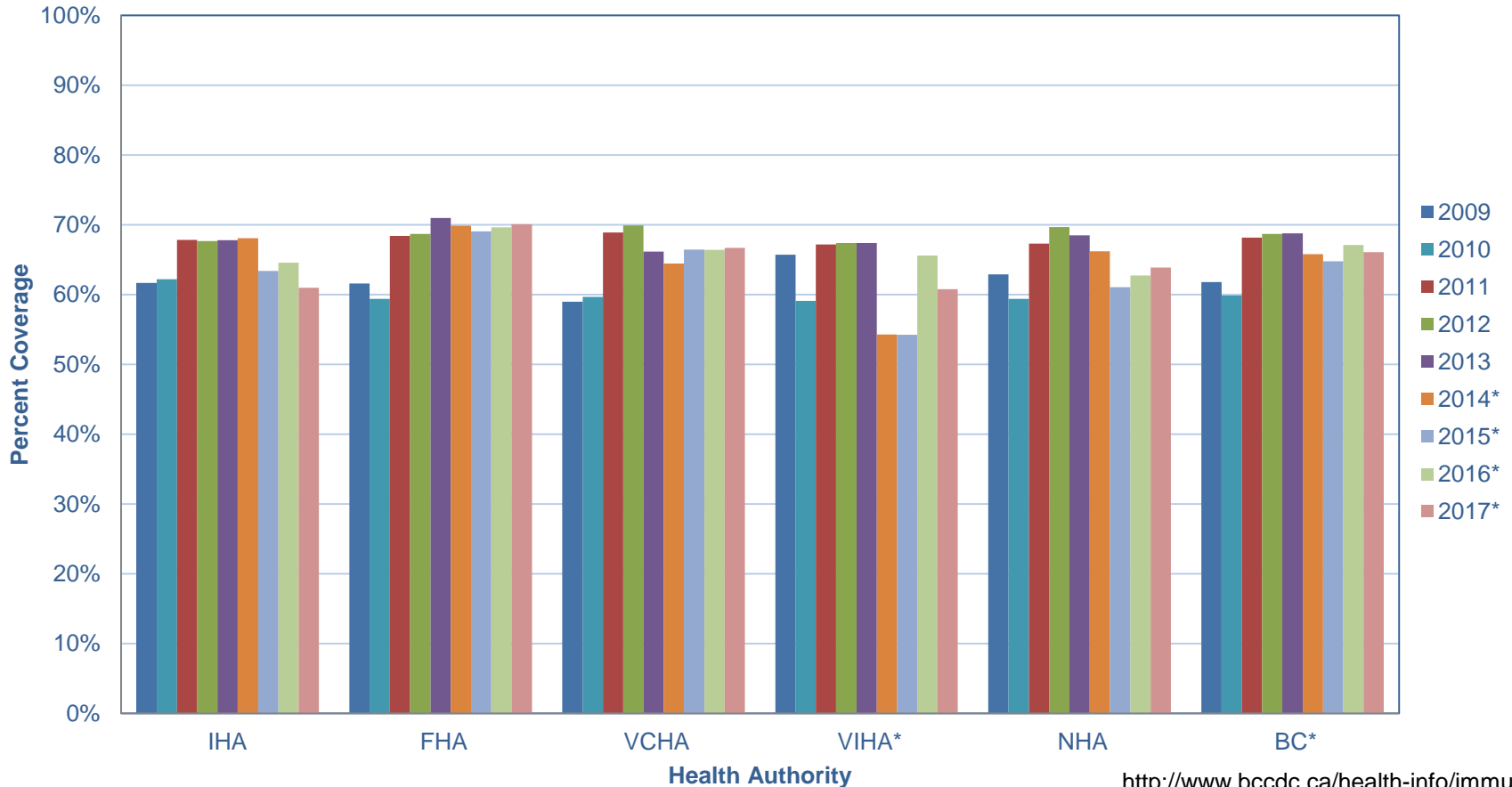


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≥30% of BC girls are not completing a series while in grade 6

Grade 6 Females with Up-to-date Immunizations, 2009-2017* Human Papillomavirus



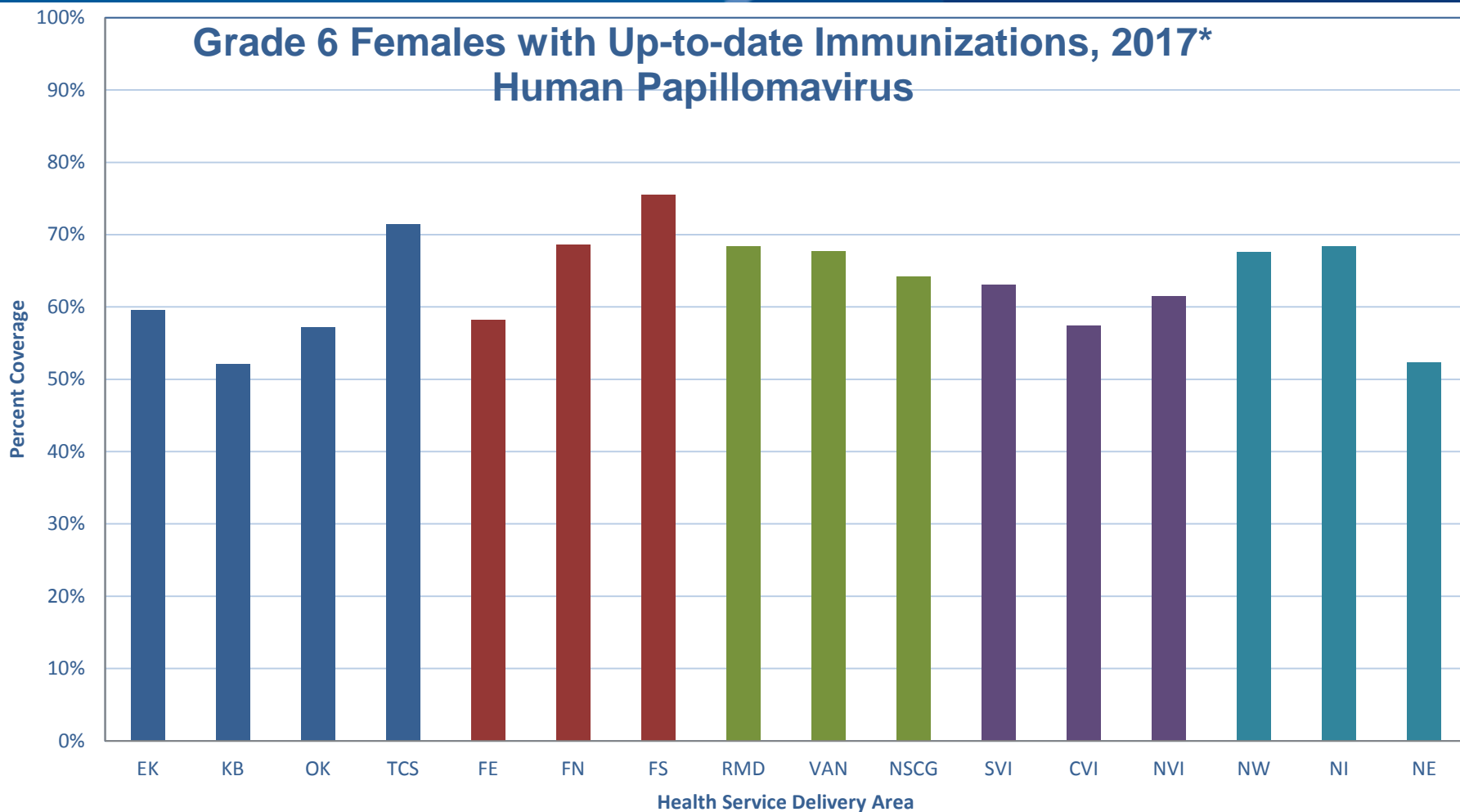
<http://www.bccdc.ca/health-info/immunization-vaccines/immunization-coverage>



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Series completion rates vary in BC at the HSDA level



Series completion rates vary in BC at the school level

Vancouver Coastal 2015/6 Grade 6

Local Health Area	School Name	HBV	MENC	VARICELLA	HPV	ZERO
Westside	SUBTOTAL	93%	83%	83%	64%	2%
	BAYVIEW COMMUNITY ELEMENTARY	79%	64%	68%	35%	NR
	CARNARVON COMMUNITY ELEMENTARY	92%	84%	84%	83%	NR
	CROFTON HOUSE	93%	77%	79%	72%	0%
	DR R E MCKECHNIE ELEMENTARY	98%	90%	90%	76%	NR
	EATON ARROWSMITH SCHOOL	75%	50%	50%	NA	NR
	ECOLE JULES QUESNEL ELEMENTARY	92%	87%	89%	63%	NR
	FRASER ACADEMY	95%	77%	73%	38%	NR
	GENERAL GORDON ELEMENTARY	92%	87%	82%	73%	NR
	HENRY HUDSON ELEMENTARY	92%	90%	90%	65%	NR
	IMMACULATE CONCEPTION SCHOOL	96%	89%	89%	47%	0%
	KERRISDALE ELEMENTARY	97%	87%	89%	65%	NR

<http://www.vch.ca/Documents/Immunization-coverage-by-school-grade-CoCs-2016.pdf>



HPV vaccines safety

- Reviewed by multiple medical authorities and regulatory agencies globally:
 - World Health Organisation; Global Advisory Committee on Vaccine Safety
 - US Food and Drug Administration
 - European Medicines Agency
 - International Federation of Gynaecology & Obstetrics
 - Country specific bodies such as:
 - Medicines & Healthcare Products Regulatory Agency of the UK
 - Therapeutic Goods Administration of Australia
 - Health Canada
 - Centres for Disease Control, USA
- All have endorsed as safe and effective
- No evidence for neurological or autoimmune diseases; no deaths directly attributed to HPV vaccination



To improve vaccine uptake, every study shows that:

- Recommendation from a physician is the **KEY** factor in the decision to be vaccinated
 - Trusted, knowledgeable
 - Basic information
 - Address specific concerns raised



www.bccdc.ca

Interactive Electronic Immunization Infographic For Health Care Providers

There is a wealth of credible and important immunization resources. This tool collates and highlights information and key national and provincial immunization resources for health care providers.

How to use the infographic:

Select the immunization topic of interest. This will display an array of applicable subcategories and corresponding resources. Select the resource of interest to you.

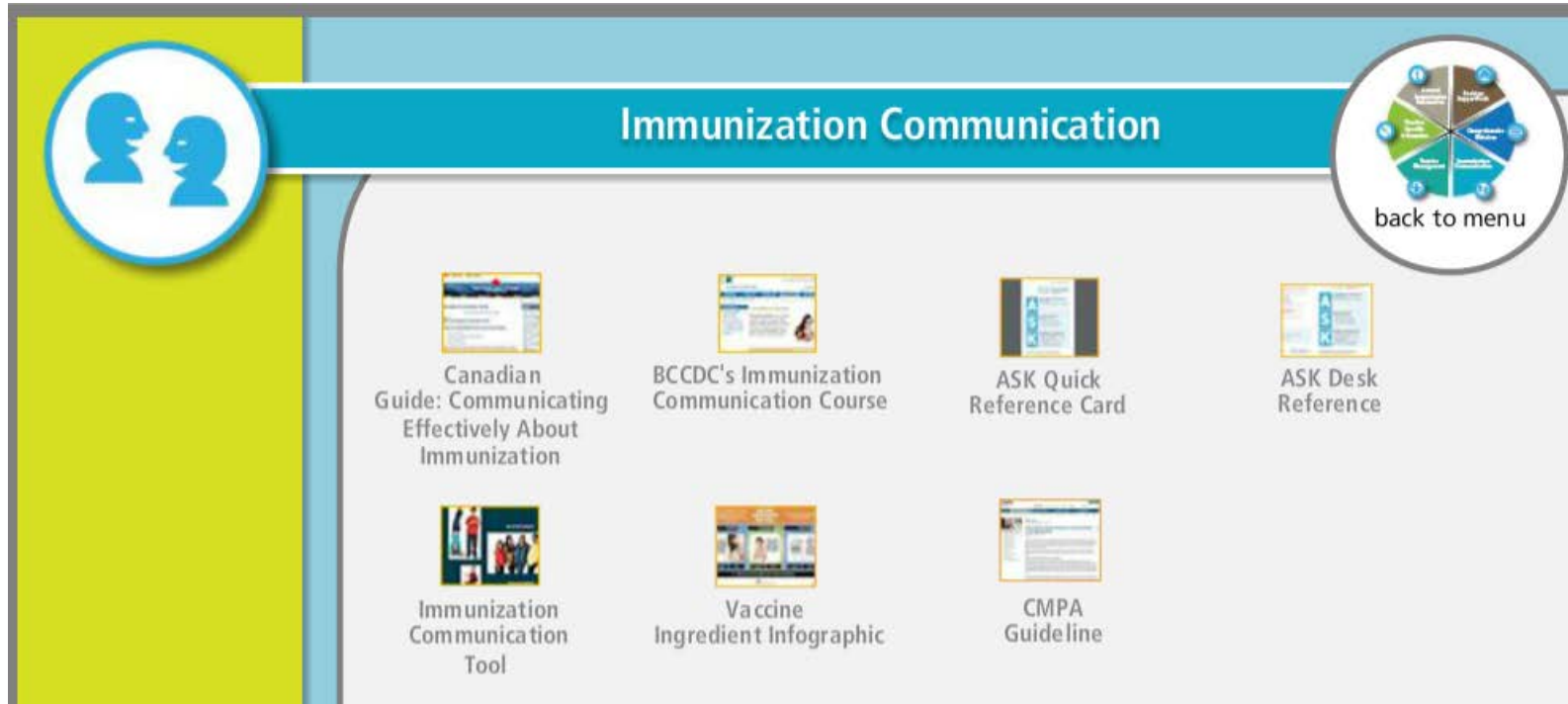
The infographic is a circular diagram with seven segments, each representing a different immunization topic. The segments are arranged around a central blue circle. Each segment contains a text label and a circular icon. The segments are: 1. General Immunization Information (top, grey, icon: lowercase 'i'), 2. Clinical Resources (top-right, brown, icon: organizational chart), 3. Credible Immunization Websites (right, blue, icon: globe with 'www'), 4. Immunization Communication (bottom-right, teal, icon: two people silhouettes), 5. Vaccine Management (bottom, green, icon: 'VACCINE' stamp), 6. Vaccine Administration (bottom-left, light green, icon: syringe), 7. Vaccines (left, olive green, icon: test tube).



ImmunizeBC



www.bccdc.ca



The graphic features a teal header bar with the text "Immunization Communication" in white. On the left is a circular icon with two blue silhouettes of people. On the right is a circular "back to menu" button with a multi-colored wheel icon. Below the header, seven resource thumbnails are arranged in two rows. Each thumbnail includes a small image of the resource and its title.

Immunization Communication

- Canadian Guide: Communicating Effectively About Immunization
- BCCDC's Immunization Communication Course
- ASK Quick Reference Card
- ASK Desk Reference
- Immunization Communication Tool
- Vaccine Ingredient Infographic
- CMPA Guideline