



Building on the Legacy of Vaccines in Canada: Value, Opportunities, and Challenges

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Vaccines Matter: Talking to Canadians



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Vaccine Industry Committee



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Vaccines Matter: Talking to Canadians

Les vaccins sont importants : Sensibiliser les Canadiens

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8.1 Executive Summary / Sommaire

8.1.1 Executive Summary

Vaccination has saved more lives in Canada in the past 50 years than any other medical intervention, and is widely viewed as a cornerstone in the efforts to promote public health. Although vaccines have provided tremendous benefits, the effectiveness of existing and new immunization programs depends heavily on their acceptance by the public, which is becoming increasingly challenged by concerns regarding vaccine safety. Thus, in addition to strong vaccine recommendations by the National Advisory Committee on Immunization (NACI) and other advisory bodies – as well as adequate vaccine funding – comprehensive, coordinated education programs that target the public (and health care providers) are urgently required in Canada to improve vaccine knowledge, attitudes, and coverage rates, and hence to reduce the incidence of vaccine-preventable disease.

Ironically, vaccination programs have recently become, to some degree, the victim of their own success. Specifically, the near disappearance of (and lack of direct experience with) target diseases such as polio or measles have led to increased complacency towards immunization, and vaccination rates have thus dropped – with frequently reported resurgence of vaccine-preventable disease. Other factors have also contributed to the recent emergence of the “anti-vaccine movement” that questions the need for vaccines and their general safety, including growing mistrust of government and public health officials, and the proliferation of electronic communications, which can rapidly propagate inaccurate information. Simultaneously, the balance has shifted away from recognizing the true benefits of vaccination towards increased suspicion of adverse effects resulting from immunization. Overall, the current complacency and growing opposition towards vaccination underscore the urgent need to improve immunization awareness and education programs, particularly in terms of achieving target immunization rates.

Unfortunately, public misconceptions regarding vaccination tend to persist, despite the large body of scientific evidence against them. In particular, there is no valid evidence to support a causal relationship between thimerosal (a mercury-containing preservative used in some vaccines) and autism – or between whole cell pertussis vaccine and brain damage, or hepatitis B vaccine and multiple sclerosis or leukemia. Broadly speaking, there remains a strong need for effective vaccine education and advocacy programs to help overcome resistance to vaccine acceptance; such programs are required to promote greater public confidence in immunization as the single most effective and safe public health intervention, especially when weighed against the health risks associated with many serious vaccine-preventable illnesses.

In Canada, as in many other developed countries, national immunization coverage rates are significantly lower than target rates for several vaccine-preventable diseases, both in children (e.g. pertussis, rubella) and adults (e.g. influenza, invasive pneumococcal disease). Such suboptimal vaccination rates help reiterate the requirement for increased public awareness regarding immunization. In addition, recent survey data have indicated that although Canadians generally hold positive views of vaccines (i.e. with respect to vaccine importance, efficacy, and the need for continued research), many respondents have demonstrated insufficient knowledge (especially regarding safety issues), uncertainty, or negative attitudes towards vaccination. Unsurprisingly, several of these themes have also been echoed against the backdrop of the current influenza A H1N1 pandemic and the so-called “*epidemic of confusion*”; recent survey results indicate that Canadians are relatively reluctant (overall) to receive the H1N1 vaccine. Since virtually all theories of “behaviour change” focus on knowledge as a necessary factor in adoptive behaviour, educational efforts directed towards the Canadian public may be expected to improve vaccine receptivity and in turn, increase immunization coverage rates. A key takeaway point that emerges from these studies is that enhanced, timely public education regarding vaccine safety and effectiveness will be required to promote positive attitudes, and to maintain support for future immunization programs.

Having unambiguously argued the case for the need to improve immunization education programs in Canada (based on currently held misconceptions, suboptimal coverage rates, and insufficient knowledge regarding vaccines), it is pertinent to review relevant avenues for education program delivery. In this context, it is well recognized that health care professionals, including physicians, nurses and pharmacists, play a critical role in educating the public regarding the value and benefits of immunization – and that their recommendations strongly influence vaccine uptake. Hence it is imperative that these front-line immunization providers are equipped with the latest evidence-based information to address public concerns. In addition, effective risk communication skills need to be developed to help create informed decision-making partnerships between individual health professionals and parents/patients, i.e. within an open, respectful atmosphere that acknowledges individual perception of risk. At present however, a diverse, uncoordinated array of professional education programs and resources is available for Canadian vaccine providers; more consistent and cohesive training programs are urgently required.

Public health officials at the national, jurisdictional and local levels also hold influential positions in guiding and educating the public on immunization issues. Although several Canadian public health experts are regarded as exemplary advocates of immunization, on the whole, public health officials have recently been criticized in terms of their inability to effectively communicate the importance and benefits of vaccination – particularly regarding the 2009/2010 H1N1 influenza vaccine campaign. While conflicting recommendations across provinces/territories are causing considerable confusion in the short term, an over-arching concern is that mixed messages may also lead to broader erosion of trust in Canadian public health authorities. Overall, publicly-funded officials have an obligation to stand up for science, which clearly indicates that lack of vaccination is associated with even greater risks. With regard to the Public Health Agency of Canada (PHAC), it should also be noted that – despite recent progress of the Professional Education Working Group (PEWG) in developing its new educational tool, *“Immunization Competencies for Health Professionals”* – little progress has been made under the National Immunization Strategy (NIS) in advancing knowledge development and dissemination to support *public* education.

In addition to the vital roles played by health professionals and public health officials, several modern media tools are currently recognized as powerful mechanisms for influencing parents and patients; such tools encompass print media, radio, television, film, and the Internet. Recently, direct-to-consumer (DTC) advertising has become an increasingly popular means of educating the public regarding vaccines. Notably, the information presented in a DTC advertisement should be intended primarily to inform individuals of the availability of a vaccine and its recommended use, and to direct patients to appropriate sources that have greater capacity to deliver educational content, including complete risk-benefit information. Finally, since school-based immunization programs are an effective means of delivering routine vaccines to children and adolescents, educational leaders (including school principals, teachers, nurses and guidance counselors) also play an integral role in disseminating immunization information to both parents and their children.

Since immunization is a collective responsibility across government and public health authorities, health care providers, industry players, and families, all stakeholders must work together to develop (and realize the full benefits of) well-structured educational programs to help protect the Canadian population. In the spirit of achieving the shared goal of improving patient health through enhanced education, the following recommendations are put forward by BIOTECanada’s Vaccine Industry Committee (VIC) for consideration by relevant stakeholders.

Federal/Provincial/Territorial (F/P/T) Recommendations

1. To achieve one of the most fundamental goals in public health, Canadian public health authorities at all levels should seek to maintain and strengthen public trust in immunization programs.
2. Policy approaches designed to maintain and improve immunization coverage rates as a primary public health objective should ensure adequate resources and infrastructure are in place to deliver effective vaccine program awareness/education programs across the country.
3. Initial goals and recent progress of the National Immunization Strategy (NIS) should be reevaluated, particularly in terms of advancing knowledge development to support public education programs.

Stakeholder Recommendations

4. Stakeholders at all levels, including F/P/T government officials, public health authorities, vaccine manufacturers, researchers, and health care professionals, should work towards the development of a comprehensive, coordinated framework for communicating with the public and other health providers regarding the benefits (both individual and community) and potential risks of vaccination.
5. All stakeholders need to take greater responsibility for educating and reassuring the public regarding the stringent regulatory measures currently in place to ensure extremely high standards of quality and safety in the research and development, manufacturing, licensing, and use of vaccines in Canada.
6. With specific regard to health care providers – who act as trusted information sources for parents and patients – there is a need for enhanced professional education in the field of immunization in Canada.
7. Improved communication plans aimed specifically at the public are needed to help overcome negative perceptions of vaccines, and to renew the motivation for vaccination – ideally through enhanced recognition that vaccines represent a worthwhile, responsible public health intervention.
 - Appropriate risk communication strategies should be used to present timely, accurate, understandable, evidence-based information regarding vaccines and immunization programs.
 - An informed decision-making partnership between a health professional and parent/patient is required to facilitate two-way messaging in an open, respectful atmosphere that acknowledges individual perception of risk (which, in turn, may help modify attitudes or behaviour).
8. Since vaccines can only be administered by a health care professional in Canada, and given that the primary purpose of a direct-to-consumer (DTC) advertisement is to inform the public regarding the availability of a vaccine and to direct parents/patients to additional education resources, the VIC proposes that fair balance requirements could be met in the following ways:
 - Fair balance requirements should be adapted and applied to specific media formats, taking into consideration differences in the time of exposure and the volume of information that can be conveyed to (and *understood* by) the intended audience.
 - For broadcast media formats that have limited information capacity (e.g. television and radio ads), fair balance could be achieved by including brief statements to: i) explain that not everyone may be eligible to receive (or be fully protected by) a given vaccine; ii) warn of the possibility of side effects; iii) recommend a consultation with a health care professional; and iv) refer to another source of additional, complete, and balanced information regarding vaccine risks and benefits.

8.1.2 Sommaire

Au Canada, la vaccination a permis de sauver plus de vies au cours des 50 dernières années que toute autre intervention de santé. Elle est considérée à grande échelle comme l'une des pierres angulaires des efforts visant à promouvoir la santé publique. Bien que les vaccins présentent des avantages importants, l'efficacité des programmes d'immunisation, actuels et nouveaux, dépend grandement de leur acceptation par le public, laquelle est de plus en plus difficile à obtenir en raison des préoccupations que soulève l'innocuité des vaccins. Outre la formulation de recommandations rigoureuses par le Comité consultatif national de l'immunisation (CCNI) et d'autres organismes consultatifs relativement aux vaccins – et la mise en place d'un système adéquat de financement des programmes de vaccination – il est urgent de mettre en œuvre au Canada des programmes complets et coordonnés de sensibilisation du public (et des fournisseurs de soins de santé) afin d'améliorer la connaissance des vaccins, les mentalités vis-à-vis de ceux-ci et les taux de couverture vaccinale pour ainsi réduire l'incidence des maladies évitables par la vaccination.

Ironiquement, les programmes de vaccination sont devenus dernièrement, dans une certaine mesure, victimes de leur succès. La quasi-disparition de maladies cibles, comme la poliomyélite et la rougeole, et l'absence d'expérience directe de cas reliés à ces maladies ont donné lieu à un relâchement accru de la vigilance à l'égard de l'immunisation, entraînant ainsi une diminution des taux de vaccination – et la réapparition fréquemment signalée de maladies évitables par la vaccination. D'autres facteurs ont également contribué à l'apparition récente du « mouvement anti-vaccin », qui remet en question le recours aux vaccins et leur innocuité en général, y compris la méfiance grandissante de la population à l'égard des instances gouvernementales et des responsables de la santé publique, et la prolifération des communications électroniques, qui, en peu de temps, peuvent propager des renseignements inexacts. On constate en même temps un mouvement d'abandon de la reconnaissance des avantages réels de la vaccination au profit de soupçons accrus d'effets indésirables résultant de l'immunisation. En général, la complaisance actuelle à l'égard de la vaccination et l'opposition croissante à celle-ci soulignent la nécessité d'améliorer les programmes de sensibilisation à l'immunisation, notamment s'il s'agit d'atteindre les taux d'immunisation visés.

Malheureusement, les idées fausses du public à propos de la vaccination ont tendance à persister malgré toutes les preuves scientifiques qu'on apporte pour les réfuter. Il n'existe notamment aucune preuve valide de l'existence d'une relation de cause à effet entre le thimérosal (agent de conservation à base de mercure utilisé dans la fabrication de vaccins) et l'autisme, entre les vaccins anticoquelucheux à germe entier et les lésions cérébrales ou entre le vaccin anti-hépatique B et la sclérose en plaques ou la leucémie. Généralement parlant, la mise en place de programmes efficaces de sensibilisation à la vaccination en vue de surmonter la résistance à son acceptation demeure une nécessité bien réelle; ces programmes sont nécessaires à la promotion d'une confiance accrue du public à l'égard de l'immunisation, l'intervention la plus efficace et la plus sûre en matière de santé publique, surtout lorsqu'on en compare les avantages avec les risques pour la santé que présentent de nombreuses maladies graves évitables par la vaccination.

Au Canada, comme dans beaucoup d'autres pays développés, les taux nationaux de couverture vaccinale sont beaucoup moins élevés que les taux visés dans le cas de plusieurs maladies évitables par la vaccination, tant chez les enfants (p. ex., coqueluche et rubéole) que chez les adultes (p. ex., grippe, infections invasives à pneumocoques). Ces taux sous-optimaux contribuent à réitérer la nécessité de mettre en place des programmes de sensibilisation accrue du public à l'immunisation. Des études récentes révèlent également qu'en dépit du fait que les Canadiens ont, en général, une opinion positive des vaccins (c.-à-d. quant à leur importance, leur efficacité et la nécessité de poursuivre les recherches), beaucoup disent posséder une connaissance insuffisante des vaccins (surtout des questions liées à leur innocuité), éprouver de l'incertitude face à la vaccination ou avoir une opinion négative de celle-ci. Il n'est pas étonnant que des questions du genre aient également été soulevées sur toile de fond de l'actuelle pandémie de grippe A (H1N1), surnommée la « grippe de la confusion »; des études récentes indiquent que les Canadiens sont relativement hésitants (en général) à recevoir le vaccin contre la grippe A (H1N1). Étant donné que pratiquement toutes les théories du « changement de comportement » sont axées sur la connaissance, élément nécessaire du comportement d'adoption, on peut espérer que les efforts de sensibilisation de la population canadienne amélioreront sa réceptivité face au vaccin et augmenteront en retour les taux de couverture vaccinale. Ce qu'il faut

principalement retenir de ces études, c'est qu'on devra prévoir une sensibilisation accrue et opportune du public à l'innocuité et à l'efficacité des vaccins si l'on souhaite promouvoir l'adoption d'une attitude positive vis-à-vis de ceux-ci et maintenir le soutien des programmes d'immunisation futurs.

Après avoir fait valoir, sans équivoque, la nécessité d'améliorer les programmes de sensibilisation à l'immunisation au Canada (compte tenu des idées fausses qu'entretient actuellement le public, des taux de couverture sous-optimaux et de la connaissance insuffisante des vaccins), il est pertinent d'examiner les avenues possibles relatives à la prestation de programmes de sensibilisation. Dans ce contexte, on sait très bien que les professionnels de la santé, y compris les médecins, le personnel infirmier et les pharmaciens, jouent un rôle important dans la sensibilisation du public à la valeur et aux avantages de l'immunisation – et que leurs recommandations ont une grande influence sur les taux de vaccination. Il est donc impératif que ces fournisseurs de première ligne aient en leur possession des renseignements récents, fondés sur des données probantes, afin de pouvoir répondre aux préoccupations du public. Ils doivent également acquérir des compétences efficaces relatives à la communication des risques afin d'établir entre eux et les patients et parents un partenariat fondé sur la prise de décisions éclairées, dans un climat d'ouverture et de respect, qui accepte la perception de chacun à l'égard des risques. Actuellement, toutefois, les vaccinateurs canadiens ne peuvent compter que sur des programmes et ressources diversifiés, non coordonnés, en matière d'enseignement professionnel; il est urgent de leur offrir des programmes de formation plus cohérents.

Les responsables de la santé publique à l'échelle nationale, provinciale et régionale exercent également une influence sur la sensibilisation du public aux questions liées à l'immunisation. Bien que de nombreux spécialistes de la santé publique au Canada soient considérés comme des promoteurs exemplaires de l'immunisation, les responsables de la santé publique ont, dans l'ensemble, fait l'objet de critiques dernièrement quant à leur incapacité de bien communiquer l'importance et les avantages de la vaccination – notamment durant la campagne de vaccination 2009-2010 contre la grippe A (H1N1). Alors que les recommandations contradictoires qui sont formulées d'une province ou d'un territoire à l'autre suscitent beaucoup de confusion à court terme, ce qui préoccupe surtout, c'est que ces messages divergents risquent également de miner encore plus la confiance de la population à l'égard des autorités canadiennes en matière de santé publique. En général, les fonctionnaires ont l'obligation de faire preuve de rigueur scientifique, ce qui indique clairement que la non-vaccination présente des risques encore plus grands. Concernant l'Agence de la santé publique du Canada (ASPC), il est à noter aussi qu'en dépit des progrès réalisés dernièrement par le Groupe de travail pour la formation des professionnels (GTFP) dans l'élaboration du nouveau manuel intitulé Compétences en immunisation à l'intention des professionnels de la santé, peu de progrès ont été accomplis dans le cadre de la Stratégie nationale d'immunisation (SNI) visant à promouvoir l'acquisition et la diffusion de connaissances en vue de soutenir les efforts de sensibilisation du public.

Outre la contribution essentielle des professionnels de la santé et des responsables de la santé publique, de nombreux médias modernes, dont les médias imprimés, la radio, la télévision, le cinéma et l'Internet, sont actuellement reconnus comme de puissants mécanismes exerçant une influence sur les patients et leurs parents. Dernièrement, la publicité s'adressant directement aux consommateurs est devenue un moyen de plus en plus populaire de sensibiliser le public à la vaccination. Les renseignements qui y sont donnés notamment doivent viser principalement à informer le public de la disponibilité d'un vaccin et de l'utilisation qui en est recommandée, et à diriger les patients vers des ressources plus aptes à leur fournir des renseignements éducatifs, y compris des renseignements complets sur les risques et les avantages associés au vaccin. Enfin, étant donné que les programmes de vaccination en milieu scolaire sont un moyen efficace d'administrer les vaccins systématiques aux enfants et aux adolescents, les leaders du secteur de l'éducation (y compris les directeurs d'école, les enseignants, le personnel infirmier et les conseillers d'orientation) font aussi partie intégrante des efforts visant à diffuser des renseignements aux parents et à leurs enfants au sujet de l'immunisation.

Étant donné que l'immunisation est une responsabilité que doivent se partager les instances gouvernementales, les autorités en matière de santé publique, les fournisseurs de soins de santé, les représentants de l'industrie et les familles, tous les intervenants doivent travailler ensemble afin d'élaborer des programmes d'enseignement bien structurés (et d'en tirer pleinement parti) en vue de contribuer à protéger la population canadienne. Afin de réaliser cet objectif commun qu'est l'amélioration de la santé des patients dans le cadre de programmes d'enseignement améliorés, le Comité de l'industrie des vaccins (CIV) de BIOTECanada a formulé les recommandations suivantes à l'intention des intervenants concernés.

Recommandations à l'intention des gouvernements fédéral, provinciaux et territoriaux

1. Afin de réaliser l'un des objectifs les plus fondamentaux en matière de santé publique, tous les responsables de la santé publique au Canada doivent s'efforcer de maintenir et de renforcer la confiance du public à l'égard des programmes d'immunisation.
2. Les mesures politiques destinées à maintenir et à améliorer les taux de couverture vaccinale, principal objectif en matière de santé publique, doivent prévoir la mise en place de ressources et d'infrastructures suffisantes à la prestation de programmes efficaces de sensibilisation aux programmes de vaccination à l'échelle du pays.
3. Les objectifs initiaux de la Stratégie nationale d'immunisation (SNI) et les progrès qui ont été réalisés dans le cadre de celle-ci doivent faire l'objet d'une réévaluation, notamment ceux qui ont pour objet de promouvoir l'acquisition de connaissances en vue de soutenir les programmes de sensibilisation du public.

Recommandations à l'intention d'autres intervenants

4. Tous les intervenants, y compris les fonctionnaires fédéraux, provinciaux et territoriaux, les autorités en matière de santé publique, les fabricants de vaccins, les chercheurs et les professionnels de la santé, doivent travailler à l'élaboration d'un cadre complet et coordonné de communication avec le public et d'autres fournisseurs de soins de santé au sujet des avantages (tant individuels que collectifs) et des risques possibles de la vaccination.
5. Tous les intervenants doivent assumer une responsabilité accrue pour ce qui est d'informer et de rassurer le public concernant les mesures réglementaires rigoureuses qui ont été mises en place pour faire en sorte que des normes très élevées de qualité et d'innocuité soient respectées dans les secteurs de la recherche, du développement, de la fabrication, de l'homologation et de l'utilisation des vaccins au Canada.
6. En ce qui a trait notamment aux fournisseurs de soins de santé, qui sont des sources d'information fiables pour les patients et leurs parents, des programmes améliorés d'enseignement professionnel doivent être mis en place à leur intention dans le secteur de l'immunisation au Canada.
7. On doit améliorer les plans de communication s'adressant notamment au public afin de surmonter les perceptions négatives vis-à-vis des vaccins et de redonner à la population le goût de se faire vacciner – idéalement dans le cadre d'un programme amélioré de sensibilisation qui présente les vaccins comme une intervention fiable et responsable en matière de santé publique.
 - On doit utiliser des stratégies adéquates de communication des risques afin de diffuser des renseignements opportuns, exacts, intelligibles et fondés sur des données probantes au sujet des vaccins et des programmes d'immunisation.
 - Les professionnels de la santé doivent établir entre eux et les patients et parents un partenariat fondé sur la prise de décisions éclairées afin de faciliter l'échange de messages bidirectionnels dans un climat d'ouverture et de respect, qui accepte la perception de chacun à l'égard des risques (ce qui, en retour, peut contribuer à changer les mentalités ou les comportements).

8. *Étant donné qu'au Canada, seuls les professionnels de la santé peuvent administrer des vaccins et que le but principal de la publicité s'adressant directement aux consommateurs est d'informer le public de la disponibilité d'un vaccin et de diriger les patients vers d'autres ressources éducatives, le CIV propose que l'on respecte les exigences relatives au juste équilibre dans les annonces publicitaires de la manière suivante :*
- *Les exigences relatives au juste équilibre doivent être adaptées et appliquées aux supports médiatiques particuliers, en tenant compte des différences sur le plan de la durée de la visibilité et de la quantité de renseignements pouvant être communiqués au public cible (et compris par celui-ci).*
 - *Dans le cas des médias électroniques dont la capacité d'information est limitée (p. ex., les annonces publicitaires à la télévision et à la radio), un juste équilibre peut être respecté en utilisant de brefs énoncés visant à : i) expliquer que toute personne peut recevoir un vaccin donné (ou en obtenir une protection complète); ii) informer des effets secondaires possibles; iii) recommander la consultation d'un professionnel de la santé; et iv) promouvoir la consultation d'autres ressources afin d'obtenir des renseignements complets et équilibrés au sujet des risques et des avantages associés au vaccin.*

8.2 The Need for Vaccine Awareness and Education

Vaccines are viewed as one of the greatest medical advances in the history of humanity. Compared with other health care measures, vaccination has also proved to be one of the most cost-effective health interventions of the 20th century, and has been credited with playing a substantial role in increasing overall life expectancy. However, despite the proven safety, efficacy and value of vaccines, immunization rates remain suboptimal in many developed countries, and several common vaccine-preventable diseases are still not as well-controlled as they could be.¹ While several contributing factors have led to this situation – including inconsistencies in regional vaccination and funding systems – the currently observed lack of compliance with recommended vaccine schedules also underscores the urgent need for improved vaccination awareness and education programs. Thus comprehensive, coordinated education campaigns that target both health care professionals and the public are required, not only to promote greater uptake of existing vaccines, but also to ensure smooth implementation of new immunization programs. In general, while vaccine awareness and educational programs are believed to represent key success factors in realizing high immunization rates, such educational initiatives have also been identified as essential components in achieving vaccine safety and continued success of immunization programs.²

Although it may appear paradoxical, vaccination programs have become (to some extent) the victim of their own success. That is, one of the main barriers in improving current vaccination rates in developed countries has been the tremendous success of vaccination campaigns implemented over the past several decades. In essence, after the near disappearance of specific target diseases from everyday life, these diseases and their complications no longer serve as tangible reminders of the continuing need for prevention through vaccination. Hence many individuals, including most parents and health care providers, have never witnessed the debilitating effects of vaccine-preventable diseases, such as the paralysis caused by polio, or brain damage caused by measles.³ As such, fears of such diseases no longer haunt the public as they once did. Ironically, this lack of direct experience (or fear of “dreaded consequences”) has resulted in increased complacency towards immunization, which has had serious implications for public health – since where vaccination rates have dropped, rates of disease and death have often increased. Specific examples of disease outbreaks have recently been reported in Canada, the United States (U.S.) and Europe, including the resurgence of pertussis,⁴ measles,⁵ mumps,⁶ rubella,⁷ and diphtheria.⁸ Clearly, recent lapses in vaccination rates speak to the need for enhanced education programs to reinforce the continuing need for immunization for both children and adults; the historical success of immunization programs in Canada is not an indication to be less vigilant.⁹

8.3 The Anti-Vaccine Movement and Overcoming Misconceptions

As a complacent attitude towards vaccination has become evident in some parts of the developed world, outright hostility in opposition to vaccination has also surfaced in certain regions, particularly in U.S. and Europe. Multiple factors have converged to facilitate the emergence of an increasingly organized and vocal “anti-vaccine movement” that questions the need for vaccines and their general safety. These factors include not only the declining incidence of vaccine-preventable disease, but also the growing public mistrust of government and public health officials – often influenced by unrelated health scares such as bovine spongiform encephalopathy (BSE), known as mad cow disease, or blood contaminated with human immunodeficiency virus (HIV)¹⁰ – and the proliferation of electronic communications, which can rapidly propagate inaccurate or misleading information.¹¹ Simultaneously, the balance has shifted away from recognizing the true benefits of vaccination towards increased suspicion of adverse effects resulting from immunization.

As a key example that has fueled the recent anti-vaccine movement, concerns regarding an alleged link¹² between autism and thimerosal – a mercury-containing preservative, as previously used in the measles, mumps, rubella (MMR) vaccine – have threatened public confidence in vaccination programs in the U.S and Europe, and to a lesser extent in Canada.¹³ Unfortunately, such concerns (which have been primarily based on misinformation) tend to persist, despite the large body of scientific evidence against them. In particular, several international studies using a variety of epidemiological methods have produced consistent evidence that there is no association between thimerosal and autism. This finding was also endorsed by the National Advisory Committee on Immunization (NACI) after scientific review in 2007.¹⁴ Subsequently, in February 2009, the U.S. Court of Federal Claims made a landmark decision by rejecting all claims that either thimerosal or the MMR vaccine caused autism in children.¹⁵ Furthermore, other concerns regarding vaccine safety that have been raised over the past two decades have also proved to be unfounded. For example, there is no valid evidence to support a causal relationship between whole cell pertussis vaccine and brain damage, or hepatitis B vaccine and multiple sclerosis or leukemia.¹⁶ Following multiple scientific investigations and independent reviews by public health and regulatory authorities, there is consensus that the evidence does not support any link between vaccines and these diseases.¹⁷

Overall, misconceptions regarding vaccines are still common, and tend to negatively influence attitudes towards vaccination. While fears of side effects have been expressed as the most frequent reason for not vaccinating children and adults, other (unsupported)¹⁸ reasons include concerns or misunderstandings pertaining to: i) the safety of vaccine ingredients (e.g. thimerosal, formaldehydeⁱ, aborted fetal tissueⁱⁱ); ii) the adequacy of safety testing; and iii) potential severe long-term consequences to children.¹⁹ Some individuals also believe that children receive too many shots, and thus have expressed concerns regarding “immunization overload” for babies and toddlers. These latter concerns are also unfounded, however, since clinical evidence has demonstrated that the capacity of an infant’s immune system is enormous, and is not compromised by multiple vaccines scheduled within the first two years after birth.²⁰ In general, such misguided convictions – including the belief that children can cope with disease without immunization (which questions the need for immunization and/or the seriousness of vaccine-preventable diseases) – are rarely based on scientific evidence.

A key lesson that has emerged from experiences regarding vaccination concerns in other countries is that once trust is lost in immunization or public health, it is difficult to regain. Ultimately, vaccination concerns and misconceptions could potentially undermine national vaccination programs, thus threatening one of our most effective preventive health care measures. Hence one of the primary goals of public health in Canada is to ensure that confidence is maintained in the safety and efficacy of vaccines; appropriate education represents a critical tool to help instill such confidence and trust. In this context, key messages that need to be disseminated to the public include the facts that no vaccine (or other biologic or pharmaceutical medicine) is 100% safe or effective, yet serious adverse reactions are rare. In fact, the dangers of vaccine-preventable diseases are many fold greater than the risks of a serious adverse reaction to vaccination.²¹ Interestingly, to keep relative risks in perspective, it is noteworthy that about five of the 400,000 Canadian children born each year (virtually all of whom are vaccinated) will have severe reactions to vaccination; this makes childhood vaccines many times safer than over-the-counter medications such as acetylsalicylic acid (Aspirin) and acetaminophen (Tylenol).²²

ⁱ Formaldehyde is a safe preservative used in many vaccines (e.g. influenza vaccines) targeting broad populations.

ⁱⁱ Vaccines do not *contain* aborted fetal tissue. However, the rubella vaccine virus is cultured in human cell lines, some of which have originated from aborted fetal tissue; these cell lines are obtained from cell banks certified by the U.S. Food and Drug Administration (FDA). Very little, if any, residual fetal tissue remains in the final vaccine formulation.

In addition, parents and patients need to be reassured (and consistently reminded) that vaccine safety and quality are highly scrutinized by Health Canada through a series of stringent regulatory controls, including scientific review of clinical trial data, lot release evaluation, and ongoing safety monitoring through surveillance programs (as described in Paper 4). Thus the public needs to be made aware that if a vaccine has been approved, this has not occurred haphazardly – but only after years and years of research have demonstrated an extremely favourable benefit-to-risk profile.²³ Broadly speaking, there is an urgent need for effective vaccine education and advocacy programs to help overcome resistance to vaccine acceptance; such educational initiatives should offer a platform to reinforce the extensive nature of the safety measures taken across all aspects of vaccine research, manufacturing, licensing and use.

Greater efforts are also needed to raise awareness regarding the rigorous scientific review undertaken by the Public Health Agency of Canada (PHAC) – led primarily by NACI – to investigate alleged links between vaccines and serious adverse events, as highlighted above for the thimerosal “debate”. Enhanced communication of such efforts would help demonstrate to the public that their concerns are being addressed appropriately. Overall, coordinated education programs are required to promote greater public confidence in immunization as the single most effective and safe public health intervention, especially when weighed against the health risks associated with many serious vaccine-preventable illnesses.²⁴

8.4 Recommended Vaccine Schedules and Coverage Rates in Canada

8.4.1 Provincial/Territorial Immunization Schedules

As described in Papers 5 and 6, official vaccine recommendations are made primarily at the national level as led by NACI, yet decisions regarding integration of new vaccines into publicly-funded immunization programs are chiefly a provincial/territorial (P/T) responsibility. Hence publicly-funded immunization schedules vary across jurisdictions; details regarding recommended immunizations for specific target populations are provided online by the PHAC (see Table 8.1).²⁵ Since P/T immunization schedules change regularly, health professionals and the public are encouraged to contact individual provinces/territories directly for the most recent information regarding recommended immunization programs.

Table 8.1 – Publicly-Funded Immunization Schedules

Target Population or Program	Website
Routine schedule for infants and children	www.phac-aspc.gc.ca/im/ptimprog-progimpt/table-1-eng.php
High risk groups	www.phac-aspc.gc.ca/im/ptimprog-progimpt/table-2-eng.php
Public funding for annual influenza vaccination	www.phac-aspc.gc.ca/im/ptimprog-progimpt/flu vacc-eng.php
Provincial/Territorial contact information (for latest immunization schedules)	www.phac-aspc.gc.ca/im/is-pi-eng.php

Source: Immunization Schedules: NACI Recommendations and Provincial/Territorial Immunization Programs; www.phac-aspc.gc.ca/im/is-vc-eng.php.

8.4.2 Current Vaccine Coverage Rates

While recommended vaccine schedules vary across provinces and territories, actual immunization coverage rates also vary across Canada – although there is a paucity of current systematic data comparing jurisdictional coverage rates. In general, immunization coverage rates are considered an important health indicator because they represent sensitive measures of the susceptibility of a population to vaccine-preventable diseases, and can also be used as a proxy measurement to evaluate health services and interventions.²⁶ It is broadly believed that immunization coverage rates should generally be well over 90% to adequately prevent and control vaccine-preventable diseases. To this end, the World Health Organization (WHO) has stated that all countries should achieve a 90% national coverage rate for routine immunization by 2010 or sooner.²⁷

In Canada, excellent coverage rates have been achieved for certain childhood vaccines, including (for example) 95% pneumococcal vaccination rates, administered in three or four doses. However, national coverage rates remain significantly lower than immunization target rates for several vaccine-preventable diseases, both in children and adults, as observed in many other developed countries. For example, the target immunization coverage rate for pertussis (whooping cough) vaccine for two-year-olds has been set at 95% by 2010, i.e. as part of the national goals developed at the National Consensus Conference for Vaccine- Preventable Diseases in Canada, Quebec City, 2005.²⁸ However, according to the latest published data, the 2004 National Immunization Coverage Survey (NICS) indicates that the actual pertussis vaccine coverage rate for two-year-olds is only 74% – and has dropped from 83% since 1997.²⁹ In addition, the 2010 target immunization coverage rate for rubella (German measles) in two-year-olds is 97%, yet only 61% of two-year-olds were up-to-date in 2004 for all of the NACI-recommended number of doses for the combination of measles, mumps and rubella, as well as diphtheria, tetanus, polio and *Haemophilus influenzae* type b (Hib) vaccinations.³⁰

In adults, key examples of vaccine-preventable disease for which coverage rates are less than optimal include invasive pneumococcal disease and influenza. While the 2010 national goal for immunization coverage in individuals ≥ 65 years with a single dose of pneumococcal polysaccharide (conjugate) vaccine is 80%, actual coverage with pneumococcal conjugate vaccine in this age group has been reported to be only 42%.³¹ Furthermore, the 2010 national goal for influenza immunization coverage for persons ≥ 65 years is also set at 80%, yet in 2008, the influenza immunization rate for adults in this category was 67%.³² Indeed, just under one third of all Canadians were immunized against seasonal influenza in 2008, falling well below optimal coverage rates. In addition, suboptimal immunization rates currently render the Canadian adult population vulnerable to diseases such as pertussis and tetanus.³³ Finally, although no national goals have been established for adult immunization against hepatitis A and B or shingles (which do not represent a significant public health threat), actual coverage rates in adult Canadians are known to be extremely low for these vaccine-preventable diseases.

Collectively, these data on current vaccination rates in Canada illustrate the requirement for increased public awareness regarding the continued need for immunization. First, it is critically important that parents understand the need to ensure their children receive all doses of recommended vaccines, since infants have not yet developed immunity to many bacteria and viruses, and hence are particularly vulnerable to vaccine-preventable diseases.³⁴ For example, four doses are required across Canada in the routine childhood series for the dTap-IPV-Hib (diphtheria, tetanus, and pertussis, inactivated polio, *Haemophilus influenzae* type b) vaccine, and several other childhood vaccines require multiple doses, depending on jurisdictional immunization schedules (see Table 8.1). Second, adults and parents also need to be made aware that vaccination is not just for children – and that immunization should continue through all stages of life, following a standard schedule that ensures the maximal protection is achieved.³⁵ Third, a vital message to articulate to the public is that while vaccines offer personal protection from diseases, immunization also protects other individuals in the broader social environment, including immediate family and community members. As one potentially alarming example, adults (including parents and caregivers) who contract pertussis can infect infants who may not have completed the full schedule of immunization.³⁶ Finally, achieving target immunization rates also benefits individuals and communities by decreasing both the health and economic burden of disease in Canada, including reduction in workplace absenteeism.^{37,38} Overall, enhanced education programs are needed to clearly convey these key messages in promoting greater immunization coverage rates – and should help to ensure that Canadians make the best use of currently available vaccines.

8.5 Public Perception of Immunization: Awareness, Attitudes & Beliefs

8.5.1 Canadian Survey Data

As a means of gaining further insight into the current low immunization coverage rates in Canada (and more importantly, the need for enhanced education programs), it is useful to examine survey responses provided by the Canadian public regarding their immunization knowledge, attitudes and beliefs – as compiled from recent studies encompassing over 4,000 Canadians (see highlights of three major surveys, as presented in Table 8.2). Taken together, these survey data indicate that while Canadians generally hold positive views of vaccines (e.g. pertaining to vaccine importance, efficacy, and the need for continued research), significant proportions of respondents demonstrated insufficient knowledge (especially regarding safety issues), uncertainty, or negative attitudes towards vaccination. It is noteworthy that one of these studies also reported that gender, level of education and employment status were significant factors in influencing the number of responses that indicated a lack of knowledge, such as “don’t know enough to comment”.³⁹ More broadly, other international studies have also demonstrated that attitudes towards vaccination can be culturally influenced or depend on ethnic background.⁴⁰

Interestingly, Canadian survey results have also shed light on other attitudes towards immunization, including strong beliefs that physicians are the most credible source of information regarding vaccination, and that the government should fund recommended vaccines (or conversely, that non-government funded vaccines may be less of a priority for children).⁴¹ The latter view has also been voiced in other independent industry surveys regarding the use and funding of biopharmaceuticals (including vaccines) in Canada.^{42,43} In addition, the most recent Canadian study regarding immunization awareness⁴⁴ has confirmed that – among those respondents with children – self-protection from disease is viewed as paramount, yet roughly one third of parents did not choose “protect my loved ones from disease”, i.e. when asked to choose all the factors that would motivate them to keep adult immunizations up-to-date. Clearly, this result corroborates the need to further educate the public regarding the importance of adult immunization in preventing the spreading of disease to other individuals in the broader community.

Table 8.2 – Canadian Survey Data Regarding Immunization Awareness, Knowledge & Attitudes

Survey Title and Publishers	Year Conducted	Number of Respondents	Highlights of Study Findings (Refer to original publications for full survey results.)
<p>National Immunization Awareness Week Survey</p> <p>Leger Marketing⁴⁵; as commissioned by the Canadian Coalition For Immunization Awareness & Promotion (CCIAP)</p>	2008	N = 1,600 adults	<p>☺ The majority of respondents were aware of the seriousness of meningitis, influenza, tetanus, pneumococcal disease (72%, 67%, 57%, 56% respectively).</p> <p>☹ 12% did not have their immunizations up-to-date; another 21% weren't sure.</p> <p>☹ 32% (of the subset that did not have immunizations up-to-date) stated the doctor had not told them; another 23% stated they were unsure what they need.</p> <p>☹ Only 11% were aware that their immunization record needed to be reviewed every 10 years.</p> <p>☺ 82% selected “protect myself from disease” when asked to choose all the factors that would motivate them to keep immunizations up-to-date.</p> <p>☹ 31% (of the subset with children) did not choose “protect my loved ones from disease” when asked to choose all the factors that would motivate them to keep immunizations up-to-date.</p>
<p>A Canadian National Survey of Attitudes and Knowledge Regarding Preventive Vaccines</p> <p>Ritvo, P., Irvine, J. et al.⁴⁶</p>	2002	N = 1,057 adults	<p>☺ Vaccine <u>research</u>: 86.8% endorsed the statement (strongly agreed or agreed), “The government should invest more money in the development of vaccines for serious diseases like AIDS, hepatitis and cancer”.</p> <p>☺ Vaccine <u>efficacy</u>: 79.4% endorsed the statement (strongly agreed or agreed), “Vaccines have, over the years, produced many more health benefits than health troubles”.</p> <p>☹ Vaccine <u>knowledge</u>: 32.1% endorsed the statement (or indicated insufficient knowledge, uncertainty or inability to comment), “I don't really know what a vaccine is and how it works”.</p> <p>☹ Vaccine <u>safety</u>: 40.4% indicated insufficient knowledge, 4.8% indicated uncertainty, and 10.5% agreed with the negatively worded statement, “The safeguards used in making vaccines are slack and ineffective”.</p> <p>☹ <u>Opposition</u> to vaccines: 61.7% were reluctant to dismiss the statement, “Those people who take anti-vaccine positions are highly prejudiced and ill-informed, scientifically”.</p>

Survey Title and Publishers	Year Conducted	Number of Respondents	Highlights of Study Findings (Refer to original publications for full survey results.)
<p>Canada's Largest Ever Survey of Canadian Parents on Their Attitudes Towards Childhood Vaccinations</p> <p>Ipsos Reid⁴⁷; as commissioned by Wyeth-Ayerst Canada</p>	2001	N = 1,500 parents of children < seven years	<p>☺ 74% rated “having children immunized” as a ‘10’ on a scale of 0 (not at all important) to 10 (extremely important) – beating out healthy diet, washing their hands and exercise.</p> <p>☺ 59% were very confident that vaccines are very beneficial (‘9’ or ‘10’ on scale of 0 to 10); another 25% gave a rating of ‘8’ out of 10.</p> <p>☺ 90% felt all children should have the standard vaccinations.</p> <p>☺ 91% expressed their belief that vaccinating children may ease the burden on the health care system.</p> <p>☺ 82% stated they actively seek the most recent information about vaccinations.</p> <p>☺ 75% stated they would turn to their physician for information on vaccines; physicians were also considered most credible source of information.</p> <p>☺ 92% felt governments should fund all vaccines.</p> <p>☺ 21% considered non-government funded vaccines less of a priority for their child.</p>
<p>Legend:</p> <p>☺ Response indicates positive/supportive attitude</p> <p>☹ Response is neutral (cannot be easily classified as ☺ or ☹)</p> <p>⊗ Response indicates lack of knowledge or uncertainty</p>			

In the context of the growing body of Canadian survey data regarding immunization beliefs, it appears likely that attitudes and self-perceived knowledge held by survey respondents – particularly regarding vaccine safety and efficacy – may influence their willingness to accept existing and/or novel vaccines. Notably, virtually all substantial theories of “behaviour change” focus on knowledge as a necessary factor in adoptive behaviour.⁴⁸ Hence educational efforts directed towards the Canadian public may be expected to improve vaccine receptivity and in turn, increase immunization coverage rates. However, the present lack of knowledge regarding immunization (or mistrust in the public health system) may make Canadians vulnerable to the influence of anti-vaccination groups or other misinformation – ultimately rendering them (and their children) susceptible to vaccine-preventable diseases if they refuse vaccination. Thus the support expressed for vaccines by the majority of Canadians in several recent surveys could potentially be undermined by unfounded fears, based on widely publicized and/or sensationalized reports of adverse events. Overall, a critical takeaway point that emerges from these studies is that enhanced, timely public education will be required to build upon current positive attitudes towards vaccination, and moreover, to maintain support for future immunization programs.

8.5.2 Current Challenges Surrounding Seasonal & H1N1 Influenza Vaccines

As potentially might have been expected, several key themes described above regarding public attitudes and uncertainty towards vaccination in general have also been echoed recently within the specific context of the current influenza A H1N1ⁱⁱⁱ pandemic. Preliminary survey results had indicated that Canadian adults would be relatively reluctant to receive the H1N1 vaccine (initially made available in Canada in late October 2009),⁴⁹ with a significant decline in “willingness to accept” rates reported in successive surveys, i.e. ranging from a high of 62% in July 2009 to a low of 33% in October 2009.^{50,51} These surveys, as well as other earlier studies, suggested that potential hesitancy to receive the H1N1 vaccine shot may be based on the perceived low risk of being infected (or lack of knowledge regarding the potential seriousness of H1N1 disease), as well as the need for additional information regarding vaccine safety and effectiveness.⁵² However, it is difficult to ascertain how representative survey findings are, in terms of predicting real behaviour such as actual immunization refusal. Indeed, while initial demand for the H1N1 vaccine at clinics across Canada has been higher than might have been predicted from early survey/poll results, it still remains to be seen how high *total* demand (overall uptake) for/of the H1N1 vaccine will be for the entire 2009/2010 flu season, i.e. among designated priority groups and the general public.

In the weeks prior to initiating the H1N1 vaccine campaign, there had been significant concern that vaccine uptake might be disappointingly low,⁵³ particularly since controversial (unpublished) data had surfaced at a very late stage in the finalization and promotion of plans for influenza vaccine roll-out. These data, as publicly announced by the government, suggested that individuals ≤ 50 years who have been previously vaccinated against seasonal flu have twice the risk of contracting H1N1, compared to unvaccinated persons.^{iv} As individual provinces and territories then suddenly announced adjustments to roll-out plans for both seasonal and H1N1 influenza vaccines – with significant disparities in sequencing and timing for various priority groups⁵⁴ – these inconsistencies were said to be causing an “*epidemic of confusion*” among the Canadian population.⁵⁵ While conflicting recommendations regarding priority groups across jurisdictions continue to cause great confusion in the short term (and may ultimately reduce H1N1 vaccine uptake), an over-arching concern is that mixed messages may lead to broader erosion of trust (and loss of credibility) by Canadians in public health authorities and future vaccination programs.⁵⁶

In addition, other uncertainties, surrounding: i) the current unpredictability of H1N1 vaccine supply and delivery (i.e. will adequate vaccine be available prior to the peak of the second wave of the H1N1 flu?); ii) current vaccine formulations (e.g. including the use of adjuvants, or “chemical boosters”, for all H1N1 vaccine delivered to Canadians – with the exception of the unadjuvanted version being delivered to pregnant women); and iii) the adequacy of clinical trial data to ensure safety, are also adding to the “confluence of confusion” that could underpin poor vaccine acceptance by the public.^{57,58,59} In a nutshell, the current environment of escalating doubt underscores the urgent need for the public to be given up-to-date information and clear direction, i.e. to encourage uptake of both seasonal and H1N1 flu vaccines being offered across the country; it also helps reiterate the ongoing need for improved public education regarding current and emerging issues in immunization. Such public education is primarily a government responsibility, since immunization is a population-based health intervention, although industry players may also contribute by providing evidence-based data through continued vaccine research.

ⁱⁱⁱ H1N1 refers to hemagglutinin sub-type 1, neuraminidase sub-type 1 (of the influenza A virus); H1N1 flu is referred to as the “swine flu”.

^{iv} This research was led by Canadian scientists Skowronski, D. and De Serres, G., and is undergoing (as of October 2009) peer review prior to potential publication in an un-named scientific journal.

8.6 Delivery of Educational Programs in Immunization

Having unambiguously argued the case for the need to improve immunization awareness and education programs in Canada (i.e. based on currently held misconceptions, insufficient knowledge or uncertainties regarding vaccine safety and efficacy, and suboptimal vaccine coverage rates), it is pertinent to examine relevant avenues for education program delivery – primarily via health care professionals, public health officials, the media, and the Canadian school system. Since immunization is a shared responsibility across health care providers, government and public health authorities, industry players, and families, all stakeholders must work together to develop (and realize the full benefits of) well-structured educational programs to help protect the Canadian population.

8.6.1 National Immunization Strategy (NIS) Goals in Education

As described in Papers 5 and 6, a National Immunization Strategy (NIS) was introduced in Canada in 2003, in efforts to end disparities in immunization programs across individual provinces and territories. Although the NIS has moved closer to realizing its broad goals of reducing vaccine-preventable diseases and ensuring equitable access to childhood and adolescent vaccines, many challenges remain ahead in achieving specific goals, including the need to develop more effective professional and public education programs (among other weaknesses identified).⁶⁰ Notably, the Professional Education Working Group (PEWG) has been set up as one of several sub-groups to support the Canadian Immunization Committee (CIC) in meeting NIS goals; the PEWG is responsible for making recommendations regarding professional development strategies and learning opportunities for immunization professionals. In 2008, the PEWG released a comprehensive, multi-disciplinary educational resource entitled, “*Immunization Competencies for Health Professionals*”,⁶¹ with intended use in developing course curricula in Canada, and to support immunization professionals in gaining the core knowledge needed to effectively deliver immunization and communicate its importance to patients.⁶² However, despite recent progress in developing professional education materials, there has been little concrete evidence of progress made under the NIS in advancing knowledge development and dissemination to support public education programs.⁶³

8.6.2 The Role of Health Care Professionals & Key Resources

It is well recognized that health care professionals play a critical role in educating the public regarding the importance and value of immunization, and that recommendations from such professionals are a strong determinant of vaccine uptake. Indeed, Canadian survey data have consistently demonstrated that health care providers – particularly family physicians, pediatricians, nurses and (increasingly) pharmacists – are the chief influencers in discussions pertaining to immunization, and in helping patients/parents to accept recommended vaccines against infectious disease.^{64,65,66,67} Hence these front-line immunization providers must be prepared to effectively address public concerns and to proactively counter immunization controversies, especially since patients are presently entering clinics armed with both information and misinformation from a variety of sources, including the Internet (see Section 8.6.4).⁶⁸ Unsurprisingly, it has been shown that immunization provider concerns regarding vaccine efficacy and safety, as well as lack of knowledge about vaccine indications and contraindications, are common reasons for noncompliance with immunization recommendations.⁶⁹

With specific regard to nurses, two surveys conducted in 2007 and 2008 have confirmed that the great majority (97%) of Canadian nurses perceive routinely recommended vaccines as very useful.^{70,71} Both studies also demonstrate that nurses’ willingness to recommend vaccines is associated with the availability of evidence-based information regarding immunization programs; nurses give clear priority to vaccines for which they feel knowledgeable, having received sufficient information for their needs. Overall, willingness to recommend a vaccine was consistently associated with perceived vaccine safety, usefulness of a potential immunization program, and professional support of a new vaccine. Since registered nurses play a key role in influencing Canadian patients and parents, their positive attitudes towards vaccination programs should not be taken for granted. A key conclusion of these studies is that targeted educational efforts are required to ensure that nurses’ information needs are met – and thus to encourage active support by nursing teams in delivering successful immunization programs to prevent infectious disease.

As trusted information sources, health professionals (including physicians, nurses, and pharmacists) are expected to provide expertise in the principles of immunization, as well as to demonstrate skills in the practice of effective risk communication. Thus, to overcome vaccine concerns and potential immunization refusal, a high-level goal for effective risk communication is to develop rapport through an informed decision-making partnership between a health professional and parent/patient. This process involves both education and advocacy, and is facilitated by clear two-way messaging within an open, respectful atmosphere that acknowledges individual perception of risk.

Several strategies have been proposed to support positive, effective risk communication in the context of immunization education.^{72, 73, 74, 75} Collectively, these approaches emphasize the need to: i) create an environment of trust and compassion in which the parent or patient feels heard and understood (and is willing to modify behaviour); ii) frame the science in a personal/emotional manner that acknowledges the perceived “dreaded consequence” (which may be influenced by individual experience as well as religious and cultural beliefs); and iii) to proactively steer the discussion through an introduction, presentation of evidence-based messages, and a predetermined point of closure (if necessary, directing individuals to additional resources tailored to specific belief systems). While implementing these techniques may place an extra time burden on the tight schedules of immunization providers,⁷⁶ careful and timely counseling will help individuals weigh the risks of vaccine-preventable disease and the benefits and risks of vaccines, and thus should encourage improved vaccine acceptance rates. Overall, by providing vaccines in a climate of appropriate informed consent, health providers can play a vital role in ensuring immunization maintains its status as one of the most effective public health measures available in Canada today.

Within the broader context of vaccine administration and opportunities for educating the public, it should be emphasized that wide variation exists in the provision of immunization across jurisdictions in Canada. Specifically, 2006 data indicates that the vast majority ($\geq 80\%$) of immunizations are provided by physicians in Ontario and Nova Scotia, whereas the vast majority ($\geq 94\%$) are provided by public health nurses in other jurisdictions, including Alberta, Saskatchewan, and all three territories.⁷⁷ In addition, wide variation is also observed across Canadian medical, nursing, and pharmacy schools in terms of immunization-related curriculum, the time allocated to teaching designated content, and delivery methods.^{78, 79} Moreover, the status of continuing education for immunization providers is even less clear.⁸⁰

Given these significant disparities, more consistent and cohesive programs are required for immunization education in Canada; it is hoped that the PEWG’s core competencies document (as introduced above) will serve as a national, standardized framework to guide curriculum development at all levels of training (potentially leading to more rigorous certification processes), and to support immunization providers in maintaining public confidence in recommended vaccines. Consistent with many of the “essential topics” outlined in the PEWG’s recent competencies publication, BIOTECanada’s current Vaccine Industry Committee (VIC) white paper series provides complementary in-depth discussion of the opportunities and challenges across the entire vaccine development chain in Canada. This series represents a broad-based educational resource for all stakeholders across Canada’s vaccine landscape – supporting not only professional and public education initiatives, but also fostering partnerships across government agencies, national/regional advisory bodies, public health officials, and the research and investment communities, i.e. by promoting the full value of immunization and vaccine innovation.

At present, a diverse, uncoordinated array of professional educational resources and training programs is available for Canadian vaccine providers in staying up-to-date on immunization issues, as summarized in Table 8.3. Within the specific context of written communication via academic journal publications (as a key information source), it should be noted that a plea has been made for the use of clear, precise language on vaccine safety, particularly to avoid possible misunderstandings by other health care professionals – and potentially also politicians, journalists and the general public – in interpreting scientific findings.⁸¹ An extensive range of general immunization training materials for health professionals (including digital media such as podcasts) is also available online through the U.S. Centers for Disease Control and Prevention (CDC) website.⁸²

Finally, the reader is referred to Paper 2, Section 2.5.3, for further details regarding other medical/professional societies and related associations supporting immunization education in Canada. Notably, the medical profession – working in partnership with consumer/patient advocacy groups and vaccine manufacturers – also plays a vital role in advocating the true value of vaccines to government officials, i.e. to promote support by relevant decision makers in creating a favourable vaccine funding and policy environment in Canada. Such advocacy initiatives have proven effective in educating policy makers, and thus in encouraging the adoption of new vaccine technologies, thereby promoting more equitable, timely patient access to innovative vaccines.⁸³ In general, recommendations put forward by professional associations help to endorse the importance and benefits of immunization by contributing additional balance and sound medical judgment on topics related to vaccine-preventable disease.

Table 8.3 – Professional Educational Resources for Canadian Immunization Providers

Resource Category	Details & Websites
Key Publications*	<ul style="list-style-type: none"> • “<i>Canadian Immunization Guide</i>” [Seventh Edition, 2006; www.phac-aspc.gc.ca/publicat/cig-gci/index.html] • “<i>Immunization Competencies for Health Professionals</i>” [Developed by the Public Health Agency of Canada (PHAC) & the Professional Education Working Group (PEWG); www.phac-aspc.gc.ca/im/ic-ci-eng.php] • “<i>Building on the Legacy of Vaccines in Canada: Value, Opportunities and Challenges</i>” White Paper Series [Developed on behalf of BIOTECCanada's Vaccine Industry Committee (VIC); www.biotech.ca/vaccines] • Canadian and international scientific journals
Major Conferences	<ul style="list-style-type: none"> • Canadian Immunization Conference (CIC) [Biannual event: Ninth CIC conference to be held in December 2010; www.phac-aspc.gc.ca/cnic-ccni/2010/index-eng.php] • Canadian Public Health Association (CPHA) [Annual event: CPHA Centenary conference to be held in June 2010; www.cpha.ca/en/about/100.aspx]
Professional Development Courses	<ul style="list-style-type: none"> • Canadian Paediatric Society (CPS) Immunization Provider Training Program [Annual event, targeting residents from pediatrics, community health, family medicine and infectious diseases, as well as family physicians, pediatricians and pediatric nurses; www.cps.ca/English/ProEdu/ImmunizationTraining.htm] • Immunization Education Initiative (IEI) Education Sessions [Monthly sessions, primarily targeting nurses; www.immunizationeducation.ca] • An Update on Swine Flu: Update for Physicians [Example of a disease-specific Continuing Medical Education program, Presented Live Online: April 28th, 2009, 7 pm; archived at: http://cme.medicine.dal.ca/online/ArchiveApril28_1.html]

Resource Category	Details & Websites
Other Training Programs and Collaborative Partnerships	<ul style="list-style-type: none"> • Canadian Training Programs in Vaccinology [British Columbia Centre for Disease Control (BCCDC), www.bccdc.ca; Canadian Center for Vaccinology (CCfV), www.centerforvaccinology.dal.ca; and the Vaccine and Infectious Disease Organization (VIDO) and the International Vaccine Centre (InterVac), www.vido.org] • Other Graduate Level Studies in Vaccinology and/or Public Health [e.g. University of Manitoba, University of Waterloo, Lakehead University] • Workshops and Personnel Exchanges [coordinated by the Western Canadian Vaccine Network (WCVNet); www.wcvnet.ca] • Emerging Training Programs [currently under development by the Pan-Provincial Vaccine Enterprise (PREVENT); http://128.233.192.88/what_we_do/training.php]
Industry-Based Educational Materials	<ul style="list-style-type: none"> • Vaccine manufacturers also develop educational programs and materials for front-line health care professionals (as well as vaccine recipients and caregivers), as an integral part of vaccine program planning functions. These educational resources are varied; they provide information regarding specific vaccines, and their contents are designed to meet the needs of the intended target audience(s).
<p>* Two excellent examples of other recent educational publications that target the general public include the books entitled, <i>“The Flu Pandemic And You: A Canadian Guide”</i> (2006) by Dr. Vincent Lam and Dr. Colin Lee, and <i>“Soap and Water & Common Sense”</i> (2009) by Dr. Bonnie Henry – both written by Canadian medical professionals.</p>	

8.6.3 The Role of Public Health

In addition to front-line health care professionals, public health officials at the national, jurisdictional and local levels all hold influential positions in guiding and educating the public with respect to the value of immunization. However, while several individual public health experts are regarded as exemplary, strong advocates of immunization, on the whole, Canadian public health officials have recently been criticized in terms of their inability to effectively communicate the importance and tremendous benefits of vaccination. Notably, as identified in the 2008 Canadian Institutes of Health Research (CIHR) report entitled “Vaccines for the 21st Century”, one of the six key vaccine-related challenges in Canada is that the public lacks accurate knowledge regarding the safety and efficacy of vaccines (see Paper 3).⁸⁴ In this context, the CIHR report states that public health experts need to do a better job at educating the public, and that such efforts will be critical since, as voiced by one survey respondent, “*We can have the best vaccines in the world, but they will remain on the shelf if people do not want them.*” In general, public health officials need to play a significantly more active role in correcting inaccurate information regarding the relative risks and benefits of vaccination; publicly-funded officials have an obligation to stand up for science, which clearly indicates that lack of vaccination is associated with even greater risks.⁸⁵

Two recent examples further illustrate the alleged weaknesses in public health responses to immunization controversies in Canada. First, it has been suggested that part of the reason the anti-vaccine movement has recently flourished – particularly surrounding the vaccine-autism debate – is that public health officials have been inept at promoting the benefits of vaccination, and even worse at answering legitimate questions from parents.⁸⁶ This example adds weight to the argument that parents should be provided with reassuring facts in plain language from public health experts (as well as health care professionals), rather than being left to rely on international court rulings.

Secondly, the discrepancies announced in the Fall of 2009 regarding individual jurisdictional approaches to rolling out seasonal and H1N1 influenza vaccine programs (see Section 8.5.2) – as well as subsequent adjustments, inconsistencies and violations in delivering the vaccine to intended priority groups during the early phase of the H1N1 vaccine campaign – have shaken public confidence in public health officials.^{87,88} In essence, Canadians are being treated as if they should accept whatever jurisdictional and regional officials decide, regardless of what the public might consider to be equitable or fair. However, the greatest danger is that heightened confusion and doubt may decrease public willingness to participate in either influenza immunization program, potentially resulting in more cases of severe illness or death.⁸⁹ Furthermore, given the current delays in H1N1 vaccine availability, and continued concern that the vast majority of vaccine doses may arrive too late (i.e. after the second wave of flu is anticipated to wane in late November), apprehension is now rising regarding the possibility that significant H1N1 vaccine inventory will indeed be left “sitting on the shelf”. In this case, public health officials will face an even bigger challenge of persuading the public to receive flu shots when the worst of the season may in fact be over.

Overall, the current environment of discord, uncertainty and mistrust surrounding H1N1 vaccination is counterproductive to immunization efforts. Moreover, as noted by Liberal Health Critic, Dr. Carolyn Bennett, the fundamental rationale for creating the PHAC’s Public Health Network (PHN) – including the introduction of the NIS and the pan-Canadian CIC structure – was to help achieve national consensus in making a single decision on essential immunization issues.⁹⁰ In contrast, the current “*epidemic of confusion*” pertaining to influenza vaccine programs provides evidence that the PHN is still far from reaching this goal, and in Dr. Bennett’s words, is “*very upsetting*” to the Canadian public.

8.6.4 The Role of the Media & Direct-To-Consumer Advertising

Several modern media tools are currently recognized as powerful mechanisms for influencing parents and patients; such tools encompass print media, radio, television, film, and the Internet (including burgeoning social media⁹¹ forums such as chat rooms, blogs, Facebook, YouTube, and Twitter). The media can have a positive or negative effect on public perception of vaccination. For example, mass media strategies can play a positive role in promoting vaccination and/or by informing the public of regional clinic locations and dates. In addition, proliferation of information through multi-media sources has increased public knowledge regarding the characteristics, risks and benefits of vaccines, and as a result, parents and patients play a more prominent role in decisions regarding vaccines.⁹² Unfortunately however, the quality of information provided by the media (which often relies on short sound bytes) is variable and frequently sensational, filled with emotionally charged anecdotes of negative occurrences that coincided in time with vaccination administration.⁹³ Hence as information consumers, patients have become increasingly vulnerable to potentially unfounded fears – through rapid dissemination of misleading data and claims.

While the Internet has become an increasingly pervasive “go to” source for up-to-date information, rapid electronic communication has also helped fuel the anti-vaccine movement⁹⁴ – which has a strong Web presence, and thus can skillfully propagate dramatized cases of vaccine adverse events without regard to scientific facts. Common online claims include allegations that vaccines cause idiopathic illness; vaccines erode immunity; adverse reactions are underreported; and vaccine policy is motivated by profit.⁹⁵ In Canada, one particularly active anti-vaccination community on the Web is known as the Vaccine Risk Awareness Network (VRAN); ironically, this group advertises itself as a “not-for-profit educational society”.⁹⁶ To help counter such vaccine opponents, individuals searching the Internet should be prepared to question information sources, and to seek credible websites featuring peer-reviewed scientific articles that present balanced, objective facts regarding risks and the exact nature of reported adverse events. To this end, tremendous progress has been made by the Canadian Coalition for Immunization Awareness & Promotion (CCIAP) in creating such a website targeting the Canadian public. More broadly, the CCIAP acts as a national partnership – spanning across non-governmental, professional, health, consumer, government and private sector organizations – to promote the understanding and use of vaccines recommended by NACI.⁹⁷

As another form of media outreach, direct-to-consumer (DTC) advertising – primarily via television, radio, or Internet – has been controversial, not only for vaccines, but also for other pharmaceutical drugs.⁹⁸ Under Canada's *Food and Drugs Act*,^v vaccines are not subject to the same advertising restrictions as for prescription drugs, nor are they covered by the less stringent rules for nonprescription drugs.⁹⁹ Recently, Health Canada's Marketed Health Products Directorate (MHPD) has invited industry review of its draft Interim Guidance document entitled, “Fair Balance in Direct-to-Consumer Advertising of Vaccines”. Members of BIOTECanada's VIC and Canada's Research-Based Pharmaceutical Companies (Rx&D) are in fundamental agreement with the guiding principles of the draft document; industry members concur with the need for DTC advertising to present accurate, objective, and balanced information on the benefits and risks of specific vaccines, i.e. to promote sound decision making by patients regarding vaccination.

Members of both industry associations also hold the opinion that advertisements cannot replace – but are complementary to – personal “two-way” consultations between patients and qualified health care professionals.^{100,101} Indeed, only a trained health care professional is able to provide, prescribe, or administer a vaccine to a patient in Canada. For this reason, the information presented in a DTC advertisement should be intended primarily to inform individuals of the availability of a vaccine and its recommended use, and to direct patients to appropriate sources that have greater capacity to deliver educational content, including complete risk-benefit information.

In addition, a key recommendation of both the VIC and Rx&D is that fair balance requirements should be adapted and applied to specific media formats, allowing for differences in the time of exposure and the volume

^v Although Health Canada is responsible for enforcing drug advertising regulations, in practice, the Pharmaceutical Advertising Advisory Board (PAAB), Advertising Standards Canada (ASC), and the Broadcast Clearance Advisory (BCA) serve as preclearance agencies to assist in the regulation of DTC advertising for drugs and vaccines in Canada; see www.hc-sc.gc.ca/dhp-mps/advert-publicit/meet-reunion/2009_04_07_rod_rdd-eng.php.

of information that can be conveyed to (and *understood* by) the target audience. For example, for short television and radio ads that have limited information capacity, it is proposed that fair balance could be achieved by including statements of the following nature, as applicable: i) an explanation that everyone may not be fully protected by the vaccine; ii) a warning that the vaccine may not be suitable for everyone; iii) a warning of the possibility of adverse events; iv) a recommendation to consult with a physician to confirm the suitability of the vaccine; and v) a reference to another source of additional, complete, objective and balanced information. As of October 2009, the MHPD is reviewing industry feedback, and is continuing internal consultations regarding DTC advertising of vaccines, also including input from the PHAC. Once available, the final Interim Guidance document will be posted on Health Canada's website.

8.6.5 The Role of the School System

School-based immunization programs are well recognized as an effective means of delivering routine vaccines to children and teens in primary/high school – and to help ensure that all recommended vaccine doses are administered.¹⁰² In fact, the administration of vaccines by public health nurses through school-based programs has been shown to be an efficient, cost-effective strategy that benefits both health and school performance.¹⁰³ As key examples in Canada, successful school-based immunization programs have been implemented to deliver vaccines against hepatitis B,¹⁰⁴ diphtheria, tetanus, and pertussis (dTdap),¹⁰⁵ and human papillomavirus (HPV)¹⁰⁶ to adolescents. Since parents act as primary guardians and decision makers for school-aged children, it is critical that parents have access to timely, accurate information regarding the value and benefits of immunization programs in schools – with adequate time for providing consent to vaccinate. School principals, teachers, nurses, guidance counselors, and other educational leaders play an integral role in disseminating such information to both parents and their children.

As the most recently introduced vaccine for Canadian adolescents, the HPV vaccine provides an excellent example to illustrate potential avenues for developing communications materials targeting educators and students in Canadian schools. To support the launch of the HPV vaccine in 2006, federal funding was provided to the Society of Obstetricians and Gynecologists of Canada (SOGC) to develop resources for teachers, as well as health care professionals. These educational materials were provided online in readily accessible language at www.hpvinfos.ca, with specific navigational tabs for teens, adults, parents, teachers and immunization providers. Among other resources, the SOGC “HPV Toolkit” includes: fact sheets; presentations and lesson plans; tips for talking to youth and parents; tips for dealing with controversies surrounding HPV vaccination; games; interviews; posters promoting HPV prevention; and self-tests to assess HPV knowledge. This educational campaign has been viewed as a success; the comprehensive toolkit materials have been very useful in supporting front-line educators – particularly when faced with difficult questions regarding sexuality, HPV prevention, vaccination, screening, diagnosis and treatment.

8.7 Recommendations

Vaccination has saved more lives in Canada in the past 50 years than any other medical intervention; immunization is viewed as the single most cost-effective health investment – making it a cornerstone in the efforts to promote public health. Although vaccines have provided tremendous benefits, the effectiveness of existing and new immunization programs depends heavily on their acceptance by the public, which is becoming increasingly challenged by concerns regarding vaccine safety (along with decreasing concerns regarding the diseases that immunization seeks to prevent). Specifically, public fears and concerns regarding vaccine safety have resulted in under-immunization as well as the resurgence of several vaccine-preventable diseases, both in Canada and other countries. Thus, in addition to strong vaccine recommendations by NACI and other advisory bodies, comprehensive and coordinated education programs that target the public (and health care providers) are urgently required in Canada to improve vaccine coverage rates, and hence to reduce the incidence of vaccine-preventable disease – as well as to maintain public confidence in immunization programs.

While educational programs are critical elements in supporting successful vaccine uptake, such initiatives should also be considered an integral part of policy planning, since vaccine acceptance ultimately impacts investment in (and commercial viability of) vaccine innovation. In particular, health care professionals can act as a positive force for health promotion through vaccination, hence it is imperative that these key influencers are equipped with the latest evidence-based information to address public concerns. Overall, governments, public health agencies, health care professionals, research scientists and vaccine manufacturers share the common vision of a healthier Canada; these stakeholders should aim to communicate the true value and benefits of vaccines through collaborative development and delivery of effective education programs in immunization. In the spirit of achieving the shared goal of improving patient health through enhanced education, the following recommendations are put forward by BIOTECanada's VIC for consideration by government and other key stakeholders.

Federal/Provincial/Territorial (F/P/T) Recommendations

1. To achieve one of the most fundamental goals in public health, Canadian public health authorities at all levels should seek to maintain and strengthen public trust in immunization programs.
 - Public health officials have an obligation to stand up for the large body of science that supports current immunization practice and to play a significantly more active role in correcting inaccurate information regarding the relative risks and benefits of vaccination.
 - Public health experts need to improve their abilities to articulate the safety and efficacy of vaccines, and to help bridge the gap (as translators) between technical scientific language and public demands for clear, concise information – with the goal of minimizing public confusion.
2. Policy approaches designed to maintain and improve immunization coverage rates as a primary public health objective should ensure adequate resources and infrastructure are in place to deliver effective vaccine program awareness/education programs across the country.
3. Initial goals and recent progress of the National Immunization Strategy (NIS) should be reevaluated, particularly in terms of advancing knowledge development to support public education programs.

Stakeholder Recommendations

4. Stakeholders at all levels, including F/P/T government officials, public health authorities, vaccine manufacturers, researchers, and health care professionals, should work towards the development of a comprehensive, coordinated framework for communicating with the public and other health providers regarding the benefits (both individual and community) and potential risks of vaccination.
 - Enhanced education programs are required to emphasize the goals and recommendations of immunization practice, and to increase awareness of both existing and new vaccine technologies.
5. All stakeholders need to take greater responsibility for educating and reassuring the public regarding the stringent regulatory measures currently in place to ensure extremely high standards of quality and safety in the research and development, manufacturing, licensing, and use of vaccines in Canada.
 - Better communication of existing efforts to test/monitor vaccine safety (and to rigorously review alleged links between vaccines and adverse events) should be an essential component of future strategies to demonstrate to the public that their concerns are being addressed appropriately.
6. With specific regard to health care providers – who act as trusted information sources for parents and patients – there is a need for enhanced professional education in the field of immunization in Canada.
 - Health professionals should receive more support for their own education, i.e. through additional training in vaccinology in the formal curricula of medical, nursing, and pharmacy schools; such training should also build risk communication skills to help refute public misconceptions.
 - Key immunization opinion leaders (who may not be communication experts) should be trained to effectively communicate with the media regarding vaccines and immunization; for example, long-term professional relationships between medical experts and journalists help lay an essential foundation for educating the public on health-related matters.
 - Health professionals, scientists and editors who author/review academic journal publications should receive formal education regarding methods for writing in a clear, straightforward manner, i.e. to ensure that key conclusions cannot be misinterpreted.
7. Improved communication plans aimed specifically at the public are needed to help overcome negative perceptions of vaccines, and to renew the motivation for vaccination – ideally through enhanced recognition that vaccines represent a worthwhile, responsible public health intervention.
 - Key messages that need to be consistently conveyed to the public include the facts that:
 - i. vaccines are overwhelmingly beneficial and extremely safe public health interventions; and
 - ii. immunization protects vaccinated individuals, but also helps protect entire communities by preventing and reducing the spread of infectious diseases.

- Appropriate risk communication strategies should be used to present timely, accurate, understandable, evidence-based information regarding vaccines and immunization programs.
 - An informed decision-making partnership between a health professional and parent/patient is required to facilitate two-way messaging in an open, respectful atmosphere that acknowledges individual perception of risk (which, in turn, may help modify attitudes or behaviour).
8. Since vaccines can only be administered by a health care professional in Canada, and given that the primary purpose of a direct-to-consumer (DTC) advertisement is to inform the public regarding the availability of a vaccine and to direct parents/patients to additional education resources, the VIC proposes that fair balance requirements could be met in the following ways:
- Fair balance requirements should be adapted and applied to specific media formats, taking into consideration differences in the time of exposure and the volume of information that can be conveyed to (and *understood* by) the intended audience.
 - For broadcast media formats that have limited information capacity (e.g. television and radio ads), fair balance could be achieved by including brief statements to: i) explain that not everyone may be eligible to receive (or be fully protected by) a given vaccine; ii) warn of the possibility of side effects; iii) recommend a consultation with a health care professional; and iv) refer to another source of additional, complete, and balanced information regarding vaccine risks and benefits.

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