



Public Health
Agency of Canada

Agence de la santé
publique du Canada

INTERIM EVALUATION OF THE NATIONAL IMMUNIZATION STRATEGY

April 2003 to June 2007

Canada 

PROGRESS TOWARDS EQUAL ACCESS TO VACCINES FOR ALL CANADIAN CHILDREN

PNEUMOCOCCAL CONJUGATE (≤ 18 months)



MENINGOCOCCAL CONJUGATE (≤ 12 months)



VARICELLA (≤ 15 months)



PERTUSSIS (13-16 years old)



To promote and protect the health of Canadians through leadership, partnership, innovation and action in public health.
— Public Health Agency of Canada

Document review prepared by
Program Monitoring and Evaluation Unit
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Qualitative assessment and interviews with key informants
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Original submitted September 2007
Approved July 2008

Published by authority of the Minister of Health.

Interim Evaluation of the National Immunization Strategy- April 2003 to June 2007
is available on Internet at the following address:
<http://www.phac-aspc.gc.ca>

Également disponible en français sous le titre :
Évaluation intérimaire de la Stratégie nationale d'immunisation - Avril 2003 à juin 2007

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Cat.: HP5-79/1-2009E-PDF
ISBN: 978-1-100-11692-1

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LIST OF ABBREVIATIONS

EAEFI	adverse events following immunization
AERSWG	Adverse Events Reporting Standards Working Group
CCIAP	Canadian Coalition For Immunization Awareness And Promotion
CIC	Canadian Immunization Committee
CIRID	Centre For Immunization And Respiratory Infectious Diseases
CIRN	Canadian Immunization Registry Network
F/P/T	federal/provincial/territorial
FTE	full-time equivalent
HPV	human papilloma virus
IMD	invasive meningococcal disease
IPD	invasive pneumococcal disease
IRID	Immunization And Respiratory Infections Division
MRAP	Management Response Action Plan
NACI	National Advisory Committee On Immunization
NDRS	Notifiable Disease Reporting System
NGO	non-governmental organization
NIS	National Immunization Strategy
P/T	provincial/territorial
PEWG	Professional Education Working Group
PHAC	Public Health Agency Of Canada
PMF	Performance Measurement Framework
PUBED	Public Education Working Group
TORS	terms of reference
VIC	Vaccine Industry Committee
VPD	vaccine preventable disease
VPRIS	Vaccine Preventable And Respiratory Infection Surveillance
VSWG	Vaccine Supply Working Group

EXECUTIVE SUMMARY

This report presents the results of the Phase 1 interim evaluation of the National Immunization Strategy (NIS), implemented from May to July 2007. The specific objectives of the evaluation are as follows:

- measure progress towards achievement of short-term outcomes;
- identify areas of future improvement;
- inform future decisions regarding immunization program planning, design and implementation;
- ensure accountability; and
- provide evidence to support decision making on improvements to the NIS.

The evaluation involved both qualitative and quantitative methods. For the first, interviews were conducted with key informants* to obtain their views on the relevance, design and delivery, and success of the NIS so far. Similar interview questions were used in an on-line survey of local health care providers contacted through an e-mail invitation to P/T networks of health professionals. The quantitative component of the evaluation aimed to assess the progress the NIS has made in achieving expected outcomes and impacts, and it was guided by several Indicators of Success:

- number of new immunization programs launched or expanded;
- amount of money spent by P/Ts on four new vaccines† before and after receipt of new federal funding;
- level of vaccine coverage for the four publicly funded vaccines before and after funding;
- incidence of the four vaccine preventable diseases before and after funding.

The necessary data, which will be used as a baseline for future evaluations, were obtained from an extensive review of relevant documents, as well as interviews with members of the (then) Immunization and Respiratory Infections Division (IRID), Public Health Agency of Canada (PHAC).

According to the responses of 48 key informants and 145 on-line surveys, the NIS continues to be relevant at both federal and P/T levels, and there is no identified need at present to revise or realign its overall goals and objectives. Four gaps identified by respondents were lack of public health research, less than optimal coordination between the Canadian Immunization Committee (CIC) and the National Advisory Committee on Immunization (NACI), insufficient attention to special populations (mobile populations, immigrants, Aboriginal peoples) and lack of sustainable funding models. The design and implementation of the NIS were considered effective overall, but further thought might be given to certain aspects: the strain on the resources of smaller jurisdictions involved in many working groups; the need for working groups to be informed about each other's activities; the greater role that NGOs would be willing to undertake on working groups; the need for working group budgets to allow activities to move forward without undue reliance on PHAC staff; and the desire for a long-term NIS vision.

The quantitative evaluation revealed that progress has been made in several key areas. The structure of the NIS with its many working groups and F/P/T representation has contributed to flourishing partnerships and collaborations on immunization issues. With federal funding, all P/Ts have now introduced programs for the four vaccines, a significant increase in coverage for three of those vaccines has been achieved since 2004, and the incidence of IPD, pertussis and IMD has decreased since that time.

RECOMMENDATIONS

The evaluation team suggested a number of recommendations that might improve the performance of the NIS further:

1. Develop a monitoring system for select key areas and indicators using the Performance Measurement Framework‡ (PMF) in order to build on current knowledge, establish baselines and prepare for future NIS evaluation.
2. Enhance communications between the CIC and NACI.
3. Increase the interaction between the NIS working groups.
4. Consider additional roles for NGOs on working groups.
5. Allocate specific resources directly to working groups.
6. Continue to develop and focus on a long-term vision.

* A broad representation of federal/provincial/territorial (F/P/T) jurisdictions and non-government organizations (NGOs) represented on the Canadian Immunization Committee (CIC) and its working groups.

† Vaccines against invasive pneumococcal disease (IPD), pertussis, varicella and invasive meningococcal disease (IMD).

‡ The PMF lists the indicators and data sources needed to measure desired outcomes and impacts.

ACTION PLAN

The Centre for Immunization and Respiratory Infectious Diseases (previously IRID) has developed a Management Response Action Plan that outlines the steps needed to address the recommendations of this interim evaluation. The Plan includes implementation of the PMF, development of sustainable funding options, review of CIC and NACI terms of reference, consideration of funding mechanisms for a coordinated research program, and improvement of national surveillance strategies.

1.0 INTRODUCTION

1.1 OBJECTIVES OF THE INTERIM EVALUATION

The results of the Phase I interim evaluation of the National Immunization Strategy (NIS), implemented from May to July 2007, are presented in this report. The specific objectives of the evaluation are as follows:

- measure progress towards achievement of short-term outcomes;
- identify areas of future improvement;
- inform future decisions regarding immunization program planning, design and implementation;
- ensure accountability; and
- provide evidence to support decision making on improvements to the NIS.

1.2 IMMUNIZATION IN CANADA: FEDERAL ROLE

In Canada, the delivery of immunization programs is a shared responsibility among the federal/provincial/territorial (F/P/T) governments. Consequently, there is a great deal of variation with respect to the consistency of immunization programs across the country. Traditionally, the provinces and territories have had primary responsibility: they are in charge of planning, funding and delivering immunization programs in their jurisdiction. The federal government, through the Public Health Agency of Canada (PHAC), has been responsible for the following areas:

- monitoring of national immunization coverage rates;
- monitoring of adverse events following immunization (AEFI) and the incidence of vaccine preventable disease (VPD);
- investigation and control of interjurisdictional VPD outbreaks;
- support to the National Advisory Committee on Immunization (NACI);
- national promotion of immunization;
- information exchange; and
- international collaboration in disease prevention, control and eradication efforts.

Health Canada regulates the manufacture and sale of vaccine products under the *Food and Drugs Act* and implements immunization programs in First Nations communities.

1.3 OVERVIEW OF THE NIS

1.3.1 GOALS AND THEMES

In June 2003, the Canadian deputy ministers of Health endorsed the *Final Report: National Immunization Strategy*. In the budget of the same year, the federal government announced \$45 million in funding for new measures in pursuit of a National Immunization Strategy. The initial funding over five years was provided to strengthen federal infrastructure and the programs addressing immunization issues. As of December 2006, the NIS receives ongoing funding of approximately \$10M per year.

The NIS has seven main goals:

- Provide high, achievable, and measurable immunization coverage rates through publicly funded programs for all Canadians, including full coverage of all children for recommended routine childhood vaccines
- Ensure equitable and timely access to recommended vaccines
- Optimize program safety and effectiveness
- Improve coordination and cost-effectiveness of immunization programs
- Ensure that the supply of vaccine is secure
- Provide rapid and effective national interventions in emergencies and in response to international requests for assistance when required
- Promote professional and public acceptance of recommended programs.

These goals are to be achieved through the NIS, which comprises five main components:

National goals and objectives: to reduce VPD and improve vaccine coverage rates by developing national goals and objectives for immunization programs.

Immunization program planning: to reduce duplication of effort, improve access to vaccines and facilitate policy analysis of new vaccines.

Vaccine safety: to improve vaccine safety monitoring and public health response.

Vaccine procurement: to achieve best value for vaccines, long-term security of supply, quality of supply and improved accountability.

Development of an immunization registry network: to establish and maintain a comprehensive, compatible national immunization registry network with a core data set and minimum standards.

There are a number of themes that intersect with these components, **including immunization research; public and professional education; approaches to special populations; and VPD surveillance.**

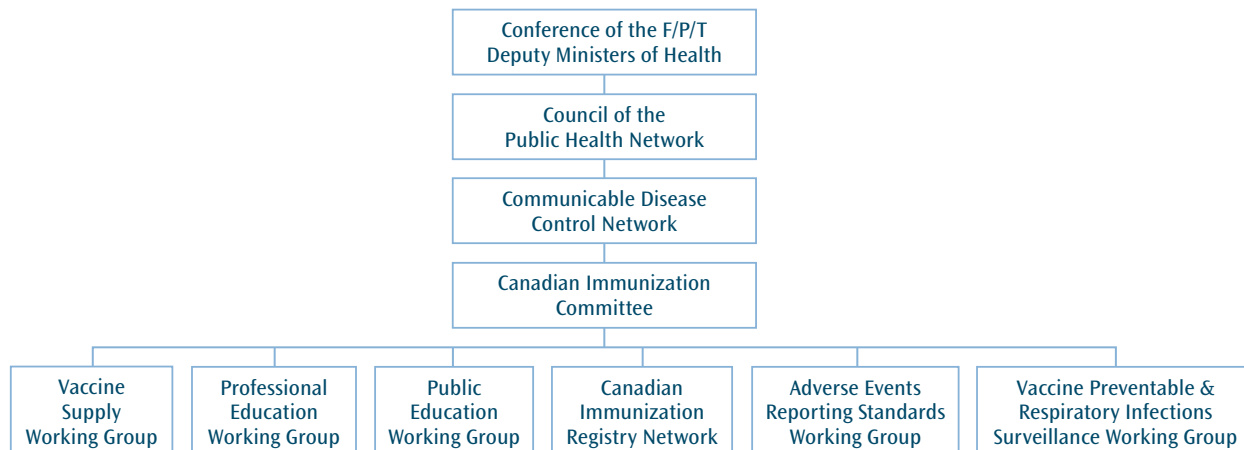
The anticipated benefits¹ of the NIS are a reduction in VPD; improved access to timely immunization programs; improved efficiencies of immunization programs; improved vaccine safety monitoring and response; enhanced affordability of vaccines; improved security of vaccine supply; and enhanced public and professional confidence in vaccine response.

At around the same time as the launch of the NIS in 2003, the federal government also announced a \$300M investment for the introduction of four newly recommended vaccines (pneumococcal, meningococcal, varicella and adolescent acellular pertussis). This funding was provided to the provinces and territories as a trust fund to be used to implement immunization programs for these new vaccines.

1.3.2 GOVERNANCE

The NIS is implemented through various committees and working groups, some of which existed in some form before the Strategy was implemented. The Immunization and Respiratory Infections Division (IRID)² provides secretariat support for the Canadian Immunization Committee (CIC) and working groups. Each of the working groups has representation from F/P/T levels. As illustrated in Figure 1, the group responsible for implementation of the Strategy is the CIC, which is composed of representatives from all provinces and territories and federal representation from PHAC. In addition, the CIC also has representation from other federal government departments, as well as from the US Department of Health and Human Services and various NGOs,³ including professional associations, the Vaccine Industry Committee (VIC), and the Canadian Coalition for Immunization Awareness and Promotion (CCIAP). The CIC is co-chaired by a PHAC representative and a P/T representative.

Figure 1: Governance structure of the NIS



¹These are intermediate outcomes (within 4–5 years).

²In December 2007 IRID became the Centre for Immunization and Respiratory Infectious Diseases (CRID). This report therefore refers to IRID during the evaluation and to CIRID in the response to recommendations (section 5.3). The current structure of CIRID does not differ greatly from the IRID structure.

³For the remainder of the report, when the term “NGO” is used it refers to the relatively heterogeneous group of organizations described above (i.e. VIC, CCIAP and professional associations). When subgroups are referred to, they are referred to directly according to their group.

1.3.3 SUPPORT

A parallel structure to the CIC and its working groups was developed under the IRID to support the working groups and provide technical support for the implementation of the nine activities (five components and four themes) under the NIS. The structure of IRID was reorganized in 2004 and expanded again to its current version in 2005.

1.4 DESCRIPTION OF THE NIS EVALUATION FRAMEWORK

The NIS evaluation framework is designed to measure the success of the NIS over the life of the strategy. It has four components: the formative (interim) and summative evaluations, the logic model and the performance measurement framework (PMF), which includes the NIS Indicators of Success.

1.4.1 PHASE I: FORMATIVE EVALUATION (INTERIM)

A formative evaluation helps to improve a program/strategy.⁴ It focuses most on program activities, outputs and short-term outcomes for the purpose of monitoring progress and making mid-course corrections when needed. (Outputs are the products and services that result from NIS-associated activities; outcomes are the specific changes in behaviour, knowledge, skills and level of functioning that are the results of the outputs.) The formative evaluation is helpful in bringing suggestions for improvement to the attention of decision makers. The NIS formative evaluation, documented in this report, was completed in 2007.

1.4.2 PHASE II: SUMMATIVE EVALUATION

The summative evaluation will measure the outcomes achieved and assess the overall impact of NIS activities on immunization programs. It will generate information that can be used to demonstrate the results of the Strategy, focusing on intermediate outcomes and impacts. Phase II will be completed after 2008.

1.4.3 LOGIC MODEL

The goals of the NIS are to be achieved through the five components and four cross-cutting themes of the Strategy. To evaluate the program activities of these components and themes, outputs and outcomes for the initial, intermediate and final stages have been identified. The logic model is a depiction of how the program activities, outputs and outcomes link together (see Annex A).

The outputs should be achieved within one to three years of the initiation of the activities. Assessment of these is mostly quantitative. The initial outcomes should be achieved within two to five years of the start of the activity; intermediate outcomes should be achieved within four to five years or should be ongoing. Assessment of these involves a mixture of qualitative and quantitative indicators. The final outcome is the overall impact of the NIS, measured for the most part quantitatively, which will focus on the NIS Indicators of Success.

1.4.4 PERFORMANCE MEASUREMENT FRAMEWORK

The PMF lists, in tabular format, the indicators and data sources needed to measure each activity in the logic model and its corresponding outputs and outcomes. The PMF provides the timeframe for when the indicators should be measured (i.e. ongoing monitoring, formative or summative evaluation). It uses performance indicators to measure the outputs and initial outcomes, and the Indicators of Success to measure the intermediate and ultimate outcomes/impact of the Strategy. Although the PMF has informed the interim evaluation, the results of the evaluation will also be used to finalize the PMF, taking into consideration the issues identified.

⁴ Adapted from Bond SL, Boyd SE, Montgomery DL. *Taking Stock: A Practical Guide to Evaluating Your Own Programs*. Chapel Hill, NC: Horizon Research, Inc., 1997. Available online at <http://www.horizon-research.com>.

2.0 METHODS

2.1 QUALITATIVE AND QUANTITATIVE METHODS

Although the report refers to the interim evaluation, methodologically it is a formative evaluation of the program: the NIS is at a relatively early stage at this point, having been implemented for approximately three years at the time of the evaluation. Thus, the evaluation measures progress towards immediate outcomes initially; longer-term impacts and outcomes will be measured within three to five years.

The methodology developed and implemented for the interim evaluation has a qualitative and a more quantitative aspect.⁵ The qualitative assessment consisted of three components, the first of which was a document review to provide context for the questions to be asked in the second component, key informant interviews with members of the CIC and NIS working groups; the final component was an online survey of health professionals involved with immunization issues at the local and/or regional level. The quantitative assessment consisted of a review of relevant strategy documents, terms of reference, surveys, planning documents, and internal reports and publications.

The evaluation findings are based primarily on qualitative methods. The quantitative assessment of performance indicators and the Indicators of Success of the NIS are included in this report to establish a baseline for subsequent evaluations. In order to have a baseline against which to compare future qualitative evaluations, scales were used for the questions in the key informant interviews and the online survey.

2.2 DOCUMENT REVIEW

Documents were included in the review if they were useful in developing the qualitative questions to be asked in the key informant interviews or if they could provide the quantitative data needed for measures such as the Indicators of Success and the outputs identified in the PMF.

The documents reviewed for the qualitative portion of the assessment can be grouped into two broad categories:

- Working group level: terms of reference, work plans, and progress reports.
- Strategy level: NIS Final Report, national conference proceedings, the NIS evaluation and logic model, Web site publications, Treasury Board submissions and guidelines.

These documents were also considered for the quantitative review, but it was necessary to find other sources of the quantitative data necessary to establish baselines for the intermediate and final outcomes. These sources included surveys, annual reports, articles and reports published in *Canada Communicable Disease Report*, other relevant publications, research reports, meeting proceedings, reports on environmental scans, immunization coverage surveys and surveillance reports.

2.3 KEY INFORMANT INTERVIEWS

2.3.1 EVALUATION ISSUES

Three broad evaluation issues were identified (Table 1). The issues were supported by the development of specific evaluation questions to be used in the interviews.

Table 1. NIS interim evaluation questions

ISSUE	QUESTION
Relevance	Question #1: What is the rationale for the NIS? Is there a continued need for national support of immunization programs?
	<ul style="list-style-type: none"> • Is the NIS consistent with the current priorities of the federal government, the PHAC and the P/Ts? • Is there a continuing need for the NIS? If so, on what basis? • Are there areas of relevance for immunization that are not supported by the NIS but should be?

⁵The qualitative assessment was performed by an external contracting agency, Goss Gilroy, and the quantitative assessment by the Program Monitoring and Evaluation Unit of IRID.

ISSUE	QUESTION
Design and delivery	Question #2: What improvements, if any, could be made to the NIS in terms of program planning, design and implementation?
	<ul style="list-style-type: none"> • Has the design of the NIS been effective? Why/why not? What areas could be improved? • Were there any external factors that affected implementation of the strategy? What are the lessons learned?
Success	Question #3: What progress has the NIS made to date in achieving its expected outcomes and impacts? What are the successes to date?
	<ul style="list-style-type: none"> • What have been the achievements, to date, in terms of objectives set? • What has been the impact of the NIS on federal coordination? • To what extent have effective partnerships and collaboration been developed in response to immunization issues? • Internally and externally, are groups aligning with the goals/objectives/structures of the NIS? • How have P/T immunization programs realigned with the NIS? Has this improved immunization programs at the jurisdictional level? • To what extent has capacity to address immunization issues increased? • What aspects of immunization programs would have been difficult to implement in P/Ts without the NIS? • To what extent have activities been successful in knowledge development and dissemination? • What has been the impact on leveraging of the NIS? • To what extent have programs demonstrated leveraging of additional funds and resources?

The findings of the qualitative portions of the evaluation are relevant to all three of the evaluation issues, whereas the document review largely addresses the question of progress and success.

2.3.2 RESPONDENTS

Sixty potential respondents were deemed to provide a broad representation across the different working groups and CIC, as well as across the different F/P/T jurisdictions and NGOs. Potential interviewees were provided with a notification letter from the CIC PHAC Co-Chair outlining the purpose of the evaluation, inviting them to participate in an interview and providing contact information if they had any questions. Overall, 45 interviews were conducted with 48 key informant respondents⁶ for an overall response rate of 75%; respondents were members of CIC and/or the various NIS working groups.

Interviews were conducted using a semi-structured interview guide, which contained a core set of questions asked of all respondents, questions specifically for P/T representatives, and separate sets of questions according to working group membership. Interviews were conducted by telephone and lasted approximately one hour. Respondents were given the guide beforehand in order to prepare their responses to the specific questions.

The distribution of interview respondents according to CIC and working group membership is provided in Table 2. In many cases, the respondents actually represented more than one committee or working group and/or CIC, in which case they were asked to respond to the relevant questions for all the groups of which they were a member.

Table 2. Distribution of respondents by committee and working group

GROUP	NO. OF RESPONDENTS *	OVERALL NO. OF GROUP MEMBERS	PERCENTAGE OF MEMBERS PARTICIPATING
CIC	14	25	56%
CIRN	10	18	56%
VSWG	12	26	46%
PUBED WG	5	12	42%
PEWG	10	18	56%
VPRIS	7	12	58%
AERSWG	8	25	32%

*Note: the total number of respondents participating was 48. Many members belonged to more than one group.

⁶Two representatives from the VIC were asked to participate in the evaluation. The VIC provided a joint written response to the questions in the evaluation guide rather than participate in interviews. In addition, some respondents preferred to be interviewed as a group rather than individuals respondents. In each of these cases, the unit of analysis has been the interview (or submission) rather than the individual.

CIC = Canadian Immunization Committee;
 CIRN = Canadian Immunization Registry Network;
 VSWG = Vaccine Supply Working Group;
 PubEd WG = Public Education Working Group;
 PEWG = Professional Education Working Group;
 VPRIS = Vaccine Preventable and Respiratory Infection Surveillance;
 AERSWG = Adverse Event Reporting Standards Working Group

2.4 ON-LINE SURVEY OF HEALTH PROFESSIONALS

At the time of the evaluation, the NIS had been in place for only three years. Therefore, the effects that might be seen at the local level were expected to be minimal, particularly given that the NIS works mostly at the level of P/T ministries of Health. However, it was decided that there would be value in interviewing local health care providers to establish a baseline for further evaluations in the future.

The questionnaire for this online survey of P/T health professionals was designed using the same questions posed to the key informants in order to collect information on familiarity with the various NIS components, improvements in immunization issues at the local/regional level and perceived overall impact of the NIS at that level. The on-line questionnaire was embedded in an e-mail invitation distributed to various provincial and territorial networks of health professionals through the P/T representatives on CIC. Since the format was an online survey, rather than an interview, the respondents could not be asked supplemental questions to determine the reasons for their ratings. However, this format allowed for a larger number of respondents.

In total, 310 people accessed the questionnaire site, 146 completing most questions on the survey. Given the snowball sampling technique used for this survey, using local, non-random networks of health professionals, the total number of invitations sent to potential respondents by the P/T representatives is unknown. As a result, a response rate cannot be calculated. Table 3 shows the distribution of respondents according to P/T.

Table 3. Distribution of local/regional survey respondents by province/territory

PROVINCE/TERRITORY	NO. OF RESPONDENTS	PERCENTAGE
British Columbia	60	41.1%
Ontario	25	17.1%
Manitoba	16	10.9%
Alberta	9	6.2%
New Brunswick	9	6.2%
Nova Scotia	8	5.5%
Quebec	8	5.5%
North West Territories	7	4.8%
Newfoundland	2	1.4%
Saskatchewan	1	0.7%
PEI	1	0.7%
Nunavut	0	0.0%
Yukon	0	0.0%
TOTAL	146	100.0%

Table 4 shows the distribution of on-line survey respondents according to their occupation.

Table 4. Distribution of local/regional survey respondents by occupation*

PROVINCE/TERRITORY	NO. OF RESPONDENTS	PERCENTAGE
Registered nurse	66	55.9%
Public health manager	28	23.7%
Other health profession	9	7.6%
Medical doctor (other specialization)	9	7.6%
Medical doctor (pediatrician)	3	2.5%
Medical doctor (generalist)	2	1.7%
Epidemiologist	1	0.8%

*Multiple responses possible

2.5 QUANTITATIVE DATA COLLECTION

2.5.1 PERFORMANCE MEASUREMENT FRAMEWORK

Process indicators in the PMF were used to measure the outputs and initial outcomes in this evaluation. These were taken from the document review and interviews with IRID staff and working group members.

2.5.2 QUANTITATIVE REVIEW OF NIS INDICATORS OF SUCCESS

The Indicators of Success were approved by the CIC in October 2004 and include the following:

- The number of new programs launched or expanded by P/Ts, including extent of coverage for the expanded programs.
- The amount of money spent by P/Ts on four new vaccines and their administration before and after receipt of new federal funding.
- The level of vaccine coverage for the four new publicly funded vaccines (before and after federal funding).
- The incidence of the four VPDs (before and after federal funding) determined from hospital separation data and surveillance data (national and/or from the P/Ts) as available.

Baselines were established for three of the above indicators, although information on money spent was not available.

CIC agreed that the following areas must also be evaluated:

- The benefits of having a national strategy (i.e. leverage or the influence of the NIS on activities by P/Ts or other organizations, such as the Canadian Institutes for Health Research, Infoway). This was assessed through the leverage analysis.
- Vaccine supply security over time (before and after federal funding).
- Enhanced vaccine safety monitoring and response.

These latter two were assessed qualitatively in this evaluation.

For the interim evaluation, documents were reviewed to assess current statistics.

3.0 EVALUATION FINDINGS

The qualitative assessment (sections 3.1 to 3.3) was supplemented with data from the PMF and the NIS Indicators of Success (sections 3.4 and 3.5).

3.1 WHAT IS THE RATIONALE FOR THE NIS?

3.1.2 IS THE NIS CONSISTENT WITH THE CURRENT PRIORITIES OF THE FEDERAL GOVERNMENT, THE PHAC AND THE P/TS?

Most key informants (81%) assessed the NIS to be highly relevant and consistent with various priorities for immunization in Canada, including their own jurisdictions. Respondents noted that the NIS consolidates many of the activities that Health Canada and then PHAC had been working on before the implementation of the NIS. Most P/T respondents (86%) reported that the NIS is consistent with and highly relevant to the various sets of priorities established within their jurisdictions. Less than 10% (primarily from the smaller jurisdictions) indicated that the NIS is broader than their own strategies or goals and has additional emphasis in some areas (e.g. research), but this was perceived as appropriate for a national-level strategy.

3.1.3 IS THERE A CONTINUED NEED FOR THE NIS?

All respondents supported the continued need for a national strategy to address immunization issues in Canada. Most (76%) rated a nationally coordinated approach to immunization programs in Canada as “very important”. Some F/P/T representatives (32%) reported that the work on coordinating beyond P/T individual borders had really just started in a concerted way, and the NIS was essential to further progress on key immunization issues. The main areas of need were identified as coordination of responses to emerging issues, consistency in immunization programs and equity of access across jurisdictions.

3.1.4 ARE THERE AREAS OF RELEVANCE THAT ARE NOT ADDRESSED BY THE NIS?

Overall, there were four main areas identified as gaps that the NIS was perceived as not adequately addressing. The most frequently cited area was the lack of sustainability with respect to funding of immunization programs. A few respondents (11%) from the P/T and NGO groups pointed to the short-term, trust fund style of funding used for the four new vaccines starting in 2004 and then the funding for HPV vaccine as being an inappropriate funding model for immunization programs in Canada. They indicated that the NIS should be actively addressing the need to develop a sustainable, longer-term funding model.

Another area cited as a gap under the NIS is research. Research is considered one of the cross-cutting themes of the NIS, but 26% of respondents indicated that there had not been as much attention paid to research and evaluation as to other areas. Suggested areas of need were targeted public health research and evaluation around vaccination issues, and federal involvement in guiding and directing research on new vaccines (6% felt that new research directions were being decided primarily by the pharmaceutical companies with limited coordinated involvement from the various jurisdictions, including the federal government).

The third gap, indicated by 8%, was in coordinating NIS and NACI activities: CIC is perceived as slow to react to new vaccines and NACI recommendations. The example provided by a few respondents is the challenge that some of the smaller jurisdictions face with respect to implementing HPV immunization and the need for direction and coordination from CIC in a relatively tight time frame.

The fourth gap, identified by 16% of respondents, was the need to address immunization issues in special populations, such as immigrants and newcomers, mobile populations and Aboriginal people. A few respondents felt that by now more attention should have been paid to this cross-cutting theme.

3.2 HAS THE DESIGN AND DELIVERY OF THE NIS BEEN EFFECTIVE?

3.2.1 HAS THE DESIGN OF THE NIS BEEN EFFECTIVE?

Overall, most F/P/T and NGO representatives (88%) indicated that the structure of the CIC and working groups has contributed to a nationally coordinated approach for immunization programs in Canada; however, 21%, mainly from the smaller jurisdictions, reported challenges, in terms of stretched resources, to participating in the various working groups.

3.2.2 WHAT AREAS COULD BE IMPROVED?

- **The timeliness of CIC decisions:** > 80% of respondents felt that CIC decisions were timely, but 17% of P/T representatives reported that they were delayed or not timely enough to adequately address some immunization issues in Canada (e.g. CIC guidance on the HPV vaccine). On the other hand, some CIC representatives (6%) noted that there is a necessary delay between NACI's scientific recommendations and CIC's work on program planning information. The CIC work is contingent, to a certain extent, on the NACI recommendations. Some respondents identified a need for improved coordination and information sharing between NACI and CIC.
- **Interaction between working groups:** 8% of P/Ts and NGO respondents indicated a lack of interaction between groups and reliance on CIC as the conduit, a less than ideal situation given the related topics with which separate working groups are dealing.
- **Representation from professional associations (e.g. Canadian Paediatric Society):** 17% of respondents from professional associations reported that their areas of expertise are not necessarily being considered and used as effectively as they could be in the current structure. Suggested roles that they might take on include providing access to local level professionals for consultation and pre-testing.
- **Resources available to working groups:** 27% felt that progress had been delayed on the NIS given the resource challenges that PHAC has had with respect to adequately staffing positions and the amount of work involved in making progress on specific working group activities; lack of resources allocated to working groups was also considered a challenge.
- **Long-term vision:** 4% of respondents reported that the implementation phase of the NIS tended to focus on short-term issues in many cases, but they felt that now that the NIS structure is complete, the focus can shift to a longer-term vision.

3.2.3 WERE THERE ANY EXTERNAL FACTORS THAT AFFECTED IMPLEMENTATION OF THE NIS?

The main external factor identified was the \$300 M federal funding made available for the four new vaccines at about the same time the NIS was implemented. Most of the P/T respondents (54%) reported that the availability of funding had raised the profile of immunization in their jurisdictions, although there were also some challenges with respect to introducing four new immunization programs at the same time as implementing the NIS.

Another external factor affecting the implementation of NIS activities was the fewer representatives available from the smaller P/Ts to participate in a number of working groups. Possible solutions are to have regional representation on some committees (e.g. the Atlantic region, Territories) or to hold several meetings back to back to allow members of several committees to attend all meetings at one time.

3.3 PROGRESS AND SUCCESS OF NIS: STAKEHOLDER ASSESSMENT

3.3.1 ANTICIPATED NIS BENEFITS: WHAT HAVE BEEN THE ACHIEVEMENTS TO DATE IN TERMS OF OBJECTIVES SET?

Table 5 highlights the outcomes of the key informant interviews and survey of local health care providers. A comparison of the results yielded the following observations:

- Improvements appeared less noticeable at the local level than at the P/T level.
- Ranking or level of improvement/impact observed was relatively consistent across both groups.
- The greatest improvement/impact was observed in the areas of VPD control and access to immunization programs.
- The least improvement/impact was observed in the areas of vaccine safety and security.

Table 5. Ratings by key informants and survey respondents of NIS impacts in anticipated benefit areas

ANTICIPATED BENEFIT	n	SOURCE OF RATINGS	DISTRIBUTION OF RATINGS* (LEVELS OF IMPACT/IMPROVEMENT)			
			Strong	Medium	Minimal	None
Improved access to timely immunization programs	28	Key informants	71%	21%	7%	0%
	119	Local survey	18%	50%	24%	9%
Enhanced affordability of vaccines	23	Key informants	57%	35%	9%	0%
	97	Local survey	22%	32%	14%	32%
Improved efficiencies of immunization programs	22	Key informants	18%	59%	14%	9%
	119	Local survey	9%	41%	30%	19%
Reduction in vaccine preventable diseases	28	Key informants	39%	50%	11%	0%
	108	Local survey	25%	44%	19%	12%
Better identification of priorities for the implementation of evidence-based and innovative strategies to improve coverage	24	Key informants	25%	50%	25%	0%
	113	Local survey	9%	53%	27%	11%
Improved security of vaccine supply	23	Key informants	35%	43%	22%	0%
	98	Local survey	8%	39%	23%	30%
Better vaccine safety monitoring and response	20	Key informants	10%	45%	45%	0%
	107	Local survey	8%	45%	31%	16%

*Key informants were asked to rate the level of impact, and local survey participants were asked to rate the level of improvement, in specific areas of benefit.

Note that the impact of the NIS at the local level is not expected to be seen until three to five years after implementation.

Respondents discussed NIS coordination activities and the \$300M of federal funding for the four new vaccines interchangeably when discussing the impacts of the NIS.

A more detailed description of points raised during key informant interviews is given below, with comparisons to the findings from the local respondents survey.

Improved access to timely immunization programs: The implementation of the NIS has had the most impact (92%) on improved equity and timeliness of access to immunization programs. Responses of survey participants suggested that large changes to access are not being seen at the local level.

Enhanced affordability of vaccines: Another area assessed favourably by the majority of key informants (92%) was in enhanced affordability of vaccines. Some respondents reported that the national procurement strategy and inclusion of industry representatives in the Vaccine Supply Working Group have resulted in some savings. The representatives from the smaller P/Ts tended to rate the impact as stronger when compared with representatives from the larger P/Ts. Survey respondents' ratings were divided across all categories, and fewer respondents answered this question than the others, suggesting that respondents did not feel adequately informed to answer.

Reduction in VPDs⁸: Almost 90% of respondents indicated that there has been an observable reduction in certain VPDs (see Section 3.5.3), e.g. in pneumococcal disease among older adults. Over two-thirds (69%) of the local respondents also felt that there had been a reduction.

Better identification of priorities for the implementation of evidence-based and innovative strategies to improve coverage: This statement was interpreted differently by respondents. Survey respondents had nearly the same percentage of "some" (53%) or "minimal"(27%) ratings as the key informants. However, they were less likely to have seen a strong improvement (9% vs 25% of key informants) and more likely to have seen no improvement at all (11% vs 0%).

⁷A combination of strong and medium impact is reported for all issues in this section.

⁸Reduction in VPDs is a long-term outcome that is not expected to be measurable for four or more years from date of implementation of new programs as outlined in the logic model. This is because time is required to set up or strengthen surveillance systems to perform the required data collection, and a sufficient number of years of data are required to establish trends and stabilize incidence rates across the country.

Improved security of vaccine supply: 78% of key informants viewed the NIS as having a medium to strong impact on the improved security of the vaccine supply (e.g. by having at least two vaccine suppliers for each vaccine and through partnerships among P/Ts). A few respondents perceived security of supply as a global issue on which the NIS has little impact. Of the survey respondents, 53% saw no or minimal improvement in security of supply.

Better vaccine safety monitoring and response: This benefit received the lowest endorsement, although over half the respondents felt inadequately informed to comment. A much higher percentage of local respondents (16% vs 0%) saw no improvement in vaccine safety monitoring and response, though a very similar percentage saw strong or medium improvement.

3.3.2 WHAT HAS BEEN THE IMPACT OF THE NIS ON FEDERAL COORDINATION?

Overall, respondents (76%) reported that they viewed the federal coordination of immunization issues under the NIS as very important, 62% noting the national and international aspects of immunization. Some P/T respondents (26%) appreciated the much needed networking opportunities between jurisdictions and the federal government, and 17% felt that PHAC's co-leadership in CIC and working groups was an important impetus for accomplishing the working group activities.

3.3.3 WHAT HAS BEEN THE IMPACT OF THE NIS ON PARTNERSHIPS AND COLLABORATION?

Partnerships and collaboration were viewed by most respondents (76%) as one of the areas of strongest impact of the NIS, and although some of the relationships existed before the NIS was formalized, 56% of respondents indicated that collaboration had increased and improved as a result of the NIS. Some partnerships developed in the various NIS working groups have been extended to include unanticipated yet supportive collaborations, both formal and informal (e.g. collaboration in research projects).

3.3.4 ARE GROUPS ALIGNING WITH THE GOALS/OBJECTIVES/STRUCTURES OF THE NIS?

Some P/Ts (33%) indicated that they have greater awareness of other jurisdictions' approaches to immunization programming which, at times, has influenced their own programming; this tended to occur in the smaller jurisdictions. With regard to meeting national goals and objectives, 8% of respondents noted that the report of the 2005 consensus conference was still in draft form, which made evaluation of progress difficult. The responses about progress towards goals were very varied.

3.3.5 HOW HAS THE NIS AFFECTED THE CAPACITY TO ADDRESS IMMUNIZATION ISSUES?

The majority of respondents (97%) indicated that the NIS had made a medium to large contribution to enhancing the overall capacity of immunization issues. Capacity has increased in the areas of immunization coverage, coordinated response to issues (e.g. recent outbreak of mumps) and the sharing of information and best practices regarding immunization programming. For some smaller jurisdictions, the NIS structure was viewed as important in providing both financial support and expertise. Of survey respondents at the local level, 39% perceived the NIS as making a medium contribution and 42% a small contribution to overall capacity.

3.3.6 TO WHAT EXTENT HAVE NIS ACTIVITIES BEEN SUCCESSFUL IN KNOWLEDGE DEVELOPMENT AND DISSEMINATION?

Three areas were addressed: knowledge development/dissemination in research, professional education and public education. Overall, research was viewed by the majority of respondents (53%) as a gap in the implementation of the NIS currently, in particular public health research and evaluation around immunization issues and new vaccines.

Professional education as a form of knowledge dissemination was viewed by the majority of respondents (57%) as an area that had made some progress under NIS. Draft core competencies for health professionals have been developed by the Professional Education Working Group with examples provided on how these have been adopted in the draft stage for inclusion in course curricula for health professionals in some jurisdictions. Comments were mixed with respect to knowledge dissemination in the form of public education.

3.3.7 WHAT HAS BEEN THE IMPACT OF THE NIS ON LEVERAGING?

Most respondents (85%) reported that the NIS and the \$300M federal investment in new vaccines had had a leveraging effect in their jurisdictions but were unable to provide actual amounts leveraged.⁹ A few (12%) described how the NIS and investment had leveraged additional full-time equivalent (FTE) positions in public health dealing with immunization issues (e.g. public health nurses, physicians, etc.); 22% also described how the NIS and federal investment in immunization had raised awareness of immunization issues among politicians. Concerns were raised by a few P/T respondents (12%) that some of the leveraging results may remain, but other amounts leveraged may not be sustained given the non-renewal of the \$300M investment.

⁹ In an internal PHAC document it was estimated that the NIS has helped provinces and territories leverage \$1.2 billion for immunization programs over three years, five times the original federal investment of \$300 million.

3.4 PROGRESS AND SUCCESS OF NIS: DOCUMENT REVIEW

3.4.1 SOURCES

In this section, the information collected from ongoing surveillance, document review and interviews with IRID staff is used to assess the progress the NIS has made to date in achieving its expected outcomes and impacts. The results presented are based on a selection of both expected outputs and initial outcome indicators from the logic model (see Annex A for the full results in tabular format); they will serve to supplement the previous qualitative assessment, establish baselines for longer-term indicators and reveal where modifications to the existing indicators are needed.

3.4.2 EXPECTED OUTPUTS AND INITIAL OUTCOMES BY WORKING GROUP

During the first two years of the NIS, 2004 and 2005, resources were focused on setting up the structure to guide, support and implement the many activities under the NIS. By the end of 2005, all major activity groups, including vaccine safety, vaccine supply, professional and public education, surveillance, immunization registry development and also the CIC, had held at least one meeting and established draft terms of reference and, as of 2006, many groups were well on their way to implementing activities. However, official approval from CIC did not come for many groups until 2007, with the exception of research.

Immunization program planning: One focus of program planning activities was the evaluation of new vaccines and existing programs. An analytical framework for the introduction of new vaccines was adopted by the NIS and applied to the new human papillomavirus vaccine (2006–07). A portion of the framework is also being developed into a tool kit to evaluate existing immunization programs in cooperation with the Canadian Nurses Coalition for Immunization (2007+). During 2005, CIC hosted a national consensus conference to establish national goals for the four VPDs affected by the vaccine funding as well as for rubella and influenza and, in 2007, established a working group to identify priority program areas for special populations.

Research: Two important national meetings were held to establish research priorities for influenza (2005) and HPV (2006). The report of the first meeting has served as the basis for a multi-year, priority-driven research agenda for the Pandemic Influenza Research Portfolio.

Vaccine safety: The Vaccine Safety Division has been working collaboratively with P/Ts to establish national standards for the management of adverse events following immunization (AEFI) and to enhance vaccine safety monitoring and response. National case definitions, standard operating procedures, definition and standards have been established. The Vaccine Safety Alert Module on CIOSC (Canadian Integrated Outbreak Surveillance Centre) was developed to enhance communication for vaccine safety and make detection and response more timely (2007). The Canadian AEFI reporting system (CAEFISS) is well integrated into Infoway's Panorama and will become web enabled in 2008.

Vaccine supply: IRID and the Vaccine Supply Working Group have made progress toward developing guidelines and criteria for the management of vaccine supply during times of shortage. Through the bulk procurement process they have strengthened the security of vaccine supply: currently, P/Ts are all actively involved in negotiations and are benefiting from multi-year contracts with multiple providers.

Public education: The Public Education Working Group has adopted a health education framework to support the development of a national multi-component public education approach to complement efforts already undertaken by P/T and local jurisdictions as well as other organizations, to improve immunization coverage rates among children aged 0–2.

Special populations: A working group for special populations (immigrants and First Nations and Inuit people) was formed on September 13th, 2007; terms of reference and membership are being developed. The group is currently completing a scan to determine the current immunization status of the two populations; available services and resources; issues specific to the target groups; and best ways to reach the specific group.

Professional education: The Professional Education Working Group has developed immunization competencies for health professionals that will be published in the near future. In addition, they are exploring ways to collaborate with professional associations involved in continuing medical education and, with the PHAC Skills Enhancement Program, to develop immunization learning opportunities for health care professionals.

VPD surveillance: The Vaccine Preventable and Respiratory Infections Surveillance Working Group has co-authored the updated national surveillance guidelines for emerging respiratory infections surveillance (severe respiratory infections protocol) and has disseminated a respiratory illness outbreak response plan (RIORP) with guiding principles for improved F/P/T communications and coordination during the investigation and control of respiratory outbreaks. The group has revised the national notifiable disease case definitions and completed a review of existing surveillance gaps and priorities.

Immunization registry development: The Canadian Immunization Registry Network (CIRN) developed and published functional data standards for registries in 2002 and updated them in 2004. It monitors the status of immunization registry development across the country (at the time of this evaluation, six P/Ts have fully functioning registries). CIRN and IRID have participated in the development of Panorama (a pan-Canadian public health surveillance system that includes a registry module). Standards for national immunization coverage have been developed. CIRN and IRID have pilot tested the application of bar codes on vaccine products, work that will be carried on by the Automated Identification of Vaccine Products Advisory Committee. The Vaccine Identification Database System was developed to support bar codes, pilot tested in 2005 and updated in 2006.

3.4.3 RESOURCES WITHIN IRID

The organizational structure of IRID has undergone several revisions since the inception of the NIS (and, as of December 2007, is now known as the Centre for Immunization and Respiratory Infectious Diseases). In 2004, 12 new FTE staff positions were created, but over half were still vacant in 2005. In 2005, the Division was restructured to better respond to the growing number of activities within the immunization and pandemic portfolios. At this time, 12 new positions were added to support NIS-related activities in the areas of vaccine safety, surveillance and immunization programs, bringing the total number of NIS-funded positions in IRID to 36.

3.5 NIS INDICATORS OF SUCCESS

The Indicators of Success of the NIS focus on measuring coverage and disease reduction with respect to the new, publicly funded vaccine programs implemented after 2004: invasive meningococcal disease (IMD), invasive pneumococcal disease (IPD), varicella and pertussis. National goals and recommendations were established for these VPDs in 2005. A select number of indicators for immunization coverage and disease reduction from the 2005 National Consensus Conference for Vaccine Preventable Diseases in Canada for which data are available are presented here (Tables 7, 8, and 9). Data reported in this section were drawn from existing sources and a comprehensive document review.

3.5.1 TIMELY ACCESS TO IMMUNIZATION PROGRAMS

NIS Indicator of Success: the number of new programs launched or expanded, including extent of coverage for the expanded programs, by P/T.

Table 6: NIS Indicator of Success: access to immunization programs

VACCINE	NUMBER OF P/Ts WITH PROGRAMS		
	2003	2005	2007
Varicella	5 P/Ts: AB, NS, PEI, NT, NU	11 P/Ts, exceptions YK, QC	All 13
Meningococcal conjugate C	4 P/Ts: BC, AB, QC, PEI	12 P/Ts, exception NU	All 13
Acellular pertussis	7 P/Ts: SK, MB, ON, PEI, NL, NT, NU	All 13	All 13
Conjugated pneumococcal (PCV7)	3 P/Ts: BC, AB, NU	12 P/Ts, exception NU	All 13

3.5.2 IMMUNIZATION COVERAGE

NIS Indicator of Success: the level of vaccine coverage for the four new publicly funded vaccines (before and after federal funding).

Table 7: NIS Indicator of Success: immunization coverage

VACCINE	VACCINE COVERAGE, BY YEAR AND AGE GROUP*								
	2 YRS			7 YRS			17 YRS		
	2004	2006	2010 [†]	2004	2006	2010 [†]	2004	2006	2010 [†]
Varicella	32.5	53.0	85	–	–	85	32.5	51.5	85
Meningococcal conjugate C	28.0	57.0	95	–	27	97	41.0	36.0 [‡]	90
Acellular pertussis	74.5	61.6 [‡]	95	68	64	95	23**	28**	85
Conjugated pneumococcal (PCV7)	7.0	26.4	90	–	–	–	41	36 [‡]	–

* Margin of error estimated to be 5%

[†] Recommended coverage (from 2005 National Consensus Conference), see Sources

‡ Reduction observed as a result of change in sampling methodology between 2004 and 2006 cycles of the National Immunization Coverage Surveys

** Based on receipt of 6 or more doses by 17th birthday

Sources

Canadian National Report on Immunization. *CCDR* 2006;32(S3).

Final Report of Outcomes from the National Consensus Conference for Vaccine-Preventable Diseases in Canada.

CCDR 2008;34(S2).

P/Ts do not routinely report coverage data to PHAC, and the National Immunization Coverage Surveys for routine childhood immunizations provide coverage data for only a selection of children (by their 2nd, 7th and 17th birthdays). As a result, accurate coverage data are available on only 10 of the 16 national recommendations set in 2005 for immunization coverage for the four vaccines.

3.5.3 VPD REDUCTION

NIS Indicator of Success: the incidence of the VPDs associated with the four newly funded vaccines (before and after federal funding) through hospital separation and surveillance data (national and/or from the P/Ts, as available).

Table 8: NIS Indicator of Success: disease incidence

VACCINE PREVENTABLE DISEASE	DISEASE INCIDENCE (PER 100,000)		DISEASE INCIDENCE GOALS FOR 2010*
	2004	2006	
Varicella	National population-based surveillance data are not available†		Achieve a sustained reduction of 70% in the incidence of varicella
Invasive pneumo-coccal disease (IPD)	National population-based data are not available for vaccine program-specific age groups‡		Achieve a sustained reduction of <ul style="list-style-type: none"> • 80% in the incidence of IPD among children < 2 years of age compared with pre-conjugate vaccine incidence • 40% in the incidence of IPD among adults ≥ 65 years of age compared with 1998 incidence
< 1 year old	42.1	19.2	
1–4 years	31.1	13.8	
> 60	20.7	18.8	
All age groups	9.1	8.7	
Invasive meningo- coccal disease, serogroup C			Achieve a sustained reduction of <ul style="list-style-type: none"> • 90% in the incidence of <i>N. meningitidis</i> serogroup C in children < 5 years of age • 95% in the incidence of <i>N. meningitidis</i> serogroup C in adolescents 12 to 19 years of age • 70% in the incidence of <i>N. meningitidis</i> serogroup C
All age groups	0.18	–**	
Pertussis			Achieve a sustained reduction in the reported incidence of pertussis among those 10 to 19 years to at least the levels present in persons 1 to 4 years of age
10–14 years	50.4	19.0	
15–19 years	18.7	5.5	
All age groups	9.69	6.87	

* As recommended at the 2005 Canadian Consensus Conference, see Source.

† Varicella, though listed as a nationally notifiable disease within the Notifiable Disease Reporting System (NDRS), does not yet have a national agreed-upon strategy and standards for national population-based surveillance. Likewise, varicella it is not a reportable disease in many P/Ts, and surveillance systems to accurately measure disease incidence are lacking. It is estimated that approximately 90% of the population will have had chickenpox by 12 years of age (with as many as 350,000 cases/year); however, < 10% of these are reported to the NDRS in any given year.

‡ Caution should be employed when interpreting these decreases, as national goals were set for the < 2 and >65 age groups, which may show a different degree of reduction than the available age groups shown. Data for 2006 are preliminary; reporting by P/Ts may not be complete.

** National enhanced surveillance data not currently available for this year. Reporting by P/Ts is not complete

Source

Summary of the Outcomes from the National Consensus Conference for Vaccine-Preventable Diseases in Canada, Quebec, June 12–14, 2005. *CCDR* 2007;33(13):10–15.

3.5.4 SECURITY OF VACCINE SUPPLY

Through the bulk procurement process, IRID and the Vaccine Supply Working Group have strengthened the security of vaccine supply in Canada by increasing P/T participation. In 2003, less than one-third of P/Ts procured all of their publicly provided vaccines through the bulk procurement process. They are now all actively involved in negotiations and benefit from multi-year contracts with multiple providers.

3.5.5 REMAINING NIS INDICATORS OF SUCCESS

Quantitative data were not available at the time of the interim evaluation to assess baselines for the following NIS Indicators of Success:

- improved vaccine safety monitoring and response
- the amount of money spent by P/Ts on the four new vaccines and their administration before and after receipt of new federal funding.¹⁰

¹⁰ Financial data are extremely difficult to obtain for the purposes of monitoring and evaluation. Under the current P/T structure, information on the purchase price is confidential, and P/Ts are not able to share implementation cost information.

4.0 CONCLUSIONS

4.1 LIMITATIONS

The NIS evaluation process had several limitations. First, it relied heavily on qualitative information from interviews and a survey, and although the major trends and themes identified were valuable they did not provide quantitative data on outcomes and impacts. These will need to be assessed in the summative phase of the evaluation. Similarly, of the many documents made available for the evaluation there were few with information on performance and outcomes. Those that did address key evaluation issues were useful in developing baselines for future NIS evaluations. Second, information on the costs of vaccines and program implementation from the P/Ts was not forthcoming, and this is a serious gap in assessing the cost-effectiveness of the NIS. A final limitation was the snowball sampling technique used in the survey, which does not allow conclusions to be drawn about how representative the sample was. Overall, the evaluation relied heavily on the reports of those directly involved in the NIS rather than on more objective performance data.

Nevertheless, the findings from this interim evaluation are positive and indicate that progress has been made in a number of areas.

4.2 CONTINUED RELEVANCE OF THE NIS

According to the information obtained, the NIS remains relevant at both federal and P/T levels. The main objectives and goals are consistent with both federal and P/T priorities with respect to immunization issues in Canada. There is no identified need at this time to revise or realign the overall goals and objectives of the NIS.

A national level strategy is required to make progress on key immunization issues, such as coordinated responses to emerging issues on a local, regional, national and international basis, to secure consistency in immunization programs and to enhance equity across jurisdictions.

The four gaps identified by respondents in key informant interviews were research, coordination with NACI, special populations, and sustainable funding models, the first three of which are in the NIS mandate but remain to be addressed.

4.3 DESIGN AND IMPLEMENTATION OF THE NIS

The design and structure of the NIS with a central CIC and various working groups were deemed effective overall, and P/T membership and co-chairing were considered essential to the success of the NIS. The strain on the resources of smaller jurisdictions involved in many working groups needs to be considered. Several aspects of the NIS need further review to determine whether improvements or changes are required:

- timeliness of CIC decisions;
- relation between NACI and CIC;
- interaction between NIS working groups and the reporting relation with CIC;
- role of NGOs on working groups;
- resources available to working groups; and
- focus on a longer-term vision.

The announcement of the \$300M in federal funding to the P/Ts for the introduction of four new vaccines had a positive impact on the implementation of the NIS, as it provided additional immunization resources and brought immunization issues onto the “radar” within the various jurisdictions, allowing additional leveraging of resources. The main concern of P/Ts is the type of funding method used and sustainability.

4.4 PROGRESS AND SUCCESS OF THE NIS

Given the formative stage of the NIS at the time of evaluation, the *process* focused on the progress that has been made in key areas of activities, outputs and short-term outcomes, and less on the identification of medium and longer term impacts. Another caveat to consider in assessing the progress of the NIS is that there were a number of pre-existing groups and activities at the F/P/T level that were subsumed under the NIS. As a result, it cannot be claimed that the progress made with respect to some activities is attributable solely to the actual implementation of the Strategy.

Overall, the NIS has made progress in a number of key areas identified as relevant to addressing immunization issues in Canada. The areas of greatest progress cited by interview respondents are as follows.

The creation of partnerships and collaborations: the development of the structure of the NIS with the CIC and multiple working groups, including F/P/T representation, contributed to the development and sustainability of partnerships and collaborations on immunization issues at various levels. Given that the responsibility for implementing immunization programs remains with the jurisdictions, whereas the nature of many components of immunization programs is cross-jurisdictional, partnerships and collaborations are essential to adequately address the relevant issues. Collaborations and relationships were closely linked to the overall increase in capacity experienced in various jurisdictions, particularly smaller P/Ts, to address immunization issues, ranging from vaccine supply, harmonization of schedules, research, immunization programming and education.

Access to timely immunization programs: as of 2006, all P/Ts had introduced immunization programs for the four newly funded vaccines, as compared with just over one-third of P/Ts offering similar programs before release of the \$300 million. With the constant challenge of ensuring that access to immunization and coverage are equitable across the country, this was an exceptional display of how best to harmonize the delivery of programs. Now, as compared with 2003, twice as many Canadian children have access to recommended immunizations.

Improved coverage: since 2004, a significant increase in coverage for three of the four new vaccines (varicella, meningococcal conjugate and pneumococcal conjugate vaccines) has been observed in children by their 2nd and 17th birthdays. However, while increases have been substantial, there is much to be done to achieve the national goals for immunization coverage set for 2010.

Reduction in VPDs: Compared with 2004, the incidence of VPD in 2006 had decreased among children, particularly those in the < 1 year and 1–4 years age groups. As well, reductions in the incidence of pertussis among adolescents (10–14 years) and young adults (15–19 years) over the same period supports the national target, set in 2005, to lower adolescent rates of pertussis to below those observed in younger children (1–4 years). However, continued monitoring will be needed to demonstrate whether these reductions can be sustained. While 2006 data were not available at the time of writing this report, from 2004 to 2005 the annual incidence of IMD serogroup C disease dropped by 33% in all age groups, a trend that is expected to continue.

Coordinated approach: the country is now in a much better position to address VPDs and immunization issues in a coordinated, effective and efficient way in collaboration with provinces and territories.

Enhanced affordability of vaccines: this was also an area in which a perceived improvement was noted. However, data to measure this are still unavailable because of contractual obligations between the P/Ts, PHAC and private industry.

Overall the NIS is having a differential level of effect on jurisdictions, depending on their size and capacity to address immunization issues. The smaller P/Ts tend to report greater impacts than the larger ones with more developed immunization programming.

As a preliminary assessment of success, overall the NIS is making progress towards reaching its objectives and achieving an impact on key areas of Canadian immunization programs. Making some adjustments at this point would be beneficial in terms of keeping the NIS on track to achieving its objectives in key areas. Further assessment of intended areas of impact will be required with the development of indicators for ongoing monitoring of outcomes and a more comprehensive evaluation. This will be possible once the NIS has had sufficient time to be fully implemented and enough time has elapsed to allow for collection of an adequate level of baseline measures.

5.0 NEXT STEPS

5.1 RECOMMENDATIONS

Overall, the findings from the interim evaluation indicate that progress has been made in a number of areas under the mandate of the NIS towards achieving not only the outputs and initial outcomes described in the logic model (expected within 1–3 years of implementation) but also the longer-term, intermediate and ultimate outcomes (NIS Indicators of Success). At the request of the project authority, the evaluation team developed a number of recommendations that may improve the performance of the NIS.

1. PRIORITIZE AND IMPLEMENT THE NIS PMF.

- a) Now that the NIS is at a stage at which the various working groups have been established and important activities identified, it is important to prioritize key areas and indicators, and implement the PMF for the NIS routinely. The PMF identifies key outputs, indicators, sources and data to be collected at both the working group and strategic level, as well as a reporting schedule for each. Indicators that are of high priority should be chosen and a monitoring system developed that builds upon the knowledge gained from this evaluation and the logic model. The results of this interim evaluation should be used to create a baseline from which to measure the longer-term outcomes and impacts of the NIS in future evaluations. It is recommended that the ongoing evaluation of the NIS be led by an F/P/T evaluation group in order to secure standard data availability from all jurisdictions (see Section 5.2: Other Considerations, on data types and sources).
- b) It was observed through this evaluation that data for all the agreed-upon Indicators of Success of the NIS are still not available. Most notably absent are accurate financial data on the amount of money spent by P/Ts on the four new vaccines and their administration before and after receipt of new federal funding. This information would allow an accurate assessment of enhanced affordability of vaccines, improved security of the vaccine supply and costs versus benefits. It must be made available by all P/Ts or the indicators will need to be reassessed.
- c) This evaluation has demonstrated the gaps in the data necessary to assess all of the recommendations from the 2005 Consensus Conference. Therefore, it would be useful to review the national goals and rationally select indicators for which data are or will be available over time from a sufficient number of P/Ts.

2. ENHANCE THE COMMUNICATIONS BETWEEN CIC AND NACI.

The evaluation found that communication, level and type, between CIC and NACI was not as effective as it could be. The CIC, with cooperation from NACI, should consider improving the communications flow, in both directions, so that there is ongoing awareness and understanding of the issues, topics and concerns that each committee is addressing.

3. INCREASE THE INTERACTION BETWEEN NIS WORKING GROUPS.

The current reporting structure requires working groups to report directly to CIC. At present, any inter-working group communication is reportedly ad hoc and somewhat dependent on the knowledge of members who belong to more than one working group. Many working groups indicated that they would likely benefit considerably if they were better informed about the types of activities and issues being addressed by other working groups as well as the CIC.

4. INCREASE THE ROLE FOR NGOS ON WORKING GROUPS.

The not-for-profit NGOs and associations representing some of the health professionals involved with immunization issues at the local level may be able to provide additional assistance to the working groups. Given their expertise and content knowledge, some NGOs/professional bodies might become more active members of NIS working groups. Consultations should take place directly with key NGOs to determine the extent to which they can and are willing to assume additional roles in working groups.

5. ALLOCATE SPECIFIC RESOURCES DIRECTLY TO WORKING GROUPS WHERE THE NIS BUDGETS PERMIT.

At present, working groups are not directly allocated annual resources to conduct high-priority tasks and activities. There is heavy reliance on the PHAC representatives to conduct large proportions of the tasks involved in order to move ahead with important activities. The evaluation indicated that progress on such activities would be improved if each working group were provided a budget with which they could commission studies, literature reviews, etc.

6. CONTINUE TO DEVELOP AND FOCUS ON A LONG-TERM VISION.

Comments were received throughout the evaluation that the NIS had made progress given the relatively early stage of its development. Now that many structures and group terms of reference are in place, it is anticipated CIC members will have more time to develop and focus on a longer-term vision for the NIS taking into account the current objectives and goals.

5.2 OTHER CONSIDERATIONS

In addition to these recommendations, the evaluation team noted a number of potential areas for consideration in future evaluations of the NIS.

- Resources should be directed towards establishing baselines for all selected indicators. Agreement from all P/Ts will be required, as PHAC is dependent upon their collaboration to receive the information essential to monitor the progress of the NIS.
- Potential external sources or lines of evidence should be identified for future evaluations, e.g. in the form of an international expert panel (external to NIS representatives) or other peer review group that could provide insight and assessment of the NIS, particularly in terms of relevance, design alternatives and cost-effectiveness. The input of such a group (or subgroup) at the evaluation framework development stage would likely assist greatly in identifying key issues to address and providing assistance with indicator development.
- During the next NIS evaluation, there will likely be a greater emphasis on cost-effectiveness than in this more interim evaluation. Consideration will have to be given to the type of data to be collected, confidentiality agreements and reporting schedules. These issues will all have to be negotiated as quickly as possible in order for there to be adequate data available for a high-quality cost-effectiveness analysis.
- The limited human resources have impeded progress in several key areas. Although work is progressing, much remains to be done. To overcome staff shortages, IRID has hired a human resources consultant to coordinate the necessary actions.
- Existing surveillance systems cannot assess progress towards all the national goals and recommendations established in 2005. While some of the issues affecting national surveillance of infectious diseases are external to the NIS, it is important to note them here as they directly affect VPD surveillance. These are the absence of data-sharing agreements, variable application of national reporting standards among jurisdictions, and the limitations of passive surveillance data available from the national NDRS. Addressing these issues will make it more possible to assess whether the goals of the NIS have been reached.

5.3 ACTION PLAN

The NIS Interim Evaluation was shared with CIC in October 2007, and members were asked to prioritize the gaps and recommendations. Although only four jurisdictions responded, gaps in research and lack of sustainable funding of new immunization programs were consistently ranked as the highest priority, and the need for a long-term plan to implement the PMF for the NIS was considered imperative. This assessment has helped guide CIRID's action plan in response to the interim evaluation. The Management Response Action Plan (MRAP) outlines the steps CIRID will take, in cooperation with stakeholders, to address the gaps and recommendations identified in this interim evaluation.

Highest on the priority list is the implementation of the PMF. The PMF incorporates measurable data into ongoing routine surveillance and reporting, and will facilitate the collection of quantitative data for the summative evaluation scheduled for 2011. The recommendations and gaps identified here will help to focus the PMF on key areas of the NIS and to address the gaps in quantitative information. Routine reports developed from the PMF will be used to keep decision-makers up to date on the performance and direction that CIRID and the CIC working groups are taking towards meeting the objectives of the NIS.

A task group of the CIC will help guide the design and implementation of the summative evaluation to ensure that stakeholders participate and there is better access to the required data.

The future vision for the NIS and the development of a sustainable funding mechanism are both high-priority action items for CIRID, and action to develop funding options and a long-term vision for the NIS is included in CIRID's 2008–2010 work plan. In 2007, it was recommended that CIRID host an international forum on immunization funding models to further assess and recommend the best model for sustainable funding of immunization programs in Canada. This meeting is tentatively scheduled for 2008/09.

In addition to these areas prioritized by the CIC, CIRID will continue to work on the following:

- In order to improve collaborations between national committees and working groups CIRID will review the terms of reference of both CIC and NACI as part of a Centre-wide restructuring exercise. To enhance efficiency and improve communication between CIC working groups, CIC has asked working group co-chairs to brief one another about their activities at their annual face-to-face meetings and teleconferences.
- CIRID is aware of the need to develop a collaborative approach to promoting evaluative research in Canada. It has been asked by CIC and the Public Health Network to investigate possible funding mechanisms for a coordinated research/evaluation program for new and existing vaccines. This will be addressed in the restructuring exercise going on within CIRID.
- CIRID has hired an HR coordinator to begin to address staffing shortages.
- CIRID will perform an inventory of existing surveillance systems across Canada necessary for assessing progress towards national goals for IMD, IPD, pertussis and varicella. In 2008, CIRID will define the infrastructure and resources it needs to assess the impact of immunization programs on national VPD rates. It will also continue to work on national committees and working groups in order to address the gaps in surveillance and assist in the development of tools (Panorama) and strategies (PHAC Integrated Surveillance Strategy). It is expected that this will have a positive impact on the larger challenges affecting national surveillance.

ANNEX A: LOGIC MODEL

