

# Immunization information systems in Canada: Attributes, functionality, strengths and challenges. A Canadian Immunization Research Network study

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## ABSTRACT

**OBJECTIVES:** Canada does not have a national immunization registry. Diverse systems to record vaccine uptake exist, but these have not been systematically described. Our objective was to describe the immunization information systems (IISs) and non-IIS processes used to record childhood and adolescent vaccinations, and to outline the strengths and limitations of the systems and processes.

**METHODS:** We collected information from key informants regarding their provincial, territorial or federal organization's surveillance systems for assessing immunization coverage. Information collection consisted of a self-administered questionnaire and a follow-up interview. We evaluated systems against attributes derived from the literature using content analysis.

**RESULTS:** Twenty-six individuals across 16 public health organizations participated over the period of April to August 2015. Twelve of Canada's 13 provinces and territories (P/Ts) and two organizations involved in health service delivery for on-reserve First Nations people participated. Across systems, there were differences in data collection processes, reporting capabilities and advanced functionality. Commonly cited challenges included timeliness and data completeness of records, particularly for physician-administered immunizations. Privacy considerations and the need for data standards were stated as challenges to the goal of information sharing across P/T systems. Many P/Ts have recently implemented new systems and, in some cases, legislation to improve timeliness and/or completeness.

**CONCLUSION:** Considerable variability exists among IISs and non-IIS processes used to assess immunization coverage in Canada. Although some P/Ts have already pursued legislative or policy initiatives to address the completeness and timeliness of information, many additional opportunities exist in the information technology realm.

**KEY WORDS:** Immunization coverage; immunization registries; immunization registers; vaccine-preventable diseases; Canada

La traduction du résumé se trouve à la fin de l'article.

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In Canada, health care is a provincial/territorial responsibility, except in the case of specific groups such as on-reserve First Nation peoples, the health care of whom is a federal responsibility. The data sources and methodology used for immunization coverage assessment vary by province and territory (P/T), posing a challenge for meaningful comparisons and for deriving national estimates. National standards for immunization registries<sup>1</sup> and methods for coverage assessment exist,<sup>2,3</sup> but the extent of their implementation is unclear. Although immunization program delivery and monitoring is conducted by individual P/Ts, certain public health responsibilities exist at the federal level, such as international reporting on immunization coverage in accordance with World Health Organization requirements.

The aim of this study was to describe the current state of surveillance systems used in Canada to assess immunization coverage for childhood and adolescent vaccines. Our objectives were to describe the immunization information systems (IISs) or

other processes used by P/Ts and relevant federal organizations and to summarize their stated strengths and limitations.

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## METHODS

### Sampling and recruitment

We conducted a survey of key informants who are subject matter experts on their provincial, territorial or federal organization's immunization coverage surveillance infrastructure. Respondents were identified by contacting members and the secretariat of the Canadian Immunization Registry Network (hereafter "registry network"). The registry network includes representation from all 13 P/Ts, in addition to Correctional Services Canada (CSC), Department of National Defence (DND) and the First Nations and Inuit Health Branch (FNIHB) of Health Canada, with secretariat support provided by the Immunization Coverage and Information Systems section of the Centre for Immunization and Respiratory Infectious Diseases, Public Health Agency of Canada (PHAC).<sup>4</sup> The registry network reports to the Canadian Immunization Committee, which then reports to the Pan-Canadian Public Health Network. We excluded representatives from DND and CSC because we were primarily interested in childhood and adolescent immunizations. We also invited a representative from the First Nations Health Authority (FNHA) of British Columbia (BC) to participate. As part of the BC Tripartite Framework Agreement on First Nation Health Governance, Health Canada transferred its role in the design, management and delivery of First Nations health programming in BC to FNHA in 2013.<sup>5</sup> All respondents provided informed consent. Ethics approval was granted by Public Health Ontario Research Ethics Board.

### Data collection

#### Questionnaire

We developed a 56-item questionnaire to collect information about immunization delivery and the systems and methods used for assessing immunization coverage using a variety of resources.<sup>1,2,6,7</sup> Key informants had the opportunity to consult with colleagues to complete the questionnaire.

#### Interview

We developed a semi-structured interview guide that included questions about the perceived strengths and limitations of the immunization coverage surveillance system(s) and the methods used to calculate coverage within the jurisdiction. In addition, we interviewed respondents to clarify responses provided in the questionnaire. All interviews were conducted in English by one member of the research team (SQ), audio-recorded, and transcribed verbatim. To ensure we captured a complete profile of the processes used by FNIHB, each of its six regions completed the interview questions separately and this was summarized by the FNIHB National Office and shared at one interview. The data tables summarizing the attributes of P/T systems reflect P/T responses and not those of FNIHB or FNHA of BC.

### Data analysis

Frequencies and proportions were calculated for the questionnaire responses. We used content analysis to analyze the interview data. Two researchers (SQ and CJ) independently coded the same 20% of transcripts, comparing coding lists throughout the process to ensure consistency and to finalize a single coding dictionary. Once

consensus on the codes was reached, the remaining 80% of interviews were analyzed separately, with the researchers consulting with each other periodically if the need for new codes arose. All coding analysis was done using QSR NVivo 10 software. Drafts of the data tables and results text, including quotations, were reviewed by key informants to ensure the responses were accurate.

## RESULTS

### Study sample

A total of 26 individuals across 16 public health organizations participated in interviews conducted from April to August 2015. Participants represented 12 of Canada's 13 P/Ts: BC (1), Alberta (2), Saskatchewan (3), Manitoba (1), Ontario (5), Quebec (1), New Brunswick (1), Nova Scotia (2), Prince Edward Island (1), Newfoundland (2), Nunavut (1) and Northwest Territories (1), as well as one federal organization [PHAC (1)], and two organizations involved in health service delivery for on-reserve First Nations people [FNHA of BC (1), FNIHB (3)]. Only one jurisdiction declined to participate, for an organizational response rate of 94% (16 out of 17 organizations contacted). Sixteen individuals were interviewed separately, while 10 were interviewed in groups (2 groups of 2 and 2 groups of 3 involving participants from the same organization). Participants included vaccine program managers, epidemiologists, immunization nurses, communicable disease control specialists, nurse consultants, public health information system specialists and a medical health officer.

Among the 16 participating organizations, 15 questionnaires were completed; 2 organizations (Ontario Ministry of Health and Long-Term Care and Public Health Ontario) completed a single questionnaire because immunization responsibilities are shared.

Due to the richness of information collected as part of this study, results focusing on methodologies used by P/Ts to assess immunization coverage are described in a separate publication.

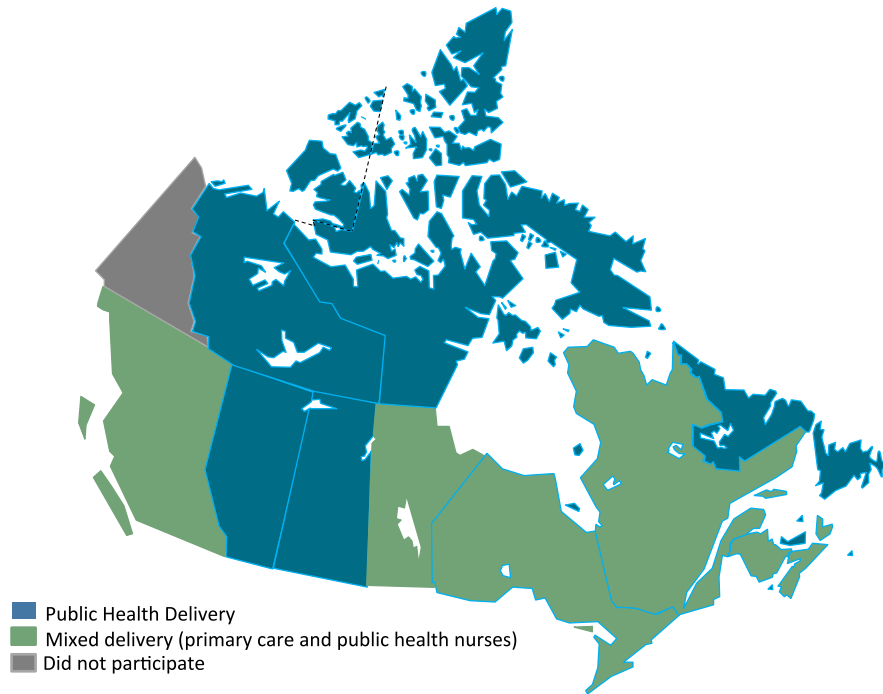
### Infant, childhood and adolescent vaccine delivery in Canada

In half of the participating P/Ts (6/12), routine infant and childhood vaccinations are primarily delivered by public health nurses (Figure 1). The remaining P/Ts use a mixed model of delivery by primary health care providers (family physicians or pediatricians) and public health nurses, depending on region (urban/rural) and age group of recipients. In all P/Ts, all or most routine adolescent immunizations are delivered by public health professionals in school-based clinics. Respondents representing P/Ts where public health delivers the majority of infant, childhood and adolescent vaccinations cited the advantages of this approach:

*"We don't have immunizations being provided by physicians or other providers for our childhood program, so we get 100% of that data of immunization events coming into the system. It becomes much more complex when you have other providers in the mix. We have been very fortunate that is the model that we are using."*

### IISs and non-IIS processes used in Canada

A variety of IISs and other processes exist across P/Ts in Canada (Table 1). At the time of the environmental scan, five provinces (BC, Saskatchewan, Manitoba, Quebec, Ontario) had recently



**Figure 1.** Infant and childhood vaccine delivery models in Canada

implemented or were in the early stages of implementing, a new communicable disease surveillance and case management system (Panorama) that includes an immunization module. Descriptions of Panorama can be found elsewhere.<sup>8,9</sup> It is important to note that Panorama is the “front-end” application by which end-users enter and can access immunization data that have been collected and stored through other provincial registry initiatives which pre-date the application (including, but not limited to, Manitoba Immunization Monitoring System [MIMS] in Manitoba, and Immunization Records Information System [IRIS] in Ontario). In 2005, Alberta implemented a new IIS, the Immunization and Adverse Reaction to Immunization (Imm/ARI). Northwest Territories, New Brunswick, Nova Scotia, and Newfoundland & Labrador use paper-based manual methods, general-purpose software applications (e.g., spreadsheets) or older systems not designed specifically to record immunizations (i.e., non-IIS processes). These P/Ts cited plans to adopt new electronic systems with additional functionality that will allow them to assess coverage more efficiently in the future. No immunization system existed in Nunavut at the time of the interview, with resource constraints, both human and financial, cited as a contributory factor.

#### **Immunization reporting, timeliness and data quality**

Among P/Ts with IISs, immunizations are either recorded by direct data entry into the system or via a paper-based format as an intermediary step (Table 1). Even P/Ts with modern and newly implemented systems still relied to some degree on manual data entry of paper-based records. The time frame between immunization administration and data capture by the system varied considerably between and even within individual P/Ts and was influenced by provider type (public health vs. non-public health), reporting requirements (including legislation), data entry resources and the

type of system. For example, there was a delay in data capture when the immunizations were delivered by non-public health providers (e.g., Manitoba: 4–6 weeks) compared to public health providers (e.g., Manitoba: immediate via direct data entry). Northwest Territories, New Brunswick and Quebec reported having legislation requirements for immunizations to be entered into a system (or reported to public health) within a specific timeframe, ranging from 48 hours to 30 days. Seven of the participating jurisdictions had formally assessed the data quality within their system.

#### **Data capture of vaccine delivery by non-public health providers**

Respondents reported several barriers to collecting immunization data directly from physicians. These included the voluntary nature of physician reporting in most P/Ts, limited incentives for immunization data reporting (Table 2), and both privacy and information management/information technology issues that need to be addressed for physicians to access P/T systems. In Nova Scotia, physicians who use a specific vendor’s Electronic Medical Record (EMR) can provide electronic data extracts. In Manitoba, Panorama is integrated with the Claims Processing System (physician billing) and since 2015, with the Drug Programs Information Network to capture pharmacy data.

Health care providers in Manitoba, Saskatchewan and Alberta can access clients’ immunization data through provincial electronic medical records systems or comparable electronic portals.<sup>10–12</sup> Many provinces are exploring mechanisms to allow vaccine providers outside of public health to access their system, including Alberta, Quebec, Ontario and Saskatchewan.

#### **IIS advanced functionality, data linkage and reporting**

IISs can do much more than serve as a repository of immunization data. Table 1 outlines P/T system attributes for reminder/recall

**Table 1.** IIS and non-IIS process characteristics by participating provinces and territories\*

	NWT	BC	AB	SK	MB	ON	QC	NS	NFL	PEI	NB
Name of system (year of implementation)	Non-IIS process <sup>†</sup>	Panorama and PARIS <sup>‡</sup>	Immunization and Adverse Reaction to Immunization (Imm/ARI) (2005)	Saskatchewan Immunization Management System (SIMS) (1995)	Manitoba Immunization Monitoring System (MIMS) (1988)	Panorama (2013)	I-CLSC (2000)	Application for Notifiable Disease Surveillance (ANDS) (2013)	Central Referral Management System (CRMS) (1994)	Integrated Services Management (ISM) (2004)	Client Service Delivery System (CSDS) <sup>§</sup> (2000)
Panorama (year of implementation)	X	✓ (2013)	X	✓ (2015)	✓ (2015)	✓ (2013)	✓ (2014–2015)	X	X	X	X
Time from immunization to data entry	Health centres – same day, within 30 days to central repository	Public health users – same day, physician immunizers approximately 2 weeks	Same day entry into regional electronic systems. Submission to provincial system varies from days to months	Immediately for public health provided vaccines (point of service); lag time for physician delivered vaccines	Variable, e.g., Panorama – immediate, 1–2 weeks for MIMS, physician billing 4–6 weeks	Varies (immediate to years)	48 hours	EMR extract done on monthly basis; public health required to enter data by December 31	Approximately 2 weeks	Unsure	1 week
Time frame from data entry to access for analysis	Varies, up to 2 years	<24 hours	Immediately after entered into provincial system	Immediate	Immediate	Immediate	Immediate	Immediate	1.5 years	Immediate	Monthly
Routine linkage with reportable disease surveillance system	✓	X	✓	X	✓	X	X	✓	X	X	X
Routine linkage with AEFI surveillance system	X	✓	✓	X	✓	X	X	✓	X	X	✓
Other data sources used for routine linkage (if done)	Provincial laboratory data	X	EMRs, provincial laboratory data, cervical screening data	X	MIMS, EMRs, cancer registry, hospital, physician, drug, and laboratory claims data	N/A	Ministry of Education database, EMRs, health insurance database	X	Cancer registry	Perinatal database	X
Data linkage method	Deterministic	N/A	Deterministic	N/A	Deterministic and probabilistic	N/A	Deterministic and probabilistic	N/A	Deterministic linkage	Deterministic and probabilistic	N/A
Have completed evaluation(s) of data quality within system	✓	✓	✓	✓	✓	X	X	✓	X	✓	X
Reminder-recall functionality	X	✓	X	✓	✓	✓	X	X	X	✓	X

Legend: ✓ corresponds to “yes”; X corresponds to “no”.

Note: AEFI = adverse events following immunization; EMR = electronic medical record; I-CLSC = Système d'information sur la clientèle et les services des Centre Locaux de Services Communautaires; IIS = immunization information system.

\* Nunavut is not included within the table as they indicated they have no IIS or other process in place.

<sup>†</sup> NWT indicated they do not currently have an IIS in place but use a series of spreadsheets to record immunization delivery.

<sup>‡</sup> PARIS is used in only one Regional Health Authority in BC (which includes Vancouver). Four of the five Health Authorities use Panorama in a decentralized manner.

<sup>§</sup> New Brunswick uses a series of spreadsheets and the CSDS system to record immunizations delivered by public health.

**Table 2.** Immunization coverage reporting capacities and activities by participating provinces and territories\*

	NWT	BC	AB	SK	MB	ON	QC	NS	NFL	NB	PEI
Health regions able to autonomously monitor coverage	X	✓	X	✓	✓	✓	✓	X	✓	✓	X
Smaller area (regional) and provincial coverage estimates prepared	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Capacity to measure coverage outside of standard boundaries	✓	✓	✓	✓	X	✓	✓	X	X	X	✓
Assess vaccine effectiveness using coverage data	X	X	X	X	✓	X	✓	X	X	X	X
Report coverage estimates to stakeholders	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coverage estimates made publicly available	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Communicate coverage estimates to immunizers	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
Provide individualized coverage feedback to immunizers (e.g., primary care practice or public health unit)	X	✓	X	✓	✓	✓†	X	X	X	X	X
Assess coverage in relation to benchmarks/targets	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓
Provide financial incentives to immunizers for meeting targets	X	X	X	X	X	✓	X	X	X	X	X

Legend: ✓ corresponds to "yes"; X corresponds to "no".

\* Nunavut is not included within the table as they indicated they have no IIS or other process in place.

† In Ontario, immunization coverage is calculated by Public Health Unit (PHU) and provided to each PHU by age and antigen. PHUs are responsible for data collection and data entry of routine infant and childhood vaccines, which are delivered in most cases by local health care providers (e.g., physicians).

functionality and the ability to answer applied research questions through routine data linkages. For example, Quebec and Manitoba routinely use coverage data to assess vaccine effectiveness. With one exception, all jurisdictions have mechanisms to assess vaccine coverage. Four jurisdictions provide coverage feedback to immunization providers. Nine P/Ts assess coverage in relation to pre-identified targets: five use targets set through F/P/T consensus conferences<sup>13,14</sup> and the remainder use targets set by the P/T based on recent trends. The use of financial incentives to providers for reaching defined coverage targets was rare.

### First Nations immunization delivery and IISs

A variety of immunization programs exist across the First Nations organizations that participated in this study. As well, Health Canada's FNIHB either directly delivers or financially supports First Nations organizations in the delivery of immunization programs for First Nations people living on-reserve. FNIHB's regional offices monitor immunization coverage in First Nations on-reserve communities and submit immunization coverage data to the FNIHB National Office as part of their annual program reporting requirements. Data collection practices, methods and reporting capabilities were largely driven by the systems in use by P/Ts. Several respondents mentioned particular challenges with tracking immunizations administered off-reserve as they did not have access to these data. This was a particular challenge for reserves located near urban centres. In response, several on-reserve communities in various P/Ts have signed data sharing agreements allowing their data to be shared with their respective P/T systems. In BC, the client must provide consent before immunization information is shared with the provincial IIS. Given the limitations with data linkage and differences in coverage measurement practices that exist across on-reserve communities, many respondents articulated the view that coverage assessment in First Nations communities is particularly challenging.

*P/T respondent: "We have some First Nations restrictions in using the [P/T] registry, but not all so that is a gap in terms of being able to provide provincial immunization coverage rates, but we are seeing more and more interest and more and more involvement of our First Nations partners in joining the electronic registry..."*

*P/T respondent: "We have many clients whether it be First Nations clients or non-First Nations clients who move frequently between communities and, so, we all know that's very challenging then to try and attribute an individual to a specific community or regional health authority in terms of defining coverage".*

### Perceived strengths and limitations of IISs and non-IIS processes in Canada

Key informants identified several strengths of their IIS such as: reminder-recall functionality; tools to assist with future vaccine scheduling; auto-populated fields, validation rules, and prompts to support data entry and data quality; electronic documentation of informed consent to maximize time efficiency at clinics; and vaccine inventory management.

Newer electronic systems (e.g., Panorama and Alberta's Imm/ARI) and those systems that were designed specifically for immunization coverage assessment (e.g., Saskatchewan Immunization Management System [SIMS] and MIMS) were more likely to have several of these functions and key informants provided examples of their benefits:

*"It is nice that it [information] is real-time. It's nice to have a repository that feeds into our electronic health record, so that when people come to emergency, you get a full immunization history. For example, when you go to emergency, they wouldn't need to give you a tetanus shot because all of that data is there. In addition to doing coverage..., it can help provide better clinical care. If a kid shows up with a rash, and you see that kid was immunized 10 days ago, then you have a better guess that the rash is due to the immunization than measles itself."*

In contrast, P/Ts that relied on paper-based methods, spreadsheets or older systems for collecting and managing immunization data described challenges with obtaining timely coverage data to evaluate their vaccine programs and to respond to outbreaks.

Many key informants stated that having a national immunization registry would ensure greater transparency and consistency in coverage estimates across P/Ts. It would also have the practical advantage of improving the tracking of immunization histories of individuals who move between P/Ts. Because

respondents recognized that a national registry was unlikely given the investments made in Panorama and other recently implemented P/T systems, several respondents noted that the alternative would be a network of interconnected systems using consistent data standards, congruent with recommendations made by the first Canadian Consensus Conference on a National Immunization Records System, held in 1998.<sup>15</sup> Key informants noted that privacy legislation and the need for consistent data dictionaries and methods were challenges that had to be overcome to fulfil the vision of such a network.

*"If you want to have interconnected registries you have to have machines that know how to talk to each other and the only way to do that is to have standard data, so that what you call a pertussis vaccine is the same thing as what I call a pertussis vaccine. Or maybe you call it something different, but we know how to map between those two things."*

*"I think it is fine for each province and territory to have its own registry. It would be nice if we had registries that were connected, a network of registries. At least if we had a network we could extend the record to other provinces if a child moves."*

## DISCUSSION

This study revealed vast differences in the sophistication of the systems and processes used to collect immunization data for analysis of coverage. Systems ranged from newly implemented information technology applications to paper-based methods and spreadsheets. Although outbreaks of vaccine-preventable diseases often prompt calls for the establishment of a national immunization registry,<sup>8,16</sup> the vision for a network of interconnected P/T registries supported by national data standards and terminology has been in place since the 1998 Canadian Consensus Conference on a National Immunization Records System and it aligns with the responsibility for health services resting at the provincial/territorial level within Canada.<sup>15</sup> However, variability in the information technology infrastructure in place in several P/Ts and the complexities of privacy legislation and data sharing agreements are challenges to achieving the goal of having interconnected immunization systems. Fifteen functional standards and core data elements for P/T immunization registries were released in 2002,<sup>1</sup> including privacy provisions, targets for timeliness, and clinical decision support (e.g., the ability to forecast doses in alignment with immunization recommendations from the National Advisory Committee on Immunization) to move towards this goal.

This study did not aim to comprehensively evaluate whether P/T IISs meet the Canadian functional standards for registries as these have not been updated since 2002, and the extent to which they have guided system change in P/Ts is unclear. However, respondents' comments regarding timeliness of immunization reporting to the system and challenges with data sharing between P/Ts suggest that several of these standards have not been achieved by all P/Ts. The Canadian national standards should be periodically revised with progress reports issued regularly, as is done elsewhere.<sup>17-19</sup> An F/P/T process to refresh the functional and data standards for immunization registries in Canada has recently been initiated. The recent application of Systematized Nomenclature of Medicine Clinical Terms (SNOMED-CT<sup>®</sup>) codes

to ensure a consistent approach to clinical vaccine terminology is a further example of important work in the area of data standards and interoperability for IISs.<sup>20</sup>

A key theme among respondents was the asymmetry between the deployment of new information systems to support immunization data management and the processes used to collect information from immunizers. With the exception of P/Ts where infant and childhood immunizations are delivered exclusively by public health, most jurisdictions continue to receive paper-based records from immunizers for subsequent data entry. Only Manitoba allowed direct data entry by clinicians into the system and only Nova Scotia had the functionality to accept electronic data extracts from physicians who use a specific EMR application. Given the investments made in EMRs in Canada, linkage of EMR data with IISs to improve the timeliness and completeness of immunization data is needed.

Information exchange between IISs and EMRs and even smartphone applications<sup>21</sup> will facilitate tracking immunizations regardless of provider type. In P/Ts where physicians deliver the majority of infant and childhood vaccines, policies are required to ensure complete reporting by non-public health providers. For example, three P/Ts have recently implemented legislation to mandate immunization reporting within a pre-defined timeline following immunization. A similar survey of IIS managers conducted in the United States found that approximately 60% of the participating 56 jurisdictions mandate providers to report immunizations to IISs.<sup>22</sup> Two thirds of jurisdictions enforce the mandate through feedback, fines and limiting vaccine supplies.<sup>22</sup> Other jurisdictions, such as Australia, provide financial incentives to immunization providers who report immunizations to the national immunization register.<sup>23</sup> Additional reporting incentives have recently been added in Australia for providing overdue vaccines.<sup>24</sup> No such incentives were reported by key informants. In Ontario, financial incentives exist for physicians within select group practice models who achieve certain coverage targets within their practice. This is assessed through billing claims submitted by physicians to the provincial health insurance system rather than incentivizing data reporting to the provincial IIS.

The limitations of several aspects of Canada's IISs are challenging for accurate and timely assessment of immunization coverage. At the time of the survey, reminder-recall functionality, an effective intervention for improving vaccine coverage,<sup>25</sup> was available in only five jurisdictions. Only seven P/Ts had formally conducted quality assessments of their data. High quality data are essential for effective and informed vaccine program decision-making. On a more positive note, the fact that the majority of jurisdictions collect individual-level immunization data suggests that with the appropriate privacy safeguards and data sharing agreements in place, mechanisms to support information exchange to address the needs of Canadians who move between jurisdictions can be implemented. It is clear that despite progress in implementing IISs in Canada, there is still much work ahead to strengthen immunization information collection and sharing across all P/Ts.

We believe our results provide a comprehensive overview of the current systems used in Canada to collect immunization data and assess immunization coverage. All P/Ts, with the exception of the Yukon territory (YT), participated and publicly available documents indicate that YT has recently transitioned to

Panorama, which has been described within this manuscript.<sup>26</sup> Data were collected directly from experts in this area, but immunization programs are complex initiatives with multiple contributors and stakeholders, even within a single jurisdiction. This inherent complexity may have led to omissions in our data collection, since we interviewed a small number of individuals as representatives of their jurisdiction. To mitigate this limitation, we encouraged respondents to solicit feedback from their colleagues and interviewed multiple respondents from the same jurisdiction whenever possible, and we validated the information and quotations presented with the key informants.

A final limitation to note is that Canadian P/Ts currently using Panorama were, over the period of information collection in 2015, in various stages of adoption and implementation of the system, and the information represented within the manuscript may not reflect current operational processes with Panorama in full use. A future study exploring the implementation of Panorama in adopting jurisdictions would be an interesting contribution to the Canadian IIS literature.

## CONCLUSION

Our results demonstrate considerable variability between IISs and processes used to assess immunization coverage in Canada, and this continues to evolve as new systems are implemented. Despite the lack of a single IIS in Canada, all participating jurisdictions – with one exception – had mechanisms to assess vaccine coverage. Although some P/Ts have already pursued legislative or policy initiatives to address the completeness and timeliness of immunization information, many additional opportunities exist in the information technology realm that could move Canada towards an interconnected network of IISs containing timely and accurate immunization data. Future work should explore how other countries with multiple parallel (i.e., decentralized) systems have overcome similar challenges.

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## RÉSUMÉ

**OBJECTIFS :** Contrairement à d'autres pays (comme les États-Unis et l'Australie), le Canada n'a pas de registre d'immunisation national. Il existe divers systèmes d'enregistrement du recours aux vaccins, mais ils n'ont pas été systématiquement décrits. Notre objectif était de décrire les systèmes d'information sur la vaccination (SIV) et les processus autres que les SIV utilisés pour enregistrer les vaccins administrés durant l'enfance et l'adolescence, et d'en présenter les forces et les contraintes.

**MÉTHODE :** Nous avons recueilli auprès d'informateurs privilégiés des données sur les systèmes de surveillance utilisés par leur organisme provincial, territorial ou fédéral pour évaluer la couverture vaccinale. Les données ont été recueillies au moyen d'un questionnaire à remplir soi-même et d'un entretien de suivi. Au moyen d'une analyse de contenu, nous avons évalué les systèmes par rapport à des attributs trouvés dans la documentation.

**RÉSULTATS :** Vingt-six personnes issues de 16 organismes de santé publique ont participé à l'étude entre avril et août 2015. Douze des 13 provinces et territoires (P/T) du Canada et deux organismes intervenant dans la prestation des services de santé des Premières Nations dans les réserves ont participé. D'un système à l'autre, on nous a signalé des différences dans les processus de collecte de données, les capacités d'établissement de rapports et les fonctions avancées. Les difficultés couramment rencontrées concernaient l'actualité et l'exhaustivité des

dossiers de données, particulièrement pour les vaccins administrés par les médecins. Les questions de confidentialité et l'absence de normalisation des données ont été indiquées comme faisant obstacle au partage de l'information d'un système P/T à l'autre. Bon nombre de P/T ont récemment mis en œuvre de nouveaux systèmes et, dans certains cas, des mesures législatives pour en améliorer l'actualité et/ou l'exhaustivité.

**CONCLUSION :** Il existe une variabilité considérable entre les SIV et les processus autres que les SIV qui servent à évaluer la couverture vaccinale au Canada. Quelques P/T mènent déjà des initiatives législatives ou stratégiques pour aborder l'exhaustivité et l'actualité des données, mais il existe de nombreuses possibilités de faire mieux dans le domaine de la technologie de l'information.

**MOTS CLÉS :** couverture vaccinale; registres d'immunisation; registres de vaccination; maladies évitables par la vaccination; Canada