VACCINATION DURING PREGNANCY IN CANADA

RESULTS FROM THE 2019 SURVEY OF VACCINATION DURING PREGNANCY



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HIGHLIGHTS

- The Survey of Vaccination during Pregnancy was first conducted in 2019 as a new component to the childhood National Immunization Coverage Survey (cNICS).
- 5,091 biological mothers of children born between September 2018 and March 2019 were surveyed about vaccines received during their pregnancy.
- Less than half of mothers (44%) had been vaccinated against pertussis.
- Similarly, 45% had been vaccinated against influenza.
- Among the mothers who had not been vaccinated against pertussis, the most common reason was not being aware the vaccine was recommended during pregnancy (60%).
- Among those not vaccinated against influenza, the most common reason was not wanting to receive the vaccine while pregnant (46%).

BACKGROUND

Vaccination for pertussis and influenza during pregnancy is safe and provides adequate protection to the mother and the fetus from infections that can be severe. Vaccination during pregnancy also protects the newborn during the first months of life.

Since 2011, the National Advisory Committee on Immunization (NACI) has recommended that pregnant women be vaccinated against influenza to prevent the disease and its complications during pregnancy, and to protect newborns[1]. This is particularly important for infants younger than 6 months old as they are too young to receive the influenza vaccine themselves[2].

In 2018, NACI recommended that all pregnant women should be vaccinated against pertussis, irrespective of their past immunization history[3]. When the tetanus, diphtheria and acellular pertussis (Tdap) vaccine is given in pregnancy, the mother produces antibodies that are transferred to the fetus, which will protect the newborn during their first months of life[4]. Pertussis is most dangerous for infants under 2 months of age because they are still too young to receive their recommended first dose[2].

Subsequent to the NACI recommendation in 2011, provinces and territories have been offering the flu vaccine free of charge to pregnant women[5]. Provinces and territories also gradually began to offer the Tdap vaccine free of charge to pregnant women following the new NACI guidelines introduced in 2018[6].

The Public Health Agency of Canada (PHAC) routinely monitors childhood vaccination coverage in Canada though the childhood National Immunization Coverage Survey (cNICS). Since 1994, cNICS has been conducted approximately every two years to estimate national uptake for all publicly funded routine childhood vaccinations that are recommended by NACI[7]. Statistics Canada has conducted cNICS on behalf of PHAC since 2011. For the first time in 2019, cNICS included a component on prenatal vaccination also known as the Survey of Vaccination during Pregnancy (SVP), which this report focuses on. A separate report for the children component of 2019 cNICS is available elsewhere[8]. In the SVP, biological mothers were asked questions about vaccines they were offered and received during their recent pregnancy, along with questions about their knowledge, attitudes and beliefs (KAB) regarding immunization to better understand factors influencing decisions on vaccination.

Overall, the main objectives of the 2019 SVP were to:

1. Produce national, provincial, and territorial estimates of immunization coverage for vaccines given during pregnancy.
2. Provide information on mother's knowledge and beliefs regarding immunization during pregnancy and vaccination in general.

METHODS

The SVP was conducted for the first time as part of the 2019 cNICS. The questions were developed by Statistics Canada and PHAC and are available on Statistics Canada's website[9]. For the 2019 cycle, the survey was conducted for the first time via Electronic Questionnaire (EQ). As part of the process to move to the EQ, experts from the Questionnaire Design Research Centre (QDRC) at Statistics Canada reviewed and tested the survey content, including reviewing the entire questionnaire and conducting one-on-one interviews in English and French prior to collection. Maternal vaccines included in the 2019 SVP were those that are recommended in every pregnancy in Canada (i.e. vaccines against pertussis[a] and influenza)[10]. Vaccines recommended in post-partum, for travel and some high-risk groups were excluded.

Sampling

The target population of the 2019 SVP is biological mothers who had given birth between September 2, 2018 and March 1, 2019 (meaning the child was under 6 months of age as of March 1, 2019) and who had lived in the 10 provinces and 3 territories for most of their pregnancy. Mothers who resided on First Nations reserves and lived in institutions were excluded.

The survey frame was built using the June and September 2019 versions of the list of children for whom the Canada Child Benefit (CCB) was claimed. The June version is a cumulative file for 2019. The September 2019 file was used to gather every child aged 0 to 6 months old as of March 1, 2019 that would have not been registered in the June CCB file due to a delay in the registration. Since the delay has been estimated to be 3 months, a 6-month gap (from March to September) ensured that all registered children are covered. The frame included children aged 0 to 6 months as of March 1, 2019, still alive as of September 2019, and where the applicant, or their spouse, was a female. There is some limited oversample given that adoptive mothers can only be excluded when the respondent is asked if they are the biological mother of the child.

The difference between the target and survey population consists of mothers who did not apply for CCB benefits, and for whom their spouse did not apply either because they were not aware of the benefit, chose not to request it, or were subsidized by the provincial government for children living with a foster family for the entire year. Nonetheless, the CCB's list was estimated to include 96% of Canadian children in 2018 when compared to the demographic projections for Canada, the provinces and territories and analysis revealed no important under-coverage bias.

A sample of children born between September 2, 2018 and March 1, 2019 were randomly selected from the survey frame by Statistics Canada. Children were selected within each strata defined by province and territory of residence. Only one eligible child from each household was selected. The biological mothers of these children were then contacted and

[a] As the primary reason to administer Tdap during pregnancy is to prevent pertussis, and this is what is (or should be) explained to pregnant women by their maternal care providers and vaccine providers, the questionnaire referred to pertussis vaccine rather than Tdap.

invited to participate in the survey, provided they had lived in Canada for most of their pregnancy. In other words, the sampling unit is the child, while the respondent is the biological mother. The final sample size and response rates by province and territory are shown in **Table 1**.

A more detailed description of data collection and processing methods is available on Statistics Canada's website[9].

Data collection

Data collection for the 2019 SVP occurred from December 2, 2019 to March 6, 2020 (i.e., between 9 and 18 months after childbirth) through a self-response electronic questionnaire (EQ) or a computer-assisted telephone interview (CATI) with mothers.

The mothers (hereafter referred to as the respondent) of the selected children were contacted and invited to participate in the survey[9]. They answered survey questions about immunizations received during pregnancy as well as questions about knowledge and beliefs regarding vaccination during pregnancy and vaccination in general.

Mail-out notification

Two weeks before data collection started, an introductory letter was mailed to the mother. The introductory letter informed respondents of the purpose of the voluntary survey and invited them to participate. The letter also provided instructions on how to log in to the self-response electronic questionnaire.

Electronic questionnaire or computer-assisted telephone interview

In the introductory letter that was mailed out, respondents were encouraged to complete the electronic questionnaire and, if they needed help, to call the help line to complete the questionnaire with a trained Statistics Canada interviewer. If the survey was not completed within a designated amount of time, interviewers followed up and offered to complete the survey by telephone. Contact information came from the CCB file and included both landlines and cell phones.

To maximize response rates, non-response follow-up was conducted by Statistics Canada trained interviewers using a tracking system.

Data processing

The survey data from the SVP 2019 was processed in order to transform survey responses obtained during collection into a form that is suitable for tabulation and analysis.

Computer-generated edits

Since collection was performed using a self-response EQ or a CATI, it was possible for certain edits to be built into the application. For example, validity edits ensured that responses fell within the allowed range and that only character values were entered into character fields, or numeric values were entered into numeric fields. After data collection, the raw data file was put through a series of standard processing steps designed to clean the data and help ensure its consistency thereby increasing its usefulness. Moreover, the flow of the questionnaire

differed depending on the responses to various questions. Flow edits replicated the flow patterns used in the application and set the non-applicable questions to a value of "Valid Skip". Meanwhile, questions that were applicable to the respondent but that were not answered (non-responses) were set to a value of "Not Stated". In addition, various types of editing were done to detect missing or inconsistent information. For example, consistency edits were performed to check the logical relationship between responses. To facilitate data analysis, some variables were derived using collected data. A derived variable may be created based on a single variable (by re-grouping or collapsing categories) or based on several variables (by combining them together to define a new concept).

Data linkage and imputation

For the 2019 cycle of cNICS, household income information was not collected from respondents. Instead, total household income for the previous year (from 2018 for this cycle) was retrieved through linkage to tax data files. When data linkage was not possible, income was imputed using the trend imputation method or nearest-neighbour imputation method[11].

Weighting

As cNICS is a probabilistic survey, weights are assigned to respondents in order for estimates to be representative of the target population. Therefore, each unit in the sample represents a number of units in the population of interest.

Survey weights are calculated using design weight which is then adjusted for survey non-response so that respondents may also represent non-respondents. The design weight is the inverse of the probability of selection, that is, the probability that a mother in the population is selected. Furthermore, given that exact counts of birth mothers do not exist, no post-stratification was made. The weights were used to estimate vaccine coverage rates as well as knowledge and beliefs about vaccines for the population groups. Finally, a set of 1,000 bootstrap weights was also created to estimate variances directly[12].

Data analysis

All analyses were conducted using SAS 9.4. Vaccination coverage rates were calculated as the proportion of pregnant women vaccinated against pertussis and influenza. Respondents who could not recall whether they have been vaccinated or not against pertussis (10%) or the flu (3%) were excluded from the calculation.

Quality levels of the coverage proportion estimates were based on domain sample size. For proportions, the domain sample size is the unweighted count of the number of respondents included in the denominator of the proportion. For a domain sample size of less than 138 at the national level, or less than 66 at the provincial and territorial level, estimates and confidence intervals are deemed to be of marginal quality (Category E) due to high sampling variability and thus are to be interpreted with caution. If the domain sample size was less than 69 at the national level, or less than 33 at the provincial and territorial level, then the estimates and confidence intervals are deemed to be of poor quality (Category F), containing a very high level of instability and thus being unreliable, invalid, and potentially misleading. Estimates that fall under Category F are not reported.

RESULTS

Participation and response rates

The overall unweighted response rate for the 2019 SVP was 58.9% at the national level. Response rates by province and territory ranged between 42.5% and 67.1% (**Table 1**). The response rates reported are the number of biological mothers who responded to questions in either the immunization or the knowledge and beliefs section of the survey, as a percentage of the number of newborns included in the initial sample, adjusted to account for out-of-scope units (for example, mothers living on a First Nations reserve and adoptive mothers). In other words, the response rate is calculated as:

Response rate=(number of respondents / effective sample size) * 100%

TABLE 1. Sample sizes and response rates (%) by province and territory

PROVINCE AND TERRITORY	CHILDREN SAMPLED FROM THE FRAME	BIOLOGICAL MOTHERS WHO PARTICIPATED	RESPONSE RATE
	n	n	%
Newfoundland and Labrador	750	420	57.8
Prince Edward Island	551	313	59.4
Nova Scotia	831	474	58.6
New Brunswick	814	465	58.2
Quebec	945	610	67.1
Ontario	978	554	60.4
Manitoba	879	452	55.4
Saskatchewan	873	468	56.1
Alberta	925	581	65.7
British Columbia	919	528	60.4
Yukon, Northwest Territories, Nunavut[a]	631	226	42.5
Canada	9,096	5,091	58.9

n=unweighted count

[a] Due to small numbers in the territories, they are grouped together.

Pertussis

There were 4,607 mothers who recalled whether they received the pertussis vaccine during their pregnancy and among them, 44% had been vaccinated against pertussis (**Table 2**). There were also significant differences between provinces and territories. These differences may be in part explained by the fact that provinces and territories have not all begun offering the Tdap vaccine at the same time, nor promoting it to health care providers and pregnant women. At the time of their pregnancy, the Tdap vaccine was offered free of charge for every pregnancy in all Canadian provinces and territories except British Columbia and Ontario. It should be pointed out that 10% of the mothers did not know if they had been vaccinated against pertussis while pregnant.

TABLE 2. Percentage of mothers vaccinated against pertussis during pregnancy for mothers who gave birth between September 2, 2018, and March 1, 2019, by province and territory

PROVINCE AND TERRITORY	PERCENTAGE OF MOTHERS VACCINATED AGAINST PERTUSSIS DURING PREGNANCY, % (95% CI)[a]
Newfoundland and Labrador	15.9 (12.6–20.0)
Prince Edward Island	76.2 (70.8–80.8)
Nova Scotia	62.2 (56.9–67.2)
New Brunswick	71.0 (66.3–75.3)
Quebec	48.8 (44.4–53.1)
Ontario	40.3 (35.9–44.9)
Manitoba	57.0 (51.4–62.5)
Saskatchewan	74.0 (69.1–78.3)
Alberta	37.9 (33.6–42.4)
British Columbia	25.6 (21.6–29.9)
Yukon	56.5 (44.8–67.6)
Northwest Territories	80.1 (54.1–93.2)
Nunavut	NA[b]
Canada	43.5 (41.4–45.6)

CI: Confidence interval

[a] Only mothers who knew if they had been vaccinated are counted in these calculations (n=4,607)

[b] The sub-sample size for Nunavut was insufficient to allow reliable estimates. However, these participants were included in the national coverage estimate.

Influenza

During the 2018–2019 seasonal influenza vaccination campaign, provinces and territories began administering vaccines on different dates. The latest date on which a jurisdiction had started their campaign was on November 1, 2018. Therefore, only 2,429 mothers who gave birth between December 1, 2018 and March 1, 2019, i.e. those who had at least one month to get vaccinated before the end of their pregnancy, were included in the analysis of influenza vaccination.

There were 2,361 mothers who knew if they had been vaccinated against influenza during pregnancy. Of them, 45% had been vaccinated (**Table 3**). There were significant differences between provinces and territories, which may be explained by the fact that they have different recommendations regarding flu vaccination during pregnancy. Furthermore, 3% of mothers did not know if they had been vaccinated.

TABLE 3. Percentage of mothers vaccinated against influenza during pregnancy for mothers who gave birth between December 1, 2018, and March 1, 2019, by province and territory

PROVINCE AND TERRITORY	PERCENTAGE OF MOTHERS VACCINATED AGAINST INFLUENZA DURING PREGNANCY, % (95% CI)[a]
Newfoundland and Labrador	41.4 (34.7–48.4)
Prince Edward Island	75.2 (67.5–81.6)
Nova Scotia	71.5 (63.9–78.1)
New Brunswick	58.4 (49.9–66.3)
Quebec	32.9 (27.6–38.7)
Ontario	43.3 (37.2–49.7)
Manitoba	48.8 (41.2–56.4)
Saskatchewan	64.9 (57.0–72.1)
Alberta	49.4 (43.5–55.3)
British Columbia	49.8 (43.3–56.2)
Yukon	66.0 (51.7–77.8)[E]
Northwest Territories	84.8 (52.9–96.5)[E]
Nunavut	NA[b]
Canada	45.0 (42.1–47.9)

CI: Confidence interval

[a] Only mothers who knew if they had been vaccinated while the flu vaccine was being offered are counted in these calculations (n=2,361)

[b] The sub-sample size for Nunavut was insufficient to allow reliable estimates. However, these participants were included in the national coverage estimate.

[E] These estimates and confidence intervals are considered to be of marginal quality due to high sampling variability and should be used with caution.

Reasons for non-vaccination during pregnancy

Among mothers who were not vaccinated against pertussis during their pregnancy, more than half (60%) did not know that the vaccine was recommended during pregnancy (**Table 4**). This recommendation was relatively new at the time of the 2019 SVP, and some provinces and territories were not yet offering the Tdap free of charge. In addition, 16% did not want to be vaccinated against pertussis during pregnancy, and 11% were not offered the Tdap by their primary maternity care provider. Concerns about the vaccine being harmful for the baby and the lack of confidence that the vaccine would help protect the baby were also reasons that prevented some mothers from receiving the pertussis vaccine during pregnancy (3%).

TABLE 4. Reasons that prevented mothers from receiving the pertussis vaccine during pregnancy, reported by mothers who gave birth between September 2, 2018, and March 1, 2019

REASON	% (95% CI)[a]
Not aware the pertussis vaccine was recommended during pregnancy	59.6 (56.7–62.4)
Did not want to be vaccinated against pertussis during pregnancy	15.9 (14.0–18.1)
Pertussis vaccine was not offered by primary maternity care provider	10.7 (9.1–12.5)
Vaccine could have been harmful for baby	3.3 (2.5–4.4)
Not confident that the pertussis vaccine would help protect baby	3.0 (2.1–4.1)
Would have been necessary to make separate appointment to get vaccine	2.0 (1.3–2.9)
Would have been necessary to visit a different health care provider to get vaccine	1.9 (1.3–2.9)
Did not know where to get the pertussis vaccine	1.9 (1.3–2.8)
Primary maternity care provider advised against getting the pertussis vaccine	1.8 (1.1–2.7)
Baby is not at risk of getting pertussis	1.6 (1.0–2.5)
Pertussis vaccine was too expensive	0.7 (0.3–1.3)
Pertussis is not a severe disease for babies	0.2 (0.1–0.6)
Other	20.6 (18.4–23.0)

CI: Confidence interval

[a] Only mothers who were not vaccinated against pertussis during pregnancy were included (n=2,260).

NOTE: respondents could provide more than one reason.

Of mothers who were not vaccinated against the flu during pregnancy, the most common reason for choosing not to be vaccinated (46%) was that they did not want to receive the flu vaccine while pregnant (**Table 5**). Furthermore, 23% of unvaccinated mothers were not aware that vaccination against influenza was recommended during pregnancy, and 6% indicated the flu vaccine would not have protected against the flu. 6% of unvaccinated mothers were also not recommended the flu vaccine by their primary maternity care provider.

TABLE 5. Reasons that prevented mothers from receiving the influenza vaccine during pregnancy, reported by mothers who gave birth between December 1, 2018, and March 1, 2019

REASON	% (95% CI)[a]
Did not want to get the flu vaccine while pregnant	46.1 (41.8–50.6)
Not aware the flu vaccine was recommended during pregnancy	23.0 (19.6–26.8)
Flu vaccine would not have protected against the flu	6.0 (4.2–8.4)
Flu vaccine was not recommended by primary maternity care provider	5.7 (4.0–7.9)
Not pregnant during flu season	4.9 (3.5–7.0)
Flu vaccine was not offered by primary maternity care provider	4.9 (3.5–6.8)
Flu vaccine could have been harmful for the baby	4.9 (3.5–6.8)
Would have been necessary to visit a different health care provider to get the vaccine	3.3 (2.1–5.2)
Would have been necessary to make a separate appointment to get the vaccine	2.6 (1.6–4.1)
Having the flu during pregnancy would not have posed risk to the baby	2.2 (1.2–4.0)
Having the flu during pregnancy would not have been serious	2.1 (1.2–3.4)
Received the flu vaccine before becoming pregnant	2.0 (1.2–3.3)
Did not know where to get the flu vaccine	0.7 (0.2–1.8)
Other	21.6 (18.2–25.3)

CI: Confidence interval

[a] Only mothers who were not vaccinated against influenza during pregnancy were included (n=1,051)

NOTE: respondents could provide more than one reason.

Knowledge, attitudes, and beliefs about vaccination

To better understand the factors influencing decisions on vaccination during pregnancy, biological mothers were asked about their views on vaccines given during pregnancy and vaccination in general.

Regarding pertussis, the majority of mothers (73%) agreed that it is a serious disease for babies (**Table 6**). Most (61%) considered that receiving the pertussis vaccine is safe for the mother, and 47% thought that the baby would be at higher risk of getting pertussis if the mother does not receive the vaccine. 38% of mothers believed that it is safer for the baby to be vaccinated with the pertussis vaccine after delivery, whereas 44% did not know. Also, almost half of mothers (47%) did not know if getting vaccinated against pertussis during pregnancy could be harmful for the fetus. The administration of Tdap vaccine during the second or third trimester of pregnancy is not associated with any adverse outcomes during pregnancy or to the newborn[13]. Furthermore, 50% did not know if pregnant women in their community were vaccinated against pertussis, and 44% did not know whether vaccination against pertussis during pregnancy protected the baby. Given the novelty of the NACI guideline, which was introduced the year prior to the 2019 SVP, pregnant women may have not been aware of the recommendation and its aim of protecting newborn infants.

TABLE 6. Knowledge, attitudes and beliefs about pertussis vaccination during pregnancy for mothers who gave birth between September 2, 2018, and March 1, 2019

STATEMENTS	n	PERCENTAGE OF MOTHERS WHO AGREE, % (95% CI)	PERCENTAGE OF MOTHERS WHO DISAGREE, % (95% CI)	PERCENTAGE OF MOTHERS WHO DO NOT KNOW, % (95% CI)
Receiving the pertussis vaccine during pregnancy is safe for the mother	5,085	60.5 (58.5–62.6)	4.5 (3.8–5.5)	34.9 (32.9–37.0)
It is safer for the baby to be vaccinated with the pertussis vaccine after delivery	5,072	38.2 (36.2–40.3)	17.4 (16.0–18.9)	44.4 (42.4–46.5)
Pertussis vaccination during pregnancy is not necessary	5,061	20.5 (18.8–22.2)	40.7 (38.7–42.6)	38.9 (37.0–40.8)
Pertussis vaccination during pregnancy does not protect the baby	5,072	8.4 (7.3–9.6)	47.3 (45.3–49.3)	44.4 (42.3–46.4)
Pertussis is a severe disease for babies	5,074	73.1 (71.2–75.0)	2.8 (2.2–3.5)	24.1 (22.3–25.9)
If the mother does not get pertussis vaccine, the baby will be at higher risk of getting the disease	5,066	46.9 (44.9–49.0)	16.3 (14.7–17.9)	36.8 (34.8–38.8)
Most pregnant women I know were vaccinated during their pregnancy	5,072	27.6 (25.9–29.4)	22.0 (20.3–23.8)	50.4 (48.4–52.5)
Vaccination for pertussis during pregnancy can be harmful for the fetus	5,078	10.0 (8.8–11.3)	43.5 (41.5–45.5)	46.5 (44.5–48.5)

n=unweighted total number of respondents who answered the question

CI: Confidence interval

Regarding vaccination against influenza during pregnancy, a majority (86%) of mothers agreed that receiving the flu vaccine during pregnancy is safe for the mother, and 85% believed it helped to protect the mother from getting the flu (**Table 7**). Most (81%) agreed that receiving the vaccine against the flu during pregnancy is safe for the fetus. In addition, 61% of mothers believed that getting the flu while being pregnant can be harmful to the fetus. Vaccination of pregnant women protects their newborns from influenza and influenza-related complications, and studies have shown no evidence of harm to the mother or fetus associated with flu vaccination[1].

TABLE 7. Knowledge, attitudes and beliefs about influenza vaccination during pregnancy for mothers who gave birth between September 2, 2018 and March 1, 2019

STATEMENTS	n	PERCENTAGE OF MOTHERS WHO AGREE, % (95% CI)
Receiving the flu vaccine during pregnancy is safe for the mother	4,914	86.1 (84.6–87.5)
Receiving the flu vaccine during pregnancy is safe for the fetus	4,813	81.0 (79.3–82.6)
Flu vaccination during pregnancy helps to protect the mother from getting the flu	4,954	85.1 (83.7–86.5)
Flu vaccination during pregnancy helps to prevent birth outcomes such as miscarriage or premature birth	4,439	43.3 (41.2–45.4)
Most pregnant women I know get vaccinated for the flu during their pregnancy	4,583	52.4 (50.3–54.5)
In general, the flu is not a severe disease	4,948	46.5 (44.5–48.5)
The flu vaccine is not effective in preventing the flu	4,904	38.3 (36.3–40.3)
Getting the flu during pregnancy can be harmful to the fetus	4,834	60.7 (58.7–62.7)

n=unweighted total number of respondents who answered the question

CI: Confidence interval

As for their views on childhood vaccination, the large majority of mothers (97%) agreed that vaccines in general help to protect their child's health, and that they are effective (**Table 8**). Most also believed that childhood vaccines are safe (95%). Regardless, more than half of the mothers (52%) were concerned about potential side effects from vaccines. 26% also agreed that a vaccine could give you the very same disease it was meant to prevent – which is not possible.

TABLE 8. Knowledge, attitudes and beliefs about childhood vaccination for mothers who gave birth between September 2, 2018 and March 1, 2019

STATEMENTS	n	PERCENTAGE OF MOTHERS WHO AGREE, % (95% CI)
Childhood vaccines are safe	5,038	94.5 (93.5–95.2)
Childhood vaccines are effective	5,030	96.9 (96.1–97.5)
Vaccines help to protect my child's health	5,052	97.3 (96.6–97.9)
I am concerned about the potential side effects from vaccines	5,021	51.8 (49.8–53.8)
A vaccine can give you a serious case of the very same disease it was meant to prevent	4,848	26.4 (24.5–28.3)
The use of alternative practices, such as homeopathy or naturopathy, can eliminate the need for vaccination	4,824	13.7 (12.2–15.3)
A healthy lifestyle, such as healthy nutrition and hygiene, can replace the need for vaccination	4,994	14.7 (13.2–16.3)

n=unweighted total number of respondents who answered the question

CI: Confidence interval

STRENGTHS AND LIMITATIONS

The SVP has several strengths and limitations that must be considered when interpreting the results of the survey.

STRENGTHS

- The SVP used random sampling from a comprehensive survey frame, the Canada Child Benefit, which is believed to include 96% of Canadian children, allowing a representative sample to be collected on national, provincial, and territorial levels. The large number of respondents, more than 5,000 mothers, is also a major strength of the survey.
- The 2019 cycle of cNICS is the first to use the self-response electronic questionnaire for data collection of each of its components. This is hypothesized to increase the accuracy of the data by reducing transcription errors that may have occurred during the telephone interviews.
- For the 2019 cycle, only one set of weights was calculated for the sample of biological mothers included in SVP. In previous cNICS cycles, two survey weights were made available: one to estimate vaccine coverage rates and another for to analyze knowledge, attitudes, and beliefs about immunization. After methodological evaluation of the weighting strategy, it was shown that only one set of weights was necessary. With only one series of weights being produced, this results in a more user-friendly product and simplifies the work for analysts.
- The overall response rate for the 2019 SVP was at 59.8%. While the response rate is not optimal, it is similar to the Canadian Community Health Survey (CCHS), another probability survey of Canadian adults (58.8% in 2018, and 54.4% in 2019)[14, 15]. It is also higher than response rates obtained in adults by random-digit dialing surveys such as the National Health Interview Survey in the United States (53.1% in 2018)[16] and the Seasonal Influenza Vaccination Coverage Survey in Canada (17% in 2019–2020)[17].

LIMITATIONS

- Data were collected from December 2019 to March 2020, which is 9 to 18 months after the selected child was born. Because mothers were self-reporting their vaccination against pertussis and influenza at the time of pregnancy, this may have led to recall bias or social desirability bias. In addition, there may have been non-response bias as mothers who agreed to participate may have been different from those who did not, and this bias would have affected coverage estimates.
- The survey questionnaire was available in both official languages; however, mothers not fluent in English or French may have had some difficulty understanding and completing the survey. This subpopulation of mothers may have differences in vaccination coverage and access or utilization of healthcare services from that of other mothers in Canada.

- Similar to many other Statistics Canada surveys, the SVP excluded First Nations on-reserve communities and institutionalized women.
- The survey was conducted the year after the new NACI guidelines for vaccination against pertussis during pregnancy. Some provinces and territories gradually began to offer the vaccine at different times throughout 2018 and 2019. Given the novelty of the recommendation, pregnant women and even health care providers might not have been aware of it.

CONCLUSION

The Survey of Vaccination during Pregnancy was first conducted in 2019 as a new component of the cNICS. Biological mothers were asked about the vaccines they received during their most recent pregnancy as well as their beliefs regarding immunization. Despite guidelines for vaccination during pregnancy, less than half (44%) of mothers were vaccinated against pertussis during pregnancy. Less than half (45%) of mothers were vaccinated against the flu while they were pregnant during the flu season. Moreover, there were significant differences between provinces and territories in vaccination coverage against pertussis and influenza during pregnancy.

Among the mothers who were not vaccinated against pertussis, the most common reason for not being vaccinated was that they were not aware the pertussis vaccine was recommended during pregnancy. As for the mothers who were not vaccinated against the flu, the most common reason was not wanting to be vaccinated against the flu while pregnant.

Furthermore, most mothers viewed pertussis as a severe disease for babies and agreed that receiving the pertussis vaccine during pregnancy is safe for the mother. A majority of mothers also believed the flu vaccine was safe for them while pregnant, in addition to agreeing that it helped to protect them against the flu.

Understanding the drivers and barriers that affect uptake of maternal vaccination is relevant. While the COVID-19 pandemic has fueled the reduction in global immunization coverage[18], many Canadians, including pregnant women, may have changed their health behaviours due to the pandemic. Given that they are considered at risk of more severe outcomes from COVID-19[19], some may have postponed or even canceled their vaccination appointments in order to follow protective measures like social distancing practices and to reduce the risk of exposure to COVID-19. Moreover, perceptions and confidence regarding vaccines could have changed during the pandemic. As the 2019 SVP provides new data on vaccination during pregnancy, it can be used to compare results of future SVP cycles and measure the impact of the pandemic on pregnant women's behaviours and perceptions about vaccination.

Data from the SVP are essential to monitor vaccination coverage during pregnancy in Canada. Results from the 2019 SVP highlight the need to increase vaccination uptake against pertussis and influenza among pregnant women in order to protect both mothers and infants. Furthermore, these results can help in guiding health promotion activities to inform pregnant women about accurate information regarding vaccines and immunization during pregnancy.

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