

# Community pharmacists' knowledge, beliefs and attitudes towards immunization in Quebec

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## ABSTRACT

**OBJECTIVES:** To describe the knowledge, beliefs and attitudes of Quebec's pharmacists towards immunization and determine their perceived barriers to pharmacist-led immunization.

**METHODS:** The current study was a descriptive survey of pharmacists working in a community setting in Quebec. Pharmacists were randomly chosen from a list of Quebec's community pharmacies and were contacted by phone from January 17 to 25, 2013. Participating pharmacists were given a web link to the online questionnaire. An e-mail reminder was sent 5–7 days after the first contact.

**RESULTS:** A total of 201 community pharmacists were contacted during the study period, and 115 answered the survey, generating a 57% response rate. The vast majority of respondents answered that vaccines have more benefits than adverse effects. Approximately 52% answered that pharmacists should be able to prescribe and administer vaccines, pending a legislative change. These pharmacists were more interested in administering travel (92%), flu (88%) and pandemic (85%) vaccines than regularly scheduled vaccines for adults (65%) or children (18%). Leading barriers to pharmacist-led immunization were lack of time (90%) and training (92%), and the most common factors that would help its implementation were increased immunization training (95%) and adequate remuneration (92%).

**CONCLUSION:** These findings should push for a renewed discussion about the role of pharmacists as immunization agents in Canadian provinces where pharmacists do not have the right to administer vaccines.

**KEY WORDS:** Immunization; vaccination; pharmacists; Quebec

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

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Immunization is one of the most useful and effective tools of modern medicine.<sup>1</sup> Its successes range from the worldwide eradication of smallpox to the drastic decrease of *Haemophilus influenzae* type b invasive infections in developed countries.

Many vaccine-preventable diseases still cause major morbidity and mortality in Canada. Influenza and pneumonia are the eighth overall cause of mortality in the country, accounting for 5,826 deaths in 2009.<sup>2</sup> One of the keys to immunization's success is a high immunization rate. Some pathogens, such as measles and pertussis, require immunization rates as high as 95% to prevent serious outbreaks.<sup>3</sup> Influenza requires lower immunization rates (80%) to establish herd immunity.<sup>4</sup>

Immunization rates in Quebec are suboptimal, especially among adults. During the 2011–2012 influenza season, 57% of the population aged 60 years and over received the influenza vaccine.<sup>5</sup> Thirty percent of people aged from 18 to 59 with chronic illnesses received the influenza vaccine during the same period. In the same groups, even lower immunization rates, 54% and 22% respectively, were reported for pneumococcal vaccines.

Several reasons contribute to low vaccination rates in developed countries. Misperception of one's vulnerability or of the disease's severity, lack of time or interest, doubts about immunization and fear of adverse effects were cited in a Quebec survey.<sup>5</sup> The accessibility and convenience of the immunization setting are important issues, especially for medically underserved

populations.<sup>6</sup> Lack of knowledge and guidance on the part of health professionals is another explanation for poor vaccine uptake in adults.<sup>5,7</sup>

To widen vaccines' availability and facilitate their uptake, several associations and government agencies, such as the Infectious Diseases Society of America and the Centers for Disease Control and Prevention, recommend that vaccines be available in pharmacies and that pharmacists administer them.<sup>8,9</sup> Such a public health strategy broadens the providers' base and benefits hard-to-reach populations because of the large number of pharmacies.<sup>10</sup>

Pharmacists are among the most trusted and accessible health care professionals.<sup>11</sup> In the US, pharmacists are authorized to immunize in every state, though each state may restrict the administration to certain populations and vaccines.<sup>12</sup> In Canada, pharmacists are allowed to immunize in six provinces (Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia and Ontario) following completion of training programs that are regulated by each province.<sup>13</sup>

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In 2008–2009, a large survey of Quebec’s community pharmacies’ immunization services was conducted by the National Public Health Institute of Quebec (INSPQ).<sup>14</sup> It showed that 90% of the community pharmacies sold vaccines, and 27% offered vaccine administration (delivered by a nurse). Many pharmacies (44%) were considering offering vaccine administration within the next five years. Half the pharmacists surveyed answered that they would be interested in providing immunization themselves, pending a legislative change.

The INSPQ survey underlined the lack of data concerning pharmacists’ knowledge, beliefs and attitudes about immunization in a Canadian context. The objectives of the current study are to fill this gap in knowledge and determine what barriers to pharmacist-led immunization are perceived by Quebec’s pharmacists.

**METHODS**

This study was a descriptive survey of pharmacists working in a community setting in Quebec. The questionnaire was created using the website www.surveymonkey.com. To preserve confidentiality, the answers could not be linked to a particular pharmacist. A copy of the full questionnaire can be found in Appendix A.

Community pharmacists were contacted by phone from January 17 to 25, 2013. Community pharmacies were randomly chosen from a list of Quebec’s pharmacies, stratified by chains and banners. In Quebec, those terms refer to commercial groups of independently owned pharmacies with more (chain) or less (banner) obligations toward the group. The first pharmacist to answer the phone call was introduced to the study and invited to answer the online questionnaire. The pharmacists who agreed to participate were given a web link to the questionnaire by e-mail or phone. The survey could be filled only once from a given IP (Internet Protocol) address, and the participating pharmacist was asked to be the only one to answer the questionnaire. An e-mail reminder was sent 5 to 7 days after the first contact. The survey could be filled until January 30, 2013. The only exclusion criterion was lack of understanding French, as the questionnaire was written in French only.

No statistical analysis was used, as this was a descriptive study.

**RESULTS**

A total of 201 community pharmacists were contacted during the study period. Of these, 167 (83%) agreed to receive the web link to the questionnaire. Principal reasons for refusal to participate were lack of time, lack of interest or the fact that the survey could only be answered using the Internet. A total of 115 pharmacists answered the survey, generating a 57% response rate. This represents 1.9% of the 6,215 Quebec pharmacists who reported working in a community setting in 2012–13.<sup>15</sup>

Population characteristics are documented in Table 1. Pharmacists practising in 15 out of 17 administrative regions of Quebec answered the survey. Most of them (58%) were under 40 years of age, while Quebec’s mean pharmacist age is 42.1 years.<sup>15</sup> A vast majority of the respondents (98%) were practising in a pharmacy affiliated to a chain or a banner. Most pharmacists (65%) had received a diphtheria and tetanus vaccine during the previous 10 years; 48% had received three influenza shots or

**Table 1.** Respondent characteristics

Respondent characteristics	n (%)
Employment status	
Pharmacy owner	42 (37)
Staff pharmacist	73 (64)
Age (years)	
20–29	29 (25)
30–39	38 (33)
40–49	26 (23)
50–59	21 (18)
60–69	1 (1)
Type of pharmacy	
Independent	2 (2)
Chain	25 (22)
Banner	88 (77)
Number of influenza vaccines received in the last 5 years	
0	16 (14)
1–2	44 (38)
3–4	32 (28)
5	23 (20)
Diphtheria–tetanus vaccine received in the last 10 years	
Yes	75 (65)
No	36 (31)
Does not know	4 (4)

more during the previous 5 years; and 14% had not received any influenza vaccine dose during that period.

A vaccination service was offered in 24% of the pharmacies. Immunization was available in those pharmacies for an average of 13 hrs per week (median 8, range <1 – 40 hrs/week).

The respondents were asked several questions to determine their general attitudes and knowledge about immunization. The results are shown in Table 2. A vast majority answered that vaccines have more benefits than adverse effects. Two thirds of the pharmacists (69%) knew where to consult Quebec’s immunization protocol. However, it was seldom used: 72% used it less than once a month, and 24% used it 1–2 times a month.

Respondents’ opinions on which immunization processes pharmacists should get involved in are presented in Table 3. When asked directly, half the pharmacists surveyed (52%) answered that pharmacists should be able to prescribe and administer vaccines, pending a legislative change. Those pharmacists were more interested in administering travel (92%), flu (88%) and pandemic (85%) vaccines than regularly scheduled vaccines for adults (65%) or children (18%).

**Table 2.** Pharmacists’ knowledge and opinion about statements concerning immunization

Statement	True n (%)	False n (%)
Vaccines do not cause adverse events.	0 (0)	114 (100)
Vaccination is not mandatory in Quebec.	73 (64)	41 (36)
We need to keep on immunizing against infectious diseases that have almost disappeared (diphtheria, mumps).	101 (89)	13 (11)
Simultaneous administration of several vaccines can overload or exhaust the immune system.	6 (5)	108 (95)
The MMR vaccine can sometimes cause autism.	3 (3)	111 (97)
The injectable influenza vaccine can cause the flu.	6 (5)	108 (95)
Vaccines have more benefits than adverse effects.	109 (96)	5 (4)

MMR: Measles, mumps and rubella.

**Table 3.** Proportion of pharmacists agreeing with immunization-related activities in which pharmacists could get involved (*n* = 115)

Activity*	n (%)
Vaccine dispensation	96 (84)
Vaccine prescription validation	89 (77)
Vaccine counselling	89 (77)
Immunization promotion	108 (94)
Vaccine prescription	60 (52)
Vaccine administration	26 (23)
None	2 (2)

\*Respondents could choose more than one activity.

Respondents' perceptions of possible barriers to pharmacist-led immunization are assessed in Table 4. The barriers most frequently identified by the respondents were lack of training (92%) and time (90%). Least cited as barriers were lack of vaccine efficacy (2%), fear of potential adverse events (14%), fear of antagonizing other professionals (25%), lack of demand (25%) and uneasiness with blood and bodily fluids (25%). Factors that would help the implementation of immunization by pharmacists are listed in Table 5. The most common answers were increased immunization training (95%) and adequate remuneration (92%).

**DISCUSSION**

Pharmacists' accurate knowledge of immunization is crucial, because patients often consult health care providers regarding immunization, and their opinions and counsel are perceived as reliable.<sup>16,17</sup> Community pharmacists appear to have an accurate perception of vaccines' adverse events. Very few respondents linked vaccines to autism or believed that the immune system can be overloaded by the administration of many vaccines. More importantly, a wide majority (96%) believed that vaccines have more benefits than adverse effects. Their immunization rate appears to be similar to that of other Quebec health care workers and superior to results from other developed countries.<sup>5,18,19</sup>

The American Pharmacists Association (APhA) identified three roles that pharmacists should assume regarding immunization: advocating (educating and motivating patients), facilitating (hosting other professionals who can immunize) and immunizing.<sup>12</sup> Our study shows that vaccine counselling and promotion were two activities in which pharmacists were ready to get involved. A Japanese study has shown that simple counselling in community pharmacies can improve the absolute influenza immunization rate by 10%.<sup>17</sup> However, that study involved a limited number of patients.

The INSPQ survey revealed that 27% of Quebec's community pharmacies offered onsite immunization administered by a nurse.<sup>14</sup> A similar use of nurses providing immunization in community pharmacies (24%) was observed in our study. While this practice is also supported by the APhA, it has some drawbacks, such as a limited period during which vaccination is available as compared with the pharmacies' opening hours. In fact, Grabenstein demonstrated that daily pharmacist-led immunization increased the number of administered vaccines eightfold when compared with weekly nurse-led immunization offered in a community pharmacy setting.<sup>20</sup>

Few studies have described the impact of pharmacists on population immunization rates. Steyer et al. reported a 7% absolute increase in the influenza immunization rate over a 4-year period among adults ≥65 years of age in states where pharmacists could immunize when compared with states that did not allow this practice.<sup>21</sup>

Canadian pharmacists are progressively gaining the authority to administer vaccines, more than a decade after their US colleagues. Our study establishes that half of Quebec's pharmacists are interested in directly administering vaccines. These results are consistent with those obtained in the INSPQ survey.<sup>14</sup> The most reported barriers, lack of time and training, could be addressed by adequate remuneration and a dedicated training program, which already exists in Canada.<sup>22</sup>

Some studies have shown that patients' opinions about pharmacist-led immunization can vary widely during the first few years of this practice. Blake et al. reported that more than half of patients immunized by pharmacists in an outpatient

**Table 4.** Pharmacists' assessment of barriers to pharmacist-led immunization

Potential barriers	Completely disagree n (%)	Disagree n (%)	Neither agree nor disagree n (%)	Agree n (%)	Completely agree n (%)
I lack the time.	0 (0)	3 (3)	8 (7)	48 (42)	55 (48)
I lack training in immunization.	1 (1)	0 (0)	8 (7)	50 (44)	55 (48)
Profitability is insufficient.	6 (5)	22 (19)	46 (40)	24 (21)	16 (14)
Demand is insufficient.	10 (9)	49 (43)	27 (24)	24 (21)	4 (4)
Immunization is already offered by another professional in my practice setting.	26 (23)	17 (15)	22 (19)	22 (19)	27 (24)
Immunization is already offered near my practice setting.	5 (4)	6 (5)	26 (23)	41 (36)	36 (32)
I want to avoid conflicts with other professionals who can immunize.	32 (28)	32 (28)	21 (18)	20 (18)	9 (8)
I feel uneasy with needles.	42 (37)	32 (28)	7 (6)	19 (17)	14 (12)
I feel uneasy with blood or other bodily fluids.	43 (38)	29 (25)	13 (11)	23 (20)	6 (5)
I feel uneasy with the patient's physical contact.	33 (29)	32 (28)	17 (15)	23 (20)	9 (8)
Lack of space or of a suitable room in my practice setting.	19 (17)	27 (24)	11 (10)	29 (25)	28 (25)
Lack of storage space.	17 (15)	29 (25)	17 (15)	36 (32)	15 (13)
I do not want to be professionally accountable for the act of vaccination.	20 (18)	24 (21)	18 (16)	25 (23)	27 (24)
I consider that vaccines are not effective enough.	78 (68)	31 (27)	3 (3)	1 (1)	1 (1)
I do not want to manage allergic reactions caused by vaccines.	19 (17)	21 (18)	18 (16)	31 (27)	25 (22)
I fear the vaccines' adverse events for my patients.	38 (33)	38 (33)	23 (20)	11 (10)	4 (4)

**Table 5.** Proportion of pharmacists agreeing with factors that would favour the implementation of immunization by pharmacists (n = 114)

Factors*	n (%)
Support from chain	76 (67)
Support from the Quebec Order of Pharmacists	93 (82)
Support from medical and nursing professional associations	79 (69)
Patients' demand	62 (54)
Increased immunization training	108 (95)
Pharmacists' personal interest	79 (69)
Collaboration with a medical clinic	40 (35)
Adequate remuneration	105 (92)

\*Respondents could choose more than one factor.

clinic were undecided or disagreed that pharmacists were qualified to administer vaccines, though only 13% remembered that a pharmacist had administered their vaccines.<sup>23</sup> Lack of information may contribute to such attitudes, because one survey indicated that 84% of the patients who had received pharmacist-led immunization in a pharmacy considered this location as the easiest to get to and that 99% of them would recommend it to a friend.<sup>24</sup> This may be reflected by an increased use of pharmacies as an immunization setting in the US: in the early 2013–2014 flu season, over 20% of immunized people received their influenza vaccine in a pharmacy.<sup>25</sup>

This study has some limitations. It was a small-scale survey. The pharmacists who chose to answer the survey may have been more interested in immunization services than most pharmacists. The small number of respondents indicates that it may be difficult to extrapolate the results to all of Quebec's pharmacists. However, a wide array of pharmacists from different settings, regions and age groups were surveyed. Whereas the INSPQ survey focused on pharmacy owners, most of our study's respondents were staff pharmacists (64%). This ratio is close to the current state of Quebec's pharmacist workforce (69% in 2012–2013).<sup>14,15</sup>

This study brings new information on the knowledge and attitudes of community pharmacists about immunization. Obstacles that should be addressed before widening the pharmacist's role in immunization were identified. These findings should encourage a renewed discussion of the role of pharmacists as immunization agents in Canadian provinces where pharmacists do not have the authority to administer vaccines. Further studies to evaluate and characterize the impact of immunizing pharmacists on immunization rates are needed to support this public health policy.

**REFERENCES**

- Centers for Disease Control and Prevention. Impact of vaccines universally recommended for children—United States, 1990–1998. *MMWR Morb Mortal Wkly Rep* 1999;48(12):243–48. PMID: 10220251.
- Statistics Canada. Leading Causes of Death in Canada, 2008. Available at: <http://www.statcan.gc.ca/pub/84-215-x/2011001/tbls-eng.htm> (Accessed October 24, 2014).
- Cockman P, Dawson L, Mathur R, Hull S. Improving MMR vaccination rates: Herd immunity is a realistic goal. *BMJ* 2011;343:d5703. PMID: 21971162. doi: 10.1136/bmj.d5703.

- Plans-Rubió P. The vaccination coverage required to establish herd immunity against influenza viruses. *Prev Med* 2012;55(1):72–77. PMID: 22414740. doi: 10.1016/j.ypmed.2012.02.015.
- Dubé E, Defay F, Kiely M. Enquête québécoise sur la vaccination contre la grippe saisonnière, le pneumocoque et la rougeole 2012. Québec: Institut national de santé publique du Québec, 2013. Available at: [http://www.inspq.qc.ca/pdf/publications/1657\\_EnqVaccGrippeSaisonPneumoRougeole\\_2012.pdf](http://www.inspq.qc.ca/pdf/publications/1657_EnqVaccGrippeSaisonPneumoRougeole_2012.pdf) (Accessed October 24, 2014).
- Centers for Disease Control and Prevention. Vaccination levels among Hispanic and non-Hispanic whites aged >65 years - Los Angeles County, California, 1996. *MMWR* 1997;46:1165–68. PMID: 9408045.
- Johnson DR, Nichol KL, Lipczynski K. Barriers to adult immunization. *Am J Med* 2008;121(7 Suppl 2):S28–35. doi: 10.1016/j.amjmed.2008.05.005.
- Immunization Work Group of the National and Global Public Health Committee of the Infectious Diseases Society of America. Actions to strengthen adult and adolescent immunization coverage in the United States: Policy principles of the Infectious Diseases Society of America. *Clin Infect Dis* 2007;44(12):e104–8. PMID: 17516393.
- Centers for Disease Control and Prevention. Noninfluenza vaccination coverage among adults—United States. *MMWR Morb Mortal Wkly Rep*, 2011 2013;62(4):66–72. PMID: 23364272.
- Vlahov D, Coady MH, Ompad DC, Galea S. Strategies for improving influenza immunization rates among hard-to-reach populations. *J Urban Health*. 2007;84(4):615–31. PMID: 17562184.
- Ipsos. Life-Savers, Medical Professionals Top the List of Most Trusted Professionals. Available at: <http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5663> (Accessed December 11, 2014).
- Skelton JB. American Pharmacists Association, Academy of Managed Care Pharmacy. Pharmacist-provided immunization compensation and recognition: White paper summarizing APHA/AMCP stakeholder meeting. *J Am Pharm Assoc (2003)* 2011;51(6):704–12. PMID: 22068191. doi: 10.1331/JAPhA.2011.11544.
- Canadian Pharmacists Association. Influenza Immunization Guide to Pharmacists. 2013. Available at: <http://www.pharmacists.ca/cpha-ca/assets/File/education-practice-resources/Flu2013-InfluenzaGuideEN.pdf> (Accessed October 24, 2014).
- Sauvageau C, Dubé E, Bradet R, Mondor M, Moisan J. Les services de vaccination dans les pharmacies du Québec. Québec: Institut national de santé publique du Québec, 2011. Available at: [http://www.inspq.qc.ca/pdf/publications/1179\\_VaccinationPharmaciesQc.pdf](http://www.inspq.qc.ca/pdf/publications/1179_VaccinationPharmaciesQc.pdf) (Accessed October 24, 2014).
- Ordre des pharmaciens du Québec. Rapport annuel 2012–2013. Available at: [http://www.opq.org/cms/Media/1585\\_38\\_fr-CA\\_0\\_Rapport\\_annuel\\_2012\\_2013\\_OPQ.pdf](http://www.opq.org/cms/Media/1585_38_fr-CA_0_Rapport_annuel_2012_2013_OPQ.pdf) (Accessed October 24, 2014).
- Freed GL, Clark SJ, Butchart AT, Singer DC, Davis MM. Sources and perceived credibility of vaccine-safety information for parents. *Pediatrics* 2011; 127(Suppl 1):S107–12. PMID: 21502236. doi: 10.1542/peds.2010-1722P.
- Usami T, Hashiguchi M, Kouhara T, Ishii A, Nagata T, Mochizuki M. Impact of community pharmacists advocating immunization on influenza vaccination rates among the elderly. *Yakugaku Zasshi* 2009;129(9):1063–68. PMID: 19721382.
- Zhang J, While AE, Norman IJ. Seasonal influenza vaccination knowledge, risk perception, health beliefs and vaccination behaviours of nurses. *Epidemiol Infect* 2012;140(9):1569–77. PMID: 22624701. doi: 10.1111/j.1365-2702.2011.03794.x.
- Blank PR, Schwenkglens M, Szucs TD. Vaccination coverage rates in eleven European countries during two consecutive influenza seasons. *J Infect* 2009;58(6):446–58. PMID: 19446340. doi: 10.1016/j.jinf.2009.04.001.
- Grabenstein JD. Daily versus single-day offering of influenza vaccine in community pharmacies. *J Am Pharm Assoc (2003)* 2009;49(5):628–31. PMID: 19748870. doi: 10.1331/JAPhA.2009.08118.
- Steyer TE, Ragucci KR, Pearson WS, Mainous AG. The role of pharmacists in the delivery of influenza vaccinations. *Vaccine* 2004;22(8):1001–6. PMID: 21864625. doi: 10.1016/j.vaccine.2011.08.051.
- Public Health Agency of Canada. Immunization Competencies Program. Available at: <http://www.phac-aspc.gc.ca/im/ic-ci/> (Accessed October 24, 2014).
- Blake EW, Blair MM, Couchenour RL. Perceptions of pharmacists as providers of immunizations for adult patients. *Pharmacotherapy* 2003;23(2):248–54. PMID: 12587814.
- Grabenstein JD, Guess HA, Hartzema AG. People vaccinated by pharmacists: Descriptive epidemiology. *J Am Pharm Assoc (Wash)* 2001;41(1):46–52. PMID: 11216111.
- Centers for Disease Control and Prevention. National Early Season Flu Vaccination Coverage, United States, November 2013. Available at: <http://www.cdc.gov/flu/pdf/fluview/nifs-estimates-nov2013.pdf> (Accessed October 24, 2014).

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**RÉSUMÉ**

**OBJECTIFS :** Décrire les connaissances, croyances et attitudes des pharmaciens québécois envers l'immunisation et déterminer les barrières perçues à la vaccination par le pharmacien.

**MÉTHODE :** La présente étude est un sondage descriptif des pharmaciens québécois pratiquant en milieu communautaire. Les pharmaciens étaient choisis aléatoirement à partir d'une liste des pharmacies du Québec et contactés au téléphone du 17 au 25 janvier 2013. Les pharmaciens participant recevaient un lien vers le site du questionnaire en ligne. Un courriel de rappel était envoyé 5–7 jours après.

**RÉSULTATS :** Un total de 201 pharmaciens communautaires ont été contactés pendant la période à l'étude et 115 ont répondu au sondage (taux de réponse 57 %). La grande majorité des répondants a répondu que

les vaccins ont plus de bénéfices que d'effets indésirables. Environ 52 % ont répondu que les pharmaciens devraient pouvoir prescrire et administrer les vaccins, advenant une modification législative. Ces pharmaciens étaient plus intéressés à administrer les vaccins de santé des voyageurs (92 %), contre la grippe saisonnière (88 %) et pandémiques (85 %) plutôt que les vaccins des calendriers vaccinaux réguliers adultes (65 %) ou pédiatriques (18 %). Les principales barrières à la vaccination par le pharmacien étaient le manque de temps (90 %) et de formation (92 %), alors qu'une formation sur l'immunisation (95 %) et une rémunération adéquate (92 %) étaient les facteurs aidants les plus courants.

**CONCLUSION :** Ces données devraient renouveler la discussion du rôle du pharmacien en immunisation dans les provinces canadiennes où le pharmacien n'a pas le droit de vacciner.

**MOTS CLÉS :** immunisation; vaccination; pharmaciens; Québec

**Appendix A. Questionnaire**

Q1) What is your employment status?	Pharmacist owner Staff pharmacist
Q2) What is your age?	≤19 years 20–29 years 30–39 years 40–49 years 50–59 years 60–69 years ≥70 years
Q3) In which Quebec administrative region do you mainly work?	01 Bas-Saint-Laurent 02 Saguenay-Lac-Saint-Jean 03 Capitale-Nationale 04 Mauricie 05 Estrie 06 Montréal 07 Outaouais 08 Abitibi-Temiscamingue 09 Côte-Nord 10 Nord-du-Québec 11 Gaspésie-Îles-de-la-Madeleine 12 Chaudière-Appalaches 13 Laval 14 Lanaudière 15 Laurentides 16 Montérégie 17 Centre-du-Québec
Q4) In what type of pharmacy do you mainly work?	Independent pharmacy Pharmacy associated with a chain Pharmacy associated with a banner Other
Q5) In the last five years, how many times were you vaccinated against the flu?	0 1 to 2 3 to 4 5
Q6) In the last 10 years, were you vaccinated against diphtheria and tetanus?	Yes No I do not know
Q7) Is there a vaccination service at the pharmacy you mainly work at?	Yes No
Q8) How many hours per week do patients have access to vaccination?	Yes
Q9) Do you know where to consult the Protocole d'Immunsation du Québec (PIQ)?	No 0 1 to 2 3 to 5 More than 5
Q10) How many times per month do you consult the Protocole d'Immunsation du Québec (PIQ) on average?	Vaccine distribution Vaccine prescriptions validation Vaccine counseling Promoting immunization Prescribing vaccines Administering vaccines None
Q11) In the United States of America and in some Canadian provinces, pharmacists have more or less extended rights to initiate and administer vaccines. According to you, in Quebec, in what vaccination process(es) should pharmacists get involved? More than one answer can be checked.	More university education on immunization Continuing education on immunization Development of tools to give to patients Relieve pharmacists from technical tasks Other
Q12) Among the following elements, which one would help you to offer more counselling on vaccination?	

*continues...*

Appendix A, continued

<p>Q13) If pharmacists could vaccinate, how much time in minutes would you estimate the process to take for pharmacists to vaccinate one patient?</p> <p>Q14) Regarding vaccine storage, refrigerators with only one door (like minibars or other refrigerators with integrated freezer) are unpredictable in maintaining a stable temperature and are therefore not recommended. According to you, what important barrier(s) prevent that recommendation from being respected in many Quebec pharmacies?</p> <p>Q15) The cold chain must be respected until the vaccine's administration. To maintain the cold chain, portable coolers or cooler bags with icepacks must be used to transport the vaccine from one place to another. According to you, what important barrier(s) prevent this recommendation from being respected in many Quebec pharmacies?</p> <p>Q16) Among the following statements, which one(s) do you consider true?</p> <p>Q17) In Quebec, nurses, licensed practical nurses, physicians and midwives can administer vaccines. According to you, should pharmacists be able to prescribe and administer vaccines pending a legislation change?</p> <p>Q18) In a focus on accessibility and public health, what vaccines should pharmacists take care of?</p> <p>Q19) Of the following, which ones are barriers to pharmacist-led immunization?          Lack of time.          Lack of vaccination training.          Profitability is insufficient.          Demand by customers is insufficient.          Vaccination is already offered by another professional in my practice location.          Vaccination is already available near my place of practice.          I want to avoid conflict with other professionals who can vaccinate.          I am uncomfortable with needles.          I am uncomfortable with blood or other bodily fluids.          I am uncomfortable with the physical contact with the patient.          Space is missing or lack of appropriate room in my practice site.          Storage space is lacking.          I do not want to be professionally responsible for the act of vaccination.          I believe that vaccines are not effective enough.          I do not want to manage allergic reactions to vaccines.          I fear the side effects of vaccines for my patients.</p> <p>Q20) According to you, what element(s) would be important for the implementation of vaccination by pharmacists in Quebec?</p> <p>Q21) Comments</p>	<p>Equipment cost          Lack of space in the pharmacy          Lack of education on the subject          Other</p> <p>Equipment cost          Lack of space in the pharmacy          Lack of education on the subject          Other</p> <p>Vaccines do not cause adverse effects.          Vaccination is not mandatory in Quebec.          We must continue to vaccinate against infectious diseases that have virtually disappeared (diphtheria, mumps, etc.).          Simultaneous administration of many vaccines can overload or exhaust the immune system.          The MMR vaccine (measles, mumps and rubella) can sometimes cause autism.          The injectable flu vaccine can cause the flu.          Vaccines have more benefits than adverse effects.          Yes          No</p> <p>Pandemic vaccines          Flu          For adults and elders          Travel          Pediatric          Completely disagree          Disagree          Neither agree or disagree          Agree          Completely agree</p> <p>Support of the chain or banner          Support of Quebec Order of Pharmacists          Support of medical and nursing professional associations          Patients' demand          Increased training in immunization          Personal interests of pharmacists          Collaboration with a medical clinic          Adequate remuneration</p>
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