INSPQ INSTITUT NATIONAL DE SANTÉ PUBLIQUE DU QUÉBEC

COVID-19 (SARS-CoV-2): Interim Recommendations on Preventive Workplace Measures for Pregnant and Nursing Workers

COVID-19 Occupational Health Work Group

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Version 2.0

Summary

Community transmission context

Since December 31, 2019, the outbreak of acute respiratory infections and atypical pneumonia caused by the SARS-CoV-2 virus has been evolving rapidly.

On March 11, 2020, the World Health Organization (WHO) called the outbreak a pandemic.

The recommendations presented in this document are to be implemented when the Québec national public health director declares that there has been sustained community transmission of COVID-19 in the Québec population. Community transmission may be declared locally, regionally or province-wide.

Epidemiological data on the global situation is available on the WHO website: https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Canadian and Québec data are available at the following addresses:

- https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html
- https://www.msss.gouv.qc.ca/professionnels/maladies- infectious diseases/coronavirus-2019-ncov/ (in French).

Québec

While SARS was primarily transmitted in healthcare settings, the potential for community transmission for COVID-19 is evident.

In the current context, the underlying premises for these recommendations are those issued by the public health authorities for the entire Québec population, who are required to postpone non-urgent appointments, remain at home except for essential trips (groceries, pharmacy, urgent healthcare), observe social distancing, and follow the established procedures when they present symptoms.

Social distancing and other specific preventive measures also apply in workplaces.

We refer the reader to the Québec government website for these public recommendations and to the INSPQ documents that are updated on its website regularly.

During a pandemic and in times of sustained community transmission, the goals of public health authorities are to minimize severe illness and total deaths.[1]

The current scientific and epidemiological data supports the fact that transmission of SARS-CoV-2 appears to occur predominantly via droplets during prolonged close contact. A number of articles cited by infectious disease experts,[2] point to transmission during close contact within two metres in particular. However, opportunistic airborne transmission (through fine droplets of aerosolized respiratory secretions) is also reported under specific conditions such as when performing activities that may increase aerosolization, particularly in hospital settings. This possibility of airborne transmission must therefore be taken into account since it can have a significant impact mainly in acute care settings that deal with severe cases.

Additional droplet and contact precautions have been identified for most outpatients. Additional airborne and contact precautions are applied during certain procedures, with cases meeting certain severity criteria, and with hospitalized patients[3].

Fecal-oral transmission is also suspected, since viral particles are found in feces.[4] [5]

Transmission is also possible through indirect contact (surfaces) under certain conditions.

With respect to immunity acquired after development of the disease, current data are inconclusive about the possibility of reinfection.

Since there is no effective vaccine or specific treatment for COVID-19 at the time of drafting of these recommendations, public health measures remain the best available tools to mitigate the incidence of the disease. The implementation of the “Pour une maternité sans danger” program is one such workplace measure intended to protect pregnant workers, their unborn child and children who are being breastfed.

The Ministère de la Santé et des Services sociaux (MSSS) has mandated the Institut national de santé publique du Québec (INSPQ) to establish a working group to develop interim recommendations for workplaces in the context of the application of preventive withdrawal and reassignment of workers who are pregnant or breastfeeding.

The working group is made up of physicians and professionals at the INSPQ with varying backgrounds in public health, occupational health and infectious diseases, the two medical communities of practice of the Public Québec Health Network in Occupational Health (Réseau de santé publique en santé au travail du Québec, RSPSATQ), namely the “Communauté médicale de pratique d’harmonisation Pour une maternité sans danger (CMPH-PMSD)” and the “Communauté médicale de pratique en santé au travail du Québec (CMPSATQ)” as well as the Québec Minister of Health and Social Services (MSSS).

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1 Health Canada, Community-based measures to mitigate the spread of coronavirus disease (COVID-19) in Canada, March 7, 2020.

2 INSPQ, CINQ, COVID-19 Avis du CINQ : Gestion du risque pour la protection respiratoire en milieux de soins aigus, Version 2.0, March 18, 2020.

3 INSPQ, CINQ : COVID-19 : Mesures de prévention et contrôle des infections pour les milieux de soins aigus : Recommandations intérimaires, Version 2.0, March 12, 2020.

4 INSPQ, CINQ, COVID-19 : Mesures de prévention et contrôle des infections pour les cliniques médicales-cliniques externes-cliniques COVID-19-GMF : Recommandations intérimaires, Version 1.0, March 13, 2020

5 Wu, Y et al. Prolonged presence *of SARS-CoV2 viral RNA in faecal samples,* The Lancet, March 19, 2020.

Experts in ethics and epidemiology at the INSPQ have also joined the working group as collaborators.

These recommendations are based on the reference framework for public health risk management in Québec (INSPQ, 2016).

These recommendations are intended to support designated physicians and the RSPSATQ's regional and local occupational health teams in making decisions regarding requests for preventive reassignment of pregnant or breastfeeding workers under the "Pour une maternité sans danger" program (AOHS, CQLR c S-2.1, sections 40 and 46).

The information presented in this document will be adjusted as the situation evolves and epidemiological and new scientific knowledge on SARS-CoV-2, COVID-19 and impacts on pregnancy and on unborn and breastfed children.

This document should be consulted along with the other documents produced by the Institut national de santé publique du Québec on COVID-19.

The latest versions of these documents are available on the INSPQ website.

1. Epidemiological and clinical characteristics

The reader may refer to the documents produced by the INSPQ:
https://www.inspq.qc.ca/covid-19 (in French).

COVID-19: Epidemiological and clinical characteristics of COVID-19
https://www.inspq.qc.ca/sites/default/files/documents/maladies-infectieuses/2020-02-28_covid-19_fiche_tableau_clinique_inspq.pdf

In general, the modelling of scenarios for the progression of an epidemic is based on possible attack rates for a population in which all individuals are vulnerable to infection according to the principle that transmission intensity is a function of R0,[6] possibly resulting in an attack rate of 50–70% if no mitigation measures were taken.[7] In the presence of public health measures, we hope to flatten the epidemic curve in order to prevent significant overloading of the health system. These measures include actively searching for cases and contacts, voluntary or forced isolation of cases and contacts, strict adherence to hygiene measures, hand washing and disinfection of surfaces and objects, social distancing, cancelling gatherings and closing schools, confinement of the entire population of an area or region to their homes, and strict travel restrictions between regions or countries.[8]

The R0 for COVID-19 is higher than that reported for SARS in 2003. Although the situation is constantly evolving and the real R0 value can only be estimated at a later date, experts currently agree that the R0 is slightly above 2.0.

Symptoms may appear between two and 14 days after exposure. The clinical presentation is varied and ranges from asymptomatic cases to very severe cases and even death. Peak viral shedding appears to occur in the early phase of the disease, unlike SARS where peak viral shedding occurred when patients were highly symptomatic.[9]

Some coronavirus-infected patients remain completely asymptomatic. The proportion of patients who remain asymptomatic is unknown, but it is thought to be less than 20%.[10] [11] Other authors have estimated it to be 31% (95% Confidence Interval: 8% to 54%) among Japanese returnees.[12]

In addition, patients with COVID-19 may begin shedding virus in the 24-hour period before symptom onset. There have been well-described situations where transmission has occurred by either asymptomatic or pre-symptomatic individuals. Although it is not known what proportion of all cases has been caused by this type of situation, it is believed that the vast majority of transmission in fact occurs during the symptomatic phase.

Although patients with COVID-19 produce aerosols that contain SARS-CoV-2 capable of replicating, the vast majority of secondary cases occur among close contacts who have spent a lot of time with the cases. For example, in a Chinese study in which 1,286 close contacts of confirmed cases were followed up actively, 80 of the 84 patients who developed COVID were family contacts (699) and only four cases occurred in the 456 close non-family contacts.[13]

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6 The reproduction number (R0), also known as the basic reproduction rate, is defined as the average number of transmissions expected from a single reported primary case in a fully susceptible population.

7 INSPQ, Villeneuve, J., *Fiche thématique : Caractéristiques épidémiologiques* (scientific watch, March 5 to 11, 2020).

8 Ibid.

9 INSPQ, Villeneuve, J. Fiche thématique : *Mesures de prévention et contrôle dans la communauté* (scientific watch, March 5 to 11, 2020).

10 Communication with Dr. Gaston De Serres, CINQ medical consultant, INSPQ, March 19, 2020.

11 Lai CC et al., *Asymptomatic carrier state, acute respiratory disease and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths*, Journal of Microbiology, Immunology and Infection, February 25, 2020.

12 Nishuira H. et al., *Estimation of the asymptomatic ratio of novel coronavirus infections (COVID-19)*, International Journal of Infectious Diseases, February 13, 2020.

13 Epidemiology and Transmission of COVID-19 in Shenzen China: Analysis of 391 cases and 1,286 of their close contacts.

One study showed that the viral load detected in asymptomatic patients was similar to that found in symptomatic patients; however, the viral load was higher in patients with severe illness than in patients with less severe illness.[14]

Severe cases and mortality present a strong association with advanced age and the presence of co-morbidities such as chronic disease and immunosuppression. Currently, complications in the third trimester of pregnancy are also related to severe illness in pregnant women.

Although initially the elderly was the group most affected by infection and serious complications from the illness, more recent studies show that over 50% of infections are found in people between the ages of 20 and 50.[15]

Lastly, where children fit in with regard to transmission of the virus in the community is not yet known. They appear to be less affected, but severe cases are still being reported.[16]

2. Immunity from SARS-CoV-2

The immune response to the virus that causes COVID-19 is not yet well understood. The infection apparently causes a cellular and humoral immune response.

The CDC indicates that patients who have been infected with MERS-CoV1 are unlikely to be reinfected with this virus soon after recovery but the CDC cannot assert that a similar response will be seen with SARS-CoV-2.

Studies have demonstrated the development and persistence of antibodies for at least two years for patients who have recovered from SARS. However, according to a virologist quoted by *The Scientist*, these antibodies were barely or not at all detectable five to 10 years after patient recovery. According to the same author, with COVID-19, some short-term protection against reinfection could be minimally anticipated, but nothing definitive can be said about this.[17]

To date, it is impossible to rule on the development of immunity after a person has had the disease. Studies are forthcoming.

3. Effects in pregnant women and adverse pregnancy outcomes

Since the publication of the *Interim Recommendations on Preventive Workplace Measures for Pregnant and Nursing Worker,* [18] on March 12, 2020, a number of additional articles and publications from national and international organizations were added to this section dealing with the effects of SARS-CoV-2 infection in pregnant women and adverse pregnancy outcomes. All currently available data are presented.

The strain of coronavirus currently implicated in the pandemic (SARS-CoV-2) is the most recent of seven coronavirus strains that cause disease in humans. Of the other six strains, four cause only minor respiratory symptoms and two have been associated with serious and sometimes fatal illnesses: severe acute respiratory syndrome (SARS) in 2003 and Middle East respiratory syndrome (MERS-CoV) since 2012.[19]

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14 Zou L et al., *SARS-CoV-2 viral load in upper respiratory specimens of infected patients*, N Eng J Med, February 19, 2020.

15 Lai CC et al., *Asymptomatic carrier state, acute respiratory disease and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths*, Journal of Microbiology, Immunology and Infection, February 25, 2020.

16 Dong Y et al., *Epidemiological characteristics of 2143 pediatric patients with 2019 coronavirus disease in China,* Pediatrics 2020.

17 This section 2 is extracted from the following document: INSPQ, Valiquette, L. *COVID-19 Questions-Réponses*, March 12, 2020.

18 INSPQ, GT SAT COVID-19, COVID-19 (SARS-CoV-2): *Recommandations intérimaires sur les mesures de prévention en milieux de travail pour les travailleuses enceintes ou qui allaitent,* Version 1.0, March 12, 2020.

19 Coronavirus COVID-19 - Professionnels de la santé - MSSS, February 23, 2020.

There is nonetheless proximity between the genome of the current SARS-CoV-2 and the SARS-CoV-1 (SARS agent).

For SARS-CoV-1, a study published in February 2020 reported on 12 pregnant women infected during the 2002–2003 epidemic (seven women in the first trimester of pregnancy and five women in the second and third trimesters). In the first trimester, four of the seven women experienced spontaneous abortions (SA), and in the second and third trimesters, two of the five women had intrauterine growth retardation (IUGR) and four of the five women had preterm deliveries (PTD).[20] [21] [22]

The CDC[23] also mentions SA cases observed with SARS-CoV-1 and MERS-CoV. [24]

In a study of nine pregnant women with COVID-19 (between the 36th and 39th week of pregnancy), there were no documented intrauterine infections.[25] There was also no intrauterine transmission with SARS-CoV-1.
A retrospective study (series of cases) of 10 newborns (including two twins) to mothers who had developed confirmed SARS-CoV-2 pneumonia during pregnancy was conducted between January 20 and February 5, 2020. The pregnant women had symptoms of fever and cough in four of the nine cases before delivery, in two cases at the time of delivery and in three cases after delivery. It should be noted that one pregnant woman also had diarrhea.

Four children were full term and six children were born prematurely; two infants were born with low birth weight (LBW); a number of children were born with respiratory problems (6), fever (2), thrombocytopenia with abnormal liver function (2), tachycardia (1), vomiting (1) and pneumothorax (1). At the time of article publication, on February 10, 2020, five children had been discharged from the hospital, one child had died and four children were still in the hospital in stable condition. Causal association is unlikely with LBW but possible for preterm delivery (PTD) and newborn respiratory distress.

The pharyngeal swabs of nine out of the ten children, one to nine days after birth, were negative. The authors concluded that perinatal COVID-19 infection may cause problems in the newborn, but that vertical transmission remained to be confirmed, as no infants tested positive for COVID-19.[26]

A case study[27] of a pregnant woman who tested positive for SARS-CoV-2 reported that she was symptomatic (fever), travelled to a risk area and delivered a healthy newborn baby prematurely at 30 weeks' gestation. The samples taken from the child and the caregivers remained negative.

One study reported on 13 pregnant women (maternal age between 22 and 36 years) hospitalized for fever accompanied by fatigue, three of whom had respiratory problems. The gestational age ranged from 28 to 36 weeks. The clinical picture of COVID-19 in these pregnant patients ranged from asymptomatic presentation to a presentation with serious complications, including pneumonia requiring intensive care. Adverse pregnancy outcomes were

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20 Favre, Guillaume et al., *2019-nCoV epidemic: what about pregnancies?* The Lancet, February 6, 2020.

21 Rasmussen, S. et al., *Coronavirus disease 2019 (COVID-19) and pregnancy: What obstetricians need to know*, American Journal of Obstetrics and gynecology, February 18, 2020.

22 Qiao, J. *What are the risks ofCOVID-19 infection in pregnant women*, The Lancet, February 12, 2020.

23 CDC: *Centers for Disease Control and Prevention*: the primary U.S. federal agency for public health protection.

24 *CDC, Coronavirus Disease 2019 and pregnancy QR,* February 21, 2020.

25 Chen, H et al., *Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records*, The Lancet, February 12, 2020.

26 Zhu, H. et al., *Clinical analysis of 10 neonates born to mothers with 2019-n-CoVpneumonia*, Translational Pediatrics, February 6, 2020.

27 Wang, X. et al., *A case of 2019 novel coronavirus in a pregnant woman with preterm delivery,* Department of hepatology and gastroenterology, Soochow University, Chine, February 2020.

reported: premature rupture of membranes, preterm delivery (6/10 with available data), stillbirth, newborn respiratory distress. However, there was no serological evidence of vertical transmission of SARS-CoV-2.[28]

A brief review [29] reported on 23 publications identified to date (some of which were cited earlier in this section) on COVID-19, but also on SARS and MERS-CoV: 32 women with COVID-19, 30 babies, including two twins, and three ongoing pregnancies. The data available from the 23 publications indicated two women with severe morbidity requiring intensive care, 27 caesarean sections out of 29 deliveries, 15 (47%) PTD, one neonatal death and one stillbirth; 7/11 babies had respiratory distress. The 29 deliveries occurred within 13 days of the start of COVID-19. There was no data on pregnancies with COVID-19 in the first trimester and no proven vertical transmission on 25 newborns tested.

A recent narrative review published in March 2020 on 38 pregnancies with COVID-19 in the third trimester, based on five publications, showed no vertical transmission among the 30 newborns tested.[30]

There is not much literature on adverse pregnancy outcomes when the disease is acquired early on in pregnancy, as we have very little experience with this virus that was identified less than three months ago. However, the immune changes that occur in a pregnant woman in early pregnancy and the important developmental stage of fetal organogenesis at this time are of concern, and further studies are needed.[31]

According to the Infectious Diseases Committee of the Society of Obstetricians and Gynaecologists of Canada (SOGC), because of the low number of reported cases of infection in the first trimester (when embryogenesis occurs), the risks of congenital anomalies associated with COVID-19 cannot be completely excluded.[32]

Given the limited information we have about pregnant women who acquired the infection early in pregnancy, it is therefore premature,[33] to confirm or rule out adverse pregnancy outcomes such as SA or congenital malformations.

Also, due to the physiological changes inherent to pregnancy, pregnant women with lower respiratory tract infections often have more worrisome outcomes compared to non-pregnant individuals, including a higher rate of hospital and intensive care unit admissions.[34] One Chinese study looked at the clinical manifestations of COVID-19 in 15 pregnant patients seen for COVID-19 pneumonia from January 20 to February 10, 2020. Gestational age ranged from 12 to 38 weeks. Eleven of the women had given birth and four were still pregnant at the end of the study, three in the second trimester and one in the third trimester. The authors found no abortions or perinatal deaths. The patients' most common signs and symptoms were fever (13/15), cough (9/15) and lymphopenia (12/15). All 15 patients had moderate pneumonia and recovered well. No newborns were infected. The authors concluded that pregnancy did not worsen COVID-19[35].

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28 Liu Y. et al., *Clinical manifestations and outcome of SARS-CoV-2 infection during pregnancy*, Journal of infection, February 27, 2020.

29 Mullins, E. et al., *Coronavirus in pregnancy and delivery: rapid review.* Ultrasound Obstet Gynecol, March 17, 2020.

30 Schwartz DA, *And Analysis of 38 Pregnant Women with COVID-19, Their Newborn infants and Maternal-Fetal Transmission of SARS-CoV-2: Maternal Coronavirus Infections and Pregnancy Outcomes.* Arch Pathol Lab Med. March 17, 2020.

31 Jia J. *Under the epidemic situation of COVID-19, should special attention to pregnant women be given?* March 2020.

32 SOGC, SOGC-COVID-19 Statement: Opinion of the Infectious Diseases Committee, March 11, 2020.

33 Ibid.

34 Rasmussen, S. et al., *Coronavirus disease 2019 (COVID-19) and pregnancy: What obstetricians need to know*, American Journal of Obstetrics and gynecology, February 18, 2020.

35 Liu D et al., *Pregnancy and Perinatal Outcomes of Women with Coronavirus Disease (COVID-19) Pneumonia: A Preliminary Analysis*. AM J Roentgenol, March 18, 2020.

It should be noted that OSHA[36] recognizes pregnancy as a co-morbidity factor for COVID-19 infection.[37]

Literature on the diseases associated with the other two coronaviruses is another source of information about pregnant women and adverse pregnancy outcomes. Serious complications have been reported: SA, PTD, complications in pregnant women and newborns (disseminated intravascular coagulation, renal failure, secondary bacterial pneumonia, sepsis (SARS), prematurity, intrauterine growth retardation (IUGR) and stillbirth (MERS).[38] [39]

In addition, vertical transmission is still a subject of study.[40] [41]

4. Risk assessment and prevention and control measures in care settings and the community

The reader may refer to the documents produced by the INSPQ, which are updated regularly: https://www.inspq.qc.ca/covid-19 (in French).

CINQ : COVID-19 : Mesures de prévention et de contrôle des infections pour les milieux de soins aigus : Recommandations intérimaires, Version 4.0, March 12, 2020.

Comité permanent MRSI : COVID-19 (SARS-CoV-19) : Recommandations intérimaires sur les mesures de prévention et contrôle des infections à appliquer en présence d'une personne sous investigation, d'un cas probable ou confirmé ou d'un contact étroit dans la communauté, Version 1.0, February 25, 2020.

Comité permanent MRSI : COVID-19 : Mesures pour la gestion des cas et des contacts dans la communauté : recommandations intérimaires, Version 4.0, March 24, 2020.

CINQ : COVID-19 : Mesures de prévention et contrôle des infections pour les cliniques médicales, cliniques externes, cliniques COVID-19, GMF : Recommandations intérimaires, Version 1.0, March 13, 2020.

CINQ : COVID-19 : Mesures pour la gestion des cas et des contacts dans les centres d'hébergement et de soins de longue durée pour aînés : recommandations intérimaires, Version 1.1, March 18, 2020.

CINQ : Évaluation et gestion du risque : Avis du CINQ : Gestion du risque pour la protection respiratoire en milieux de soins aigus, Version 2.0, March 18, 2020.

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36 Occupational Safety and Health Administration.

37 Occupational Safety and Health Administration, Guidance on Preparing Workplaces for COVID-19, March 2020.

38 Ibid.

39 Favre, G. et al., *Guidelines for pregnant women with suspected SARS-CoV-2 infection*, The Lancet, March 3, 2020.

40 Fan, C et al., *Perinatal Transmission of COVID-19 Associated SARS-CoV-2: Should We Worry?* Infectious Diseases Society, United States, March 2020.

41 SOGC, SOGC-COVID-19 Statement: Opinion of the Infectious Diseases Committee, March 11, 2020.

5. Workplace exposure levels

COVID-19 guidelines are currently available to support workplaces.[42]

The following exposure levels can serve as a basis for appropriate preventive measures in the workplace (occupational risk pyramid established by OSHA[43]) and guided the work group's efforts:

Low: Low risk of exposure in the absence of or minimal contact with people at work.

Medium: Medium risk of exposure in the course of work involving frequent and close contact of less than 2 metres with people who may be infected with SARS-CoV-2.

High: High risk of exposure in the course of work with clients under investigation for COVID-19, or who are probable or confirmed cases of COVID-19.

Very high: Very high risk of exposure during aerosol-generating procedures with clients who are under investigation for COVID-19 or who are probable or confirmed cases of COVID-19, during the collection of clinical specimens from persons under investigation for COVID-19, or who are probable or confirmed cases of COVID-19, and during the handling of bodies of persons who were under investigation for COVID-19 or who were probable or confirmed cases of COVID-19.

In OSHA's assessment, the mode of transmission is primarily droplet contact transmission, at the low, medium and high levels, and airborne transmission, at the very high level.

In order to complete the workplace characterization, we also refer the reader to the INSPQ COVID-19 website for preventive measures to be implemented in the workplace.

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42 Occupational Safety and Health (OSHA), *Guidance on Preparing Workplaces for COVID-19*, U.S. Department of Labor Occupational Safety and Health Administration, March 2020.

43 Ibid.

6. Ethical approach to the implementation of recommendations for the preventive reassignment of pregnant and nursing workers in the context of community transmission of SARS-CoV-2

Analyzing the ethical dimensions of public health actions helps to ensure the legitimacy of interventions that can contribute to improving the health of the population. In this case, such an analysis would require considering all the consequences of implementing the proposed recommendations. This is beyond the mandate of the working group.

However, in the context of community-wide transmission of COVID-19, **precaution**[44] calls for preventive action to be taken, as the risk of adverse pregnancy outcomes is potentially significant. The application of preventive reassignment of a pregnant or nursing worker with regard to the Act respecting occupational health and safety (AOHS) is one such measure to protect pregnant women and their unborn children.

7. Workplace risk characterization for pregnant workers

The authors of these recommendations sought to clarify certain elements of risk for pregnant workers in the workplace in the presence of sustained community circulation of the virus.

Virus transmission:

In the presence of sustained community circulation, transmission of the virus is primarily through symptomatic cases, mainly in the early and more severe phases of the illness, but also possibly in the pre-symptomatic phase;

In the presence of sustained community circulation, there is also the possibility of asymptomatic cases that can transmit the virus and remain asymptomatic throughout the course of the disease.

Clinical symptoms and signs:

For older clients, the disease (which is typically expressed through symptoms like fever, cough and breathing difficulties) may be expressed through non-classic symptoms, such as absence of fever, increased confusion, worsening of chronic lung disease, loss of appetite, headache, myalgia or arthralgia, nausea or vomiting, diarrhea, conjunctivitis and hemoptysis.[45] [46]

Digestive symptoms are also increasingly reported in the clinical history of the illness, with or without respiratory symptoms.[47]

Children generally play a major role in the community transmission of infections.

The studies presented at the beginning of the COVID-19 pandemic did not appear to demonstrate intense virus circulation in this group. However, a recent Chinese retrospective study presented data from 2,143 pediatric patients reported to the CDC from China between January 16 and February 8, 2020.[48] The analysis included suspected (66%) and confirmed (34%) cases. Of the confirmed cases, 13% were asymptomatic and 3% were serious or critical. Toddlers of preschool age were more vulnerable to infection.

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[44] La prudence se traduit par la précaution dans le cas des risques potentiels (INSPQ, *Gestion des risques en santé publique au Québec : cadre de référence,* 2016).

[45] INSPQ, CINQ, COVID-19 *: Mesures pour la gestion des cas et des contacts dans les centres d'hébergement et de soins de longue durée pour les aînés : recommandations intérimaires,* March 18, 2020.

[46] Lai CC et al, *Asymptomatic carrier state, acute respiratory disease and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths*, Journal of Microbiology, Immunology and Infection, February 25, 2020.

[47] Pan, L et al., *Clinical characteristics of COVID-19 patients with digestive symptoms in Hubei, China: a descriptive, cross-sectional, multicenter study*, March 2020.

[48] Dong, Y et al., *Epidemiological characteristics of 2143 pediatric patients with 2019 coronavirus disease in China*, Pediatrics, March 16, 2020.

Based on this study, the clinical manifestations in children appear to be less severe than in adults, but children may contribute to community transmission of the infection.

The current closure of schools and daycare centres is likely to significantly reduce the role of children as vectors, making them less likely to introduce the virus into home environments.

Distancing: public health authorities recommend social distancing. This would significantly reduce the risk of acquiring the disease.

Other modes of transmission: Fecal transmission through contaminated surfaces and oral fecal transmission are suspected, but further studies are still to come. Thorough and frequent hand and surface washing is recommended.

8. Basic principles for the preventive reassignment of pregnant workers

In Québec, pregnant or nursing workers can take advantage of a preventive reassignment under the "Pour une maternité sans danger" program provided for by the AOHS.[49]

The following recommendations are made in this legal context and are based on the following considerations:

In the context of community transmission, either at the local, regional or provincial level, as declared by the Québec public health authorities:

Whereas:

- During pregnancy, immunity is reduced[50] and physiological and immunological changes make pregnant women more vulnerable to respiratory infections, including COVID-19;[51] [52]
- SARS-CoV-1 and MERS-CoV are associated with adverse pregnancy outcomes and SARS-CoV-2 is related to SARS-CoV-1 and MERS-CoV in its genome, raising concerns that it could also cause adverse pregnancy outcomes;[53]
- The knowledge on COVID-19 and pregnancy that is currently available is limited to infections acquired in late pregnancy and is insufficient to suggest the absence of adverse pregnancy outcomes;
- Uncertainty remains about the impact of infection with SARS-CoV-2 in the early months of pregnancy, but adverse outcome data in early pregnancy is known for SARS and MERS-CoV;
- The relatively rapid deterioration of more vulnerable patients with respiratory problems in the course of an infection with SARS-CoV-2[54] raises this concern for pregnant women;
- The current assessment of risk to the pregnant woman and the fetus is based on previous experience with SARS and MERS, currently available studies since the beginning of the SARS-CoV-2 outbreak, and the risk assessments issued by various national and international authorities;
- Transmission of the infection can occur in the pre-symptomatic and symptomatic phase of the disease;
- People who are asymptomatic and remain asymptomatic throughout the infection can transmit the infection;

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49 Act respecting occupational health and safety, CQLR c S-2.1, sections 40 and 46.

50 Blackburn S. *Maternal, fetal and neonatal Physiology, Elsevier,* 5th edition, 2017.

51 CDC, *Coronavirus Disease 2019 and pregnancy QR,* February 21, 2020.

52 WHO, *Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected,* March 13, 2020.

53 SOGC, https://www.sogc.org/en? January 28, 2020.

54 CDC, *Interim Considerations for Infection Prevention and Control of Coronavirus Disease 2019 (COVID-19) in Inpatient Obstetric Healthcare Settings,* March 2020.

- Children and adults can transmit the infection;
- The symptoms are primarily fever and upper or lower respiratory tract involvement, but other clinical manifestations may be an atypical presentation of the disease;
- Preventing the infection from being transmitted to others by a person under investigation for COVID-19, or by a probable or confirmed case of COVID-19 requires the implementation of administrative measures (e.g. triage and pre-triage, reduction in the number of personnel assigned to patient care), group protective measures (e.g. respiratory etiquette, isolation of cases), and protective measures such as adherence to basic practices and additional precautions, and the wearing of recommended personal protective equipment depending on the mode of transmission of infection;
- No specific vaccine or treatment is currently available.

In the context of a pandemic and local, regional or Québec-wide community transmission, the **precautionary principle** must therefore guide current recommendations.

9. Recommendations concerning pregnant workers (hospital settings, dedicated or non-dedicated medical clinics and isolation settings) (High or very high level)[55]

During the entire Québec epidemic period, and in the context of sustained local, regional or provincial community transmission declared by the public health authorities:

We recommend that, for the duration of the pregnancy, pregnant workers be immediately reassigned, regardless of their immune status with respect to COVID-19, in order to eliminate:

- Close contact (less than 2 metres and without physical protection measures, such as glass barriers) with clients and co-workers;
- Being in the same room (treatment room, etc.) with persons under investigation for COVID-19 or probable or confirmed cases of COVID-19;
- Having to perform care, sampling, medical examinations, paraclinical examinations and treatment of persons under investigation for COVID-19 or probable or confirmed cases of COVID-19;
- The transportation of persons under investigation for COVID-19 or probable or confirmed cases of COVID-19;
- Tasks related to the cleaning and disinfection of the environment, equipment and personal belongings that have been in contact with a person under investigation for COVID-19, or a probable or confirmed case of COVID-19;
- Handling the bodies of persons who were under investigation for COVID-19 or who were probable or confirmed cases of COVID-19;
- Contact with, care or treatment of persons under investigation for COVID-19 or probable or confirmed cases of COVID-19 in home or residential confinement;
- All tasks in sectors or establishments declared to be under isolation for COVID-19 by the authorities of those establishments.

[55] Levels represent the risk assessment for pregnant workers: positions are presented in the decision-making tool appended at the end of the document.

10. Recommendations concerning pregnant workers in other workplaces with close contact with clients and co-workers (Medium level)

During the entire Québec epidemic period, and in the context of sustained local, regional or provincial community transmission declared by the public health authorities:

We recommend that, for the duration of the pregnancy, pregnant workers be immediately reassigned, regardless of their immune status with respect to COVID-19, in order to eliminate:

- Close contact (less than 2 metres and without physical protection measures, such as glass barriers) with clients or co-workers.

11. Recommendations concerning pregnant workers in workplaces without close contact with clients but with close contact with co-workers (Low level)

During the entire Québec epidemic period, and in the context of sustained local, regional or provincial community transmission declared by the public health authorities:

We recommend that, for the duration of the pregnancy, pregnant workers be immediately reassigned, regardless of their immune status with respect to COVID-19, in order to eliminate:

- Close contacts (less than 2 metres and without physical protection measures, such as glass barriers) with co-workers.

12. Recommendations for workers who are breastfeeding

There is currently no evidence of vertical transmission of the infection through breast milk.

One small Chinese study[56] showed that SARS-CoV-2 was not detected in the colostrum of infected patients.

Breastfed newborns in fact appear to be at risk of COVID-19 infection through frequent and close contact with a mother who is infected with CA-MRSA-CoV-2.

The CDC [57] recommends that nursing mothers who are infected, after the recommended isolation period in the care setting with the newborn, wear a surgical mask and wash their hands thoroughly before each nursing period.

The SOGC does not recommend universal isolation of the infant from either confirmed or suspected infection in the mother. However, depending on a family's values and available resources, they may choose to separate the infant from the mother until isolation precautions for the mother can be formally discontinued. Women should practice proper handwashing before and use a mask while engaging in infant care. Women who choose to breastfeed should be allowed to do so as long as they practice proper handwashing and wear a mask.[58]

On the basis of this information, and in light of the current data, we do not recommend preventive reassignment of nursing workers.

These recommendations will be adjusted, if necessary, in the light of subsequently published data or recommendations from public health authorities.

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56 Chen H et al., Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. The Lancet 2020.

57 CDC, Coronavirus Disease 2029 (COVID-19) : Interim Considerations for Infection Prevention and Control of Coronavirus Disease 2029 (COVID-19) in Inpatient Obstetric Healthcare Settings 2020.

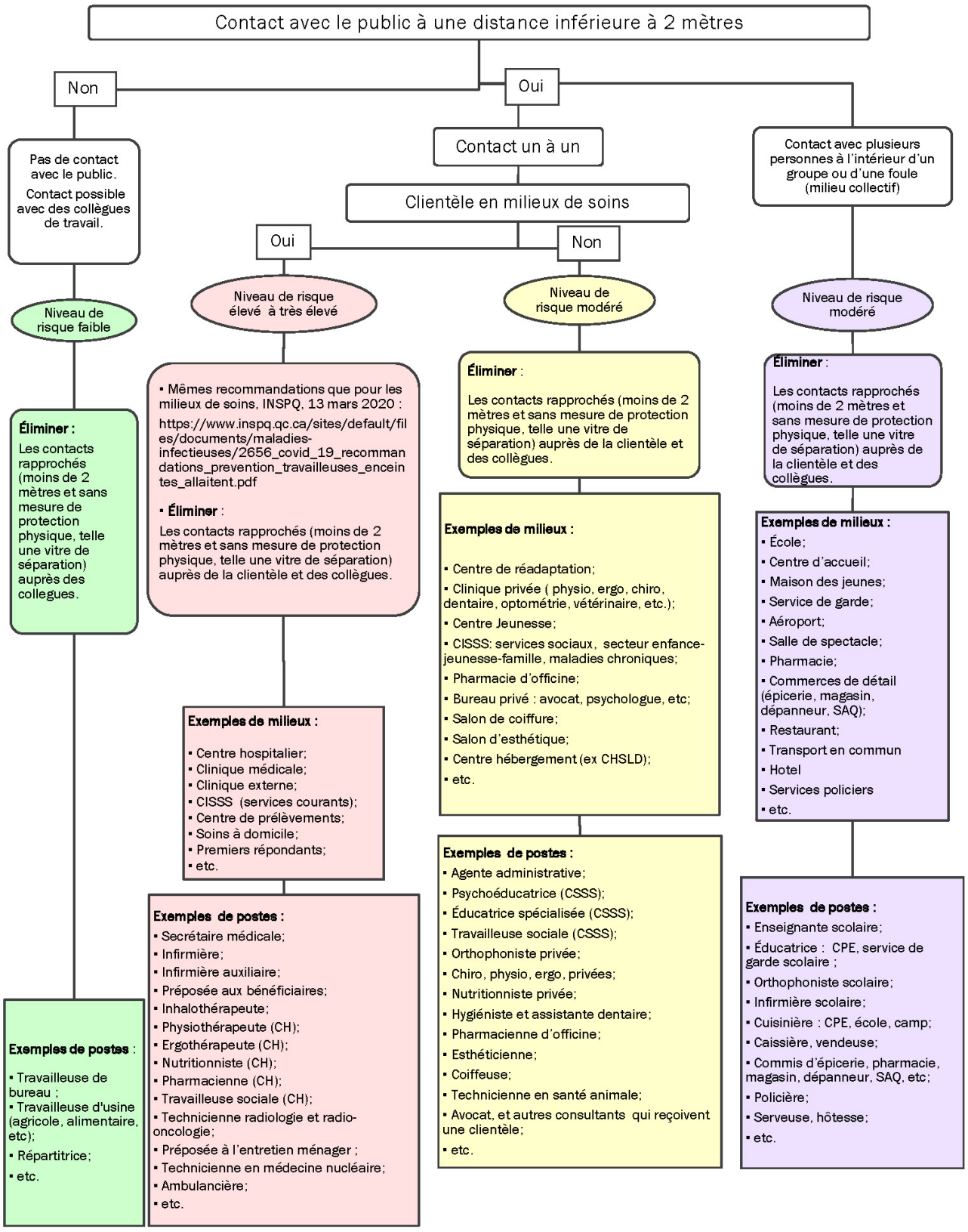
58 SOGC: COVID-19: Postpartum and newborn care, Opinion of March 13, 2020.

13. Risk factor in the « Système d'information en santé au travail »

In an effort to harmonize the processing of requests for preventive reassignment of pregnant or nursing workers, the biological risk factor SARS-CoV-2 COVID-19 was added to the drop-down menu of risk factors in the occupational health information system known as SISAT ("Système d'information en santé au travail"). This tool would also allow for the monitoring of applications where this risk factor is identified by designated medical practitioners (DMPs) in the assessment of the position and work tasks of pregnant workers.

Outil d'aide à la décision

Contexte de transmission dans la communauté



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COVID-19 (SARS-CoV-2): Interim Recommendations on Preventive Workplace Measures for Pregnant and Nursing Workers

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