



Sars-CoV-2 and Breastfeeding

Geneva, June 29, 2020

WHO recommendation FAQ of May 7, 2020

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-on-covid-19-and-breastfeeding>

Can COVID-19 be passed through breastfeeding?

"Transmission of active COVID-19 (virus that can cause infection) through breast milk and breastfeeding has not been detected to date. There is no reason to avoid or stop breastfeeding."

State of Knowledge according to recent publications

- Buensenso et al. (May 2, 2020, Am J Perinatol)

Neonatal Late Onset Infection with Severe Acute Respiratory Syndrome Coronavirus 2

<https://doi.org/10.1055/s-0040-1710541>

Two newborns were enrolled in the study. At birth and 3 days of life, newborns were negative to SARS-CoV-2. At 2-weeks-follow-up, one newborn tested positive although asymptomatic. The mother (mother 1) of this newborn had 10 samples of breastmilk, all negative. On the other hand, mother 2 had also 10 samples: 3 out of 5 during the first five days of newborn life (samples 1, 2 and 4) tested positive, but the newborn was Covid-19 negative. 5 other samples collected on day 14 to 17 were all negative.

"In case 1, the mother opted for breastfeeding. Since milk samples tested negative, respiratory secretions were the probable source of late-onset neonatal infection. However, the newborn was asymptomatic. We can speculate that the maternal immunoglobulin G (documented at birth in the neonatal blood) and breastmilk antibodies may have protected the newborn from a symptomatic infection, preserving the benefits of breastfeeding."

- Wu et al. (May 5, 2020, BJOG)

Coronavirus disease 2019 among pregnant Chinese women: case series data on the safety of vaginal birth and breastfeeding. <https://doi.org/10.1111/1471-0528.16276>

Study on 13 SARS-CoV-2 infected pregnant women. After delivery (5 mothers), one of three samples of breast milk from 3 different mothers was positive by viral nucleic acid testing, neonatal throat swab of this baby was negative. (See graphic) None of the five newborns was infected, although one of the three breast-milk samples was positive. The same mother gave another breast-milk sample 2 days later, which was negative.

However, the authors state : "Although we retested the breast milk from this infected women [sic] 2 days later and found it to be negative, the possibility of viral transmission through breast

milk cannot be excluded. Until large studies have demonstrated the safety of breast milk, our advice is against the use of breastfeeding even through breast expression; mothers with COVID-19 should not breastfeed until after full recovery, when breast milk tests negative for the virus."

- Kirtsman et al. (May 14, 2020, OMAJ)

Probable congenital SARS-CoV-2 infection in a neonate born to a woman with active SARS-CoV-2 infection <https://doi.org/10.1503/cmaj.200821>

Study on one mother with newborn delivered by cesaerian section and infected before skin-to-skin contact and before breastfeeding. Authors state:

"We have determined this case to be a probable case of congenital SARS-CoV-2 infection...In our case, the mother's nasopharyngeal swab, breast milk and vaginal swab were positive for SARS-CoV-2 RNA." and

"The potential for respiratory secretion contamination of breast milk cannot be ruled out but was minimized by breast hygiene and cleaning before specimen collection. [...] Given that SARS-CoV-2 genes were not detected in the umbilical tissue, we suspect the possibility of a transamniotic route of infection via the placenta. [...] In our case, maternal familial neutropenia and the associated immunocompromised state may have contributed to the widespread dissemination of the virus throughout body tissues and secretions. It is possible that the neutropenia in the neonate was secondary to inheritance of the maternal condition (confirmatory tests are pending), which may have altered his immunologic state, contributing to the acquisition of SARS-CoV-2 infection."

- Gross et al. (May 21, 2020, Lancet)

Detection of SARS-CoV-2 in human breastmilk [https://doi.org/10.1016/S0140-6736\(20\)31181-8](https://doi.org/10.1016/S0140-6736(20)31181-8)
2 mothers Covid-19 positive, mother1 negative breastmilk samples; mother2 had 4 BM samples on Days 10, 12 and 13 with virus RNA (not active virus). On Days 14 she had 2 negative samples , and on J25 a last sample, also negative. It is not clear how the baby of mother 2 was contaminated. Both mothers shared a room in maternity ward. (See graphic)

- Chambers et al. (June 16, 2020, medrxiv) (not peer-reviewed to date)

Evaluation of SARS-CoV-2 in Breastmilk from 18 Infected Women
<https://www.medrxiv.org/content/10.1101/2020.06.12.20127944v1>

64 serial breastmilk samples from from 18 SARS-CoV-2-infected women residing in the U.S. have been analysed. "Although SARS-CoV-2 RNA was detected in one milk sample from one of eighteen infected women, the viral culture for that sample was negative. This suggests that SARS-CoV-2 RNA does not represent replication-competent virus and that breastmilk itself is likely not a source of infection for the infant."

Several other studies on breastmilk samples from Covid-19 positive mothers did not find virus or viral material in breastmilk.

- Chen L et al. (February 12, 2020, Lancet)

Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. Lancet 2020;395:809–15.
[https://doi.org/10.1016/S0140-6736\(20\)30360-3](https://doi.org/10.1016/S0140-6736(20)30360-3)

Breastmilk samples from six patients were tested for SARS-CoV-2, and all samples tested negative for the virus.

- Lackey et al. (April 20, 2020, Medrxiv) (Review article)

SARS-CoV-2 and human milk: what is the evidence?

<https://www.medrxiv.org/content/10.1101/2020.04.07.20056812v2>

There are 9 case studies of human milk tested for SARS-CoV-2; none detected the virus.

- Salvatori et al. (April 13, published May 8, 2020, BFM) (Italian study)

Managing COVID-19-Positive Maternal–Infant Dyads: An Italian Experience

<https://doi.org/10.1089/bfm.2020.0095>

2 mothers, all samples of breastmilk were negative.

- Chen et al. (April 17, 2020, N Engl J Med)

Clinical Characteristics of Pregnant Women with Covid-19 in Wuhan, China

[DOI:10.1056/NEJMc2009226](https://doi.org/10.1056/NEJMc2009226)

From December 8, 2019, to March 20, 2020, authors identified 118 pregnant women with Covid-19 in Wuhan. Breast-milk samples of 3 mothers, no positive results were reported. The present data do not suggest an increased risk of severe disease among pregnant women, as has been observed with influenza.

- Yang N et al. (April 19, 2020) (Review)

Breastfeeding of infants born to mothers with COVID-19: a rapid review.

<https://www.medrxiv.org/content/10.1101/2020.04.13.20064378v1>

Five case reports showed that the viral nucleic acid tests for all thirteen collected samples of breast milk from mothers with COVID-19 were negative. Conclusion: There is currently no evidence of detected viral nucleic acid in breast milk of mothers infected with SARS-CoV-2.

Questions by GIFA

- 1) There was "seroconversion" in breastmilk of mother 2 after J13 (Gross et al) and of mother 2 among the samples within the first 5 days (Buensenso) as well as in Chambers et al. (1 mother, 1 sample tested positive, 1 sample before and 2 samples after tested negative). What is the mechanism when there are positive and then negative samples?
- 2) Have other studies using a single sample to determine if there is SARS-CoV-2 virus in Breastmilk missed out something because there was only 1 sample for each mother?
- 3) Even if there is the virus or virus-RNA in Breastmilk, what would be the pathway for pulmonary infection as the milk is digested in the Gastrointestinal tractus?
- 4) How can we determine if infection of newborn is due to virus in breastmilk?
- 5) Is the presence of SARS-CoV-2 a kind of vaccine for the baby, and in addition, breastmilk offers antibodies to mitigate infection?
- 6) Is it justified, and reasonable that a newborn positive for SARS-CoV-2 is not getting breastmilk and is separated from his mother, knowing that breastfeeding and skin-to-skin contribute to build up the immune system in babies?

WHO 2020 Status Report on Code Implementation

<https://www.who.int/publications/i/item/9789240006010>

At the [Launch Webinar on May 28](#), WHO states: "The COVID-19 pandemic highlights the importance of protecting optimal nutrition, including breastfeeding, to improve child health

and survival. Formula manufacturers are exploiting the panic and fears of contagion to intensify their aggressive marketing practices. In this context, government action to regulate the marketing of breast-milk substitutes has never been greater. The [International Code of Marketing of Breast-milk Substitutes](#) and subsequent relevant World Health Assembly resolutions (“the Code”) spell out key legal safeguards against industry practices that undermine breastfeeding."

"WHO, UNICEF, and the International Baby Food Action Network (IBFAN) launched the 2020 Status Report that highlights which countries have implemented measures required by the Code. Given the important role of health workers in protecting pregnant women, mothers and their infants from inappropriate promotion of breast-milk substitutes, the 2020 report provides an extensive analysis of legal measures taken to prohibit promotion to health workers and in health facilities."

WHO Film on "Breastfeeding during Covid-19"

<https://www.facebook.com/154163327962392/posts/3189616161083745/>

<https://www.youtube.com/watch?v=dJIWAjOZKjA&feature=youtu.be>

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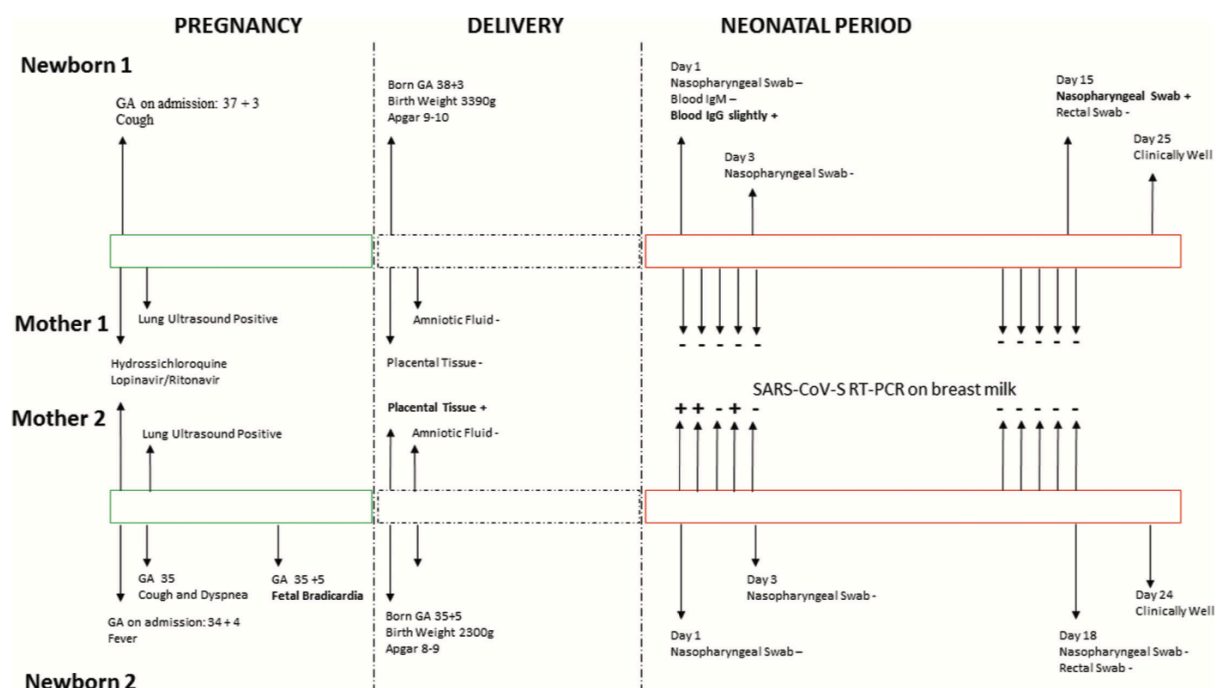
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Appendix

Graphic1: Buensenso et al

<https://doi.org/10.1055/s-0040-1710541>



Graphic2: Wu et al

<https://doi.org/10.1111/1471-0528.16276>

Wu et al.

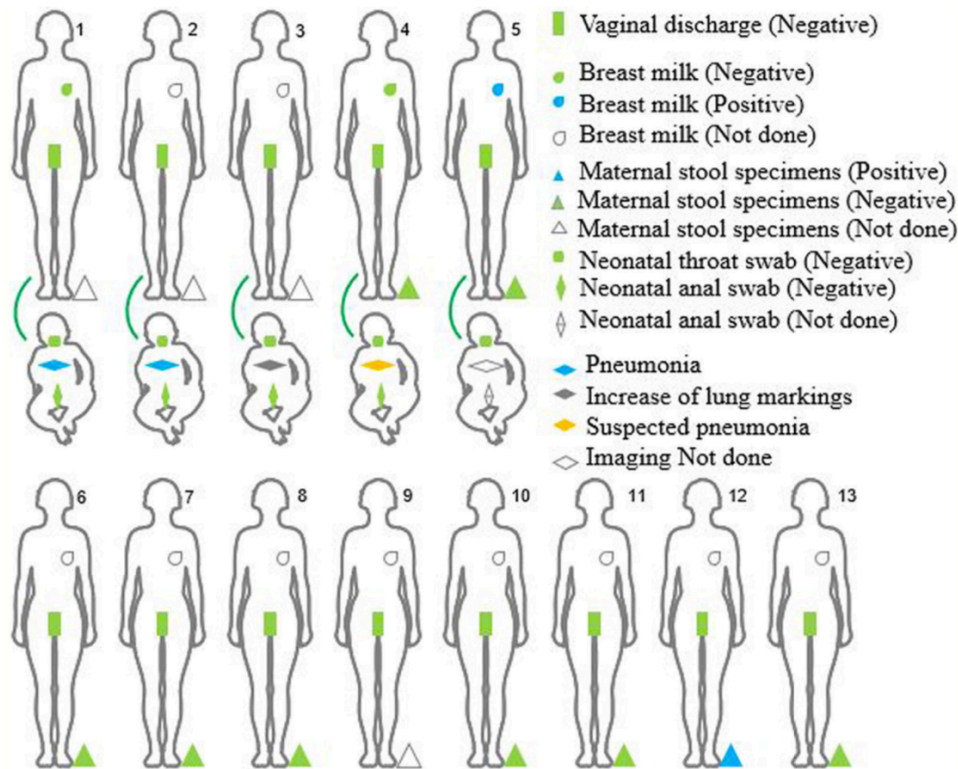


Figure 1. Summary of virus detection in pregnant women with COVID-19. Samples of vaginal secretions, breast milk and stool were collected from 13 pregnant women with SARS-CoV-2 infection. Four of the pregnant women in their third trimester (Patients 1 to 4) had caesarean sections, one woman (patient 5) had a vaginal birth. The neonatal throat and anal swabs were collected on the 1st and 3rd days after birth to detect the COVID-19 virus. Four neonates received chest X-rays or computed tomography imaging on the 2nd day after birth.

Graphic3 : Gross et al.

[https://doi.org/10.1016/S0140-6736\(20\)31181-8](https://doi.org/10.1016/S0140-6736(20)31181-8)

