

## **Optimising mother-baby contact and infant feeding in a pandemic Rapid analytic review**

### **Part 1**

Part 2 to follow:

Additional considerations for women with suspected or confirmed COVID-19  
and for newborn infants in neonatal units and their parents

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NOTE: Additional recommendations for women with suspected or confirmed COVID-19  
and for newborn infants in neonatal units and their parents will be the subject of an  
additional review.

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## Summary

Optimising close, ongoing contact between mothers and newborn infants and enabling women to breastfeed/feed with breastmilk, or to use breastmilk substitutes as effectively and safely as possible, are key elements of maternity and neonatal care. They are especially important during the COVID-19 pandemic. Extensive evidence-based positive developments in policy and practice to promote and support mother-baby contact, attachment, and breastfeeding have been implemented in the UK and many other countries in the last 15-20 years, though such changes have not been universally implemented and barriers still exist in many settings. The coronavirus pandemic and the inevitable focus on reducing infection has disrupted many of these developments and adversely affected mother-baby contact and infant feeding in many contexts, augmenting existing barriers. Societal changes such as hygiene measures and social distancing, lockdown, isolation, fear, and food security challenges complicate the lives of women and families. Health service changes in the UK and other countries have included service re-design including virtual contact and the use of masks and personal protective equipment, staff redeployment and shortages and the interruption of Unicef UK Baby Friendly Initiative accreditation programmes. Taken together, these changes pose a risk to immediate, close and loving contact between the mother and newborn infant and with the other parent and the wider family, to the initiation and continuation of breastfeeding, and to future individual and family well-being and public health. Some reports are emerging about potential positive impacts of the restrictions on postnatal visiting and increased levels of virtual contact for some families.

In the context of the COVID-19 pandemic and the need to prevent or reduce infection, this rapid analytic review considers:

- What is the evidence base and best practice on optimising mother-baby contact?
- What is the evidence base and best practice on optimising infant feeding?
- What are the implications of this knowledge for guidance for health professionals, the care of women and babies, and information for women and families?

## Summary of key findings and recommendations

### Infection risk

1. While the possibility of vertical transmission cannot be ruled out at present, at the time of writing (13<sup>th</sup> May 2020) there is no conclusive evidence of in utero transmission, and there are no reports of transmission of coronavirus in breastmilk. It is essential to continue to keep this situation under review.
2. To minimise infection risk, all parents and carers should be encouraged to observe strict hygiene measures.
3. COVID-infected infants and infants who have been in contact with COVID-infected mothers, but who are otherwise well, should not be cared for in neonatal units where the risk of infecting caregivers and immune compromised infants is high.
4. Minimising the number of caregivers the infant is exposed to is essential to reduce the infection risk both for the infant and for the caregivers.

5. Special attention is needed for women in BAME groups as they are at higher risk of becoming significantly unwell with COVID-19 in pregnancy and requiring hospital admission (Knight *et al.*, 2020).

### **Mother-baby contact**

6. Separating mothers and babies is an intervention with serious consequences and it should be avoided unless essential.
7. There are no grounds for separating asymptomatic, healthy mothers and newborn infants.
8. The establishment of close and loving relationships and avoiding unnecessary separation of mother and baby is likely to help to protect against the anxiety, fear, and other mental health challenges resulting from the pandemic, lockdown, isolation, and other constraints.

### **Infant feeding – for all women and newborn infants**

9. Detailed guidelines for staff and services on infant feeding in the current context should be implemented and consistently used to optimise care and to avoid inconsistent and inaccurate information for women.
10. Regardless of infant feeding method, all women need ongoing close contact with their babies, and information and support with feeding until they are confident and the infant is feeding effectively.
11. Appropriate postnatal contacts and referral systems should be in place for all women and infants.
12. It will be important to seek the views of women and staff about effective, context-specific ways of enabling women to breastfeed and to minimise the risks of breastmilk substitutes in this current crisis.

### **Breastfeeding**

13. Breastfeeding is strongly recommended for all women and newborn infants.
14. The unique value of breastfeeding to newborn infants, women, and public health in this pandemic should be recognised by health professionals and the public.
15. Sensitive conversations about infant feeding should be conducted with all women, and should include information, encouragement and support to consider breastfeeding.
16. Information and support, psychological and practical, should be available to all women in pregnancy and from the first feed onwards.
17. Women and babies should be enabled to stay together, to have skin-to-skin contact, and to breastfeed responsively to optimise the establishment of breastfeeding.
18. Accessible resources for staff will be needed to enable them to inform and support women and to have appropriately sensitive conversations with women.

19. Accessible resources for women will be needed to inform and enable them to breastfeed, especially those from communities where breastfeeding rates are normally low, and where effective interventions will be needed to enable them to start and to continue to breastfeed.

### **Formula feeding**

20. Some women may find breastfeeding especially challenging in circumstances of lockdown and social isolation, and some women will decide to formula feed. Their decision should be respected and practical and psychological information and support provided to enable them to bottle feed responsively and effectively.
21. Parents who formula feed should be encouraged to adhere to current guidance on washing and sterilising equipment, and to bottle feed responsively.
22. Health professionals should be alert to any local problems with food security and the supply of infant formula, bottles and teats, and sterilising equipment.
23. Supporting families to claim their Healthy Start vouchers or the equivalent in devolved nations will help them to overcome some of the logistical challenges and purchase adequate supplies of formula and to access Healthy Start vitamins.

## Background and context

### The importance of mother-baby contact and breastfeeding

Optimising close, ongoing contact between mothers and newborn infants and enabling women to breastfeed/feed with breastmilk, or to use breastmilk substitutes as effectively and safely as possible, are key elements of maternity and neonatal care. There is a wealth of existing evidence that mother-baby contact and breastfeeding both have an important positive impact on short, medium, and long-term outcomes for both women and newborn infants, including mortality, health, wellbeing, attachment, and development outcomes (Acta Paediatrica, 2015; Rollins *et al.*, 2016; Victora *et al.*, 2016). They contribute to close mother-baby and family relationships that lay a foundation for the survival, health and wellbeing of the baby into childhood and adult life (Schore, 2001; Shonkoff *et al.*, 2012; McManus and Nugent, 2014).

Skin-to-skin contact, both immediate and ongoing, has physiological as well as psychological benefits for all newborn infants (Moore *et al.*, 2016). For preterm, small, and sick newborn infants, kangaroo care is associated with reduced mortality as well as improved health outcomes (Conde-Agudelo and Díaz-Rossello, 2016).

Breastfeeding/feeding with breastmilk improves short, medium and long-term outcomes for both infants and women, and the World Health Organisation and UNICEF recommend exclusive breastfeeding for six months and thereafter with other foods for two years and beyond (<https://www.who.int/nutrition/topics/global-breastfeeding-collective/en/>).

Breastfeeding/feeding with breastmilk optimises the immune system, confers active and passive immunity, and protects against infection (Bode *et al.*, 2014; Gomez-Gallego *et al.*, 2016; Victora *et al.*, 2016). This includes protection against life-threatening conditions for preterm, small and sick infants including necrotising enterocolitis, sepsis, and pneumonia (Cacho, Parker and Neu, 2017; Lewis *et al.*, 2017; Woodman, 2017). Infant feeding rates are strongly socio-economically patterned. Women and newborn infants from population groups already likely to be more vulnerable to coronavirus are least likely to breastfeed, contributing to the cycle of nutritional deprivation (Dykes and Hall Moran, 2006; McAndrew *et al.*, 2012; National Institute for Health and Clinical Excellence, 2014).

### Existing practice developments and challenges

Extensive evidence-based positive developments in policy and practice to promote and support mother-baby contact, attachment, and breastfeeding have been implemented in the UK and many other countries in the last 15-20 years, though such changes have not been universally implemented and barriers still exist in many settings (Davies, 2013, 2015; Leadsom *et al.*, 2013; Public Health England and Unicef UK Baby Friendly Initiative, 2016). These include immediate, uninterrupted, and ongoing skin-to-skin contact at birth, early initiation of breastfeeding, and supporting close and loving relationships for all women and newborn infants. For babies in neonatal units and their families, positive developments that are being implemented, though again not universally, include family-centred care, kangaroo care, maximising breastmilk intake, and parents as partners in care with unrestricted access to their babies (Yu and Zhang, 2019). Multidisciplinary staff education and training in infant feeding remains a challenge however, and women and newborn infants do not reliably

receive consistent care and support (Schmied *et al.*, 2011; McAndrew *et al.*, 2012; Yang *et al.*, 2018). Unicef UK Baby Friendly Initiative (BFI) standards for maternity and neonatal services, health visiting services, early years settings, neonatal units, and university pre-registration midwifery and health visiting programmes have been key in promoting evidence-based practice (Entwistle, 2013; Unicef UK Baby Friendly Initiative, 2019), as have national maternity and neonatal policies in all four UK countries (Department for Health, Social Services, 2013; NHS England, 2016; The Scottish Government, 2017; Department of Health and Social Services, 2019; Welsh Government, 2019). All babies in Scotland and Northern Ireland are now born in a BFI-accredited environment, whereas in England this is only 57%. In 2019, NHS England published their Long Term Plan (NHS England, 2019) which recommends that all maternity and neonatal services implement BFI accreditation, highlighting that breastfeeding rates compare unfavourably with other countries in Europe, with substantial variation across England: 84% of children reported as breastfed at 6-8 weeks in London compared to 32% in the North East.

### **Changes resulting from the current pandemic**

The coronavirus pandemic and the inevitable focus on reducing infection has disrupted many of these developments across the UK and other countries and has adversely affected mother-baby contact and infant feeding, augmenting the barriers that still exist (Unicef UK Baby Friendly Initiative, 2020). Mother-baby contact has been reported as being reduced or stopped in some contexts (Baker, 2020, Brown, 2020, Vogel, 2020). Forty percent of UK infant feeding services in a recent (unpublished) survey reported that their staffing has reduced as a result of the COVID-19 pandemic, and 30% report that parental access to the neonatal unit is now 'very restricted' (Unicef UK Baby Friendly Initiative, 2020). This affects women and newborn infants whether in the community or hospital, whether infected with coronavirus or not, whether the newborn infant requires care in the neonatal unit or not, and at every stage of the continuum, in pregnancy, birth, and after birth. Health service changes have included service re-design including virtual contact and the use of masks and personal protective equipment (PPE), staff redeployment and shortages (Royal College of Midwives, 2020) and the interruption of BFI accreditation programmes (Unicef UK Baby Friendly Initiative, 2020a). Societal changes including hygiene measures and social distancing, lockdown, isolation, and financial and food security challenges further complicate the lives of women and families. Taken together, they pose a risk to immediate, close and loving contact between the mother and newborn infant and with the other parent and the wider family, to the initiation and continuation of breastfeeding, and to future individual and family well-being and public health. Some reports are emerging about potential positive impacts of the restrictions on postnatal visiting; some women, their partners, and newborns are reported as having more uninterrupted time together, which may be of benefit to women living in supportive home situations where this occurs.

At the time of writing (13<sup>th</sup> May 2020) the available data on the potential for in-utero transmission of COVID-19 are inconclusive, though it cannot be ruled out. There are no reports of transmission in breastmilk. Existing data are considered in this review.

### **Review questions and aims**

In the context of the coronavirus pandemic and the need to prevent or reduce infection:

- What is the evidence base and best practice on optimising mother-baby contact?
- What is the evidence base and best practice on optimising infant feeding?
- What are the implications of this knowledge for a) guidance for health professionals, b) care of women and babies, c) information for women and families?

For each of these questions, this review will consider:

- clinical, psychological, social, and cultural aspects of safety
- the specific needs of:
  - healthy women and babies
  - women with suspected/actual COVID-19 infection
  - babies needing care in neonatal units (preterm, small, sick) and their parents

These overarching questions require consideration of related issues including:

- Optimising maternal and newborn outcomes
- Reducing/preventing infection for women, newborn infants, families, staff
- Maintaining essential aspects of quality in a time of health service, social, and economic turbulence
- Maximising workforce capacity and capability
- Optimising staff health and wellbeing
- Identifying novel or additional forms of care delivery or modifications in care

### **Core principles for quality care of women and newborn infants in a pandemic**

A set of core principles for quality care of women and newborns in a pandemic have been developed to inform the series of rapid evidence review to inform RCM/RCOG guidance. They draw on evidence of essential components of quality care for all women and newborn infants (Renfrew *et al.*, 2014) and incorporating the latest information from the World Health Organisation (World Health Organisation, 2020b, 2020a), the International Confederation of Midwives (International Confederation of Midwives, 2020b, 2020a) and the Royal College of Obstetricians and Gynaecologists (Royal College of Midwives and Royal College of Obstetricians and Gynaecologists, 2020b) and the Royal College of Midwives (Royal College of Midwives and Royal College of Obstetricians and Gynaecologists, 2020c) on COVID-19:

- Continue to provide evidence-informed, equitable, safe, respectful, and compassionate care for physical and mental health of all women and newborn infants, wherever and whenever care takes place
- Protect the human rights of women and newborn infants
- Ensure strict hygiene measures, and social distancing when possible

- Maintain community services and continuity if possible
- Ensure birth companionship by the woman's own chosen companion (who should be free of COVID-19 symptoms)
- Prevent unnecessary interventions
- Enable close contact between mother and newborn infant from birth
- Promote, enable, and value breastfeeding/breastmilk feeding and support women to breastfeed
- Involve women, families, and staff in co-designing and implementing changes
- Monitor the impact of changes including assessment of unanticipated consequences
- Protect and support maternity and neonatal staff and students, including their mental health needs

**Specific additional principles related to mother-baby contact and infant feeding in a pandemic for all maternity and newborn services** draw on the evidence identified in this review, and the work of the Unicef UK Baby Friendly Initiative (Unicef UK Baby Friendly Initiative, 2020b):

- Provide information and support for all women to optimise contact with their baby, and infant feeding
- Minimise the risks of using breastmilk substitutes especially at this time of heightened risk
- Involve parents as partners in care and promote close and loving family relationships

## Methods

This was a rapid analytic scoping review. Timing precluded a full systematic approach, but a structured approach was used.

Our searches were supported by resources collated by Unicef UK Baby Friendly Initiative and the British Association of Perinatal Medicine. Specific searches conducted by MIDIRS used the following databases: Maternity and Infant Care, Pubmed, The Cochrane Library, NICE and the Pan American Health Organization (PAHO) 'COVID-19 guidance and the latest research in the Americas'. Key words used are shown in the Appendix.

## Key findings and recommendations

### Infection risk

1. ***While the possibility of vertical transmission cannot be ruled out at present, at the time of writing (13<sup>th</sup> May 2020) there is no conclusive evidence of in utero transmission, and there are no reports of transmission of coronavirus in breastmilk. It is essential to continue to keep this situation under review.***
  - a. The UKOSS study (Knight *et al.*, 2020) reports 12 newborn infants who tested positive for COVID-19, six of them within 12 hours of birth; 5% of the 247 UK women in the study who were hospitalised for COVID-19 who gave birth or

- had a pregnancy loss. None of the infants died. There is no indication yet of how these babies were fed.
- b. There are reports of three newborn infants in China who showed elevated IgM levels in blood drawn after birth and who may have been infected with COVID-19 in utero (Dong *et al.*, 2020; H. Zeng *et al.*, 2020). None of the infants had any symptoms.
  - c. These data are not conclusive and do not prove in utero transmission, though neither can it be ruled out (Kimberlin and Stagno, 2020).
  - d. The majority of newborn infants born to women who tested positive for COVID-19 in the UKOSS study were not infected (Knight *et al.*, 2020). There are international reports of COVID-19 infected women where the infant was not infected (Chen *et al.*, 2020; L. Zeng *et al.*, 2020; Schwartz DA, 2020; Nan Yu *et al.*, 2020).
  - e. Larger cohorts are needed for adequate investigation, and further work is required on the reliability of amniotic testing for the virus, and for the significance of virus specific antibodies in neonatal blood.
2. The newborn infant may become infected after birth. COVID-19 appears to be a fairly minor illness in young infants and may be asymptomatic (Knight *et al.*, 2020; L. Zeng *et al.*, 2020; Royal College of Paediatrics and Child Health, 2020). **To minimise infection risk, all parents and carers should be encouraged to observe strict hygiene measures**, including hand washing with soap and water before and after contact with their baby, and washing surfaces around the home regularly with soap and water. Women with suspected or confirmed COVID-19 should practice respiratory hygiene and wear a mask when handling the baby. (World Health Organisation, 2020a). If a fluid-resistant surgical face mask is available, this should be considered while feeding and caring for the baby (Royal College of Obstetricians and Gynaecologists and Royal College of Midwives 2020b).
  3. **COVID-infected infants and infants who have been in contact with COVID-infected mothers, but who are otherwise well, should not be cared for in neonatal units where the risk of infecting caregivers and immune compromised infants is high.** Infected infants will be potentially infectious and there are concerns that illness could potentially be more severe in preterm or otherwise immune compromised babies (L. Zeng *et al.*, 2020; Royal College of Paediatrics and Child Health, 2020). They should be kept with their mothers in situations where women can practice effective hygiene measures and self-isolation; at home if the mother is well enough, or in a side ward.
  4. **Minimising the number of caregivers the infant is exposed to is essential to reduce the infection risk both for the infant and for the caregivers** (Stuebe, 2020). Keeping newborn infants with their mothers is key to this.
  5. There is evidence emerging that the BAME population is more susceptible to COVID-19 (Kirby, 2020; Knight *et al.*, 2020). There are already increased rates of mortality in women and babies from these groups, and **special attention is needed for women in BAME groups** in regard to promoting contact and enabling women to

breastfeed, as well as being vigilant about preventing infection and taking measures to avoid all forms of discrimination.

### **Mother-baby contact**

6. ***Separating mothers and babies is an intervention with serious consequences and it should be avoided unless essential*** (Stuebe, 2020; World Health Organisation, 2020a; World Health Organisation Euro, 2020). It causes physiological stress in the baby (Morgan, Horn and Bergman, 2011; Moore *et al.*, 2016; UNICEF, 2020) and may make the infant more vulnerable to severe respiratory infections, including COVID-19, in the first year of life (Galton Bachrach, Schwarz and Bachrach, 2003; Davanzo *et al.*, 2020).
7. ***There are no grounds for separating asymptomatic, healthy mothers and newborn infants***. Immediate and uninterrupted contact should be encouraged, and women and newborn infants should be kept together thereafter (Scottish Government, 2020; World Health Organisation, 2020a; World Health Organisation Euro, 2020).
8. ***The establishment of close and loving relationships and avoiding unnecessary separation of mother and baby is likely to help to protect against the anxiety, fear, and other mental health challenges*** resulting from the pandemic, lockdown, isolation, and other constraints (eg Charpak *et al.*, 2017).

### **Infant feeding – for all women and newborn infants**

9. ***Detailed guidelines for staff and services on infant feeding in the current context should be implemented and consistently used to optimise care and to avoid inconsistent and inaccurate information for women***. Appropriate guidelines developed by the Scottish Government are listed in the Resources section (Scottish Government, 2020).
10. ***Regardless of infant feeding method, all women need ongoing close contact with their babies, and information and support with feeding until they are confident and the infant is feeding effectively*** (McFadden *et al.*, 2017). This information and support can be provided by health professionals, peer supporters, and by appropriately trained voluntary services, and be by face-to-face or virtual contact. Information is provided in the Resources section.
11. ***Appropriate postnatal contacts and referral systems should be in place for all women and infants***, whether face to face or by virtual technology, and whether delivered by midwives, health visitors or the voluntary sector, to meet women's needs for information and support and address their concerns about infant feeding, until effective infant feeding is established (Scottish Government, 2020). PPE should be available for staff and volunteers conducting face to face visits.

12. **It will be important to seek the views of women and staff** about effective, context-specific ways of enabling women to breastfeed and to minimise the risks of breastmilk substitutes in this current crisis (Renfrew *et al.*, 2008; McAndrew *et al.*, 2012; The Food Foundation, 2020).

## Breastfeeding

13. **Breastfeeding is strongly recommended for all women and newborn infants** because of its known lifelong importance for women's and children's health and well-being (World Health Organisation, 2020a; World Health Organisation Euro, 2020).
14. **The unique value of breastfeeding to newborn infants, women, and public health in this pandemic should be recognised by health professionals and the public.** The active and passive immunity to infections conferred by breastfeeding increase its benefit at this time. There are growing indications that breastmilk may be a valuable source of antibodies against COVID-19 (Fox *et al.*, 2020). Mother's own milk should always be the first choice as this is responsive to her and her baby's environment. However, if mother's own milk is not available, donor human milk is the second choice (Shenker *et al.*, 2020).
15. **Sensitive conversations about infant feeding should be conducted with all women, and should include information, encouragement and support to consider breastfeeding** (Scottish Government, 2020; Unicef UK Baby Friendly Initiative, 2020b; World Health Organisation, 2020a; World Health Organisation Euro, 2020).
16. **Information and support, psychological and practical, should be available to all women in pregnancy and from the first feed onwards** to enable them to initiate and continue breastfeeding, including breastmilk expression, whether they or their infants and young children have suspected, probable or confirmed COVID-19 (Balogun *et al.*, 2016; McFadden *et al.*, 2017; The Scottish Government, 2017; Unicef UK Baby Friendly Initiative, 2020b; World Health Organisation, 2020a).
17. **Women and babies should be enabled to stay together, to have skin-to-skin contact, and to breastfeed responsively** to optimise the establishment of breastfeeding (Moore *et al.*, 2016; Unicef UK Baby Friendly Initiative, 2020b).
18. **Accessible resources for staff will be needed to enable them to inform and support women and to have appropriately sensitive conversations with women** (<https://www.unicef.org.uk/babyfriendly/guidance-documents/>). Staff shortages and redeployment mean that not all staff caring for women in pregnancy, at birth, and postnatally will be up to date with the knowledge and skills to help women with breastfeeding (Unicef UK Baby Friendly Initiative, 2020), and they may need easily accessible support so they can rapidly learn to do this effectively and sensitively. Appropriate resources to support staff in this situation, developed by Unicef UK BFI, are listed in the Resources section.

19. **Accessible resources for women will be needed to inform and enable them to breastfeed, especially those from communities where breastfeeding rates are normally low, and where effective interventions will be needed to enable them to start and to continue to breastfeed** (Renfrew *et al.*, 2008; Balogun *et al.*, 2016; McFadden *et al.*, 2017; Relton *et al.*, 2018). Appropriate links are listed below in the Resources section.

## Formula feeding

20. Some women may find breastfeeding especially challenging in circumstances of lockdown and social isolation, and some women will decide to formula feed. **Their decision should be respected and practical and psychological information and support provided to enable them to bottle feed responsively and effectively.** Appropriate resources developed by Unicef UK Baby Friendly Initiative are listed in the Resources section.
21. **Parents who formula feed should be encouraged to adhere to current guidance on washing and sterilising equipment, and to bottle feed responsively**, including pacing feeds and limiting the number of people who feed their baby (Scottish Government, 2020; Unicef UK Baby Friendly Initiative, 2020b; Unicef UK Baby Friendly Initiative, First Steps Nutrition and National Infant Feeding Network, 2020).
22. **Health professionals should be alert to any local problems with food security** and the supply of infant formula, bottles and teats, and sterilising equipment. Women may need support to find appropriate suppliers, or to re-lactate (Unicef UK Baby Friendly Initiative, 2020b; Unicef UK Baby Friendly Initiative, First Steps Nutrition and National Infant Feeding Network, 2020). Midwives should be aware of the impact of food poverty (Etheridge, 2014; The Food Foundation, 2019, 2020), which is likely to increase in the wake of the pandemic.
23. Increasing numbers of families rely on universal credit at this time of social and economic turbulence, and existing inequities are likely to be exacerbated by this pandemic. Families in receipt of universal credit are entitled to Healthy Start vouchers or the equivalent in devolved nations. **Supporting families to claim their Healthy Start vouchers or the equivalent in devolved nations will help them to overcome some of the logistical challenges and purchase adequate supplies of formula and to access Healthy Start vitamins** (McFadden *et al.*, 2014, 2015; Unicef UK Baby Friendly Initiative, First Steps Nutrition and National Infant Feeding Network, 2020).

## Resources for staff and parents

### Staff:

- Detailed evidence-informed guidelines on infant feeding for maternity services: <https://www.gov.scot/publications/coronavirus-covid-19-guidance-infant-feeding-service/pages/2/>

- Unicef UK Baby Friendly Initiative statements on infant feeding during the COVID-19 outbreak: <https://www.unicef.org.uk/babyfriendly/infant-feeding-during-the-covid-19-outbreak/>
- COVID-19 relevant, evidence-based guidance sheets for staff have been developed by Unicef UK BFI and are available at <https://www.unicef.org.uk/babyfriendly/guidance-documents/>
- Unicef UK Baby Friendly Initiative easy-to-use education refresher sheets for staff working to deliver postnatal care during the coronavirus outbreak <https://www.unicef.org.uk/babyfriendly/education-refresher-sheets/>
- Unicef UK Baby Friendly Initiative guide for local authorities on infant feeding during the coronavirus crisis (including information on formula feeding supplies) <https://www.unicef.org.uk/babyfriendly/wp-content/uploads/sites/2/2020/04/Unicef-UK-Baby-Friendly-Initiative-guide-for-local-authorities-on-infant-feeding-during-the-coronavirus-crisis.pdf>
- Unicef UK Baby Friendly Initiative resources on maximising breastmilk <https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/breastfeeding-resources/maximising-breastmilk/>
- World Health Organisation HO FAQs on breastfeeding and COVID-19 for healthcare workers: [https://www.who.int/docs/default-source/maternal-health/faqs-breastfeeding-and-covid-19.pdf?sfvrsn=d839e6c0\\_1](https://www.who.int/docs/default-source/maternal-health/faqs-breastfeeding-and-covid-19.pdf?sfvrsn=d839e6c0_1)
- Institute of Health Visiting information for health visitors: <https://ihv.org.uk/news-and-views/press-releases/ihv-launches-covid-19-professional-advice-for-health-visiting/>

#### Parents:

- Appropriate resources for parents:
  - <https://www.nhs.uk/start4life/baby/coronavirus-covid19-advice-for-parents/>
  - <https://www.nhsinform.scot/illnesses-and-conditions/infections-and-poisoning/coronavirus-covid-19/coronavirus-covid-19-pregnancy-and-newborn-babies>
  - <http://www.healthscotland.com/uploads/documents/120-Off%20to%20a%20good%20start-Feb2019-English.pdf>
  - <https://ihv.org.uk/news-and-views/news/new-resource-for-parents-supporting-breastfeeding-during-covid-19/>
- The National Breastfeeding Helpline is available 7 days a week, from 9.30am to 9.30pm: <https://www.breastfeedingnetwork.org.uk/coronavirus/>
- Breastfeeding support can be accessed from national voluntary organisations:
  - NCT: <https://www.nct.org.uk/>
  - La Leche League GB: <https://www.laleche.org.uk/>
  - The Breastfeeding Network: [www.breastfeedingnetwork.org.uk](http://www.breastfeedingnetwork.org.uk)
  - Drugs and Medicines advice from The Breastfeeding Network: <https://www.breastfeedingnetwork.org.uk/drugs-factsheets/>
  - Association of Breastfeeding Mothers: <https://abm.me.uk/>

- Information on infant formula and bottle feeding is available from First Steps Nutrition Trust: <https://www.firststepsnutrition.org/parents-carers>

**Covid-relevant studies, reviews, and guidelines**

Source document	Relevant information
Empirical studies	
Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. (Chen <i>et al.</i> , 2020)	
Epidemiological Characteristics of 2143 Pediatric Patients With 2019 Coronavirus Disease in China (Dong, Mo and Hu, 2020)	
Possible Vertical Transmission of SARS-CoV-2 From an Infected Mother to Her Newborn (Dong <i>et al.</i> , 2020)	This paper reports a case study of an infant born by caesarean section to a mother with COVID-19, and immediately separated from the mother. Tests showed some serological changes but the baby developed no symptoms.
Can SARS-CoV-2 Infection Be Acquired In Utero? More Definitive Evidence Is Needed David W. Kimberlin, MD; Sergio Stagno, MD <a href="https://jamanetwork.com/journals/jama/fullarticle/2763851">https://jamanetwork.com/journals/jama/fullarticle/2763851</a>	This editorial examines the evidence presented in Dong et al 2020 and Zeng et al 2020. It concludes that there is not virologic evidence for congenital infection to support the serologic suggestion of in utero transmission.  'Is it possible that SARS-CoV-2 can be transmitted in utero? Yes, especially because virus nucleic acid has been detected in blood samples. Is it also possible that these results are erroneous? Absolutely. Although these 2 studies deserve careful evaluation, more definitive evidence is needed before the provocative findings they report can be used to counsel pregnant women that their fetuses are at risk from congenital infection with SARS-CoV-2'.
Characteristics and outcomes of pregnant women hospitalised with confirmed SARS-CoV-2 infection in the UK: a national cohort study using the UK Obstetric Surveillance System (UKOSS) (Knight <i>et al.</i> , 2020)	Prospective national population-based cohort study using the UK Obstetric Surveillance System (UKOSS) of 427 pregnancy women admitted to UK hospitals with confirmed COVID-19 infection. 247 gave birth or had a pregnancy loss. Twelve of the 244 liveborn babies tested positive for COVID-19, six in the first 12 hours after birth. None of these babies died; six were admitted to the neonatal unit. There is no information on feeding method.

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	Five babies in the cohort died: three stillborn and two in the neonatal period. Three were reported as definitely unrelated to COVID-19. For two stillbirths it was unclear if COVID-19 contributed to the death.
Pregnancy and Perinatal Outcomes of Women With Coronavirus Disease (COVID-19) Pneumonia: A Preliminary Analysis. (Liu <i>et al.</i> , 2020)	
Management of pregnant women infected with COVID-19 (Luo and Yin, 2020)	
An Analysis of 38 Pregnant Women with 2 COVID-19, Their Newborn Infants, and Maternal-Fetal Transmission of SARS-CoV-2: Maternal Coronavirus Infections and Pregnancy Outcomes. (Schwartz DA, 2020)	<p>This study examined 38 pregnant women with COVID-19 and their newborn infants. There were no maternal deaths and no confirmed cases of intrauterine transmission. All specimens tested were negative.</p> <p>'At this point in the global pandemic of COVID-19 infection there is no evidence that SARS-CoV-2 undergoes intrauterine or transplacental transmission from infected pregnant women to their foetuses. Analysis of additional cases is necessary to determine if this remains true'.</p>
Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study (N Yu <i>et al.</i> , 2020)	
No SARS-CoV-2 detected in amniotic fluid in mid-pregnancy (Nan Yu <i>et al.</i> , 2020) Nan Yu, Wei Li, Qingling Kang, Wanjiang Zeng, Ling Feng, Jianli Wu <a href="https://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099(20)30320-0.pdf">https://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099(20)30320-0.pdf</a>	
Antibodies in Infants Born to Mothers With COVID-19 Pneumonia (H. Zeng <i>et al.</i> , 2020)	This paper reports on a small cohort of 6 women with mild coronavirus symptoms; all had caesarean sections and separated from their babies. Although there were some serological changes none of the infant showed any clinical symptoms.
Neonatal Early-Onset Infection With SARS-CoV-2 in 33 Neonates Born to Mothers With COVID-19 in Wuhan, China. (L. Zeng <i>et al.</i> , 2020)	<p>This study examined outcomes in a cohort of 33 infants with symptoms of COVID-19. All samples, including amniotic fluid, cord blood, and breast milk, were negative for SARS-CoV-2.</p> <p>'Vertical maternal-fetal transmission cannot be ruled out in the current cohort. Therefore, it is crucial to screen pregnant women</p>

	and implement strict infection control measures, quarantine of infected mothers, and close monitoring of neonates at risk of COVID-19'.
Reviews and overviews	
Breastfeeding and the risk of hospitalization for respiratory disease in infancy: a meta-analysis. (Galton Bachrach, Schwarz and Bachrach, 2003)	When infants are not breastfed, they have 3.6 times the risk of being hospitalized for pneumonia compared to infants who are exclusively breastfed for $\geq 4$ months.
Breastfeeding Protection, Promotion, and Support in Humanitarian Emergencies: A Systematic Review of Literature. (Dall'Oglio <i>et al.</i> , 2020)	There is a dearth of studies evaluating the influence of interventions aimed at improving breastfeeding in emergency settings. More evidence is urgently needed to encourage and implement optimal breastfeeding practices.
Considerations for Obstetric Care during the COVID-19 Pandemic (Dotters-Katz and Hughes, 2020)	
Coronavirus disease (COVID-19) and neonate: What neonatologist need to know. (Lu and Shi, 2020)	
Coronavirus in pregnancy and delivery: rapid review (Mullins <i>et al.</i> , 2020)	
Coronavirus Disease 2019 (COVID-19) and Pregnancy: What obstetricians need to know. (Rasmussen <i>et al.</i> , 2020)	
Should infants be separated from mothers with COVID-19? First do no harm. (Stuebe, 2020)	<p>'Separating mothers and babies is an intervention with serious consequences. It may not prevent infection or may simply delay infection of the neonate.</p> <p>Mothers will be in hospital for a short time only and once home, they are not likely to be able to isolate their own baby from self and/or other family members living in that household. Thus, separation in hospital provides a transient and artificial situation with potentially far more serious consequences for the health of mother and baby.</p> <p>Early skin-to-skin contact is crucial. Withholding this has potentially serious consequences for neonatal physiological and</p>

	<p>emotional wellbeing. Isolation of a neonate from his/her mother constitutes a significant stress factor. A study of healthy term infants placed skin-to-skin versus alone in a crib showed that separation increased stress activity by 176% (Morgan, Horn, Bergman 2011).</p> <p>Healthy term infants who are separated from their mothers have higher heart rates and respiratory rates and lower glucose levels than infants who are placed in skin-to-skin contact (Moore et al 2016). Skin-to-skin contact is important for colonization of the infant microbiome.</p> <p>Separating mother and baby immediately after birth may make the infant more vulnerable to severe respiratory infections, including COVID-19, in the first year of life.</p> <p>Keeping the mother and baby together minimises the burden on the health care system. Isolating the mother and infant adds considerable burden onto the health care system.</p> <p>Separation of mother and baby doubles the required resources: two hospital rooms, two provider teams, and two sets of personal protective equipment (PPE) each time a provider enters or leaves the room. In overstretched health care services where there are shortages of PPE, this is potentially very problematic’.</p>
<p>Neonatal Management during Coronavirus (COVID-19) Outbreak: Chinese Experiences (Ma, Zhu and Du, 2020)</p>	
<p>Guidelines</p>	
<p>Pregnancy, breastfeeding, and caring for young children: coronavirus disease 2019 (Centres for Disease Control, 2020)</p>	

<p>COVID-19 – guidance for neonatal settings (Royal College of Paediatrics and Child Health, 2020)</p>	<p>It is currently considered possible, but not proven, that SARS-CoV-2 can be transmitted vertically. The proportion of pregnancies affected and the significance for the child are yet to be determined. To date, viral RNA has not been detected in amniotic fluid, vaginal secretions or breast milk. In the individual reported cases of possible vertical transmission, viral RNA in the infant's respiratory secretions was not demonstrated before 36 hours of life.</p> <p>The newborn may become infected after birth, either from their mother, another family member or within the hospital setting. COVID-19 appears generally to be a fairly minor illness in young infants, and may be asymptomatic. Infected infants will, however, be potentially infectious and there are concerns that illness could potentially be more severe in preterm or otherwise immune compromised babies.</p>
<p>Coronavirus (COVID-19) infection in pregnancy (Royal College of Midwives and Royal College of Obstetricians and Gynaecologists, 2020a)</p>	<p>Transmission: Pregnant women are no more vulnerable than the general public, but some women may have a more severe immune response with more severe symptoms. There may be a cohort of asymptomatic individuals, with minor symptoms, incidence is unknown. Vertical transmission is possible but no evidence for this yet. No evidence that the virus is teratogenic. The newborn may become infected after birth. The benefits of breastfeeding far outweigh potential risks of virus in breast milk. Breastfeeding should be promoted and supported. An increase in levels of anxiety is to be expected. Acknowledge anxieties and build awareness and signing into routes of support including remote access.</p>
<p>Coronavirus (COVID-19) guidance for Infant Feeding Service. (Scottish Government, 2020)</p>	<p>It is essential that the Infant Feeding Services delivered throughout NHS Boards continued to deliver the minimal standards which will protect the establishment and maintenance of breastfeeding and safe formula feeding.</p>
<p>SOGC Committee Opinion – COVID-19 in Pregnancy (Elwood <i>et al.</i>, 2020)</p>	
<p>Statement on infant feeding during the coronavirus (COVID-19) outbreak (Unicef UK Baby Friendly Initiative, 2020b)</p>	

<p>COVID-19 and breastfeeding: position paper        (World Health Organisation Euro, 2020)</p>	<p>There is currently no evidence that COVID-19 can be passed to the baby through breastfeeding</p> <p>To facilitate breastfeeding, mothers and babies should be enabled to stay together as much as possible, to have skin-to-skin contact, to feed their baby responsively and to have access to ongoing support when this is needed.</p> <p>There is indisputable evidence that breastfeeding reduces the risk of babies developing infectious diseases.</p> <p>Human milk contains numerous live constituents, including immunoglobulins, antiviral factors, cytokines and leucocytes that help to destroy harmful pathogens and boost the infant's immune system.</p> <p>Considering the protection that human milk and breastfeeding offers the baby and the minimal role it plays in the transmission of other respiratory viruses, we should do all we can to continue to protect, promote and support breastfeeding.</p>
<p>Guideline: Protecting, Promoting and supporting breastfeeding in facilities providing newborn services. (World Health Organisation, 2017)</p> <p>And the implementation guide</p> <p>Implementation Guide. Protecting, promoting and supporting Breastfeeding in facilities providing maternity and newborn services: the revised Baby Friendly Hospital Initiative. (World Health Organisation, 2018)</p>	

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## APPENDIX

### Keywords used in MIDIRS searches

An asterisk \* has been used to denote truncation in searches

#### Mother-baby contact and separation

##### Keywords

Epidemic\*, pandemic\*, “disease outbreak\*”, coronavirus, COVID-19, covid-19, “severe acute respiratory syndrome”, SARS, “Middle East respiratory syndrome”, MERS, H1N1, influenza, flu pneumonia, contact, separation, “kangaroo care”, “skin to skin”, skin-to-skin, post-birth, postbirth, “post birth”, post-natal, postnatal, “post natal”, post-partum, postpartum, “post partum”.

##### Example search strings:

(pandemic\* OR epidemic\* OR “disease outbreak\*”) AND (contact OR separation) AND (post-birth OR postbirth OR “post birth” OR post-natal OR postnatal OR “post natal” OR post-partum OR postpartum OR “post partum”).)

(coronavirus OR COVID-19 OR covid-19) AND (contact OR separation) AND (post-birth OR postbirth OR “post birth” OR post-natal OR postnatal OR “post natal” OR post-partum OR postpartum OR “post partum”)

#### Infant feeding and pandemics

##### Keywords

Breastfeed\*, breast-feed\*, “breast feed\*”, “bottle feed\*”, bottle-feed\*, “infant feed\*”, infant-feed\*, “infant formula”, epidemic\*, pandemic\*, “disease outbreak\*”, coronavirus, COVID-19, covid-19, “severe acute respiratory syndrome”, SARS, “Middle East respiratory syndrome”, MERS, H1N1, influenza, pneumonia

##### Example search strings:

(pandemic\* OR epidemic\* OR “disease outbreak\*”) AND (breastfeed\* OR breast-feed\* OR “breast feed\*” OR “bottle feed\* OR bottle-feed\* OR “infant feed\* OR “infant-feed\*”) (coronavirus OR COVID-19 OR covid-19) AND (breastfeed\* OR “breast feed\*” OR “breast-feed” OR “bottle feed\* OR bottle-feed\* OR “infant feed\* OR “infant-feed\*”)

#### Infant feeding in emergency situations

Breastfeed\*, breast-feed\*, “breast feed\*”, “bottle feed\*”, bottle-feed\*, “infant feed\*”, infant-feed\*, “infant formula”, “donor milk”, “donor breast milk” emergenc\*, war\* disaster\*, earthquake\*, hurricane\* tsunami\*, refugee\*, asylum seeker\*, “misplaced person\*” immigrant\*, famine)

##### Example search strings

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(breastfeed\* OR "breast feed\*" OR breast-feed\* OR "bottle feed\* OR "infant feeding" OR "infant formula") AND (emergenc\* OR war\* OR disaster\* OR earthquake\* OR hurricane\* OR tsunami\* OR famine)  
("donor milk" OR "donor breast milk") AND (emergenc\* OR war\* OR disaster\* OR earthquake\* OR hurricane\* OR tsunami\* OR famine)

### **Search pack PN3 – Breastfeeding the baby in intensive care**

PN3 – Breastfeeding the baby in intensive care, is one of over 600 search packs compiled and regularly updated by MIDIRS Librarians when selecting items for the Maternity and Infant Care (MIC) database. Each search pack comprises collections of records on a particular topic, selected from a wide range of information resources that include more than 400 journals and other research materials.