

Good clinical practice advice for the management of pregnant women with suspected or confirmed COVID-19 in Nigeria

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Abstract

The impact on healthcare services in settings with under-resourced health systems, such as Nigeria, is likely to be substantial in the coming months due to the COVID-19 pandemic, and maternity services still need to be prioritized as an essential core health service. The healthcare system should ensure the provision of safe and quality care to women during pregnancy, labor, and childbirth, and at the same time, maternity care providers including obstetricians and midwives must be protected and prioritized to continue providing care to childbearing women and their babies during the pandemic. This practical guideline was developed for the management of pregnant women with suspected or confirmed COVID-19 in Nigeria and other low-resource countries.

KEYWORDS

COVID-19; LMICs; Management; Nigeria; PPE; Pregnancy; Telehealth

1 | INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a disease caused by a novel strain of coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). On January 30, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak as a Public Health Emergency of International Concern.¹ It is anticipated that COVID-19 will occur in most communities and populations across the world due to the current widespread community transmission in most countries, including Nigeria.²

Limited data are available on COVID-19 in pregnancy, but the studies published to date do not show an increased risk of severe disease in pregnancy^{3,4} or substantial risk to newborns.^{3,5} Congenital infection with COVID-19 has not been found, and the virus has not been detected in expelled products of conception.⁴ However, the impact on healthcare services in settings with under-resourced health systems, such as Nigeria, is likely to be substantial in the coming months, and maternity services still need to be prioritized as an

essential core health service. According to the WHO, "All pregnant women have the right to a positive childbirth experience whether or not they have a confirmed COVID-19 infection" (WHO 2020).⁶ The healthcare system should ensure the provision of safe and quality care to pregnant women during labor and childbirth, and at the same time, maternity care providers (including obstetricians, midwives, and all other healthcare workers providing maternal and newborn care) are essential healthcare workers and must be protected and prioritized to continue providing care to childbearing women and their babies during the COVID-19 pandemic. Maternity care providers have the right to full access to all personal protective equipment (PPE), sanitation, and a safe and respectful working environment.⁷ Maintaining a healthy workforce will ensure ongoing quality care for women and their newborns; without healthy maternity care providers there will be limited care for women and newborns.

This practical guideline was developed by the maternity unit of the Lagos University Teaching Hospital (LUTH) for the management of women with suspected or confirmed COVID-19 in

pregnancy. According to the WHO, a suspected COVID-19 case is “a patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g. cough, shortness of breath), and a history of travel to or residence in a location reporting community transmission of COVID-19 disease within 14 days prior to the onset of symptom; or a patient with any acute respiratory illness who has been in contact with a confirmed or probable COVID-19 case in the last 14 days prior to the onset of symptom; or a patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g. cough, shortness of breath; and requiring hospitalization) and in the absence of an alternative diagnosis that fully explains the clinical presentation”.⁸ A confirmed case is “a person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms”.⁸

At the time of writing, most of the states in Nigeria were reporting widespread community transmission of COVID-19.² This guideline is provided as a resource for the maternity staff of LUTH and other secondary/tertiary facilities in similar resource-constrained settings where pregnant women with COVID-19 can receive care. The recommendations in the guideline are based on a combination of WHO guidelines,^{6,8} United Nations Population Fund (UNFPA) interim guidance,⁹ a guideline from the Royal College of Obstetricians and Gynaecologists (RCOG),¹⁰ guidance from the International Federation of Gynecology and Obstetrics (FIGO) and allied partners,¹¹ good practice, and expert advice or consensus¹² based on the latest scientific evidence. The situation with COVID-19 is evolving daily and the guideline will be updated when new evidence or information becomes available.

2 | PRENATAL CARE

Maternity care providers can deliver respectful and individualized prenatal care services that promote the safety of women with suspected or confirmed COVID-19, their families, and health professionals during the current COVID-19 pandemic.⁹ At present, maternity care providers should minimize direct patient contact in nonurgent situations to minimize the spread of COVID-19.^{13–15} Wherever possible, the current WHO-recommended schedule of eight prenatal contacts should be provided and maintained.^{16,17} Information on the contact telephone details of the hospital’s ambulance call handler as well as maternity staff should be communicated to all pregnant women, and those with suspected or confirmed COVID-19 based on the WHO definition⁸ should be encouraged to call before they visit the hospital if necessary.

2.1 | Telehealth

For women with suspected or confirmed COVID who are self-isolating at home, routine in-person appointments at the maternity unit (scans, oral glucose tolerance test, etc) should be delayed until the advised self-isolation period has ended or there has been full recovery after treatment.¹⁰ With the availability of digital technology services, some prenatal appointments during the standard prenatal care schedule may be conducted remotely using telehealth, such as by phone or video chat (remote contact), to ensure that there is no disruption to service or breakdown in women’s maternity care. The schedule in Table 1 offers guidance on which contact appointments might best be undertaken in person and those that might suit remote contact.

TABLE 1 Alternate modality for prenatal contact appointments.

Current WHO recommended prenatal care contact time		Alternate modality for prenatal care contact (must include information on danger signs in pregnancy) ^a
1	12 wk	In person <ul style="list-style-type: none"> • Comprehensive history and plan for care • Blood pressure, urinalysis, blood tests, ultrasound • Initial risk assessment
2	20 wk	Remote contact—including ongoing risk assessment
3	26 wk	Remote contact—including ongoing risk assessment
4	30 wk	In person <ul style="list-style-type: none"> • Blood pressure, blood tests, abdominal palpation including fetal heart rate • Ongoing risk assessment
5	34 wk	Remote contact—including ongoing risk assessment
6	36 wk	In person <ul style="list-style-type: none"> • Blood pressure, blood tests, abdominal palpation including fetal heart rate • Ongoing risk assessment
7	38 wk	Remote contact—unless risk factors for hypertension in pregnancy or growth restriction identified previously
8	40 wk	In person <ul style="list-style-type: none"> • Blood pressure, blood tests, abdominal palpation including fetal heart rate • Ongoing risk assessment

^aDanger signs: vaginal bleeding; convulsions/fits; severe headache and/or blurred vision; leakage of fluid from the vagina; fever and extreme fatigue; severe abdominal pain; fast or difficult breathing; reduced fetal movement in the third trimester (World Health Organization, 2016).³³

Obstetricians will need to use clinical judgement when deciding which women with COVID-19 will be suitable for an alternate schedule of in-person care that includes remote prenatal contact (Table 1). Primarily this will be women who have reliable mobile phone access and are deemed low obstetric risk, while recognizing that risk status may change as pregnancy progresses so that risk assessment must occur at every prenatal contact. Standard practice should continue for all in-person visits. Box 1 provides guidance on how remote prenatal contact appointments should be structured.⁹

2.2 | Hospital attendance/admission

Where attendance to the maternity unit is necessary, the following suggestions apply to a woman with suspected or confirmed COVID-19:

- The woman should make her own way to hospital where possible or call the hospital for an ambulance.

Box 1. Checklist for remote prenatal contact appointments.^a

ALL contact appointments regardless of remote contact method should include

Respectful maternity care:

- Treating all women with dignity and respect
- Maintaining confidentiality and privacy
- Freedom from discrimination
- Supporting women's rights to information and informed autonomous decision making

Suggested actions at every remote contact:

- Introduce yourself and greet the woman in a friendly manner
- Enquire about the woman's general health and well-being
- Consider physical, social, emotional, and cultural well-being
- Ask about pregnancy progress
- Undertake routine observation and assessment
- Explain all tests and procedures and obtain consent
- Review history and undertake an ongoing assessment of risk factors
- Discuss danger signs
- Offer time for questions – take time to answer
- Provide gestation and pregnancy-specific information and education
- Undertake consultation and referral where necessary
- Discuss the plan for emergency transport from the woman's home to a health facility if needed
- Plan for next prenatal contact and ongoing care
- Document assessments, discussions, and plans for continued care

^aAdapted from UNFPA.⁹

- If an ambulance is required, the woman should notify the call handler that she is currently in self-isolation for suspected or confirmed COVID-19.
- The woman should notify a member of maternity staff of their arrival at hospital, by telephone, prior to entering the hospital.
- The woman should be encouraged to put on a face mask when entering hospital premises.
- Staff providing care should wear PPE according to hospital protection guidance (Box 2).
- The woman should be met at the entrance of a dedicated maternity unit (COVID zone) by staff wearing appropriate PPE and be given a fluid-resistant surgical mask. The COVID zone is a separate area with isolated rooms dedicated to the care of women with suspected or confirmed COVID-19.¹⁸ This area must have its own supply of materials and equipment which should preferably not be moved or used outside the zone unless it is necessary.
- The woman should immediately be taken to the isolation ward or designated clinic space, which should be suitable for the majority of her care while in hospital. The woman should not remove her face mask until she is isolated and alone in a suitable room or cohort bay.
- Women with suspected COVID-19 infection should be kept in a separate room/space away from confirmed cases until the confirmatory test result has been obtained.
- The isolation ward or designated clinic area should ideally have a defined area for staff to put on and remove PPE, and suitable bathroom facilities.
- Only essential staff should enter the designated clinic area or ward and all nonessential items should be removed from the clinic/scan room prior to receiving pregnant women.
- The designated clinic area or ward must be cleaned or

Box 2. Appropriate personal protective equipment (PPE) for staff managing patients with COVID-19.^a

Minimum PPE required to attend any suspected/confirmed COVID-19 patient should consist of:

- Full water-resistant disposable gown
- Sterile gloves and surgical masks with visors or face shields for labor cases

For surgical procedures, surgeons will also require the following PPE:

- Above-elbow-length gloves
- N-95 face masks
- Tyvek disposable Hazmat coverall suits^b

^aAdapted from "Recommended PPE for healthcare workers by secondary care inpatient clinical setting, NHS and independent sector by Public Health England (PHE)"³³

^bAdvisable for use particularly in hospitals where there are no negative pressure surgical theaters or rooms.

decontaminated after use according to the hospital protection guidance as recommended by WHO.¹⁹

The following additional recommendations apply to pregnant women with moderate or severe signs and symptoms of COVID-19.

- A multidisciplinary team planning meeting ideally involving the following personnel should be implemented as a priority: consultant physician (infectious disease specialist or clinical microbiologist), consultant obstetrician, senior midwife, neonatologist, and consultant anesthetist responsible for obstetric care. The discussion should be communicated to the woman and the following should be considered: key priorities for maternal and fetal/neonatal medical care, birth preferences, most appropriate location of care (e.g. intensive care unit, isolation room in infectious disease ward or other suitable isolation room), and any special obstetric considerations, including the health of the baby in particular.
- Monitor signs of decompensation or increased disease severity including: (1) increase in oxygen requirements, fraction of inspired oxygen (FiO₂) greater than 40% or reduced blood oxygen saturation less than 95%; (2) respiratory rate greater than 30 per minute; (3) reduction in urine output; or (4) drowsiness, even if the oxygen saturation levels are normal.
- Escalate the situation urgently if any signs of decompensation develop in a pregnant woman or a woman who has recently given birth.
- Titrate oxygen to keep blood oxygen saturation levels above 94%.
- Chest imaging (X-ray or CT) with abdominal shielding should be performed. This is essential to assess an unwell patient with COVID-19 and should not be delayed because of fetal concerns.²⁰⁻²²
- Additional investigations such as clotting profile, electrocardiogram, CT pulmonary angiography, and echocardiogram should be carried out to rule out differential diagnoses. Pulmonary embolism should be considered if there is chest pain, worsening of hypoxia (especially with a sudden increase in oxygen requirements), or when breathlessness persists or deteriorates after expected recovery from COVID-19.
- It should not be assumed that all cases of pyrexia result from COVID-19; therefore, full sepsis screening should be performed, including complete blood count, rapid diagnostic test for malaria, and blood culture. If white blood cell count is raised (lymphocytes are typically normal or low with COVID-19) then bacterial infection should be considered; begin antibiotics where appropriate.
- Given the link between COVID-19 and acute respiratory distress syndrome, intravenous fluid management should proceed cautiously.²³ Women with moderate to severe COVID-19 symptoms should be monitored regularly, with hourly fluid input/output charts. The aim of management efforts should be to achieve neutral fluid balance in labor to avoid the risk of fluid overload.²⁴

- If an urgent intervention for delivery is indicated for fetal reasons, birth should be expedited as normal, if the woman's condition is stable.
- The multidisciplinary team should make an assessment of whether emergency cesarean delivery or labor induction is indicated, either to assist efforts in maternal resuscitation or where fetal condition poses serious concerns. Maternal well-being must always be given priority. If the woman requires stabilization before intervention for birth, this takes priority, as in other obstetric emergencies such as severe pre-eclampsia and placental abruption.¹⁰
- Prenatal corticosteroids should be given when indicated as per the usual guideline.²⁵ There is no evidence to suggest that steroids for fetal lung maturation cause any harm in the context of COVID-19. However, according to standard practice, urgent intervention for birth should not be delayed for their administration.²

3 | INTRAPARTUM CARE

3.1 | Attendance in labor

- All pregnant women with suspected or confirmed COVID-19 who are self-isolating at home should call the maternity unit for advice once in labor.
- When a woman arrives at the maternity unit, standard hospital attendance guidelines apply (see section 3.2).
- Once admitted to an isolation room, full maternal and fetal assessment should include:
 - Assessment of COVID-19 symptom severity by the most senior obstetrician available.
 - Multidisciplinary team discussion, including an infectious diseases specialist.
 - Maternal observations including temperature, respiratory rate, and oxygen saturation levels.
 - Confirmation of labor onset, according to standard care.
 - Continuous electronic fetal monitoring using a dedicated cardiotocograph (CTG) for all women with COVID 19, given the relatively high rate of fetal compromise.^{26,27}
- If the woman has a fever, investigate for other causes of sepsis other than COVID-19 and treat accordingly.
- If there are no concerns regarding the condition of either the woman or baby, women should be admitted to the obstetric ward in the isolation unit.
- If labor is confirmed, it is advised that care during labor continues in the same isolation room.

3.2 | Care in labor

The following should be considered during care of women with COVID-19 in spontaneous or induced labor:

- When a woman with suspected/confirmed COVID-19 is admitted to a dedicated maternity room, these multidisciplinary team members should be notified: consultant obstetrician, consultant anesthetist, senior midwife, consultant neonatologist, senior neonatal nurse, and infection control team.
- Efforts should be made to minimize the number of staff members entering the labor isolation room.
- No birth partner should be allowed in the isolation area; however, nursing staff should be designated to provide one-on-one care. The nursing staff should be designated midwives that have been trained in infection prevention and control and should wear appropriate PPE.
- If available, a central nursing station monitor with audiovisual component should be placed in the labor room so that the CTG machine and the patient's monitor can be viewed remotely. This will limit the frequency of entry into the patient's room.
- According to the guideline on COVID-19 released by the Society of Gynaecology and Obstetrics of Nigeria (SOGON),²⁸ there is no need to interfere with labor or the management of pregnant women in labor and the puerperium.
- Epidural analgesia may be recommended in labor to minimize the need for general anesthesia if urgent intervention for birth is needed.
- Maternal observations and vital signs monitoring should be continued according to standard practice, with the addition of hourly oxygen saturations using a dedicated vital signs monitor. Aim to keep oxygen saturation above 94% while titrating oxygen supplementation accordingly.
- If the woman develops a fever, investigate for any cause of sepsis other than COVID-19 and treat accordingly.
- An individualized informed discussion and decision should be made regarding shortening the length of the second stage of labor with elective instrumental delivery in a symptomatic woman with COVID-19 who is becoming exhausted or hypoxic.
- In the case of fetal compromise or deterioration of the woman's symptoms, an immediate assessment of the risks and benefits of continuing the labor versus switching to an emergency cesarean delivery should be made.

3.3 | Cesarean delivery

- In cases where elective (planned) cesarean delivery cannot be safely delayed, the general advice for providing care to women with suspected/confirmed COVID-19 should be followed (see section 3.2), as should the recommendation on PPE for cesarean delivery (Box 2).
- Obstetric management of elective cesarean delivery should be in keeping with standard practice.
- Donning PPE is time-consuming, and this may impact on the decision-to-delivery interval during emergency cesarean delivery, but this must be done. Women and their families should be told about this possible delay.

3.4 | Regarding mode of delivery

- A positive COVID-19 result in an asymptomatic woman with no evidence of fetal compromise is not an indication to expedite delivery.¹⁰
- No evidence currently exists to favor one mode of delivery over another¹²; therefore, mode of delivery should be discussed with the woman, taking into consideration her preferences and any obstetric indications for intervention.
- Mode of delivery should not be influenced by a positive COVID-19 result,¹² unless the woman's respiratory condition demands urgent intervention for delivery.
- When a cesarean delivery or other operative procedure is indicated, follow the infection control guideline by wearing the appropriate PPE (Box 2).

4 | SPECIFIC RECOMMENDATIONS FOR THE CARE OF PREGNANT WOMEN WITH COVID-19 WHO REQUIRE SURGICAL INTERVENTION

- Elective/planned obstetric procedures (e.g. cervical cerclage or cesarean delivery) should take place in a designated obstetric theater to allow time for full postoperative theater cleaning per hospital protection guidance as recommended by WHO.¹⁷ The designated theater should ideally be separate from the theater used for non-COVID-19 cases.
- The number of staff in the operating theater must be kept to a minimum, with all required to wear appropriate PPE.
- All staff (maternity, neonatal, and domestic) should have received training in PPE use so that 24-hour emergency surgeries are available and possible delays reduced.
- For previously unbooked women with unconfirmed COVID-19 who present with serious obstetric complications (e.g. obstructed labor, uterine rupture, etc) that require immediate surgical interventions, maternity staff should follow the general advice for providing care to women with suspected/confirmed COVID-19 (see section 3.2) and wear the appropriate PPE for surgical procedures (Box 2).
- There should be regular simulation exercises to prepare staff, build confidence, and identify weak areas to prepare for emergency transfers to the operating theater.

5 | POSTNATAL CARE

5.1 | Neonatal care

- There are limited data to guide the postnatal care of neonates born to women with active COVID-19 infection. The RCOG has specifically

recommended that routine precautionary separation of a woman and her healthy neonate should not be undertaken lightly, given the potential detrimental effects on feeding and bonding.¹⁰ Therefore, given the limited evidence, women with COVID-19 and their healthy babies, not otherwise requiring neonatal care, should be kept together in the immediate postpartum period.²⁹ This can minimize strain on resources, ensure mother and child bonding and adequate breastfeeding.³⁰ We have had a positive experience using this recommendation for the care of five women delivered in our center with their newborns testing negative for COVID-19 on RT-PCR.

- A risk/benefit discussion with neonatologists and families to individualize care for neonates that may be more susceptible is usually recommended.¹⁰

5.2 | Infant feeding

Considering the current evidence, the benefits of breastfeeding outweigh any potential risks of transmission of the virus through breastmilk.^{24,30} The risks and benefits of feeding choices, including the risk of holding the baby close to an infected mother, should be discussed with the parents. However, the following precautions should be undertaken by the mother to limit infecting the baby:

- Strict hand washing before touching the baby, breast pump, or bottles.
- Avoid coughing or sneezing on the baby while feeding.
- Wear a fluid-resistant surgical face mask while feeding or caring for the baby.
- A dedicated breast pump should be used if expressing breastmilk at hospital. If a pump is used, follow guidelines to clean the pump after each use.³¹
- If babies are bottle-fed with formula or expressed milk, strict sterilization guidelines should be followed.
- If the woman is unwell or symptomatic for COVID-19, Consider asking someone who is well to nurse the baby.³²

6 | EQUIPMENT DISINFECTION

Provision of PPE for housekeepers/cleaners should be made to allow proper disinfection of the isolation unit of the prenatal clinic, labor ward, and labor ward theater. All equipment and instruments used in the clinic and at delivery must be promptly disinfected by soaking in chemical disinfectants such as chlorine or by autoclaving. Used PPE must be removed correctly and carefully disposed of following the hospital protocol.

7 | CONCLUSION

This article highlights the practical guidelines for the management of pregnant women with suspected or confirmed COVID-19 in secondary

and tertiary hospitals with designated isolation facilities and resources for infection prevention and control in resource-constrained settings such as Nigeria. The standard WHO recommended prenatal visits should be adopted; however, routine in-person appointments to the maternity unit for women with suspected or confirmed COVID-19 should be delayed until after the recommended period of self-isolation or after full recovery following treatment. The standard prenatal schedule may be conducted remotely using telehealth; however, where attendance at the maternity unit is necessary, the woman should be encouraged to call the maternity staff before attending and when on hospital premises. An initial risk assessment should be carried out by a maternity staff member wearing appropriate PPE before further management at a dedicated maternity unit within the COVID-19 zone. There should be an individualized discussion with each woman on the management of her pregnancy, delivery, and newborn care. There is limited evidence in support of routine precautionary separation of a woman and her healthy baby and this should not be undertaken lightly. Considering current evidence, the benefits of breastfeeding the newborn outweigh any potential risks of transmission of the virus through breastmilk, but this should be undertaken with the necessary precautions.

AUTHOR CONTRIBUTIONS

Conceptualization: KSO, CCM, BBA. Literature review: KSO, CCM, ORA, EO, EOO, OAB, AAO, SIO, BBA. Supervision: RIA, BBA. Writing – original draft: KSO, CCM, AAO, JAO, OA, BBA, Writing – review and editing: All authors.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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