

The impact of a segregated team roster on obstetric and gynecology services in response to the COVID-19 pandemic in a tertiary care center in India

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Abstract

Objective: To determine the impact of roster reorganization on ensuring uninterrupted services while providing necessary relief to healthcare workers (HCW) in the obstetrics department of a tertiary care center amid the COVID-19 outbreak.

Methods: The COVID-19 rostering response began in April 2020 and evolved in two phases: (1) development of new areas for screening and managing suspected/positive cases of COVID-19; and (2) team segregation according to area of work. The impact of these changes on HCWs and patients was assessed 3 months later.

Results: Developing separate areas helped to minimize the risk of exposure of patients and HCWs to those with COVID-19. Residents and consultants worked intensively in clinical areas for 1 week followed by 1–2 weeks of non-clinical or standby assignments, providing adequate opportunity for isolation. Frequent re-evaluation of the roster was nevertheless required as the pandemic progressed. Segregating teams vertically significantly reduced the number of contacts identified on contact tracing and quarantine leaves, while maintaining patient satisfaction with no increase in adverse events. Residents found the roster to be “smart” and “pandemic-appropriate.”

Conclusion: The “COVID emergency roster” helped ensure quality care with minimum risk of exposure and sufficient breaks for physical and psychological recovery of HCWs.

KEYWORDS

COVID-19; Pregnancy care; Rostering; Segregated teams

1 | INTRODUCTION

The novel COVID-19 disease has left almost no country unaffected.¹ On March 11, 2020, WHO declared it as a pandemic,² by which time most cities in India were already affected. Worldwide, health systems had to be rapidly converted for the management of patients affected by COVID-19, suspending all non-emergency treatments, elective surgeries, and routine consultations.

In India, a national lockdown was declared on March 24, 2020.³ Routine outpatient departments (OPD) were closed and all hospital services, including infrastructure and manpower, were diverted

to manage the increasing number of cases of COVID-19 along with emergency services.

The All India Institute of Medical Sciences, a tertiary level center, is a university hospital with excellent facilities for all super-specialty care and serves as a referral center for high-risk pregnancies. The Department of Obstetrics and Gynaecology has three independent units providing services in the OPD, delivery room, gynecology theatres, and special clinics. Before the pandemic, each unit had a team of consultants and residents on call who took care of all the areas, with daily bedside rounds and frequent movement between the OPD, wards, and delivery room.

Once routine services were suspended, the major work areas were the delivery room and maternity ward areas. As a first step towards ensuring continuity of services while safeguarding the health and welfare of healthcare workers (HCWs) and maintaining a buffer for quarantine leaves, new areas were organized to screen all patients and to admit suspected and positive cases of COVID-19. Entry and contact had to be restricted everywhere since the novel coronavirus infection spreads mainly through close contact. After consultation with the faculty and residents, a team-based roster was devised that would deploy fewer persons per team, allowing scope for time off and isolation if needed. As the pandemic progressed, further segregation of teams and division of work ensured appropriate care for all pregnant women, including the cases positive for COVID-19.

The aim of the present study was to determine the impact of the "COVID emergency roster", specifically the restructuring and management of working arrangements of residents and consultants in the Department of Obstetrics and Gynaecology in response to the COVID-19 outbreak.

2 | MATERIALS AND METHODS

Preparedness for the pandemic began towards the end of March 2020 and was implemented from April 1, 2020. The first step, as per hospital policy, was training all HCWs (doctors, nurses, and support staff) about the new disease and safety measures, use of personal protective equipment (PPE), and donning and doffing procedures.⁴ All HCWs were instructed to maintain social distancing at the workplace and avoid gathering during lunch breaks and meetings, a habit that took time to break. N-95 masks and sanitizers were distributed to all staff members on a regular basis. The mnemonic SMS (Sanitizer, Mask, Social Distancing) proved to be an easy aid to memory. All these measures continue to be followed and shall be continued as long as the pandemic continues.

The next step was the preparation of the departmental protocols and setting up new areas: a screening desk to ensure cases with symptoms or signs of COVID-19, or those who were residents of a hotspot, were sent directly to the emergency room for testing; and conversion of the obstetrics and gynecology OPD space now lying unused to a COVID-19 facility as a temporary measure.^{5,6}

Each department seconded a minimum of 25% of their residents to work in the general COVID-19 pool. In order to ensure availability of manpower, all non-essential and duty leave was cancelled.

It was recognized very early that with a pandemic of this magnitude, there would be instances of exposure and quarantine among HCWs. In the first phase, faculty and residents agreed that the best way forward would be to reorganize the roster: teams comprising a consultant, senior and junior residents, fellows, and interns from each unit were designated for an entire week. They managed all patients in the screening area and suspected COVID and emergency areas for 2 days each week (Table 1), regardless of the unit to which they belonged. For the care of cases positive for COVID-19, there was a

dedicated team each week, drawn from each of the three units in rotation. This method enabled each team to be posted on clinical duties for 1 week, with 1–2 weeks off clinical work, working on teaching and other non-clinical duties or remaining on standby in case they were needed. The handover from one team to the next at the end of each week was done through telecommunication.

One faculty member was appointed as the chief departmental nodal officer who was assisted by a junior consultant from each unit to take care of the distribution of consultants and residents in all areas. A single web-based platform was used to spread the information to all and to receive feedback from them. In this new model, consultants who wished to attend to their own patients could still do so on any day, but only with the residents on duty in the area. Thus, the number of doctors entering and the quantity of PPE used could be contained.

Throughout the month of May, as the number of cases in the city increased, increasing numbers of suspected cases of COVID-19 began to slip through the screening system. It was also realized that there was still considerable overlap of residents, mainly due to all units visiting the postnatal cases, as well as the delivery room team visiting the Emergency Room to attend to calls. Sending these residents to isolation was playing havoc with the roster. Thus, in the second phase, it was decided to completely segregate the teams, implement universal testing of all pregnant women coming to the hospital, and to create additional donning and doffing areas to reduce exposure (Table 2).

All routine obstetrical and gynecological consultations were managed through teleconsultation. Once OPD services were resumed, patients were given appointments for physical visits depending on their symptoms and diagnosis. This helped to restrict the number of physical appointments per OPD and avoid crowding of patients.

Figure 1 illustrates the plan of manpower distribution in various areas to ensure appropriate triaging without compromising patient care, to avoid unnecessary crowding of patients in any place, and at the same time protect the HCWs from exposure.

Three months after the implementation of the emergency roster, an assessment was carried out of the following: the number of HCWs contracting COVID-19 infection; the number of contacts in case a positive patient unexpectedly comes to the delivery room or ward; the need of quarantine leaves; and adverse event(s). For a qualitative assessment from the residents' perspective, a focused group discussion (FGD) was planned as a web-based online meeting following social distancing norms. A preliminary questionnaire was constructed with open-ended questions so that diverse views of all the participants could be obtained. The FGD was facilitated by three consultants responsible for management of the roster. Eight residents (three senior residents, four junior residents, and one fellow) who had been working in the department for at least 6 months before the pandemic and had worked in the various areas thereafter were invited to participate in the FGD, as they would be able to compare the two roster systems. The discussion was audio recorded and the information and discussion points were summarized.

TABLE 1 Weekly arrangements of teams in different areas.^a

Duty shifts	Monday C1	Tuesday C2	Wednesday C3	Thursday C1	Friday C2	Saturday C3	Sunday (by rotation)
Emergency team							
Day ^b	SR1; F1; JR1 (n=2); Int 1	SR2; F2; JR2 (n=2); Int 2	SR3; F3; JR3 (n=2); Int 3	SR1; F1; JR1 (n=2); Int1	SR2; F2; JR2 (n=2); Int 2	SR3; F3; JR3 (n=2); Int 3	
Night ^c	SR1; F1; JR1 (n=2); Int 1	SR2; F2; JR2 (n=2); Int 2	SR3; F3; JR3 (n=2); Int 3	SR 1; F1; JR1 (n=2); Int 1	SR 2; F2; JR2 (n=2); Int 2	SR 3; F3; JR3 (n=2); Int 3	
Screening team							
Day ^b	SR3/JR3/Int 3	SR1/JR1/Int 1	SR2/JR2/Int 2	SR3/JR3/Int 3	SR1/JR1/Int 1	SR2/JR2/Int 2	
Night ^c	SR3/JR3/Int 3	SR1/JR1/Int 1	SR2/JR2/Int 2	SR3/JR3/Int 3	SR1/JR1/Int 1	SR2/JR2/Int 2	
Suspect team							
Day ^b	SR2/JR2	SR3/JR3	SR1/JR1	SR2/JR2	SR3/JR3	SR1/JR1	
Night ^c	SR2/JR2	SR3/JR3	SR1/JR1	SR2/JR2	SR3/JR3	SR1/JR1	
Ward team							
Day ^b	SR/JR (separate team)			SR/JR (separate team)			

Abbreviations: C, consultant; F, fellow; Int, intern; JR, junior resident (postgraduate student); SR, senior resident.

^aAfter 1 week, all residents and consultants are replaced by new members.

^bDay shift: 8:00 AM–9:00 PM.

^cNight shift: 9:00 PM–8:00 AM.

3 | RESULTS

The restructuring of the roster became effective from April 1, 2020. Between April 1 and June 18, 2020, a total of 2081 patients were screened, of whom 192 (9.22%) were kept in the COVID-suspect area until the test report was available.

Initially, only those who screened positive were kept in the suspect area but later all patients were kept there until their COVID reports

became available. With the rising number of cases in the city, patients who tested negative for COVID-19 began developing symptoms while in the ward and turned out to be positive for COVID-19. By mid-May, nine patients and eight HCWs (three residents, three nursing staff, and two operating theater staff) working in the delivery room and operating theater had tested positive, of whom one resident had contracted the infection from her family. Contact tracing of other patients and HCWs revealed 10–20 (mean 15) other at-risk HCWs and patients

TABLE 2 Phase-wise development of the “COVID emergency roster.”

Challenge	Solutions
Phase 1 (development of new areas – April 2 to May 23, 2020)	
To screen and manage suspected and positive cases of COVID-19	<ul style="list-style-type: none"> • Development of screening and COVID-suspect areas • Distribution of duties in emergency, screening, and suspect areas on a weekly basis • Each unit divided the residents into three teams with the plan of 1 week on duty and 1–2 weeks off with the clause of being called in case of emergency • Screening team for screening and triaging of patients based on symptoms and area of residence; screen positive (with symptoms or coming from red zones, i.e. containment areas) transferred to suspect area until COVID test results were available • A dedicated team each week for patients positive for COVID-19 (from each unit by rotation) • Faculty and residents of all three units would see their patients in the wards in addition to their duties in the respective areas • Patients coming from red zones in labor were managed presuming they were positive for COVID-19
Phase 2 (complete team segregation – May 24 to date)	
Patients tested negative for COVID-19 admitted to ward or delivery room who were then found to be positive	<ul style="list-style-type: none"> • Total segregation of teams working in different areas, e.g. delivery room, general and private wards, emergency room, screening area, COVID-suspect area, to reduce the number of contacts with every patient • One team per day to manage all patients in the maternity ward and delivery room, irrespective of unit and primary consultant in-charge • Primary consultants were informed telephonically about their patients • Every patient was tested for COVID-19 before admission and remained in the COVID-suspect area until the results were available. Accordingly, they were transferred to non-COVID or COVID-positive areas • Patients in advanced stages of labor were managed in the COVID-suspect area when testing was not feasible

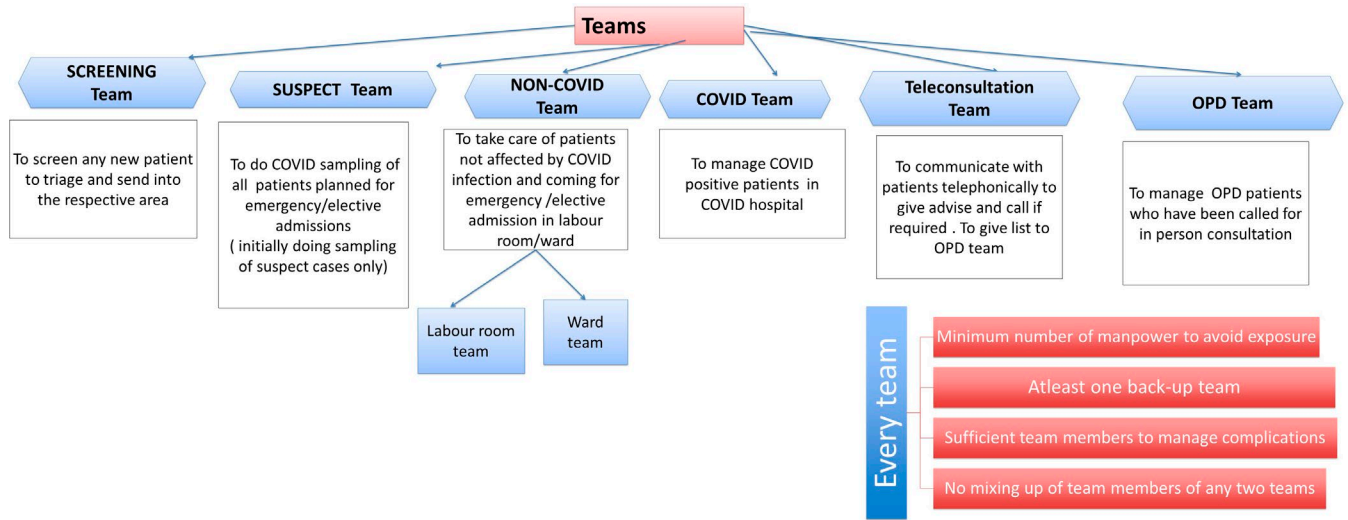


FIGURE 1 Revised distribution of teams at different places.

who were asked to proceed on quarantine leave or were moved to isolation (Fig. 2).

Table 2 describes the specific challenges in the different phases that prompted the rearrangements of the roster and the solutions thereof.

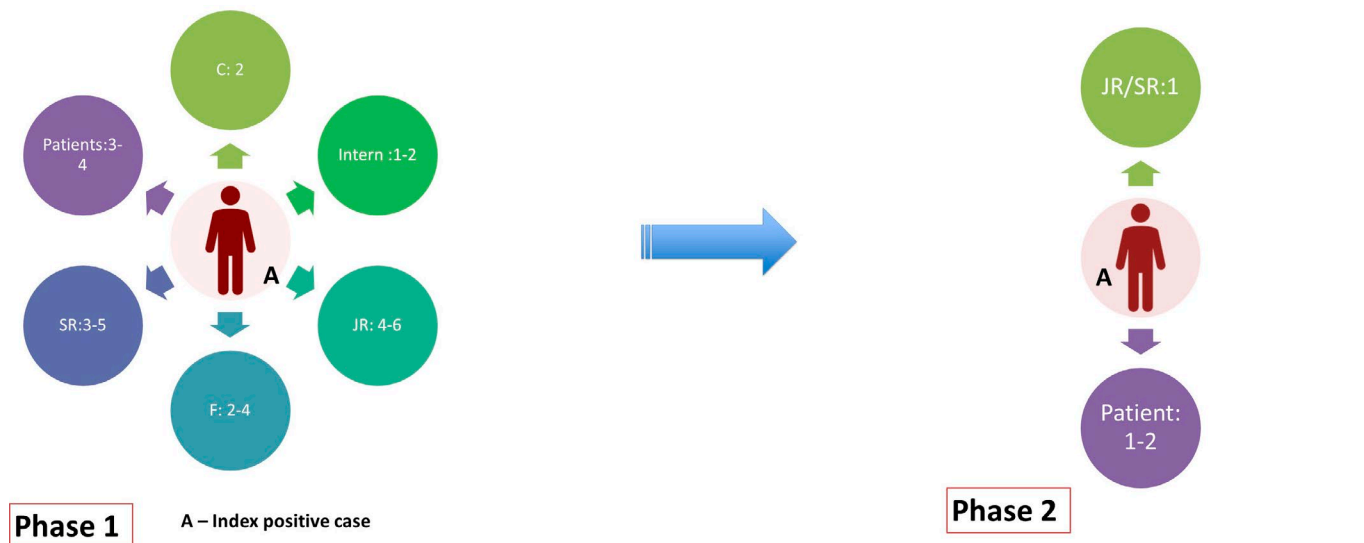
In phase 2, although there were 19 cases positive for COVID-19, there was no instance of any HCW becoming infected. With the complete segregation of the teams, the contact tracing list of patients positive for COVID-19 could be shortened despite more patients testing positive (Fig. 2). Consequently, there was a decrease in the number of quarantine leaves and the need to call in standby personnel. There has been no increase in obstetric complications during this period (data not shown).

Table 3 describes the points discussed in the FGD and the responses of the residents in terms of their views and feedback regarding the

COVID emergency roster. Overall, the residents liked the roster and referred to it as “pandemic-appropriate.” They expressed a desire to have more online teaching sessions.

4 | DISCUSSION

The COVID-19 pandemic has necessitated rapid responses to an unprecedented situation. The segregation team model in the present study evolved in response to the needs of the situation and helped to maintain the resident pool by decreasing exposure to the virus. These protocols are expected to continue for the duration of the pandemic, subject to modifications according to the needs and feedback as the situation evolves.



Effect of segregation model and universal testing on contact tracing list of COVID positive patient

FIGURE 2 The impact of team segregation on a contact tracing list for a patient positive for COVID-19 (marked as A). Abbreviations: JR, junior resident; SR, senior resident.

TABLE 3 Results of the FGD with the residents about the roster.

Questions	Results
Comments on the new emergency roster	<ul style="list-style-type: none"> • Widespread approval by the residents • Described as "...the current roster is 'smart' and '...well adapted,' "everyone can work comfortably without any stress"
Impact on surgical skills	<ul style="list-style-type: none"> • Benefits: fewer residents on duty at a time giving more opportunities for decision-making and to perform surgery independently, boosts confidence • Feelings of "...more confident" and "...independent decision-making" were reported
Impact of "off-emergency duty" time	Working during the pandemic, especially in high-risk areas, has been stressful. The break from active emergency calls offers an opportunity for "physical and mental relaxation" to recover from stress. Residents reported: "I use this time to refresh my hobbies, reading, doing thesis and paper-work and physical fitness"
What is felt to be missing	Less exposure to routine gynecological surgeries and other elective procedures Fewer learning opportunities with respect to examining patients, bedside teaching, academic classes, and tutorials. While it was understood that these were not possible due to the risk of spreading COVID-19 infection, it was felt that more weekly tutorials or virtual discussions could fill this gap to a large extent
Drawbacks of the COVID-19 roster	During the week of clinical duty (Table 1), duty shifts of 10–12 h are difficult because wearing level 2 PPE for more than 6–8 h becomes exhausting
Overall remarks	100% of participants wanted to work according to this roster until the pandemic settles

Abbreviations: FGD, focused group discussion; h, hours; PPE, personal protective equipment.

Maintaining separate facilities helped to improve outcomes, but it required a considerable adjustment in attitude, which was, however, essential to improve the safety net for all. All patients were provided with the teleconsultation numbers of the residents and consultants in their respective units. They adapted to these measures very well.

It is believed that the present study is the first from India on emergency rostering for patient care during the COVID-19 pandemic. Recently, there have been two reports from Singapore on an emergency roster system aimed at making teams segregate HCWs as a national prevention and response measure.^{7,8} In neurosurgery, the department was divided into two completely segregated teams to work on alternate weeks. The concern reported was the availability of only two teams, which limited the availability of a buffer in case some HCWs were affected.⁷ In a specialty like obstetrics, especially running a high-risk pregnancy center, it would not have been feasible to close it down and refer patients elsewhere. The roster was therefore devised with the aim of creating three teams, which permitted everyone to get sufficient breaks from clinical work, for physical and mental recovery, and to step in when some members were quarantined. The average number of duty hours over the month did not exceed 40–42 hours per week.

As the routine antenatal clinic remains closed, the main concern is providing prenatal and postpartum care with minimal hospital visits. Prenatal care designed with flexible maternal care models and using virtual visits has been devised with the aim of reducing in-person visits while continuing care via teleconsultations. This model may prove to be of excellent help while the pandemic continues.⁹

Creating separate teams and separate shifts has been described as a key initiative to reduce the risk of infection among healthcare providers at work places, thus creating a "social bubble".¹⁰ This could be achieved with rearranging the roster and segregating the teams. The same team/resident followed a specific patient or ward for 1 week and they were advised to minimize contact with other teams, even outside duty hours.

Before the COVID-19 pandemic, planning the monthly roster was a simple task that one consultant, one senior resident, and one junior

resident would take approximately 10–15 minutes each to complete for their respective cadres. During the pandemic, three consultants had a weekly huddle to arrange the departmental roster and resolve other issues, taking 1–2 hours to allocate personnel to the various areas, ensuring there was no overlap with COVID personnel, designating standby teams, excluding residents on quarantine leave, and so on. However, with experience, 3 months later, this had decreased to 15–20 minutes per week. In addition, the FGD provided insights into the reactions of residents working at the frontlines and feedback on how to improve the roster system.

5 | CONCLUSION

The COVID-19 pandemic has posed unique challenges in terms of managing manpower and arranging rosters. Having multiple teams, implementing universal testing, and receiving frequent feedback helped to decrease the risk of contact, to have a buffer capacity in case of exposure, to triage patients according to their COVID-19 status, and to give sufficient time off to HCWs to recover physically and mentally from the stressful duty hours, while ensuring patient care and satisfaction.

AUTHOR CONTRIBUTIONS

NB devised the roster rearrangement. RM, GK, AK, AS, and MG worked closely with her on making and implementing rosters for different areas. NB, RM, AS, and AK planned the focused group discussion while RM, AS, and AK conducted it. RM and NB wrote the manuscript and all other authors gave their input.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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