

Preparedness strategies in neonatology units during the COVID-19 pandemic: A survey conducted at maternity centers in Argentina

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ABSTRACT

Introduction. The objective of this study was to analyze available resources, guidelines in use, and preparedness to care for newborn infants at maternity centers in Argentina during the COVID-19 pandemic.

Method. Cross-sectional study based on a survey administered to medical and nursing staff. In May 2020, Argentine facilities with more than 500 annual births were contacted; 58 % of these were from the public sector.

Results. In total, 104/147 facilities answered (71 %). All had guidelines for care during the pandemic, and 93 % indicated they had been trained on how to use them. A companion was not allowed during childbirth in 26 % of private facilities and in 60 % of public ones ($p < 0.01$). Deferred cord clamping was recommended in 87 %; rooming-in with asymptomatic newborns was promoted in 62 %; breastfeeding using protective measures was recommended in 70 %; and breast milk using a bottle, in 23 %. In 94 %, family visiting in the Neonatology Unit was restricted.

Difficulties included the unavailability of individual rooms for symptomatic newborn infants and a potential shortage of health care staff and personal protective equipment.

Conclusions. All facilities are aware of the national guidelines to fight the pandemic. Most have the resources to comply with the recommended protective measures. There is uncertainty as to whether personal protective equipment, staff, and physical space available at the different facilities would be enough if cases increased significantly.

Keywords: newborn, COVID-19, patient care team, personal protective equipment, Argentina.

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INTRODUCTION

The pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) affects mainly adults and is more severe among older adults.¹ It is striking how newborn infants (NBIs) are less affected, in whom transplacental, breast milk, and postnatal horizontal transmission have been reported.^{2,3} The former two mechanisms appear to be an exception. Most NBIs from mothers with coronavirus disease 2019 (COVID-19) are asymptomatic.⁴⁻⁶

Nosocomial transmission is presumably responsible for the infection of 29 % of affected health care providers and of 12 % of hospitalized patients.⁷ Personal protective measures play a key role in minimizing the risk of intra-hospital virus transmission.

Health system inequalities may become evident in terms of resource availability in different settings, as is the case of public versus private facilities and among provinces or districts in each country. A recent study explored the preparedness for neonatal care in 20 countries and showed a great variability in management.⁸ In May 2020, the recommendations developed by the National Ministry of Health (MoH) of Argentina and a working group made up of neonatology specialists laid the basis for a consensual approach across the country.⁹ A recent international study investigated the preparedness for neonatal care in 58 low- and middle-income countries.¹⁰

OBJECTIVES

1. To analyze the protective measures implemented in maternity centers in Argentina.

2. To know which guidelines were used, which practices were proposed for implementation, and the potential differences between the public and private health sub-systems.
3. To compare the perspective of physicians and nurses.
4. To assess the potential shortage of staff and consultants.

METHODS

This was a cross-sectional study based on a survey translated and modified by the authors of this study from the "COVID-19 Neonatal Guidelines Survey" questionnaire.^{8,10} That survey asked about facilities, recommendations, and general measures for the admission of NBIs from mothers with suspected or confirmed COVID-19, the management of NBIs admitted to the neonatal intensive care unit (NICU) with or without suspected COVID-19, and also the availability of personal protective equipment (PPE) and health care staff at the unit.

The first version was administered to four neonatologists to assess its structure and suggest modifications. Afterwards, four other providers assessed the second version for comprehension problems, language accuracy, question order, and the time required to complete it. The outcome measures for analysis included the guidelines in use at the institutions, knowledge of protective items, material and staff availability, training on their implementation, and other outcome measures detailed in the final version of the survey (*Annex 1*).

Distribution mechanism

Public maternity centers were invited to participate if they had more than 500 annual births, according to the MoH's database for 2017, and had a contact from the medical and/or nursing areas of the Department of Neonatology. The survey was also distributed to private facilities by convenience, based on the possibility of contacting them, but not on prior information about the number of annual births.

Representatives from each facility (one nurse and one physician) were selected. If both contacts were not available, the survey was sent only to one representative per facility. Each participant received a link to the online survey. Anonymized data were exported for analysis.

Statistical analysis

Quantitative outcome measures were

described as mean (standard deviation) or as median (range), based on their distribution. Categorical outcome measures were expressed as frequency and percentage. Student's test was used to compare continuous outcome measures if they had a normal distribution, whereas the χ^2 test was used for categorical outcome measures. A value of $p < 0.05$ was considered significant. The strength of the association was described using an odds ratio (OR) and a 95 % confidence interval (CI). The Stata/R software, version 11, was used.

Ethical aspects

The protocol was approved by the Research Protocol Ethics Committee of Hospital Italiano de Buenos Aires. It was also registered in the Computerized Health Research Registry Platform of Buenos Aires as per Resolution 2019/1679 by the Government of the Autonomous City of Buenos Aires (CABA)-Ministry of Health of CABA (GCABA-MSGC).

All participants were informed of the study objectives before completing the survey. Data were maintained confidential in compliance with National Law no. 25326 for the Protection of Personal Information by the National Ministry of Justice, Security, and Human Rights of Argentina.

RESULTS

The survey was sent between May 24th and June 9th, 2020 to the medical and nursing staff representatives of 147 maternity centers. In total, 104 maternity centers replied (response rate: 71 %) from across the country, except for the provinces of Tierra del Fuego, Chubut, Jujuy, Catamarca, and Formosa.

Among all answers, 42 corresponded to nursing staff and 91, to medical staff (from 13 facilities, only nurses replied). For most analyses, the results corresponded to the 91 facilities with answers from the medical staff. Of these, 53 were from the public sector (58 %) and 38, from the private sector (42 %) (*Table 1*).

One hundred percent of survey respondents referred that they had guidelines for the management of NBIs from mothers with COVID-19. Eighty-three percent used the national recommendations together with their facility's internal guidelines. Ninety-three percent stated that they had received training on the management of these patients based on the guidelines in use. In 94 % of facilities, family visiting in the NICU was restricted during the pandemic, both in terms of the number of visitors

TABLE 1. Characteristics of participating facilities

Number of annual births	
> 1500	59 (65 %)
≤ 1500	32 (35 %)
Type of facility	
Public	53 (58 %)
Private	38 (42 %)
Availability of mechanical ventilation	
Yes	91 (100 %)
No	0 (0 %)
Availability of neonatal surgery	
Yes	64 (70 %)
No	27 (30 %)

(91 %) and the duration of the visit (44 %).

In relation to feeding in NBIs from mothers with COVID-19 who did not require neonatal intensive care, 70 % of facilities recommended breastfeeding with protective measures (face mask/surgical mask, skin and hand hygiene); 23 % recommended breast milk using a bottle; and 7 %, formula feeding. In most facilities, physicians and nurses said that they involved the mother in the decision-making in relation to their baby's feeding (Table 2). Regarding the hospitalization of these babies, 20 % of facilities recommended rooming-in; 42 %, rooming-in, but

TABLE 2. Level of agreement with the following statement: "In our Department, the mother's wishes are taken into consideration and the decision whether to breastfeed and how is made with the mother."

Level of agreement	Answers from nursing staff	Answers from medical staff	Overall*
Agree, n (%)	31 (74 %)	71 (78 %)	102 (77 %)
Disagree/unknown, n (%)	11 (26 %)	20 (22 %)	31 (23 %)

* p : 0.59.

TABLE 3. Organization, patient management, and availability of supply and staff during the pandemic

	Private (n = 38) n (%)	Public (n = 53) n (%)	Total (n = 91) n (%)	p
Organization				
Restricted family visiting in NICU	36 (95)	50 (94)	86 (94)	0.93
Allowed companion during childbirth for women with suspected/confirmed COVID-19	28 (74)	21 (40)	49 (54)	< 0.001
Special delivery room for COVID-19	35 (92)	50 (94)	85 (93)	0.67
Routine PCR test in the NBI of a mother with suspected/confirmed COVID-19	11 (29)	22 (42)	33 (36)	0.22
PCR: results are available in ≤ 24 h	22 (58)	14 (26)	36 (40)	< 0.001
Asymptomatic NBIs				
Rooming-in	23 (61)	33 (62)	56 (62)	0.87
Shared decision	33 (87)	47 (89)	80 (88)	0.79
Direct breastfeeding	27 (71)	37 (70)	64 (70)	0.90
Shared decision	35 (92)	47 (89)	82 (90)	0.59
NBIs requiring admission to NICU				
Individual room	23 (60)	21 (40)	44 (48)	0.05
Supply availability*				
PCR	35 (92)	46 (87)	81 (89)	0.42
Gloves	38 (100)	53 (100)	91 (100)	NS
Surgical mask/face mask	38 (100)	53 (100)	91 (100)	NS
N95 mask	38 (100)	50 (94)	88 (97)	0.14
Goggles	38 (100)	48 (91)	86 (95)	0.05
Face shield	37 (97)	50 (94)	87 (96)	0.49
Water-repellent gown	38 (100)	52 (98)	90 (99)	0.39
HEPA filters (+)	32 (84)	44 (83)	76 (83)	0.88
Alcohol-based hand gel	38 (100)	53 (100)	91 (100)	NS
Staff availability				
Less nursing staff	3 (8)	23 (43)	26 (29)	< 0.001
Less medical staff	10 (26)	24 (45)	34 (37)	0.07

* Available (limited access + no significant limit) versus not available.

+ HEPA: high efficiency particulate arresting.

NICU: neonatal intensive care unit; PCR: polymerase chain reaction; NBI: newborn infant; NS: not significant

in the care of another caregiver; 21 %, admission to the NICU; and 17 %, hospitalization in an isolated area (38 % recommended separating mother and child).

Table 3 shows the results of the different outcome measures and the comparison of answers from the public and the private sectors. In 46 % of assessed facilities, no companion was allowed for pregnant women with suspected or confirmed COVID-19; if authorized, 30% did not allow the access of the woman's living partner, even if they were asymptomatic, for being a close contact.

PPE use for intubation is shown in Table 4, and health care staff availability at maternity centers, in Table 5. A reduction in the attendance from NICU consultants was mentioned by 16 %. In case of a significant increase in the number of COVID-19 cases, 30 % of survey participants said that, at their facility, it would not be possible to comply with the recommended protective measures.

DISCUSSION

In the setting of the current SARS-CoV-2 pandemic, a cross-sectional study was done using a survey among health care providers

working in maternity centers in Argentina to assess preparedness strategies in neonatal care. Participating maternity centers accounted for approximately 21 % of births in Argentina.¹¹

The analysis of the answers from the medical team of 91 facilities showed a great similarity with the recommendations. In most births, deferred umbilical cord clamping was done, rooming-in with the baby was encouraged, and breastfeeding was promoted, which is consistent with the current national recommendations.^{9,12,13} These three measures were more common in our study than in two other recent international studies.^{8,10} Most probably, the difference is partially due to the fact that those studies were done in different countries, which may account for such greater variability. Difficulties observed included potential limitations in PPE availability, the unavailability of individual rooms for symptomatic NBIs, and a shortage of NICU staff.

In Argentina, isolation, social distancing, and other measures were implemented early, which made it possible to strengthen the health care system. This way, the number of cases increased at a more progressive rate compared to other countries.^{14,15} This allowed more time to develop

TABLE 4. Personal protective equipment recommended for the intubation of newborn infants WITH and WITHOUT suspected COVID-19

	% of recommendation for patients WITHOUT suspected COVID-19	% of recommendation for patients WITH suspected COVID-19	<i>p</i>
Gloves	89 %	96 %	0.24
Surgical mask/ face mask*	77 %	47 %	< 0.001
N95 mask*	31 %	99 %	< 0.001
Goggles	56 %	93 %	< 0.001
Face shield	38 %	88 %	< 0.001
Water-repellent gown	38 %	98 %	< 0.001

* In some facilities, both masks are worn together.

TABLE 5. Shortage of health care staff in maternity centers

	Answers from medical staff (n: 91)	Answers from nursing staff (n: 42)	<i>p</i>
Percentage that has noticed a reduction in medical staff by shift	37 %	52 %	0.10
Percentage that has noticed a reduction in nursing staff by shift	29 %	57 %	< 0.001
Percentage that has noticed a reduction in staff from other medical specialties	17 %	12 %	0.49
Percentage that has noticed a reduction in ophthalmologists	3 %	3 %	0.77
Percentage that considers that such reduction has impacted on the facility's compliance with regulations	5 %	6 %	0.86

national recommendations. In the initial stages of the pandemic, proposed guidelines varied greatly. There is currently more information about the modes of transmission, prevention, and potential clinical manifestations of COVID-19, so the current recommendations provided by international organizations are rather uniform.¹⁶⁻¹⁹

All maternity centers whose staff completed the survey followed the MoH's recommendations together with the guidelines proposed by their facility, which adapted the standards to their local setting. This may be explained by the wide dissemination of national and international guidelines through scientific societies and specialty discussion forums. A great majority of survey respondents referred that they had received training for the management of these patients.

In relation to the management of NBIs from mothers with suspected COVID-19, there is little evidence about the possibility of transplacental dissemination to the baby; some studies have demonstrated that, if hygiene measures are taken, horizontal transmission is uncommon.^{16,20} Most facilities conduct deferred umbilical cord clamping in mothers with COVID-19, in accordance with current recommendations. Although in the early stages of the pandemic some guidelines indicated immediate cord clamping, this has been modified.^{9,16} The proven benefits of this practice are now prioritized against the remote possibility of increasing the NBI's risk of transmission.

Most facilities indicated that they had an operating room exclusively designated for the birth of children from mothers with suspected or confirmed COVID-19. On the one side, although this is ideal, its feasibility is affected in the presence of positive, asymptomatic pregnant women who did not have a test done before the onset of labor. On the other side, having a single site may increase the number of C-sections because it is not easy to maintain a prolonged labor in a different place with the staff wearing level 3 PPE.²¹

Almost half of maternity centers did not allow a companion in the operating room or delivery room, and this was more prevalent in public hospitals. This is concerning in the light of pregnant people's right to be accompanied by someone of their choice during childbirth (Law no. 25929). Such percentage is probably explained by the requirement of not allowing the companion to be a close contact or a person with risk factors or symptoms. It is difficult to find a

companion who meets all these requirements.

In relation to the hospitalization of NBIs who do not require intensive care, although the initial guidelines recommended keeping the baby and the mother apart, the current evidence suggests that the risk of transmission for the NBI is extremely low, as long as the suitable precautions are taken: the mother and companion have to wear a surgical mask/face mask, a distance of more than 1.5 m should be kept between the mother's bed and the cradle, breastfeeding has to be done outside the mother's bed, and hygiene measures, including hand washing and local skin hygiene during feeding, have to be implemented.^{9,22}

Approximately 62 % of facilities allow rooming-in (with the mother or with the mother and another caregiver in charge of the NBI). Most likely, the 38 % of facilities that indicate to keep the mother and the baby apart do so because they cannot comply with the recommendations due to infrastructure and/or logistics characteristics. Some countries still recommend the separate hospitalization of the mother and the baby.⁸

In relation to breastfeeding, although some reports suggest that SARS-CoV-2 genetic material has been found in breast milk,^{23,24} this route of dissemination has not been demonstrated, so the recommendation remains direct breastfeeding or the administration of breast milk using a bottle or other methods.^{9,15,17} According to our survey, most facilities promote breastfeeding and, in 90 % of maternity centers, NBI feeding is agreed upon with the mother.

According to the national MoH's guidelines, a nasal swab in NBIs from mothers diagnosed with COVID-19 is indicated if they are symptomatic. Among surveyed facilities, 54 % performed a nasal swab in NBIs if they had symptoms and 36 %, as part of routine care. This is different from what has been observed in a study conducted in high-income countries, where most recommendations indicate a universal nasal swab in NBIs from mothers diagnosed with COVID-19.⁸

In relation to PPE use, it is worth noting that most survey respondents recommended using level 3 PPE during intubation of these patients, and a very small percentage did not recommend using a N95 mask or goggles. Although the survey was administered in Argentina at a time when the virus community circulation was limited, different professional societies and national and international authorities have made broad recommendations about PPE use, even in

NBIs without suspected COVID-19 exposure.

Most survey respondents indicated that they considered that the MoH's recommendation guidelines could be complied with.⁹ The main difficulties among those who believed that guidelines could not be adhered to included PPE availability (N95 mask, water-repellent gown, and goggles), limited access to high efficiency particle arresting (HEPA) filters, lack of physical space for patient isolation, and shortage of available health care staff. It is important to have all PPE available. Worldwide, a large number of health care staff got COVID-19, so being a staff member should be considered a primary risk factor.

The shortage of human resources is due not only to preventive leaves (for staff members in risk groups) and sick health care providers, but also to the redistribution of staff members to other specialty departments where the number of patients has increased, such as the emergency and general medicine departments. The latter was more evident among nurses.

One of the limitations of this study is that, since there is no national registry of private maternity centers, our access to those facilities depended on contact availability, with the resulting selection bias. Another limitation is that we were not able to obtain paired physician-nurse answers from most participating facilities, which restricted the possibility of performing an analysis to adequately compare professional perspectives.

A strength of this study is that data were collected from a large number of public and private maternity centers from most provinces for assessment during a common epidemiological moment before massive virus circulation. No other study of these characteristics has been done at a national level.

The possibility of slowing the contagion curve through social isolation has enabled each facility to develop their own standards based on the MoH's recommendations and potential staff training. In the setting of the pandemic, it is essential to achieve a balance between protective measures for the health care staff, the prevention of COVID-19 dissemination to other patients, limited PPE availability, and an individualized, family-centered approach to patients with suspected COVID-19.

CONCLUSIONS

All facilities claim that they know and comply with the indications of national guidelines. Most maternity centers have the material resources to

comply with protective measures. However, there is uncertainty as to whether protective equipment, staff, and physical space would be enough if the number of cases increased significantly. ■

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ANNEX 1
Survey on perinatal COVID-19 in Argentina
List of questions

A. FACILITY INFORMATION:

1. Name of individual completing the survey:
2. E-mail address of individual completing the survey:
3. Position:
 - a. Physician.
 - b. Nurse.
 - c. Other.
4. Facility name:
5. City:
6. Province:
7. Annual number of births in your hospital (please provide an estimated range):
 - a. 0.
 - b. 1-500.
 - c. 501-1500.
 - d. 1501-3000.
 - e. 3001-6000.
 - f. > 6000.
8. Annual number of patients admitted to your hospital's NICU (please provide an estimated range):
 - a. < 101.
 - b. 101-500.
 - c. 501-1000.
 - d. 1001-2000.
 - e. > 2000.
9. Type of facility:
 - a. Public.
Level IIIB (high) II.
Level IIIA (middle) III.
Level II (low).
 - b. Private.
10. Level of care:
 - a. Availability of MV.
 - b. Availability of CPAP / non-invasive ventilation.
 - c. Availability of oxygen support.
 - d. Availability of neonatal surgery.

B. IN YOUR FACILITY:

11. Recommendation guidelines about COVID-19 patient management have been provided (select only one answer):
 - a. Yes.
 - b. No.
12. The guidelines used in your facility are the ones provided by (select all the answers that apply):
 - a. The National Ministry of Health.
 - b. The CEFEN (Committee for Fetal and Neonatal Studies).
 - c. Your facility for internal use.
 - d. Other.
13. You have received training on COVID-19 patient management in accordance with the recommendation guidelines (select only one answer):
 - a. Yes.
 - b. No.

14. In the setting of the pandemic, family visiting in the NICU has been restricted (select all the answers that apply):
- Yes.
 - Restriction in the number of family visitors.
 - Restricted duration of visits.
 - No.

C. MANAGEMENT OF NEWBORN INFANTS FROM MOTHERS WITH SUSPECTED OR CONFIRMED COVID-19:

15. At the time of childbirth (C-section or natural birth)
- Is a companion allowed inside? (Select only one answer)
 - Yes.
 - No.
 - If yes, and if the companion is asymptomatic, could it be the mother's living partner (close contact of the mother with suspected COVID-19)? (Select only one answer)
 - Yes.
 - No.
16. What are the recommendations regarding cord clamping? (Select only one answer)
- Immediate.
 - Delayed.
 - Milking.
17. Area where women with suspected or confirmed COVID-19 give birth (select only one answer):
- Usual delivery room/operating room.
 - Delivery room/operating room designated for COVID-19 patients.
18. Area where NBIs could be resuscitated (select only one answer):
- In the same room where childbirth occurred.
 - In a different room designated for the birth of babies from women with suspected COVID-19.
 - In the "resuscitation" area (the same area used for the resuscitation of depressed NBIs without suspicion or risk of COVID-19).
19. If the NBI does not require intensive care (select only one answer):
- They are allowed to rooming-in with their mother.
 - They are allowed to rooming-in with their mother, but in the care of a caregiver without suspected COVID-19, 2 meters apart from their mother's bed.
 - They are admitted to the NICU until their mother's diagnosis is confirmed or ruled out.
 - They are kept in isolation outside the NICU.
20. In relation to asymptomatic NBIs from mothers with suspected or confirmed COVID-19, indicate your agreement with the following statement: "In our facility, the mother's wishes are taken into account and the decision about where the baby will stay after birth is made with her." (Select only one answer)
- Strongly agree.
 - Somewhat agree.
 - Neither agree nor disagree.
 - Somewhat disagree.
 - Strongly disagree.
21. In relation to breastfeeding, if the NBI does not require neonatal intensive care (select only one answer):
- There is no specific recommendation.
 - The recommendation is direct breastfeeding with the mother wearing a surgical mask.
 - The recommendation is direct breastfeeding with no additional precautions.
 - The recommendation is pumping milk to be given by another person using a bottle.
 - The recommendation is formula feeding.

22. In relation to asymptomatic NBIs from mothers with suspected or confirmed COVID-19, indicate your agreement with the following statement: "In our Department, the mother's wishes are taken into consideration and the decision whether to breastfeed and how is made with the mother." (Select only one answer)
 - a. Strongly agree.
 - b. Somewhat agree.
 - c. Neither agree nor disagree.
 - d. Somewhat disagree.
 - e. Strongly disagree.
23. In the facility where you work, there is a possibility to perform a PCR test for COVID-19 (select only one answer).
 - a. Yes.
 - b. No.
24. If you answered yes to the previous question, how long does the result take? (Select only one answer)
 - a. Less than 24 h.
 - b. 24-72 h.
 - c. More than 72 h.
25. PCR testing in NBIs from mothers positive for COVID-19 (select only one answer):
 - a. It is done routinely.
 - b. It is done in case of symptoms.
 - c. It is not done.
26. If the PCR test is done routinely in NBIs, it is requested (select **all** the answers that apply):
 - a. At birth.
 - b. At 24 h.
 - c. At 48 h.
 - d. At 72 h.
 - e. > 72 h.

D. MANAGEMENT OF NEWBORN INFANTS ADMITTED TO THE NICU WITH SUSPECTED COVID-19:

27. What personal protective equipment (PPE) is recommended to perform positive pressure ventilation, if necessary? (Select all the answers that apply)
 - a. There is no specific recommendation.
 - b. Gloves.
 - c. Surgical mask.
 - d. N95 mask.
 - e. Goggles.
 - f. Water-repellent gown.
 - g. Transparent face shield.
28. What PPE is recommended to intubate a patient? (Select all the answers that apply)
 - a. There is no specific recommendation.
 - b. Gloves.
 - c. Surgical mask.
 - d. N95 mask.
 - e. Goggles.
 - f. Water-repellent gown.
 - g. Transparent face shield.

29. Possibility of isolation in your unit (select only one answer):
 - a. There are individual rooms available for isolation inside the unit.
 - b. There are individual rooms available for isolation in other units designated for neonatology.
 - c. There are individual rooms available for patient cohorts.
 - d. There are no rooms available and isolation is done inside the unit establishing cohorts and keeping the recommended distance.
 - e. There is no possibility for isolation.
30. Hospital discharge of NBIs from mothers with COVID-19 (select only one answer):
 - a. No differences in relation to routine care.
 - b. The recommendation is a longer hospital stay for clinical control.

E. ROUTINE MANAGEMENT OF NEWBORN INFANTS ADMITTED TO THE NICU WITHOUT SUSPECTED COVID-19:

31. What PPE is recommended to perform positive pressure ventilation, if necessary? (Select **all** the answers that apply)
 - a. There is no specific recommendation.
 - b. Gloves.
 - c. Surgical mask.
 - d. N95 mask.
 - e. Goggles.
 - f. Water-repellent gown.
 - g. Transparent face shield.
32. What PPE is recommended to intubate a patient? (Select **all** the answers that apply)
 - a. There is no specific recommendation.
 - b. Gloves.
 - c. Surgical mask.
 - d. N95 mask.
 - e. Goggles.
 - f. Water-repellent gown.
 - g. Transparent face shield.

F. AVAILABILITY OF MATERIALS IN YOUR UNIT:

33. PCR testing materials for COVID-19 (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
34. Gloves (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
35. Surgical mask (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
36. N95 mask (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
37. Goggles (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.

38. Face shield, transparent plastic shield (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
39. Water-repellent gown (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
40. HEPA (high efficiency particulate air) filters for invasive or non-invasive ventilation (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
41. Alcohol for hand hygiene (select only one answer):
 - a. Not available.
 - b. Limited availability.
 - c. Available with no significant limitations.
42. Do you think your facility would manage to comply with the recommendations mentioned above if the number of COVID-19 cases increased significantly in the following months? (Select only one answer)
 - a. Yes.
 - b. No.
43. Why? (Open answer)

G. STAFF AVAILABILITY:

44. The number of nurses per shift has decreased (select only one answer).
 - a. Yes.
 - b. No.
45. The number of neonatologists has decreased (select only one answer).
 - a. Yes.
 - b. No.
46. If you answered yes to any of the previous questions, has this affected compliance with the department's rules, such as infection control, oxygen management, nutrition, etc.? (Select only one answer)
 - a. Yes.
 - b. No.

If yes, please describe how compliance with the department's rules has been affected (free text).
47. Have ophthalmologists stopped attending or reduced their attendance to the NICU to screen for ROP or administer an eventual treatment? (Select only one answer)
 - a. Yes.
 - b. No.
48. Have other specialists reduced their attendance to the NICU? (Select only one answer)
 - a. Yes.
 - b. No.

If yes, please describe what other specialists have reduced their attendance to the NICU (free text).

H. REMARKS: Please write here any additional remark you may have:

-----END OF SURVEY-----

ANNEX 2

Last and first names

Acevedo, Alberto David
 Acosta, Elizabeth
 Acosta, María Inés
 Agüero, Jorge
 Ahumada, Luis
 Alda, Ernesto
 Alegre, Gastón Gabriel
 Álvarez, Alina María
 Allende, Alejandra
 Amdreussi, Lorna
 Arimany, Marcela
 Bahamondes, Anabella
 Banin, Natalia
 Barresi, Mónica
 Barrionuevo, Laura S.
 Barrionuevo, Mercedes Graciela
 Barros Sosa, Julio
 Barthe, Manuel
 Bas, José Ignacio
 Becerra, Marina Fabiana
 Bernaldo de Quirós, Ignacio González
 Bianchi, Evelyn
 Bogado, Carina del Valle
 Boichetta, Gustavo
 Borrás, Lucas
 Brizuela, Priscila
 Bruno, Silvia Patricia
 Caram, Edgardo Daniel Fernando
 Cardetti, Marcelo
 Casali, Roberto Osvaldo
 Casas, Ofelia
 Cassatti, Fernanda
 Castillo, Fabiana
 Celotto, Marcela Elina
 Chara, José
 Chávez Suárez, Patricia
 Colantonio, Guillermo
 Concaro, Norma Beatriz
 Contrera, Pamela Judith
 Cracco, Lionel
 De Abrantes, Lorena
 De Risio, Karina
 Delarosa, Valeria
 Del Barco, Mario
 Di Tullio, Adriana Graciela
 Díaz Arguello, Claudia
 Díaz Gabellotta, Daniela
 Díaz, Juan Matías
 Dip, Viviana
 Dudkevich, Julia
 Espinoza, Eva
 Ezquer, Analía
 Fernández Jonusas, Silvia
 Ferreyra, Alejandra
 Ferreyra, Mirta
 Finotti, Gabriela
 García, Cecilia
 García Fiorini, María Inés
 Gigli, Mariel Vivian
 Goldsmit, Gustavo
 Gómez, Noemí Aida
 González, Alejandra Verónica
 González, Brígida
 Gordillo, Esteban

Facility

Hospital López Lima
 Hospital General de Agudos Dalmacio Vélez Sarsfield
 Hospital Julio C. Perrando
 Hospital Iturraspe
 Hospital Misericordia
 Hospital Privado del Sur
 Sanatorio de La Trinidad San Isidro
 Policlínico Neuquén
 Hospital Dr. Arturo Oñativia
 Maternidad Martin
 Sanatorio de la Trinidad Palermo
 HIGA Gandulfo
 Hospital Oñativia
 Sanatorio Finochietto
 Hospital Interzonal General Dr. J. Penna
 Hospital Descentralizado Dr. Guillermo Rawson
 Clínica Mayo de Urgencias Médicas Cruz Blanca SRL
 Clínica Yunes
 Hospital Privado Universitario de Córdoba
 HIGA Abraham Piñeyro
 Sanatorio San Lucas
 Hospital Dr. Gutiérrez
 Hospital Materno-neonatal E. T. de Vidal
 Hospital Durand
 Hospital Roque Sáenz Peña
 Hospital de la Madre y el Niño
 Sanatorio Güemes
 Hospital Antonio J. Scaravelli
 Clínica y Maternidad CERHU
 Hospital General de Agudos Dalmacio Vélez Sarsfield
 Maternidad Otoño
 Hospital Antonio J. Scaravelli
 H. I. G. Dr. José Penna
 Hospital Argerich
 Hospital Regional Ramón Carrillo
 Hospital Municipal Raúl F. Larcade
 Sanatorio Finochietto
 Clínica Delta
 Sanatorio de la Trinidad San Isidro
 Instituto Maternidad Santa Rosa
 Hospital Durand
 Hospital Iriarte de Quilmes
 Hospital Reconquista
 Hospital Público Materno Infantil
 Sanatorio Boratti
 Hospital Italiano Regional del Sur
 Hospital Dr. Lucio Molas
 Hospital Provincial de Neuquén Dr. Castro Rendón
 Hospital Nicolás Avellaneda
 Hospital Municipal Raúl F. Larcade
 Hospital Materno Infantil de Tigre
 Hospital Virgen de la Misericordia
 Hospital Italiano
 Hospital de la Madre y el Niño
 Sanatorio del Salvador
 Clínica Pasteur
 Sanatorio de la Trinidad Palermo
 Clínica Colón
 Hospital Provincial de Rosario
 Hospital Británico
 Hospital Julio C. Perrando
 Hospital Iriarte de Quilmes
 Maternidad San Lucas
 Maternidad de Tucumán

Grethelm, Ferrufino	Hospital Nacional Alejandro Posadas
Hermida, Agustina	Sanatorio Mater Dei
Hernández Blanco, María	Hospital Área Programa Francisco López Lima
Hernández, María Gabriela	Hospital Piñero
Herrero, Ernesto Ángel	Sanatorio Güemes
Ilera, Sebastián	Sanatorio San Carlos
Ingrassia, Guillermo	Sanatorio de la Mujer
Irrazabal, Daniel	Hospital Gobernador Centeno
Israilev, Adriana	Hospital Álvarez
Juárez, Marisa	Hospital Orán
Lapuente, María Belén	Hospital Provincial de Rosario
Larcade, Ramón	Sanatorio Trinidad Ramos Mejía
Levinson, Laura	Hospital Provincial del Centenario
Liva, Carlos Daniel	Hospital Ángela Iglesia de Llano
Luna, Graciela Silvina	Hospital Evita Pueblo
Manzolido, Silvana	Hospital Churrucá-Visca
Marinero, Silvia	Hospital D. F. Santojanni
Martin, Yamila	Casa Hospital San Juan de Dios
Martínez, Liliana	HUMN-UNC
Martínez, Marina	Instituto Maternidad Santa Rosa
Martocchia, Juan Carlos	Hospital Zonal Caleta Olivia
Mato, Ivana	Hospital Provincial de Neuquén Dr. Castro Rendón
Maubett, María Delcys Albas	CEMIC
Mazzitelli, Yanina Gisela	Hospital Italiano
Meléndez, Norma Elena	Hospital Materno Infantil de Tigre
Mertes, Jorgelina Andrea	Hospital J. M. Cullen
Miranda, Inés Roxana	Hospital Fernández
Morillo, María Marta	Maternidad San Lucas
Moretta, Sonia E.	HIGA Abraham Piñeyro
Mortarotti, Norma	Sanatorio 9 de Julio
Nemer, Patricia Elena	Hospital Diego Paroissien
Ortiz, Silvina Verónica	Hospital Rawson
Pagniez, María Eugenia	Clínica Colón
Palacios, Laura Lilian	Hospital Ángela Iglesia de Llano
Re, Silvina	Hospital Lucio Molas
Riffo, Néstor Teobaldo	Policlínico Neuquén
Rivarola, Victoria	Hospital Iturraspe
Rodríguez, María Gabriela	Hospital Zonal Dr. Antranik Eurnekian
Rubio, Soraya	Hospital Regional Dr. Alejandro Gutiérrez, Venado Tuerto, Santa Fe
Ruiz, Claudia	Sanatorio Trinidad Ramos Mejía
Saa, Gladys	Hospital Fernández
Sabatelli, Débora	Sanatorio Mater Dei
Salas, Guillermo	Hospital Español de La Plata
Salazar, Natalia	Hospital Regional Goya
Salvatierra, Adriana María	Hospital Eva Perón
Savorani, Mónica	Casa Hospital San Juan de Dios
Schavlovsky, Graciela Beatriz	H. I. G. A. Evita, Lanús
Seminario Gómez, Blas E.	H. D. C. Masvernat
Sexer, Héctor	Sanatorio Anchorena, Recoleta
Solana, Claudio	Maternidad Sardá
Soler, Liliana	Hospital Diego Paroissien
Sotomayor, Mayra	Hospital Materno Neonatal Nuestra Señora del Pilar
Steinberg, Diego Ariel	Hospital Ramón Carrillo
Subotovsky, Patricia	Clínica y Maternidad Suizo Argentina
Svriz Wucherer, Natalia Elizabeth	Sanatorio Argentino
Tirigay, Lucas	Hospital Municipal de Morón (Ostaciana Lavignolle)
Trujillo, Natalia	Hospital Piñero
Turturici, Mariana	Hospital Materno Infantil de San Isidro
Valdés, Martín	Sanatorio Altos de Salta
Valdez Pérez, María Florencia	Hospital Descentralizado Dr. Guillermo Rawson
Vecchiarelli, Carmen	Sanatorio Otamendi
Vega, Patricia	Sanatorio Allende Cero
Vera, Gabriel	Hospital Español de La Plata
Vidal, Juan Carlos	HEMI Ana Goitía
Viñales, Viviana	Hospital Materno Neonatal, Misiones
Wittbecker, Patricia Liria	HZGA Héroes de Malvinas
Zambosco, Guillermo	Hospital Italiano de La Plata
Zanetti, Ana	Hospital Jaime Ferré
