

Social distancing measures and demands for the reorganization of hemotherapy services in the context of Covid-19

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Abstract *The article aims to discuss the consequences of social distancing measures on the availability of blood and organization of blood therapy services at the beginning of the Covid-19 pandemic in Brazil. News published in April 2020 on the websites of the country's state Blood Service Networks were consulted and organized in an Excel spreadsheet, presented in summary charts, and descriptions of results were prepared. A critical situation of blood supply, especially of some blood types, has been observed in many states. This situation is influenced by the circulation of the new coronavirus. The adoption of social distancing measures associated with unchanged transfusion demands for outpatient, urgency and emergency care required the implementation of strategies and actions for the reorganization of the services. Protection measures were incorporated, flows were changed and new routines were established. This study shows the extent to which the epidemiological situation of Covid-19 and the necessary measures for its control influenced the stocks and availability of blood. Changes in the organization of blood therapy services were fundamental in order to ensure protection, mitigate the risks of spreading the virus, and ensure the blood supply to meet the needs of the health system.*

Key words *Coronavirus infections, Brazil, Blood Therapy Service, Organization and administration*

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Introduction

Studies show that the spread of the SARS-Cov-2 virus, the etiological agent of the disease known as Covid-19, has had an impact on the number of blood donations and, therefore, on the supply of blood products to health services. Furthermore, it heated up the discussion on blood safety and surveillance measures, even though there is no confirmed scientific evidence of transmission of the virus by transfusions¹⁻³.

The increase in the number of confirmed cases of SARS-Cov-2 has led governments to decide to adopt measures of social distancing, with interruption of activities in the community, due to the need to flatten the curve. This posed challenges to health services, including for blood therapy services, whose offer of therapeutic resource depends on the availability and willingness of donors. Added to this, blood products are perishable⁴ and require constant replenishment⁵.

The adoption of social distancing measures aims to reduce interactions in a community, considering that people can be infected and not yet identified nor isolated. In this sense, reducing circulation and avoiding agglomeration of people reduce the transmission of diseases whose contagion requires physical proximity between people⁶.

Examples of measures that aim at social distancing are the closing of schools and workplaces, the suspension of some types of commerce activities and the cancellation of events/meetings to avoid crowding⁶. Such initiatives have had an impact on the supply of “priceless resources” to health, so that the emergence of the pandemic led to the interruption of activities in the community, including the closure of donation centers/units in many areas around the world, reaching the point in which the demand exceeded the supply⁴.

Measures to prevent the spread of the virus were adopted by many countries in the world threatens the blood supply, for example, precautionary, quarantine or confinement exclusions and fears of causing self-exclusions^{4,7}. Still, the uncertainty, fear, assumptions existing in the mind of donors and their reluctance to go to services to donate blood imply a significant reduction in the amount of blood collected worldwide⁸.

In a recent publication, heads of blood banks and transfusion departments in hospitals in 12 countries around the world, including Australia, Brazil, Canada, Denmark, Iran, Israel, Italy, Ja-

pan, Korea, Spain, the United Kingdom and the United States, reported on the different expectations and deadlines for blood shortage considering the levels of the pandemic in their countries until the penultimate week of April. Israeli, Spanish, Danish, British and Korean respondents did not expect a shortage of blood as a result of this pandemic, while the others expected shortages in the short, medium or long term⁹.

The pandemic and the adoption of measures such as physical distancing and closing and locking cities, provinces or countries in the attempt to contain the spread of the infection can result in a great decline in blood supply and in a generalized scarcity of blood products¹⁰. It is important to note that patients suffering from cancer, hematological disorders, and also surgery, urgency and emergency services need blood components for provision and prescription to patients.

This article aims to discuss the consequences of social distancing measures on the availability of blood and the organization of blood therapy services at the beginning of the Covid-19 pandemic in Brazil.

Methodology

In order to monitor the consequences of the pandemic and the strategies adopted by blood therapy services to ensure the availability of blood to meet the demands of health services, a bank was built in the Excel software with news from the websites of state Blood Service Networks in Brazil. The first synthesis produced based on such news was published on the Observatory of Political Analysis in Health (<https://www.analisepoliticaeamsaude.org/oaps/>)¹¹, considering the period from February 26 (date of notification of the first case confirmed in Brazil, in the state of São Paulo) until March 31, 2020.

On March 31, 2020, there were 5,824 confirmed cases of Covid-19 in Brazil, and that number went to 87,126 on April 30, 2020 (<https://painel.covid19br.org/>). In this sense, this study presents the following question: how did the social distancing measures adopted influence blood stocks and the organization and functioning of blood therapy services in the first months of the Covid-19 pandemic in Brazil?

The news published on the websites of the state Blood Service Networks of Brazil and used for discussion in this article include publications of the month of April 2020 and are summarized in two charts.

The discussion of the results is collated with the synthesis of experiences and publications from other countries found in a survey in PubMed (using the descriptors: *Covid-19 or new coronavirus or coronavirus disease 2019 and blood transfusion or blood donors or blood supply or blood bank or blood donation or transfusion medicine*), as one of the activities developed by the author at Rede CoVida - Science, Information and Solidarity, which is characterized as a scientific and multidisciplinary collaboration project focused on the Covid-19 pandemic resulting from the partnership between the Center for Data Integration and Knowledge for Health (Cidacs/Fiocruz Bahia) and the Federal University of Bahia (UFBA) (<https://covid19br.org/>).

Results

The records showed that the Covid-19 pandemic caused changes in the organization and functioning of blood therapy services, including a reduction in the levels of blood stocks due to the mandatory social distancing measures adopted to control the spread and transmission of the virus. Chart 1 summarizes these results.

According to the news published on the websites of the state Blood Service Networks in April 2020, there was a “critical situation” in the supply, especially for blood types with negative RH factor, O+ and platelets. In some states, at the beginning of the month, the records showed a reduction of 30% in the number of daily donations (Hematology and Blood Therapy Center of Alagoas - Hemoal, 07.04.20), or 35% in the total number of donors (Arthur de Siqueira Cavalcanti State Institute of Hematology of Rio de Janeiro - Hemorio, 07.04.20) and even 60% of donors (Hematology and Blood Therapy Center of Amazonas - Hemoam, 01.04.20).

This situation presented on the websites remains justified/compromised by the “new coronavirus pandemic (Covid-19)” (Hematology and Blood Therapy Center of Maranhão - Hemomar, 03 and 08.04.20; Hematology and Blood Therapy Foundation of Rondônia - Fhemeron, 24.04.20) and because of the growth in the number of cases in Brazil, according to news from the Hospital Foundation of Hematology and Blood therapy of Amazonas (Hemoam).

According to statements identified on the websites, directors and those responsible for

blood collection and other departments of the blood cycle revealed their concern with the situation. About this, the director of the Hemoam Foundation pointed out that “despite adopting measures to avoid crowding of people, scheduling, changing the layout of waiting rooms to maintain a minimum distance between donors, and placing alcohol gel dispensers at will with in the blood center, donations are increasingly reduced” and, he added that “the pandemic slowed everything down”, calling attention to the fact that “the consumption of blood products is still high” (Hemoam, 01.04.20).

Information from the website of the Hematology and Blood Therapy Center of Maranhão (Hemomar) highlights that “due to the social isolation measures adopted to combat the Covid-19 pandemic, blood donations dropped and the stock of bags was at a critical level” (Hemomar, 08.04.20). About this, the website of the Hematology and Blood Therapy Foundation Center of Minas Gerais reaffirmed that in this moment of social isolation, “reflexes can be observed in the flow of donors” (Hematology and Blood Therapy Foundation Center of Minas Gerais - Hemominas, 15.04.20).

It was also emphasized in some publications that there is still a need for blood, such as in cases of patients with sickle cell anemia and thalassemia (Fhemeron, 02.04.20). The need for blood and blood components for such services was also mentioned by the director of the Hematology and Blood therapy Foundation of Bahia, who made reference to patients with dengue (Hematology and Blood Therapy Foundation of Bahia - Hemoaba, 29.04.20). The coordinator of the Hematology and Blood Therapy Foundation of Rondônia also “clarified that the Covid 19 does not dictate the demand for blood types O+ and O in the bank, nor reduction in the number of surgeries and accidents during the quarantine”. She stressed that “these types are the most transfused” and highlighted the need to meet the urgent needs of cancer patients (Fhemeron, 30.04.20).

Other statements identified on the websites showed that the reduction in the service capacity of mobile units (Blood Therapy and Hematology Center of Goiás - Hemogo, 24.04.20) due to the adoption of measures to ensure greater safety for donors extended the waiting time and some people have no patience or cannot wait (Hemomar, 08.04.20), and this also influences the blood stock levels.

Chart 1. Consequences of the pandemic, due to the adoption of social distancing measures, on blood therapy services in Brazil, April 2020.

Consequences	Blood therapy services – State blood service networks
Reduction in blood stock levels due to drop in donations	Hemoal, 07.04.20; Hemorio, 07.04.20; Hemoam, 01.04.20; Hemomar, 08.04.20
Increased waiting time for service due to reduced capacity of mobile units	Hemomar, 08.04.20; Hemogo, 24.04.20
Change in the functioning and organization of services due to the adoption of precautionary/safety measures and establishment of new routines	The majority recorded some change in functioning and organization (Chart 2)

Source: Blood center websites in Brazil, April 2020.

Demands and changes in the organization and functioning of blood therapy services

The context of the pandemic had an impact on blood stock levels, so that strategies for organization, functioning and routine of the services needed to be implemented. This study revealed that such strategies were related to safety, precaution and risk reduction measures for the spread of the virus in services, incorporation of new technologies, among others (Chart 2).

Protection and precautionary measures against the transmission of the virus were implemented in the month of April, including intensified hygiene of areas and surfaces (Hemoba, 13.04.20; Blood Center Foundation of Brasília - FHB, 08.04.20); use of masks by patients and donors (Hemoba, 29.04.20); respect for a minimum distance between donors; expansion of the quantity of alcohol gel dispensers; use of safety equipment (Hemoba, 29.04.20; FHB, 08.04.20; Hematology and Blood Therapy Center of Pará - Hemopa, 13.04.20; Pró-Sangue Blood Center Foundation of São Paulo - Pró-Sangue, 27.04.20).

New measures to protect people, patients and candidates for donation have been incorporated, for example, “to measure the body temperature of all patients arriving at the institution” (Hemopa, 13.04.20), thus requiring a referral flow, so that “in case of fever or other symptoms of Covid-19, people are referred to other public health units, and they are temporary impeded to donate” (Hemoam, 03.04.20). As a protective measure, other flows were changed and routines were established, for example, at the Hemopa, emergency cases are priority in medical consultations, in case of patients who need to receive transfusions, platelets and Factor. Also, in the case of patient

with aplastic anemia, consultations for physical therapy and scheduling to retrieve medications are suspended (Hemopa, 13.04.20).

The expansion of donation points/locations was reported on the websites. The Hematology and Blood Therapy Center of Ceará decided to provide new places for donation in strategic points of the state to continue receiving volunteers during the pandemic (Hemoce 23.04.20), although in many realities the implantation of external tents (Hemomar, 08.04.20) as a measure to reduce agglomerations (FHB, 22.04.20) has reduced the collection capacity of such collection units (Hemogo, 03.04.20; Hemogo, 24.04.20). In this sense, other strategies used are the scheduling of the donation (Hemoba, 13.04.20; FHB, 20.04.20; Hemogo, 03.04.20; Hemogo, 24.04.20; Pró-Sangue, 27.04.20; Hematology and Blood Therapy Center of Sergipe - Hemose, 27.04.20), the pre-scheduled donation (Hematology and Blood Therapy Center of Mato Grosso do Sul - Hemosul, 30.04.20) of groups of up to ten people (Hemose, 20.04.20; Hematology and Blood Therapy Center of Tocantins - Hemoto, 24.04.20) and the call of healthy people (Hemoba, 29.04.20; FHB, 02.04.20).

The context of the pandemic influenced the routines of the services, with extended opening hours, and opening on Saturdays and/or holidays (FHB, 22.04.20; Hemosul, 30.04.20; Hemominas, 15.04.20; Hematology and Blood Therapy Center of Santa Catarina - Hemosc, 01.04.20; Hemoto, 24.04.20). Some blood centers included in their routine, in April, the validation, offer and realization of diagnostic tests for Covid-19. For example, the Hematology and Blood Therapy Center of Ceará validated the effectiveness of rapid tests for Covid-19 (Hemoce, 15.04.20)

Chart 2. Measures and routines implemented by blood therapy services in the background of the Covid-19 pandemic, April 2020.

Measures and routines	Description	Sources/records on the websites of Blood Service Networks
Protection measures (individual, collective) and organization of the physical space to prevent the spread and transmissibility of the virus	Recommendation of the use of masks by donors and patients	Hemoba, 29.04.20
	Measuring the temperature of everyone who arrives at the institution	Hemopa, 13.04.20; Hemoam, 03.04.20
	Intensified hygiene of areas and surfaces	Hemoba, 13.04.20; FHB, 08.04.20
	Changing the layout of waiting rooms respecting a minimum distance between donors; greater quantity of gel alcohol dispensers	Hemoba, 29.04.20; FHB, 08.04.20; Hemopa, 13.04.20; Pró-Sangue, 27.04.20; Hemoam, 01.04.20
Expansion of donation points/locations	Offering new places for donation at strategic points; implantation of external tents	Hemoce, 23.04.20; Hemomar, 08.04.20
Donation scheduling and call	Individual and group scheduling for donation	Hemoam, 01.04.20; Hemoba, 13.04.20; FHB, 20.04.20; Hemogo, 03.04.20; Hemogo, 24.04.20; Pró-Sangue, 27.04.20; Hemose, 27.04.20; Hemosul, 30.04.20; Hemose, 20.04.20; Hemoto, 24.04.20; Hemoba, 29.04.20; FHB, 02.04.20
Change in days and hours of operation of blood therapy services	Extension of opening hours and opening of services on Saturdays and/or holidays	FHB, 22.04.20; Hemosul, 30.04.20; Hemominas, 15.04.20; Hemosc, 01.04.20; Hemoto, 24.04.20
Change in the supply and service flow routine	Medical consultations as a priority for emergency cases; suspension of some appointments; scheduling for medication dispensing	Hemopa, 13.04.20
	Validation and/or offering and realization of diagnostic tests for Covid-19	Hemoce, 14.04.20; Hemoce, 15.04.20; Hemominas, 22.04.20
Incorporation of information technologies	Incorporation of information technologies for consultation/scheduling, information and clarification of doubts of donors	Pró-Sangue, 01.04.20; Pró-Sangue, 13.04.20
New strategies and/or maintenance of varied measures to encourage donation	Partnerships with services, institutions and media; partnerships with transportation applications; condominium collection; free shuttle to the route	Hemopa, 30.04.20; Hemoba, 27.04.20; Hemoal, 22.04.20; Hemoam, 14.04.20; Hemoce, 04.04.20; Hemopi, 06.04.20; Hemorio, 07.04.20; Hemonorte, 20.04.20; Pró-Sangue, 27.04.20; FHB, 08.04.20; FHB, 20.04.20; Hemomar, 03.04.20; Hemogo, 01.04.20; Hemogo, 29.04.20
Offer of courses and events related to the demands of facing the pandemic	Updating of screening criteria, protocols, procedures and training for health workers	Hemoam, 03.04.20; Hemogo, 03.04.20; Hemogo, 24.04.20; Hemominas, 22.04.20

Source: Websites of Blood Service Networks. The measures mentioned in this chart were identified from the publications of the websites in the month of April/2020, which does not eliminate the possibility that other blood therapy services also adopted them.

and is qualified to perform the laboratory diagnosis of coronavirus, sending the material to be analyzed at the Molecular Biology Laboratory of

the Hemoce (Hemoce, 14.04.20). Also, since the beginning of April, the Hemominas Foundation joined the Redelab Covid-19 and has contributed

to the increase in the capacity of testing in SUS (Hemominas, 22.04.20).

Information technologies have been incorporated in order to streamline services and qualify the experience of donors in blood centers. The Pró-Sangue Foundation in São Paulo established a partnership with a specialized company that uses Artificial Intelligence in order to facilitate the search for information and clarify doubts of donors (Pró-Sangue, 01.04.20) and modernized its scheduling system through a partnership with a Brazilian startup company, giving the candidates greater agility and autonomy when scheduling or canceling their donations (Pró-Sangue, 13.04.20).

The maintenance of old strategies such as partnerships to encourage donation was mentioned on the websites visited, however, new partners and new strategies were also highlighted. A sanitation process to sanitize and eliminate agents that cause various infections was mentioned in Pará, through a partnership with the city halls of two municipalities (Hemopa, 30.04.20). In Bahia, a partnership was established with a transport service to disseminate information and a message was posted to encourage donation (Hemoba, 27.04.20). External collection in condominiums was adopted by Hemorio and this initiative has been expanded to other states. Many states have established partnerships with transportation applications to help in the travel to collection units (Hemoam, 14.04.20; Hemoce, 04.04.20; Hematology and Blood Therapy Center of Piauí - Hemopi, 06.04.20; Hemorio, 07.04.20; Hematology and Blood Therapy Center of Rio Grande do Norte - Hemonorte, 20.04.20; Pró-Sangue, 27.04.20) and/or free transportation for the round trip with a limited number of people inside the vehicle (FHB, 08.04.20; FHB, 20.04.20; Hemomar, 03.04.20; Hemogo, 29.04.20). Also, according to the initiative of the Court of Justice and the Secretariat of Public Security, the blood service network of the state of Goiás expects an increase in the number of donations, under Ordinance 01/2020 of the Court of Execution of Penalties and Alternative Measures, which determines that blood donation held from March to June 2020 will be equivalent to 35 hours of provision of services to the community by convicts (Hemogo, 01.04.20).

Blood centers have also promoted, in some cases articulated with other institutions, qualification and training related to the demands of facing the pandemic. The training includes updating of the screening criteria, rational use of personal protective equipment (PPE) to guide on

proper use (Hemoam, 03.04.20); security protocols (Hemogo, 03.04.20; Hemogo, 24.04.20); protocols and adjustments in teams (Hemominas, 22.04.20).

Discussion

Before the Covid-19 epidemic, blood stocks varied between states in Brazil, however, as of mid-March, some Blood Service Networks announced blood stocks, especially of the O and AB groups, positive and negative, were in critical levels, for example, in the states of Alagoas, Bahia, Mato Grosso do Sul, Espírito Santo, Maranhão, Rio Grande do Norte, Rondônia, Minas Gerais, Rio de Janeiro and São Paulo¹¹. The supply and destocking situation continued in Blood centers in Brazil during the month of April, as shown here, justified by the adoption of the necessary social distancing measures to contain the spread of the SARS-Cov-2 virus.

Social distancing measures⁶ included the interruption of activities in the community and specifically the closure of donation centers/units in many areas around the world, causing an impact on the offer of “priceless resources” to health⁴. Therefore, the significant reduction in the number of blood donations is confirmed as a repercussion of the social restrictions made by governments to combat the spread of Covid-19¹². For example, in New York City there was a significant reduction in blood supply during the week of March 16, 2020, when schools, businesses and religious institutions were closed due to the coronavirus outbreak⁴.

In China, the first country to record SARS-Cov-2 cases, strict social distancing measures effectively contained the virus; however, the mobility restrictions implemented also had a profound impact on the health system, including a reduction in blood donation in many areas of the country, requiring initiatives and strategies to ensure blood supply¹.

In this sense, it should be noted that social distance and its consequence on blood stocks brought the need to reorganize blood therapy services and include new strategies and actions to ensure blood supply in several countries, including Brazil, as the present study revealed. Thus, safety and precautionary measures for donation candidates, patients and workers, as well as new routines, flows and technologies were incorporated in the services, including the adoption of protocols, information and communication

technologies, offering diagnostic tests to Covid-19, and actions to encourage donation were intensified along with old and new partners.

Since the beginning of the first cases of Covid-19 in Brazil, blood centers have incorporated routine donations to ensure the blood supply and avoid crowding in services, the provision of transportation services for commuting, the expansion of waiting room environments, protocols with guidelines for the disposition of chairs in the waiting room and in the donation room, use of PPE and intensification of cleaning¹¹. In addition, the epidemic also added a new profile of users entering the collection room, which should be screened according to new criteria established and subject to updating according to the behavior of the pandemic. During this period, donor and worker safety must remain a priority for any collection and transfusion service, which implies the adoption of a set of measures⁸, including the provision of training on the proper use of PPE and application universal precautions for the safety of workers⁹.

Studies report the experiences of several countries in the world in the pandemic and the measures adopted to maintain and ensure the blood collection and supply system. Actions range from raising awareness to stimulating donations through information resources, media and communication^{1,2,5} to the adoption of new protocols, flows and routines, such as screening blood donors⁵, implementing protocols of no shows and review of transfusion requests¹³, adoption of a patient's blood management program (PBM) using information systems^{2,14}, patient-centered approach, application of good practice consensus¹², change in the dynamics of hospital activities that change routine operations into pandemic and urgent operations¹³, among others.

Also in the set of strategies to mitigate blood shortages, medical information campaigns on the appropriate thresholds for transfusion and appropriate use of pharmaceutical products⁹ have gained attention and have been incorporated into the routine of services as well as the organization in the provision of care and dispensing of blood products to patients who depend on them as therapeutic resource in several countries. For example, in the United Kingdom, national expert advice from a Covid-19 working group has been implemented for medical updating, with practical guidance and counseling for the optimal use of blood products and methods to mitigate the use of blood in patients with hemoglobin diseases¹⁵.

A Technical Note published by Rede CoVida in Brazil presented a review of recommendations for the planning and organization of blood therapy services, with a view to guaranteeing the blood supply to the needs of the health system and the supply of convalescent plasma for the tests in the treatment of Covid-19¹⁶. The importance of planning and organizing services to respond to events was pointed out as “lessons learned from this pandemic” by representatives of banks and transfusion departments from different countries around the world⁹.

For the discussion, it is important to note that the dissemination of the new coronavirus also produced an intense debate on blood safety, including the issuance of recommendations by health authorities, emphasizing the lack of scientifically documented evidence of transmission by blood transfusions¹². For example, in Italy, recommendations with preventive measures for the transmission of SARS-CoV-2 were published and updated in several versions/decrees². In Brazil, technical notes were also published informing the criteria for clinical screening for dengue (DENV), chikungunya (CHIKV), zika (ZIKV) and coronavirus (SARS, MERS, 2019-nCoV) in blood donation candidates¹⁷ and the criteria related to the risk of infection by SARS-CoV-2 are updated¹⁸. These notes clarify criteria that generate temporary disqualification for donation, which in the case of Brazil the danger of returning to epidemics due to arboviruses needs to be taken into account¹⁹ and presents general guidelines for the functioning of blood therapy services to prevent the spread of the virus and protect the health of patients, donors and workers, which to some extent affects the number of donations and stock conditions.

Finally, this study showed that the adoption of social distancing measures required changes in the routine and organization of the blood collection and supply system, but such necessary and effective measures – in the context of a pandemic with rising growth in Brazil, with registration of 431.609 confirmed cases on May 28, 2020 (<https://painel.covid19br.org/>) – should take into account, for the sake of flexibility, the monitoring of the epidemiological situation, the speed of transmission of the epidemic and the number of cases²⁰. Thus, in order to meet the demands of health services with regard to blood products, the dissemination, sharing and incorporation of strategies, practices and routines by Blood Centers should be fully active in this context of a pandemic.

Final considerations

This study showed that the epidemiological situation and the necessary measures for its control influenced blood stocks conditions and availability and, consequently, demanded changes in the organization of blood therapy services.

As in other countries, in the Brazilian reality, the adoption of distancing measures has required a reorganization of blood therapy services. Strategies, actions and routines have been incorpo-

rated and/or intensified to ensure protection, mitigate the risks of spreading the virus, and guarantee the supply of blood and blood components to meet the needs of the health system.

Therefore, the strategies and new routines incorporated by services, discussed in this article in the light of experiences in other countries, are important and must be maintained and implemented in order to contain the epidemiological situation of the Covi-19 pandemic and mitigate the health risks of population.

Acknowledgements

I am grateful for the support in the collection and updating of the matrix of news from the Blood Service Networks through the Observatory of Political Analysis in Health of the Institute of Collective Health (OAPS/ISC/UFBA) and the scientific support of the CoVida - Science, Information and Solidarity Network (Cidacs/Fiocruz and UFBA).

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Article submitted 28/05/2020

Approved 07/10/2020

Final version submitted 09/10/2020