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# HEMATOPOIETIC CELL TRANSPLANTATION (HCT) FOR ALL: A REPORT FROM THE 2024 CONGRESS OF THE BRAZILIAN BONE MARROW TRANSPLANTATION AND CELLULAR THERAPY SOCIETY (SBTMO)

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## ABSTRACT

This article analyzes current data, and the main challenges faced in Hematopoietic cell Transplantation (HCT) in Brazil, as presented at the SBTMO 2024 meeting, with the aim of guiding future actions. Topics discussed included the waiting list for HCT transplants, access to beds for adults and pediatric patients, and the need for a more efficient distribution of resources across the country. Among the identified needs were the creation of a program to expand access to transplants through the Brazilian Unified Health System (SUS), the importance of health registries for data-driven decisions, and the development of the "Mais Saúde Amazônia" project to expand transplant centers in the Amazon region. Additionally, the provision of financial incentives for transplant centers, the implementation of mentorship programs to increase access to HCT, and the formation of a cooperative network between SBTMO (Brazilian Society of Bone Marrow Transplantation and Cellular Therapy), ABHH (Brazilian Association of Hematology, Hemotherapy, and Cellular Therapy), ANVISA (Brazilian Health Regulatory Agency), ABRALE (Brazilian Association of Lymphoma and Leukemia), and INCA (Brazilian National Cancer Institute) to improve the integration of HCT services were discussed.

**Keywords:** Hematopoietic Stem Cell Transplantation. Brazil. Adult. Pediatrics.

## INTRODUCTION

There are significant challenges for Hematopoietic Cell Transplantation (HCT) in Brazil[1]. Although the country has the largest public organ, tissue, and cell transplant program in the world, access to transplantation is hindered by an insufficient number of active beds for adults and even scarcer availability for pediatric patients. Despite this, there is a long waiting list that exceeds 65,000 individuals, with most of these patients waiting for solid organ transplants such as kidneys, livers, and lungs[2]. Additionally, there is a significant demand for HCT, which is a critical area requiring urgent attention. These issues were discussed with members of SBTMO, the president of ABHH, the manager of the Blood, Tissues, Cells, and Organs Management (GSTCO/2nd Directorate of ANVISA), the coordinator of REDOME (Brazilian Bone Marrow Donor Registry/INCA), and the CEO of ABRALE with the goal of improving the situation.

## HCT IN BRAZIL

According to the Ministry of Health in Brazil, 88% of HCT are performed through the SUS, while 12% are carried out in private centers[1]. Brazil also has the third-largest donor registry in the world, the Brazilian Registry of Bone Marrow Donors (REDOME), which has over 5.5 million registered donors[2,3].

Currently, Brazil has 275 accredited medical transplant teams across 133 establishments: 133 for autologous transplants only, 82 for related allogeneic transplants, and 60 for unrelated allogeneic transplants. Most of these centers are concentrated in the Southeast and South regions of Brazil[4].

In 2023 and 2024, 50 new teams were authorized for autologous transplants, 33 teams for both autologous and related allogeneic transplants, and 8 teams for autologous, related allogeneic, and unrelated allogeneic transplants[4].

In 2023, according to data from the Data System of the Unified Health System (DATASUS), 2,959 bone marrow transplants were performed through the SUS. Of these, 1,851 were autologous transplants, 883 were with related donors, and 225 were with unrelated donors[4].

However, there is a significant demand for patients waiting for transplants, both autologous (for conditions such as multiple myeloma, lymphomas, and germ cell tumors) and allogeneic (particularly for acute leukemias, bone marrow failure syndromes, myelodysplastic syndromes, myeloproliferative disorders, and sickle cell anemia). Currently, there is no available data on the number of patients on the waiting list for bone marrow transplants in Brazil in the Brazilian Transplant Registry (RBT)[2]. It is important to emphasize that there no mandatory registry for HCTs performed in private hospitals, so we lack accurate data in this sector.

The waiting list for bone marrow transplants represents one of the greatest challenges. In addition to high demand, the time between diagnosis and transplant is influenced by the limited availability of specific HCT beds, as well as access to treatment, which depends on socioeconomic, ethnic, and cultural factors, the structure of public and private health systems, and the availability of a compatible donor or the appropriateness of the recipient for transplantation[5].

According to the HCT waiting list survey conducted by SBTMO on July 23, 2024, across 63 transplant centers, 1,762 patients were awaiting a HCT, with 1,164 waiting for autologous transplants and 598 for allogeneic transplants (Figure 1). Of these, 1,015 patients were on the waiting list at public centers, 556 at mixed centers, and 191 at private centers (Figure 2).

In this survey, a questionnaire was used to assess the practice of reporting transplant data. It was found that 85.7% of the centers report their data, with 68.3% reporting it to the SBTMO/CIBMTR platform, 65.1% to ABTO/RBT, and 23.8% to other platforms. The data from the 63 centers analyzed in this study represent 49.7% of the transplants performed in 2023. Among these, 67.7% were allogeneic transplants.

When analyzing the Brazilian states with the highest number of patients on the HCT waiting list, São Paulo leads with 523 patients, followed by Minas Gerais with 214, and Ceará with 184 patients (Figure 3). At the Walter Cantídio University Hospital/UFC/EBSERH in Ceará, the HCT service has been receiving patients from other regions and expects to perform over 100 transplants in its HCT service alone this year.

According to data from the CIBMTR (Center for International Blood and Marrow Transplant Research), 12,230 transplants were performed in Brazil between 2012 and 2023. Of these, 5,573 were autologous transplants and 6,657 were allogeneic, with a predominance of allogeneic transplants, as data on autologous transplants are not fully reported[5]. The primary indication for transplantation is multiple myeloma, and infection is the leading cause of death within 100 days after the procedure, highlighting the crucial importance of addressing this problem in Brazil[6].

Another unmet need in HCT in Brazil is that, despite having 165 teams authorized to perform unrelated HCT through SUS, there are insufficient available beds. Additionally, according to the REDOME, there is a shortage of collection centers to meet the demand for harvesting stem cell products for these transplants. This delay increases the risk of death for patients awaiting this potentially curative therapy.

## PEDIATRIC HEMATOPOIETIC CELL TRANSPLANTATION IN BRAZIL

There is a clear need to increase the number of pediatric transplants in Brazil, especially in the North, Northeast and Central-West regions. The limited availability of pediatric transplant beds and the lack of specialized care for infants and children with rare diseases are significant constraints. According to data from the SBTMO/CIBMTR Multicentric HCT Registry, between 2012 and 2023, out of the 6,657 allogeneic transplants performed, the age group of 0 to 9 years had the highest number of procedures, with 1,195 transplants. Most of these procedures were carried out in centers in Brazil's Southeast and South regions. The primary indications for allogeneic HCT in children were non-malignant diseases, acute lymphoblastic leukemia (ALL), and aplastic anemia. Infection is also the leading cause of death within 0 to 100 days after transplantation among these patients[6].

According to the 2023 analysis of the Brazilian Transplant Registry, there is a significant disparity in the performance of pediatric transplants across different regions of Brazil, with a concentration in the South and Southeast regions, particularly in Curitiba and São Paulo. These discrepancies highlight the difficulties in accessing these procedures caused by the scarcity of specialized centers in various regions[7]. The lack of centers in different cities in the North, Northeast, and Central-West regions highlights the urgent need for a more accurate assessment of transplant demand. This evaluation will enable the mapping of available beds within SUS and promote more significant equity in access to transplants across different regions of the country[7].

## BRAZILIAN SOCIETY OF BONE MARROW TRANSPLANT AND CELLULAR THERAPY (SBTMO)

The SBTMO has experienced significant growth, with 1,537 members in 2024, reflecting a 64.7% increase from the 542 members registered in 2020. The SBTMO also has partnerships with other organizations in the field, such as EBMT, ASTCT, LABMT, and WBMT[8].

The SBTMO publishes an online journal, the Journal of Bone Marrow Transplantation and Cellular Therapy (JBMTCT), which is the first in Latin America dedicated to this topic. In its 17th edition, JBMTCT had 8,000 users in 2023 and over 35,000 page views. Between 2020 and 2024, the journal received 59 citations on Google Scholar, 24 on OpenAlex, and 19 on CrossRef, and holds a Qualis C rating and an H-index. The SBTMO consensus guidelines, including the Brazilian HCT Consensus and the Pediatric HCT Consensus, are periodically updated in JBMTCT and have played a crucial role in guiding transplant practices in Brazil and across Latin America[8,9].

Through its partnership with CIBMTR, the number of centers reporting their data to this platform has grown to over 92 centers, with 35 active HCT centers in 2023 and 1,922 new HCTs registered, coordinated by the SBTMO data managers group[6,8]. These reporting centers are certified by SNT. The CIBMTR Data Back to Center (DBtC) tool returns this information to SBTMO, contributing to the establishment of the Brazilian HCT Registry, which captures data on both HCT and CAR-T cell infusions.

The summary slides with general outcomes of HCT are published annually in JBMTCT[6]. In addition to this published information, SBTMO promotes various educational initiatives, such as regional and national meetings, interactions with FACT, and the "Young Transplant Program," which are fundamental for training residents and young professionals. The GEDECO, SBTMO's scientific working group,

has also significantly contributed by publishing numerous collaborative studies in prestigious scientific journals[8].

## PROPOSALS AND PERSPECTIVES

During the meeting, several proposals were discussed, which can be summarized to guide future efforts to improve HCT in Brazil[2]:

1. **Creation of a Program to Simplify Access to Transplantation within SUS:** Develop a program to facilitate access to transplants for SUS patients across all Brazilian states, aiming to standardize and expand the available services.

**2. Importance of Health Registries:** Emphasize the need for detailed health registries so that managers can make informed decisions. Expand access and reduce health disparities based on recorded data.

**3. Development of the "Mais Saúde Amazônia" Project:** Promote the establishment of new transplant centers in the Legal Amazon region, where there is currently only one center in Belém (Pará). Encourage the growth and expansion of transplant services in the area.

**4. Financial Incentives for Transplant Centers:** Propose greater financial incentives for transplant centers to increase the number of transplants performed and improve their capacity to provide care.

**5. Mentoring to Expand HCT Access:** Implement mentoring programs to expand access to HCT in more locations, fostering the formation of new teams and the expansion of services.

**6. Formation of Cooperation Networks:** SBTMO and ABHH should form a network with entities such as REDOME, ABRALE, and ANVISA to improve collaboration and integration of HCT services.

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**FIGURE 1: Hematopoietic cell Transplantation Waiting List in Brazil by Type of Transplant**

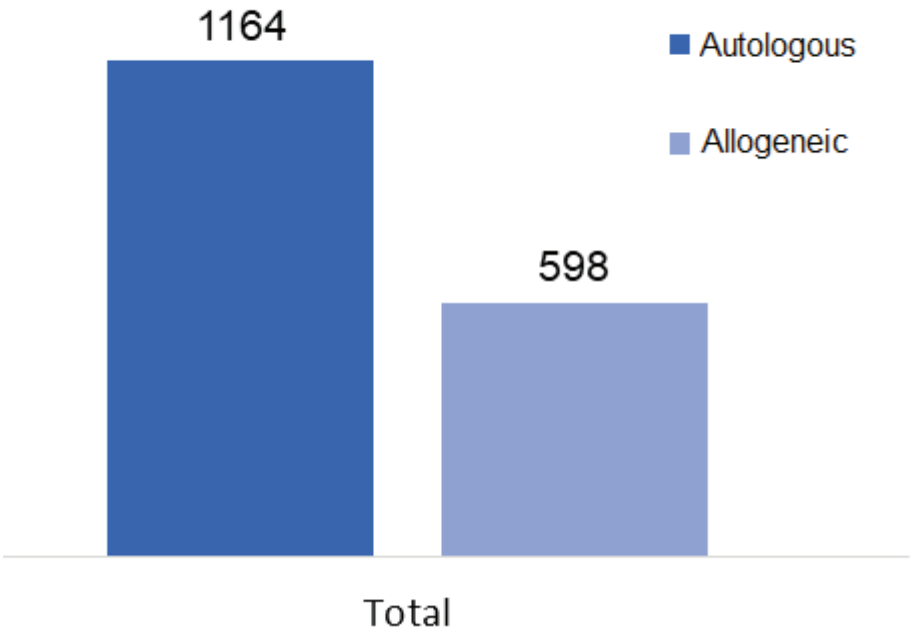


**FIGURE 2:** **Distribution of patients submitted to an Hematopoietic cell Transplantation by Type of Center**

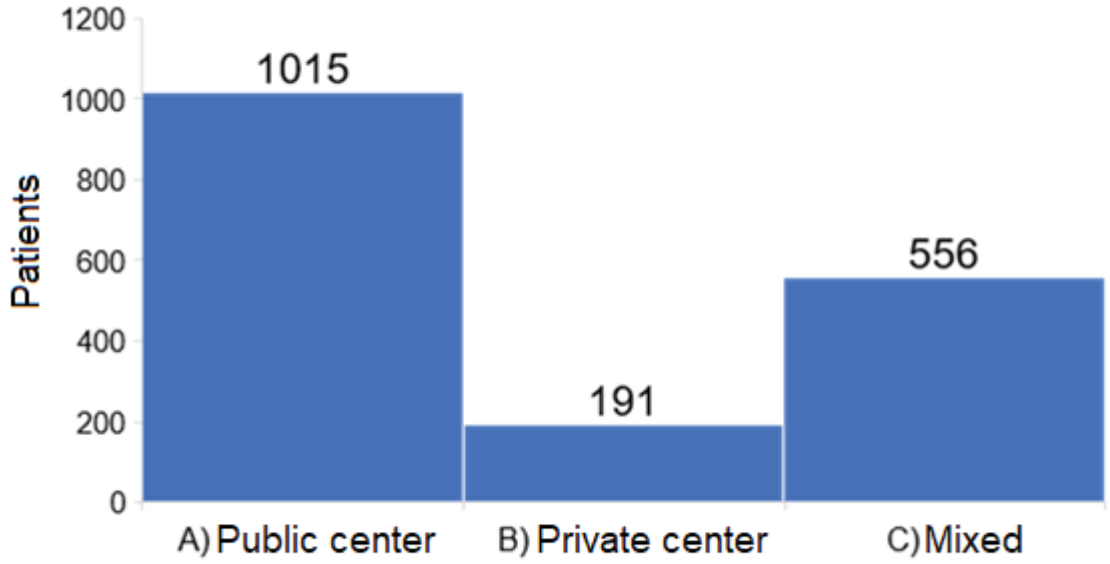
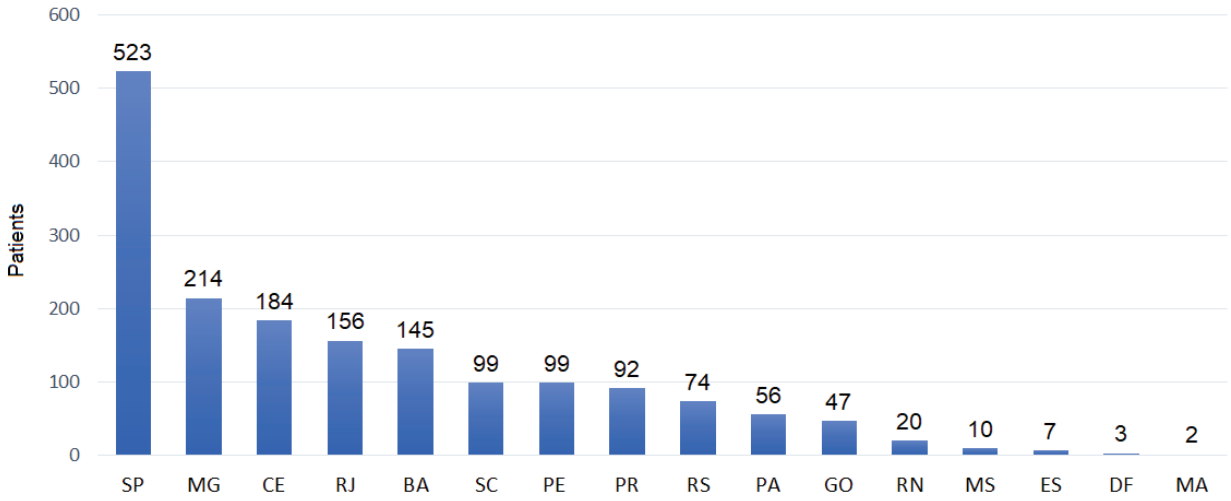



**FIGURE 3:** **Distribution of the waiting list by State for Hematopoietic cell Transplantation in Brazil**



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