


REDMO

2023



**JOSEP
CARRERAS**
Leukaemia Foundation

REDMO.
Bone Marrow Donors Registry



**JOSEP CARRERAS
FOUNDATION
AND THE BONE
MARROW DONORS
REGISTRY**



JOSEP CARRERAS
Leukaemia Foundation

REDMO
Bone Marrow
Donors Registry

Josep Carreras Leukaemia Foundation was created in 1988 with the aim of finding a definitive cure for this disease and improving patients' quality of life. Its work focuses on **four basic areas**: searching for compatible donors for patients in need of a transplant who do not have a compatible family member through the Bone Marrow Donors Registry (REDMO) programme; supporting scientific research, especially that carried out by Josep Carreras Leukaemia Research Institute; providing patients and their families with medical and social guidance through the Patient Experience Programme and welfare flats for patients who have undergone treatment and are required to spend long periods away from home.

REDMO was created by Josep Carreras Foundation in 1991. It became fully operational in 1994 when it was incorporated into the public health system with the signing of the **first framework agreement between Josep Carreras Foundation, the Ministry of Health and the National Transplant Organisation (ONT).**

REDMO is **Spain's only official programme entrusted with managing the database of bone marrow donors** (data that is received directly from the autonomous communities), searching for compatible donors across the world for Spanish patients, and coordinating the transport of bone marrow, peripheral blood and umbilical cord blood from donation sites to transplant centres. REDMO also receives requests from registries in other countries to search for Spanish donors who are compatible with foreign patients.



Josep Carreras
President of Josep Carreras
Leukaemia Foundation



**REDMO, A REGISTRY
CERTIFIED BY THE
WORLD MARROW
DONOR ASSOCIATION**



JOSEP CARRERAS
Leukaemia Foundation

REDMO
Bone Marrow
Donors Registry



In 2023, REDMO spent a number of months preparing to pass an audit by the World Marrow Donor Association (WMDA), an entity that represents all marrow donor registries in the world and establishes the quality and safety standards that must be met.

The goal of the audit was to obtain WMDA certification, which would recognise REDMO as a donor registry that ensures that each and every stage of the process, from donor recruitment to follow-up after the progenitor cell donation process, always complies with every international standard and treats donors with the utmost care to guarantee their safety and well-being.

In February 2019, REDMO passed the first stage, which was certification. This was valid for four years, so in 2023 it was required to pass the next and final step in the process, i.e. certification.

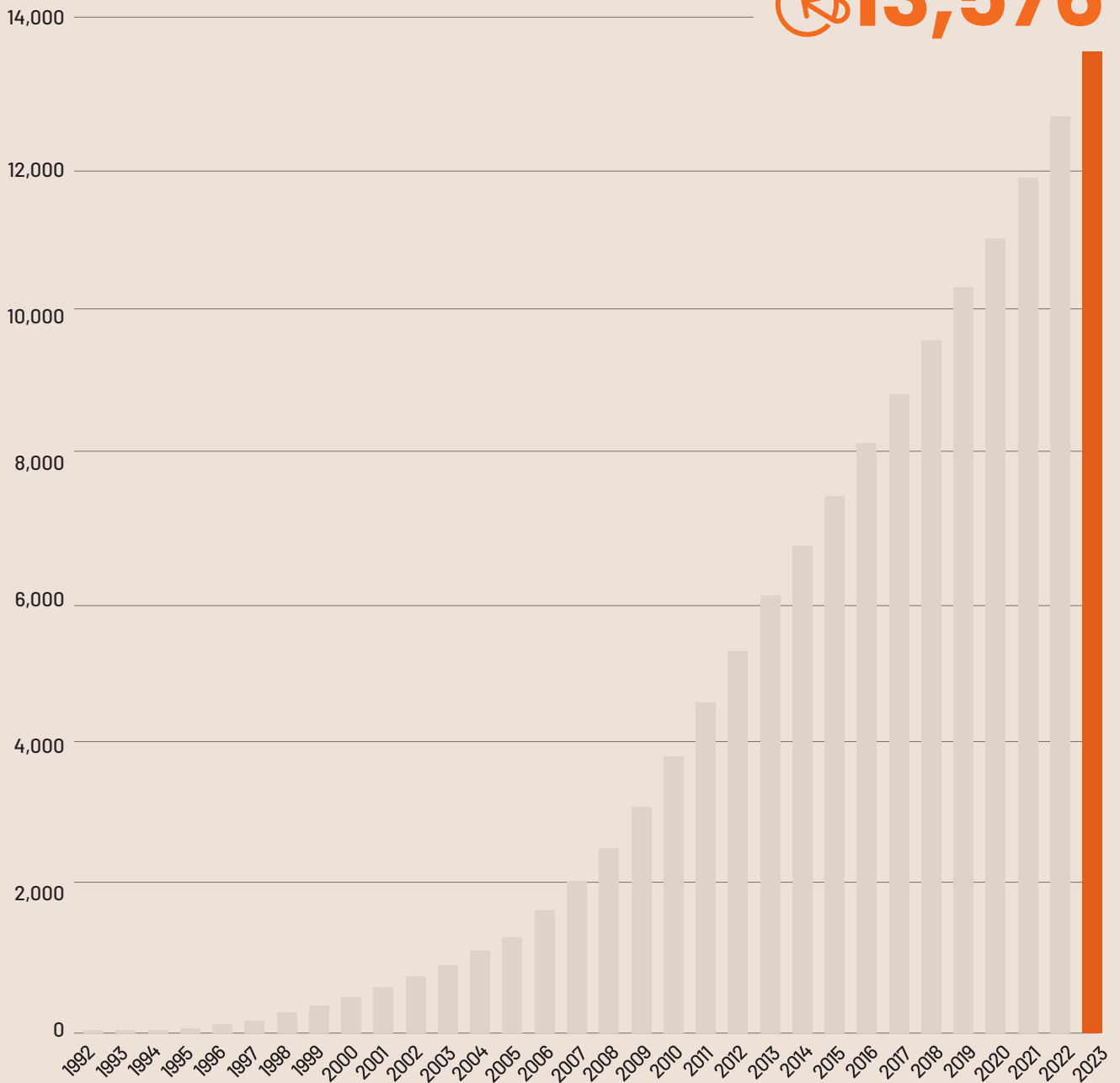


In March 2024, we received the news that REDMO had achieved certification!

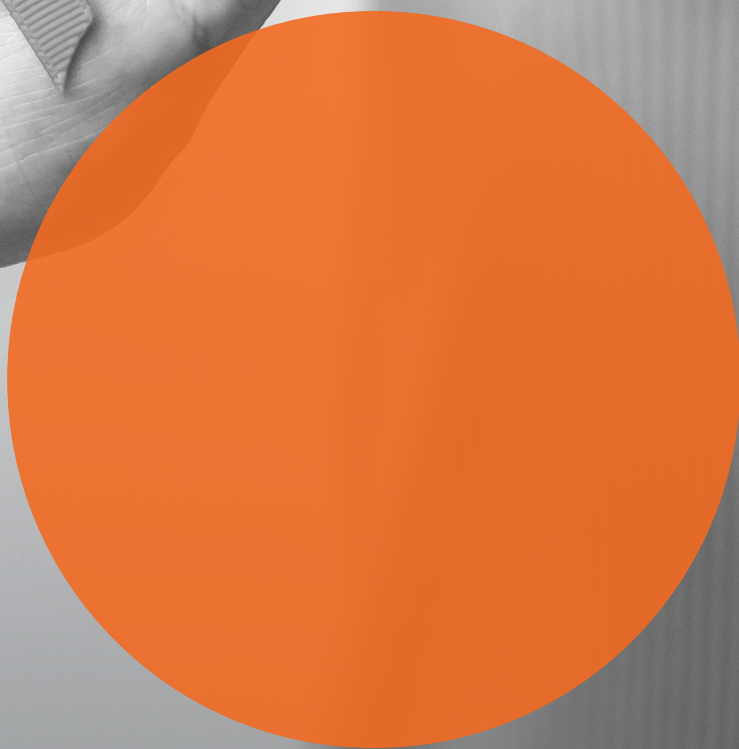
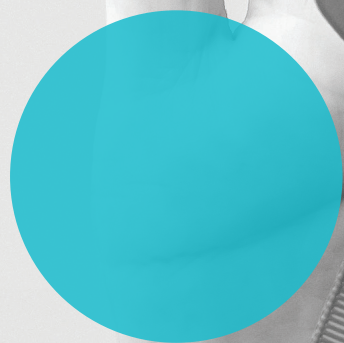
GLOBAL ACTIVITY

Since its inception, REDMO has coordinated **13,576 transplants for patients all over the world**. We would like to thank the **6,301 Spanish** and **7,275 international** donors whose generosity has allowed us to give patients in need a second chance at life

 **13,576**



DONORS



JOSEP CARRERAS
Leukaemia Foundation

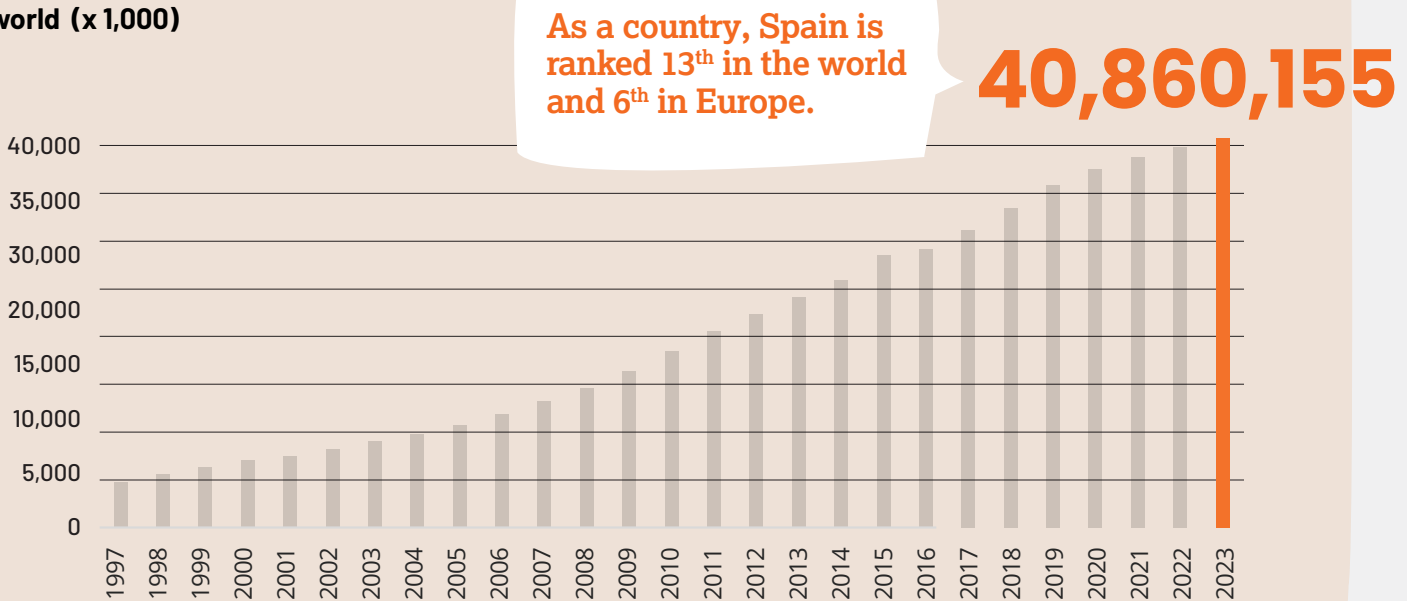
REDMO
Bone Marrow
Donors Registry

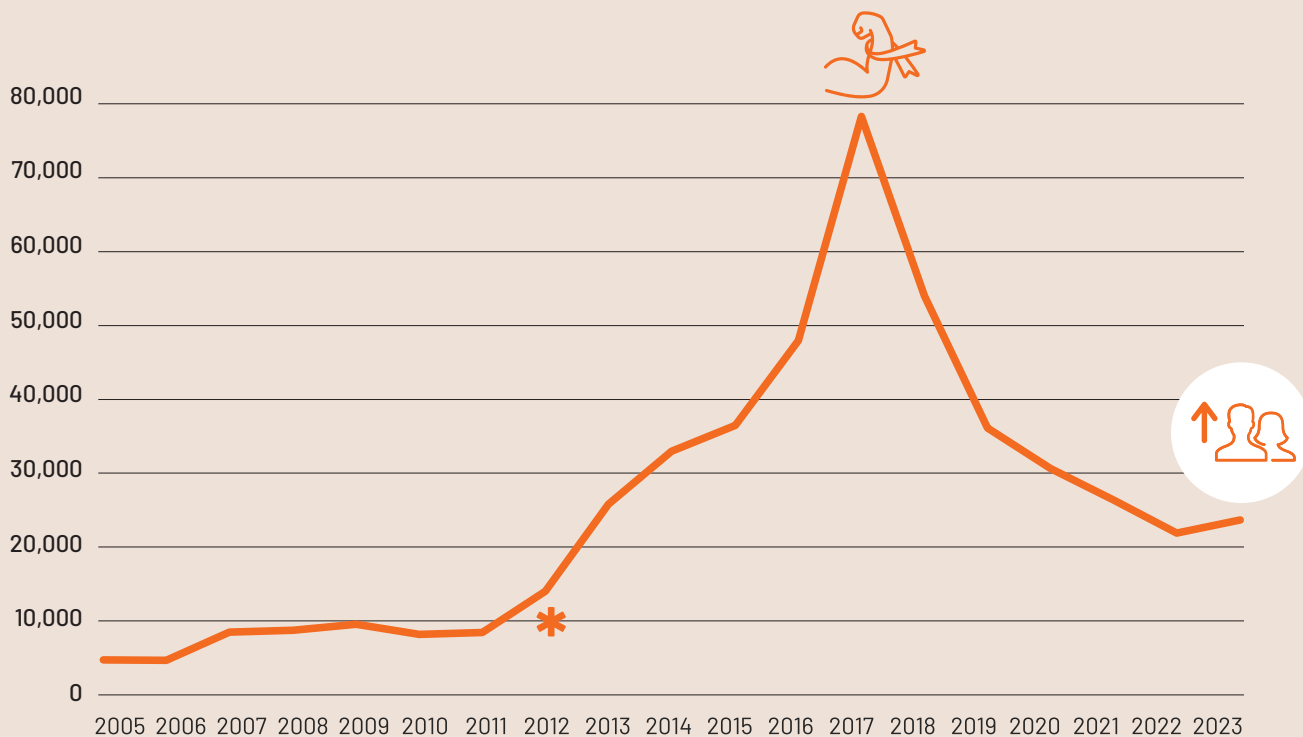
SPANISH DONORS

We are very close to achieving the National Bone Marrow Plan's target of 500,000 active donors in REDMO.




Evolution of donors available in the world (x 1,000)





* In 2012, successive National Bone Marrow Plans (PNMOs) were launched with the aim of increasing the number of bone marrow donors in Spain.

 **Pablo Ráez** suffered from leukaemia and decided to launch a major social media campaign to raise awareness of bone marrow donation. His testimonial made it possible to dramatically increase the number of new donors. After the negative effects of the pandemic, we finally recovered our growth trend in this regard.

In 2023, the Josep Carreras Foundation, the National Transplant Organisation and all autonomous communities wanted to carry on with the “The Match of Your Life” campaign that was launched in 2019. The tour took us to 17 cities in Spain and Andorra and was a great success, given that we managed to significantly increase the number of donors added to REDMO, with **23,686 new donors**.

UN
MATCH
X UNA
VIDA

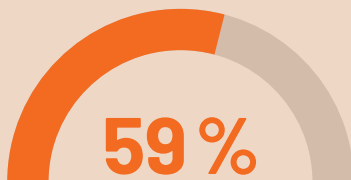
MATCH
TOUR

REDMO improved not only quantitatively but also qualitatively.

Donor information is becoming increasingly comprehensive.

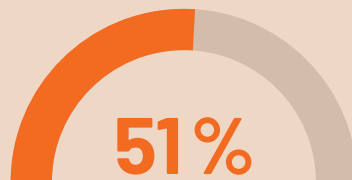
When it comes to selecting the most compatible donors for a patient, the characteristics that influence transplant outcomes are growing every day.

For that reason, donor centres are increasingly studying and updating donor data:



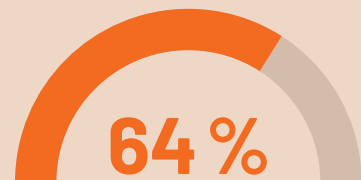
HLA TYPING

59% had full typing*
(28% increase with respect to last year)



AGE

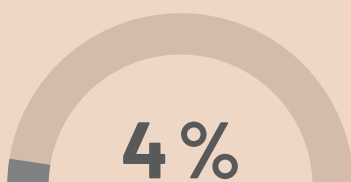
51% of donors were under the age of 40



SEX

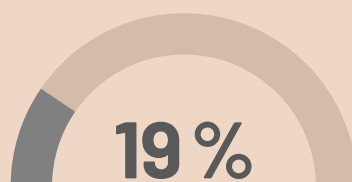
64% of donors were women

Historically, the most important factors when selecting a donor for a patient were donor typing and the donor's age and sex. To improve transplant outcomes, compatibility in more aspects is increasingly being sought. Donor centres and REDMO have recently been working to improve these three factors.



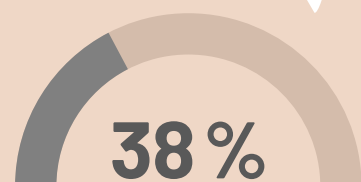
CYTOMEGALOVIRUS (CMV)

4% of donors have been tested for CMV
(228% increase with respect to 2022)



DONOR RETENTION

19% of donors were contacted to confirm availability



BLOOD GROUP

38% have blood group information
(51% increase with respect to last year)

* **Typing:** genetic markers required to assess compatibility between a donor and a patient.

A DONOR'S JOURNEY

1 Registration, typing, and addition of new donors to REDMO

The donor registration process begins by checking that the donor is aware of the commitment involved in becoming a bone marrow donor. If donors accept this commitment in a voluntary and altruistic way, they are required to sign a consent form and provide a blood or saliva sample to perform HLA typing.

Once registered, the donor's demographic and HLA typing data is entered into REDMO's database by the donor centre and the donor then becomes part of the global donor database.



23,686

new donors in 2023

2 Search for compatible donors

Once donors have been added to REDMO, they become available to any patient in the world who needs a donor.

In the process of searching for an unrelated donor for a patient, it may be necessary to carry out extended donor typing (if not complete) or to request a sample to confirm the donor's typing profile, availability, and physical condition.



32,434

searches in 2023

3 Extended HLA typing information for each chosen donor

This work is carried out by a laboratory. Generally, the laboratory that registered the donor retrieves the stored sample to do this extended typing.

In 2023, extended typing increased by 12% compared to the previous year.



1,170

extended typing in 2023



One of the objectives set by the National Bone Marrow Plan (PNMO) was to carry out this process in 14 days and we reached this goal.

4

Donor verification requests

Donors who have enough information to be selected are required to confirm that the information is correct. In 2023, REDMO processed 2,032 requests. These consist of:

Completion of a medical and availability questionnaire. The objectives of the questionnaire are as follows:

- To check that the donor is healthy.
- To assess whether they have any mild conditions that might affect the patient.
- To study whether they are affected by any temporary situations (such as a recent piercing or tattoo) that could delay the transplant due to the so-called “window period”.
- To check the donor’s logistical availability in the next six months.
- To confirm that the donor understands the two donation methods and find out if they have any physical or personal impairments that could prevent either method.

Taking of blood samples to:

- Confirm HLA typing at the transplant centre.
- Analyse basic infectious studies at the donor centre to prevent transmission to the patient (hepatitis, HIV, etc.).



1,934

medical questionnaires were conducted in 2023



1,432

samples were sent in 2023

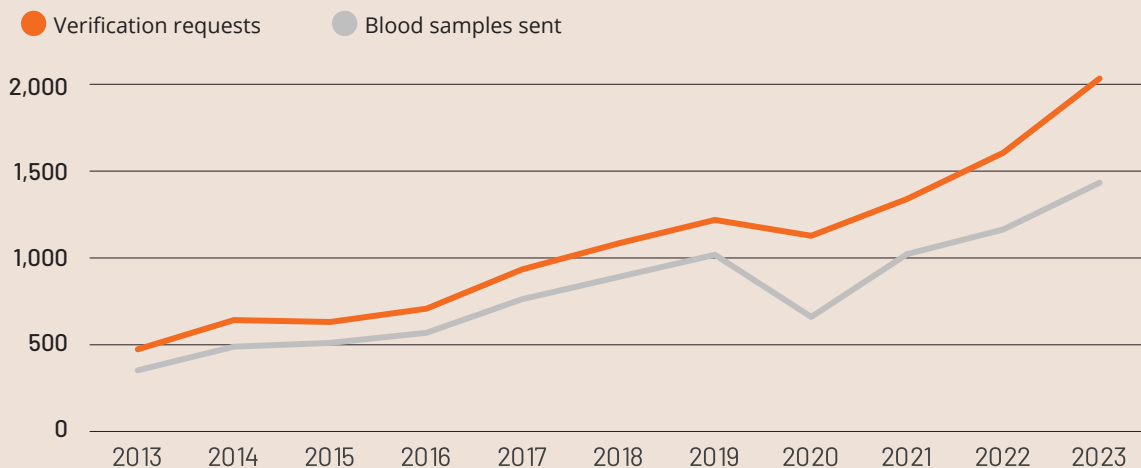
When donors were unavailable, this was mainly due to:

- Clinical conditions (temporary or permanent): 128
- Voluntary cancellations: 110
- Inability to contact donors: 98



This entire process, from request to sample extraction, was carried out in an average of 10 days, as established by WMDA standards and the National Bone Marrow Plan (PNMO).

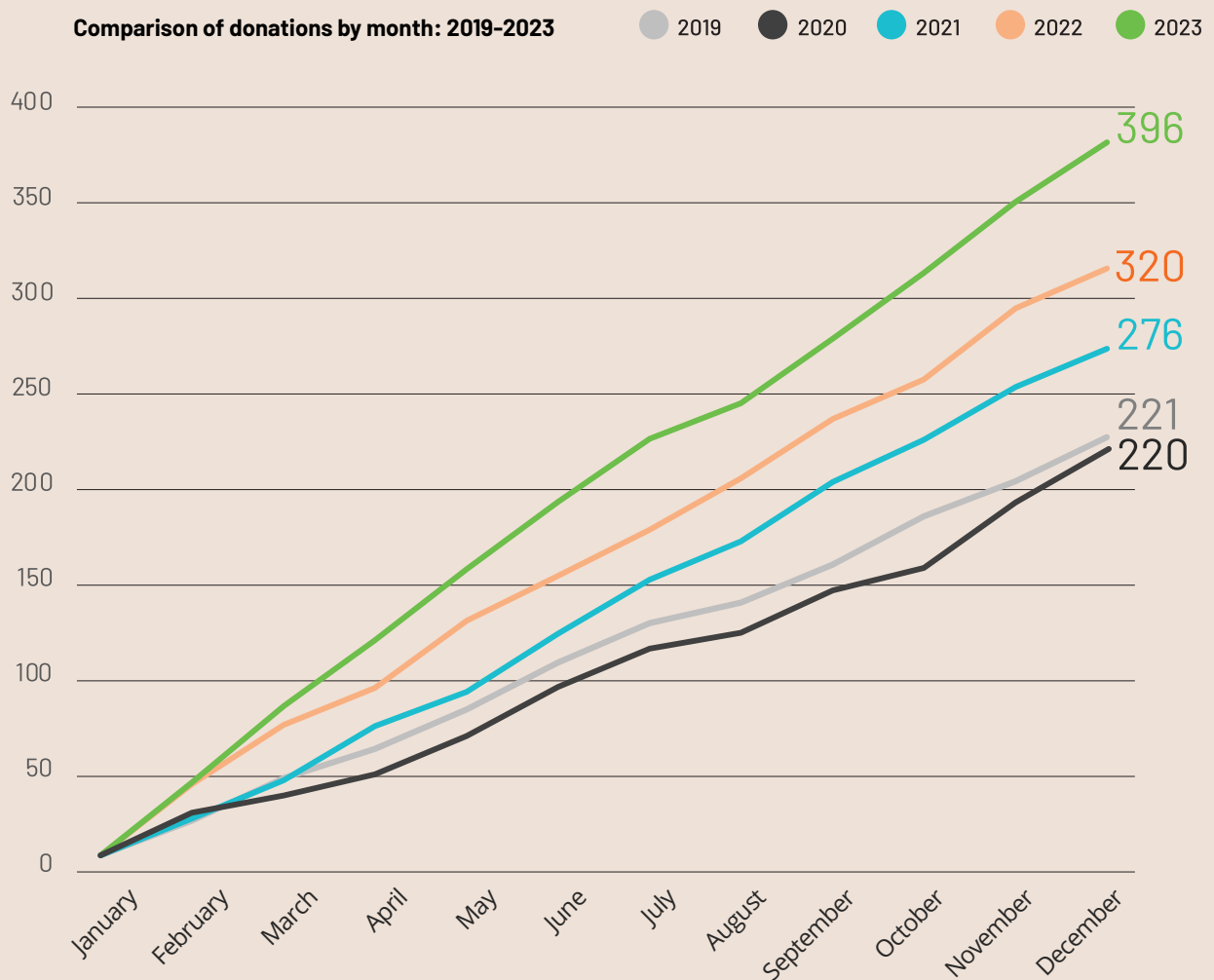
The availability of our donors was 81%, which exceeds the target set by WMDA.





5 Requests for collection of haematopoietic progenitors

In addition to reaching almost half a million donors, the qualitative improvements in our donors allowed us not only to make our donors more visible to other registries, but also to strengthen our position as a high-quality registry. This means that more and more transplant centres are choosing REDMO-registered donors for their patients. We received **642** requests for the collection of haematopoietic progenitors (54% international patients). Of these, 62% resulted in an actual donation (n=396).



Donor availability rate at the time of the donation was 91%, which was just three points short of the goal set by WMDA.

In the other cases, the process was temporarily or permanently cancelled by the patient or the donor.

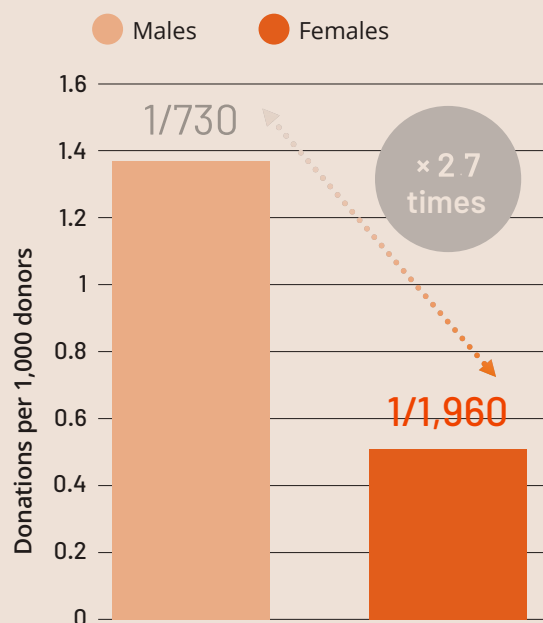
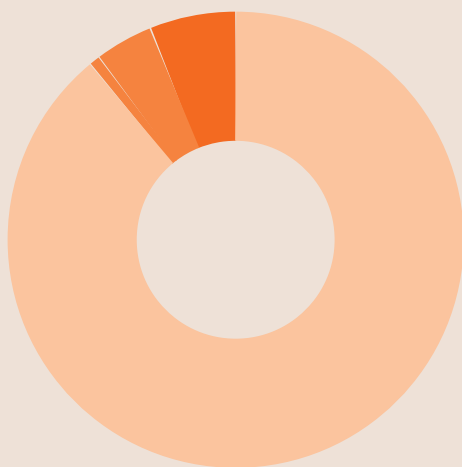
Most **effective donors** were male (60%), and the average age was 27 years. Right now, the probability that a male donor will make an actual donation is 1 in 730 active donors. In the case of women, it is 1 in 1,960.

Compared to 2022, there was a 16% increase in men, but for women, the probability of being selected increased by 28%.

Peripheral blood

Bone marrow

Lymphocytes



In terms of products collected, **87% came from peripheral blood**. Bone marrow accounted for just 6%, while lymphocytes (subsequent donations for the same patient) accounted for 6% of donations in 2023.

6 Post-donation follow-up

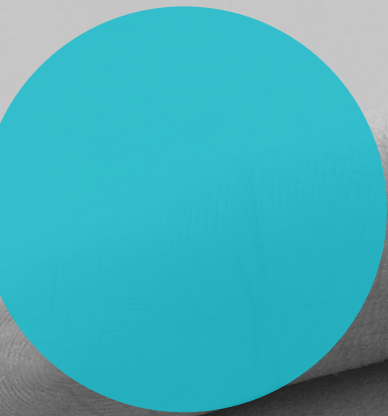
After the actual donation, REDMO follows up with the donor 24 hours after the donation and then after one week (in addition to subsequent annual follow-ups).

These follow-ups indicated that, in the case of bone marrow donation (n = 22), 91% of donors expressed slight discomfort 24 hours after donation. A visit to the collection centre was required in just one case.

In the case of peripheral blood (n = 346), 51% reported no discomfort at 24 hours. An assessment by the collection centre was necessary in just three cases. The most common types of discomfort were tiredness (33%) and muscle pain (25%).

In both donation methods, **85% of donors had returned to their normal activity within a week of donation.**

UMBILICAL CORD BLOOD UNITS



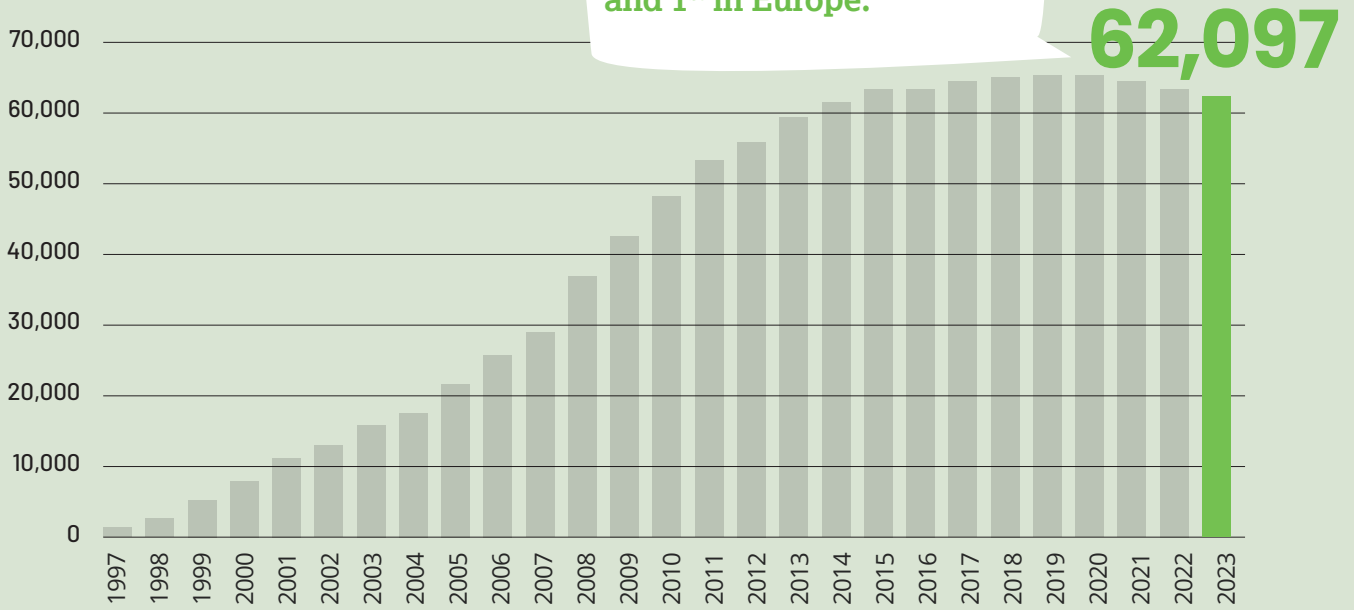
JOSEP CARRERAS
Leukaemia Foundation

REDMO
Bone Marrow
Donors Registry

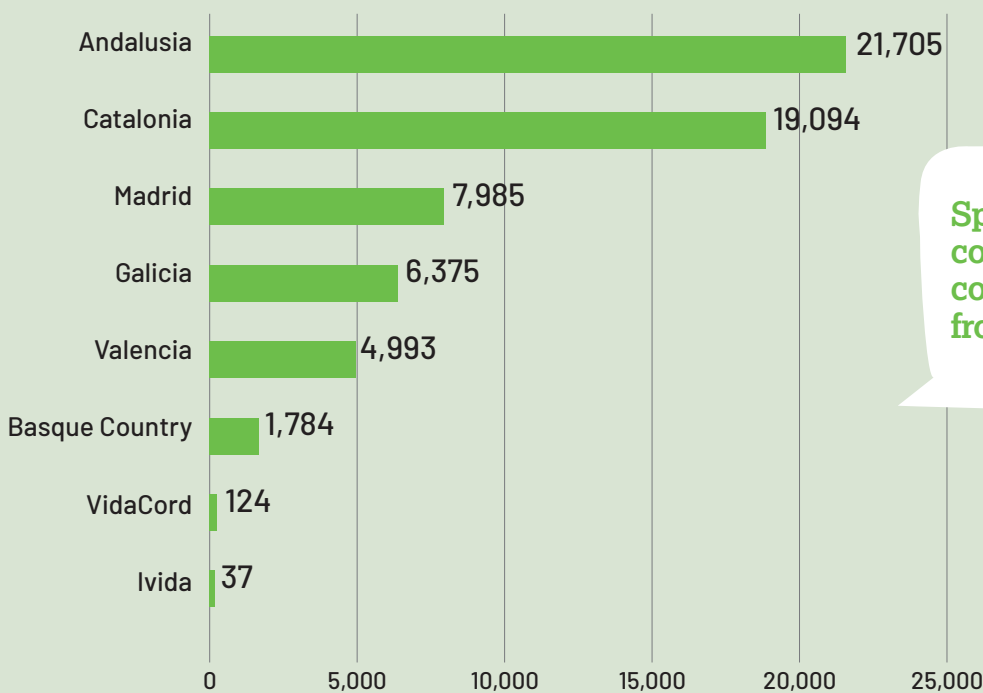
UMBILICAL CORD BLOOD UNITS

There are 805,525 cord blood units available in the world. As a country, Spain is ranked 2nd in the world and 1st in Europe.

Evolution of CBU available



Distribution of units by banks



Spain has eight umbilical cord blood banks that collect cord blood units from all over the country.

To improve the registry, the National Umbilical Cord Blood Plan (PNSCU) began to promote cryopreserved units, which are **rich in blood stem cells**.

Whenever an umbilical cord unit is requested for a patient, the post-thawed unit must be checked for viability and quality.

Until now, these studies were conducted **only** when a transplant centre requested an umbilical cord blood unit.

In 2023, the **Ready2ship** project was launched to **pre-analyse** the units with higher levels of blood stem cells to confirm that they are of high quality and immediately available.

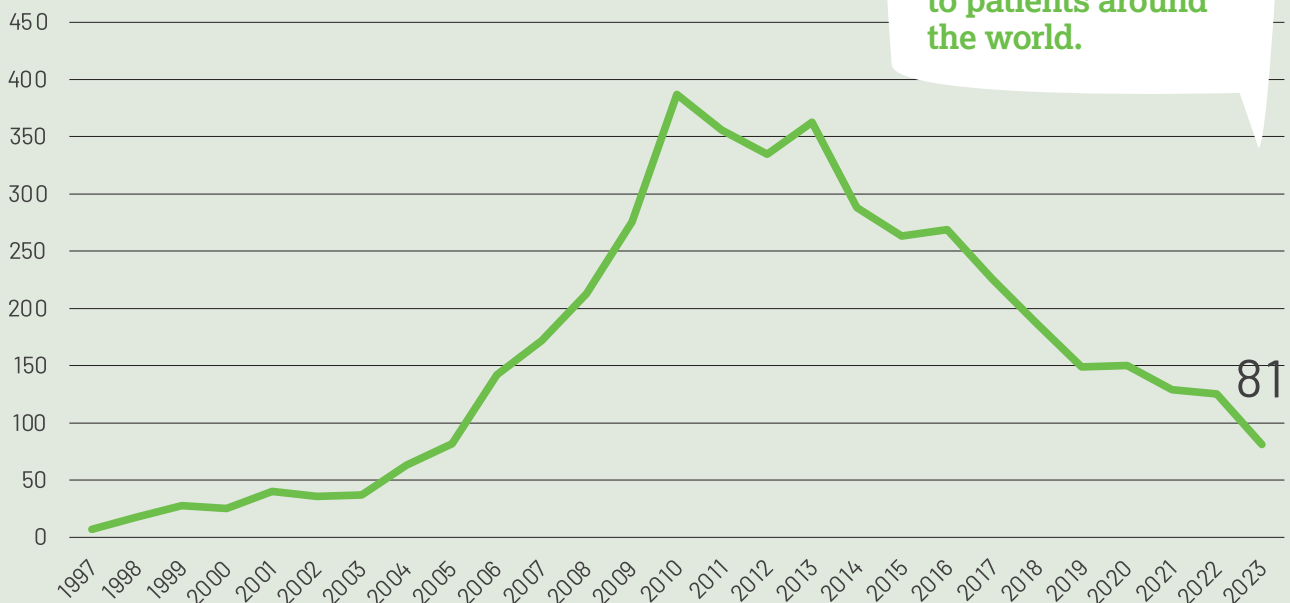
This means that they can be shipped to any patient in the world in record time; within 48 hours, the bank can supply the cord so that

the transplant centre can start treating the patient immediately.

Units with less common HLA typing have also been selected to give ethnic minority patients a greater chance, since they often lack a compatible donor.

As of December 2023, 4,920 umbilical cord blood units had been selected for analysis over the next few months.

Currently, more than 600 units have the **Ready2ship** stamp and 20 have already been transplanted.



In 2023, 81 units were sent for transplantation to patients around the world.

PATIENTS



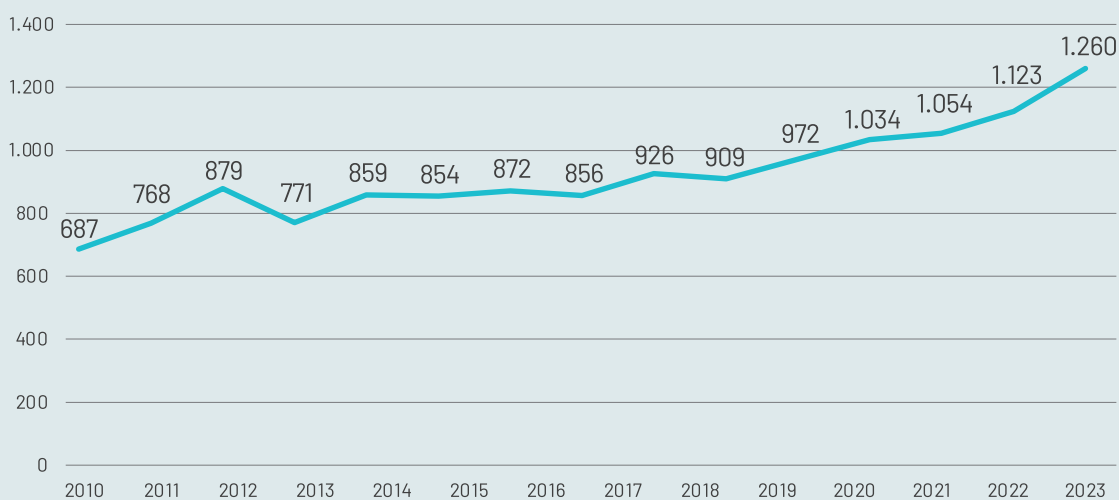
JOSEP CARRERAS
Leukaemia Foundation

REDMO
Bone Marrow
Donors Registry

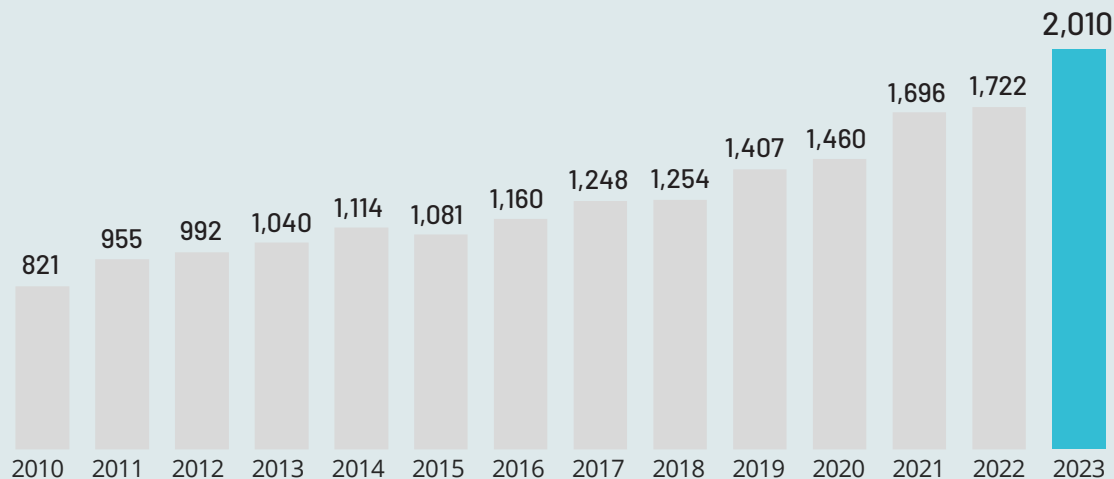
SPANISH PATIENTS

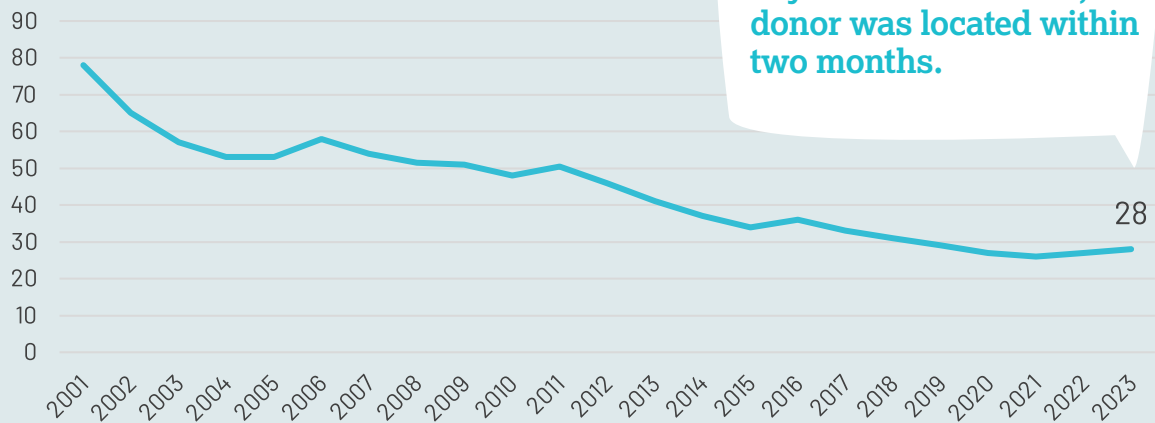
REDMO's activities for Spanish patients who require a transplant from a voluntary donor have also continued to grow.

1 Searches for a compatible donor: we are receiving more and more requests from Spanish transplant centres asking us to search for and identify a suitable donor for their patient in the global donor base. **In 2023, REDMO started searches for more than 1,200 patients**, which represented a 12% increase over the previous year and almost 20% more than five years ago.



2 Donors found: in 2023, we found **2,010 donors for 990 Spanish patients** who required a transplant. This means that 2,010 donors were interviewed by their donor centre to confirm that they were suitable (in terms of both their health and their personal situation) for the collection of haematopoietic progenitors for transplantation. In addition, the transplant centre confirmed through blood samples that the donor typing was correct and compatible with the patient. At this point, if the patient is ready for transplant, they have at least one donor waiting to start the donation process.



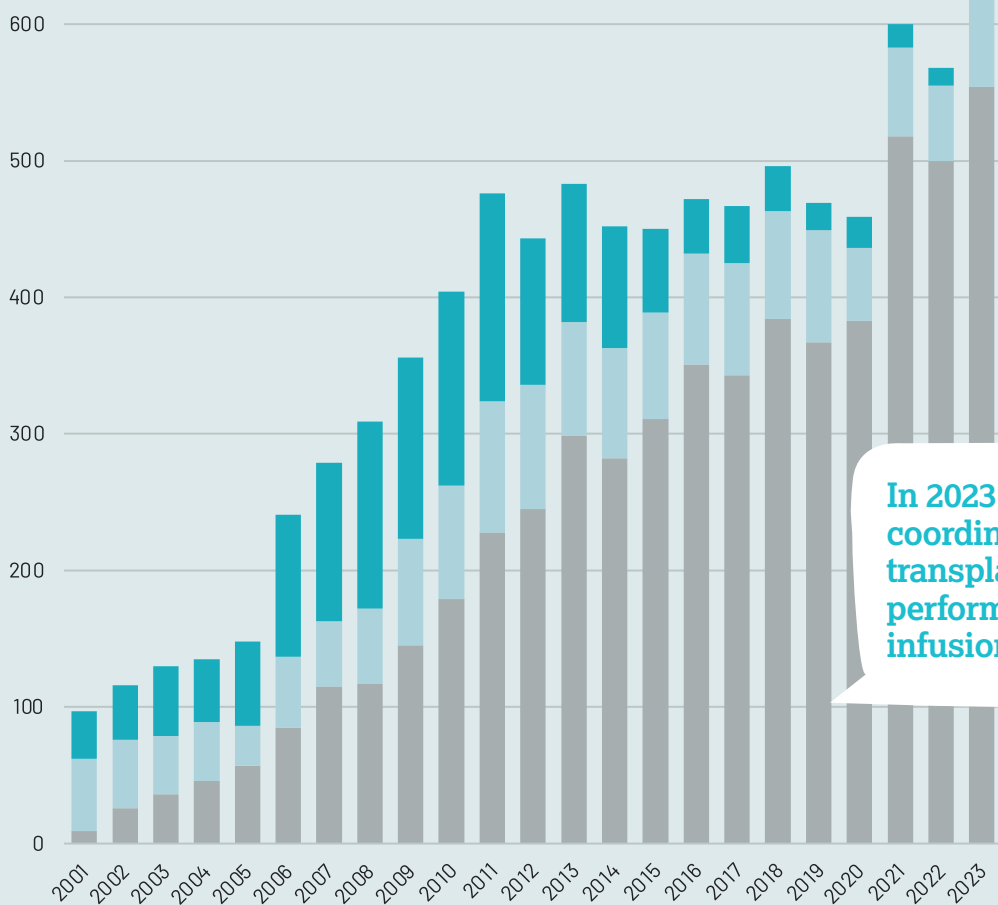


The average time taken to find donors was 28 days. In 93% of cases, the donor was located within two months.

3

Transplant: finding suitable donors for an increasing number of patients means that Spanish transplant centres can perform more transplants.

● Peripheral blood (n = 554) ● Bone marrow (n = 64) ● Umbilical cord blood (n = 14)

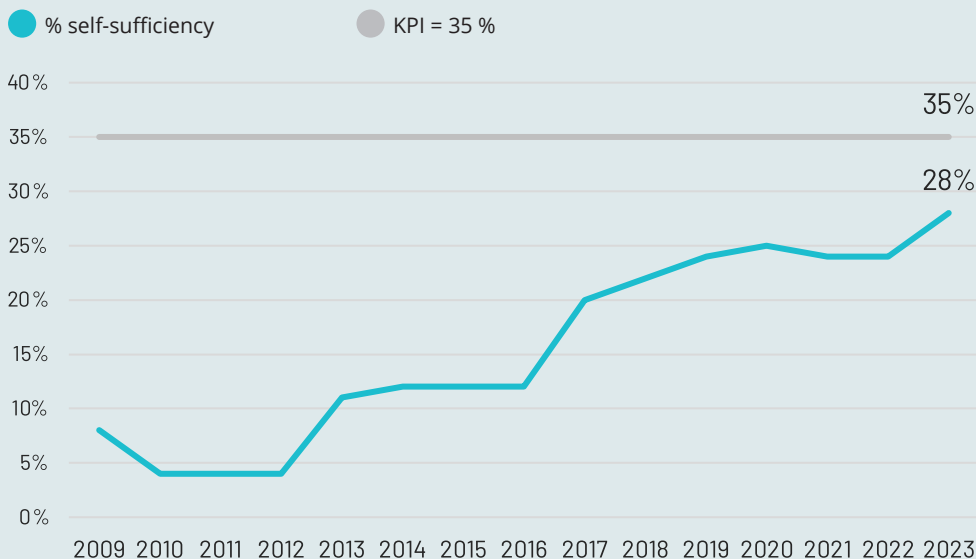


In 2023, REDMO coordinated 632 transplants and performed lymphocyte infusions in 25 patients.

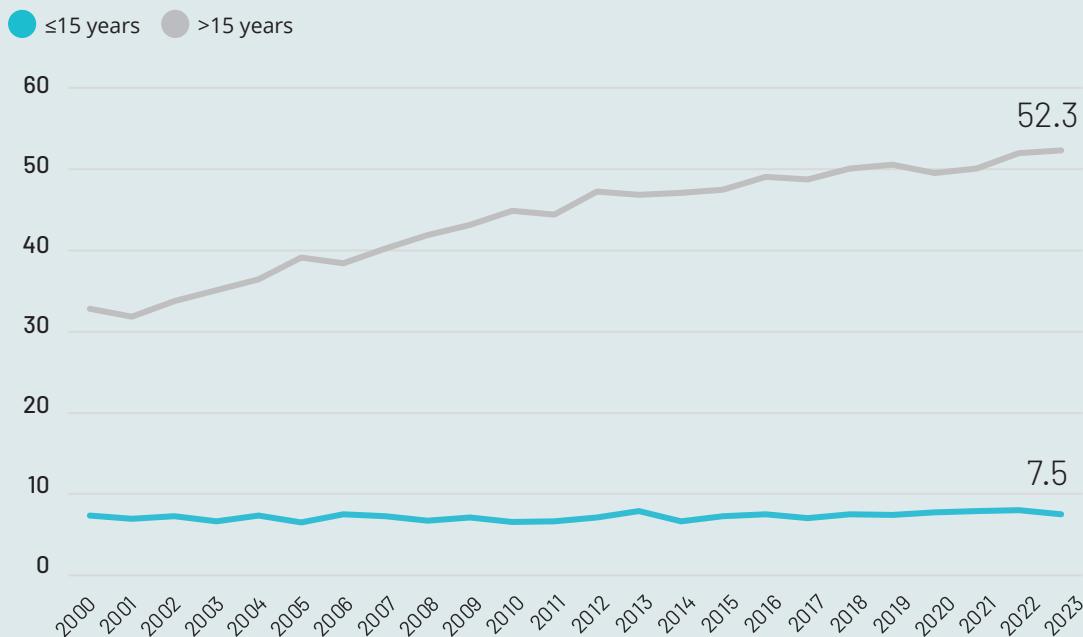
When compared to five years ago, this represents an increase of 37%.

Moreover, improvements in our donors are also benefiting our patients. For that reason, increasing numbers of Spanish patients are receiving transplants from cells taken from a REDMO donor.

This concept is known as **self-sufficiency** and, in 2023, almost three out of every 10 patients who underwent a transplant in Spain received a donation from a Spanish donor.



The average age of adult patients increased from 35 years to 52. This is a very positive aspect because it shows that patients can undergo a transplant at an age that would have been impossible 20 years ago. This is thanks to advances in treatments and improvements in the time required to find donors. In the case of paediatric patients, the average age is still around 7 years.



REDMO'S WEEKLY WORK IN 2023

In 2023, the Bone Marrow Donors Registry carried out these activities every week:



Registering

455

new donors



Completing

37

medical questionnaires with potential donors registered with REDMO



Shipping

28

blood samples from Spanish donors to transplant centres around the world to confirm suitability



Coordinating

9

effective donations from Spanish donors and cord units



Starting

24

new searches for unrelated donors for Spanish patients



Offering

38

suitable donors for different patients in search of a donor from Spanish transplant centres



Delivering

13

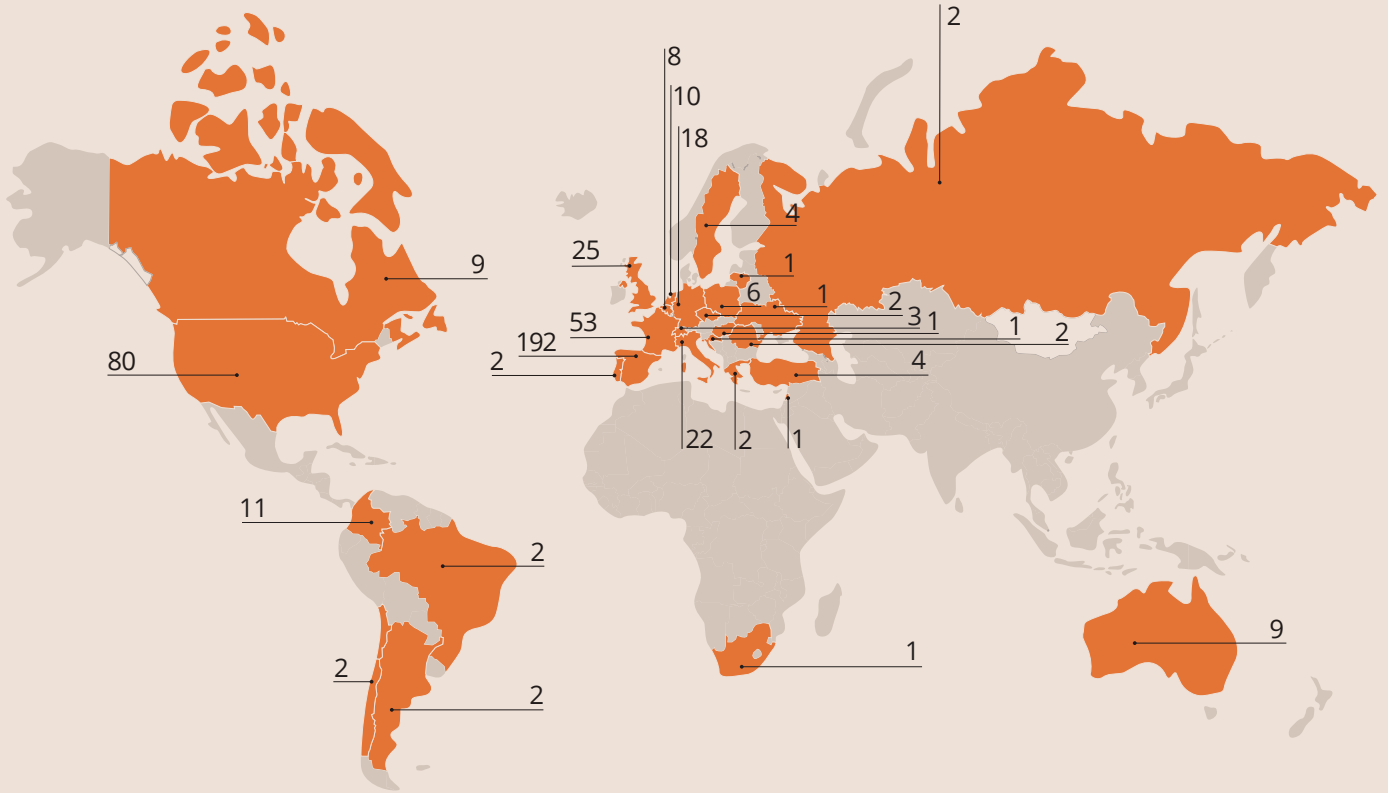
donation products from all over the world to patients being treated at Spanish transplant centres



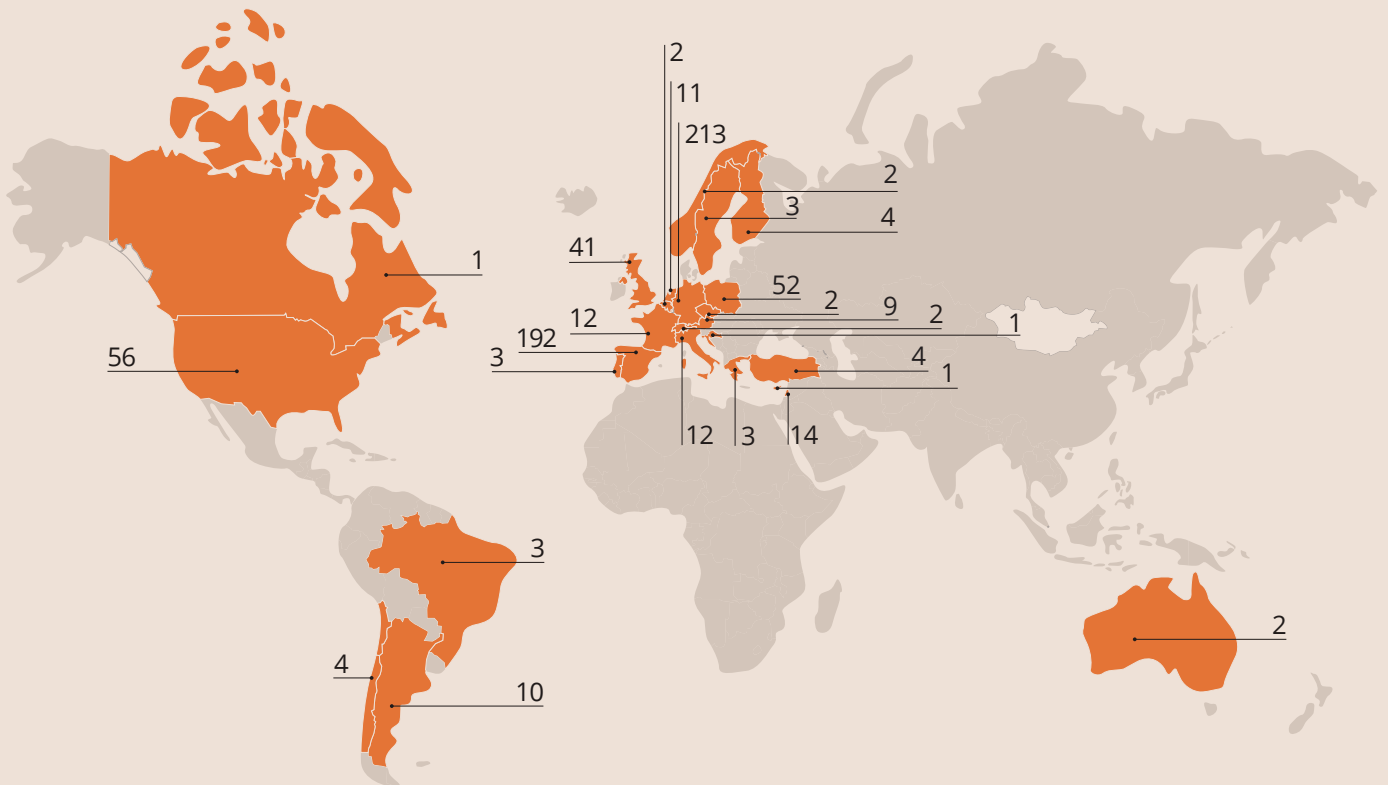
Our courier companies travelled 2,886,633 kilometres to deliver blood stem cells from donors to the patients who were waiting for them.

The Moon is 384,400 kilometres away: that means we've been to the Moon and back 7.51 times!

The blood stem cells from our donors have travelled to...



The blood stem cells for our patients have travelled from...



THANKS

Voluntary donors

Donor referral centres

Immunology laboratories

Donor collection centres

Transplant centres

World Marrow Donor Association

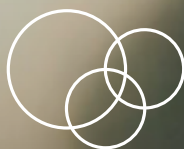
International registries

Courier companies

Cord blood banks

Autonomous Communities Transplant Coordinations

National Transplant Organisation



JOSEP CARRERAS
Leukaemia Foundation

REDMO
Bone Marrow
Donors Registry