

Hematopoietic Stem Cell Transplant in Puerto Rico

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Hematology and Medical Oncology
Blood and Marrow Transplantation

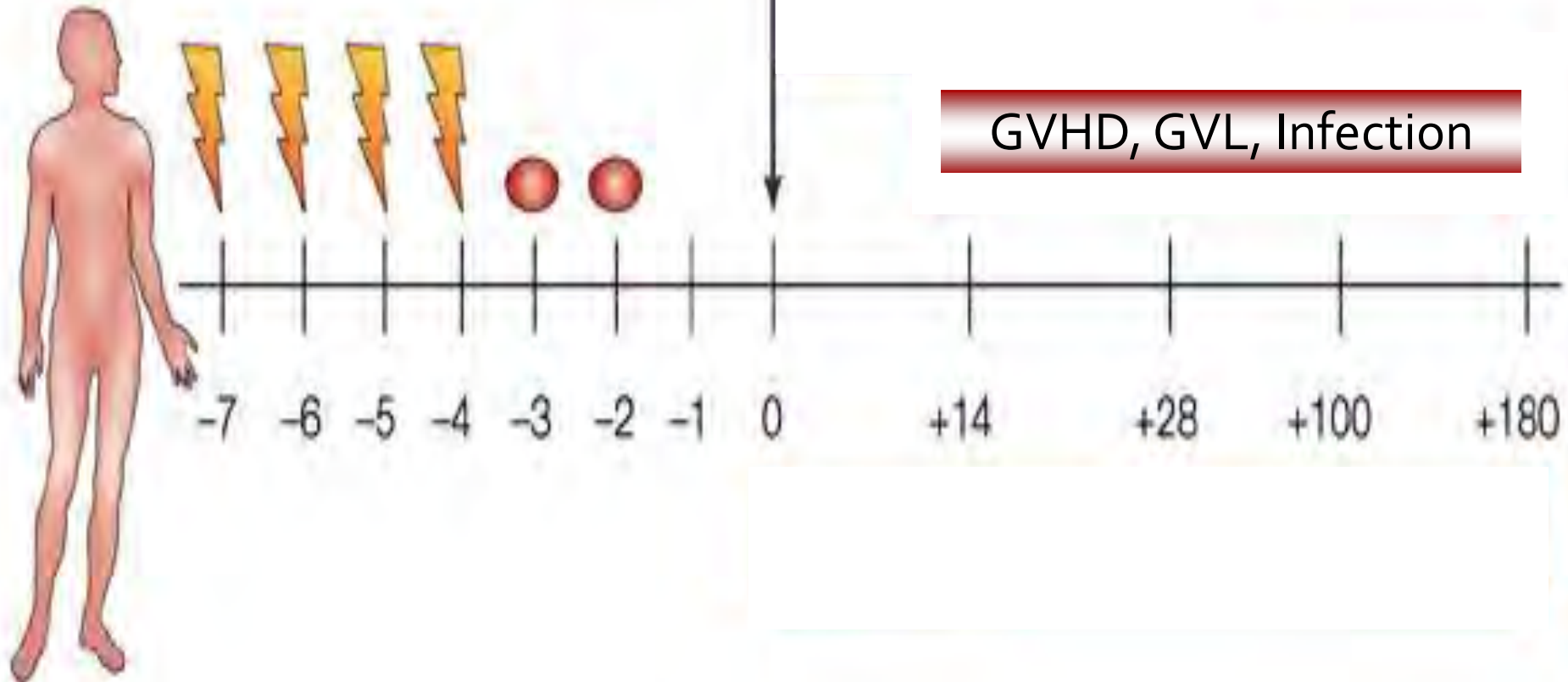


How a HSCT Works?

Radio-chemotherapy:
- Debulk malignancy (Auto/Allo)
- Suppress host immunity (Allo)

Hematopoietic Stem Cell Transplant:

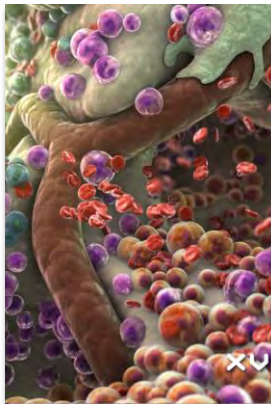
- HSCs: Rescue or Replace BM
- T cells against:
 1. Leukemia = GVL
 2. Host tissues = GVHD



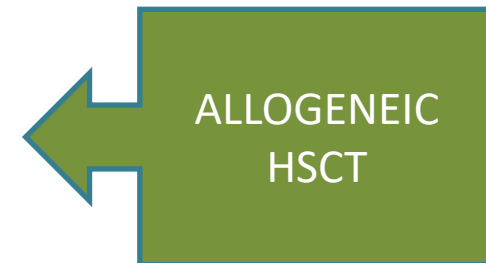
Why to perform a HSCT?

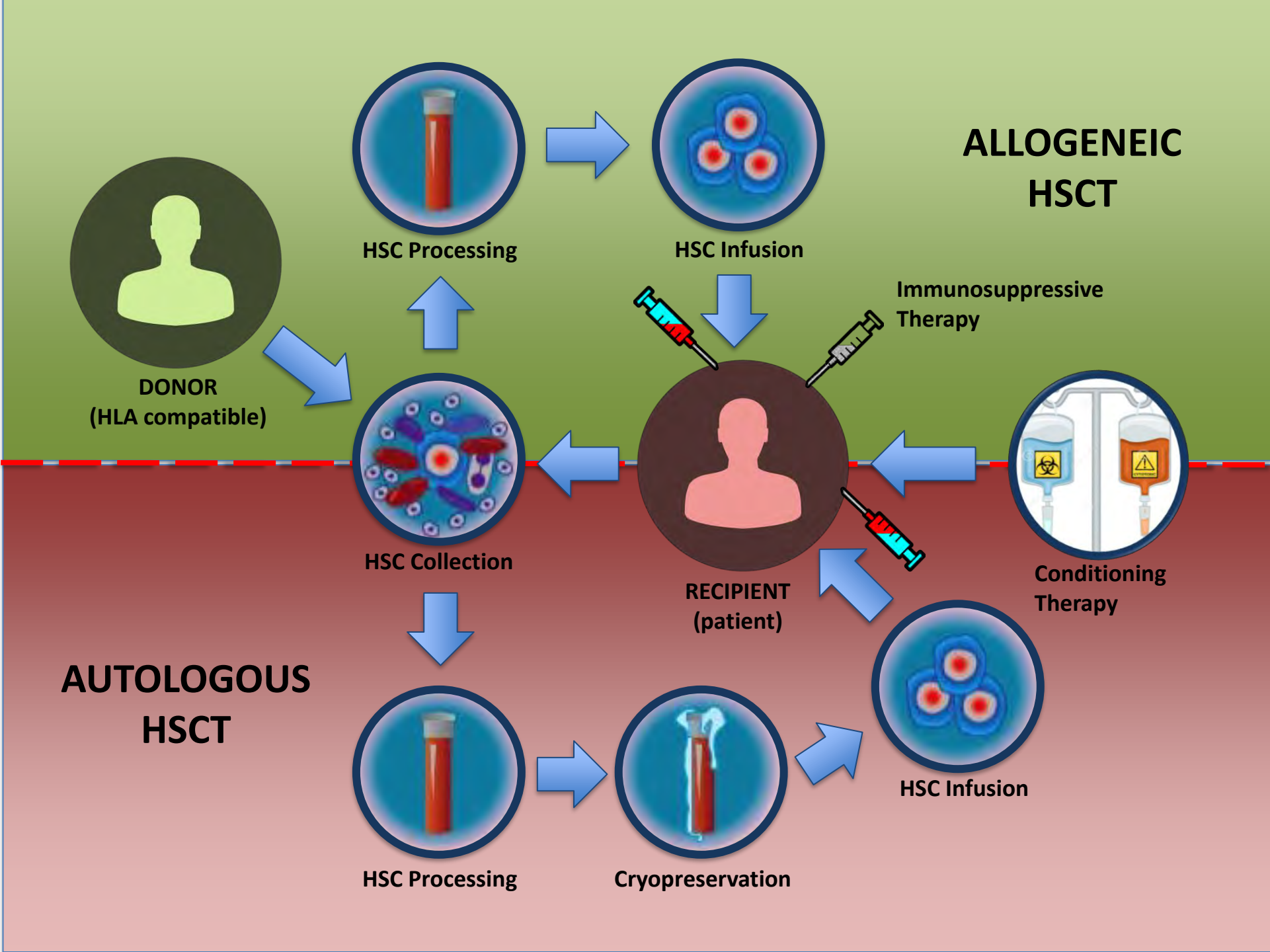


Allow administration of high dose anti-neoplastic therapy, avoiding prolonged or irreversible myelosuppression through administration of rescue HSCs from patient.

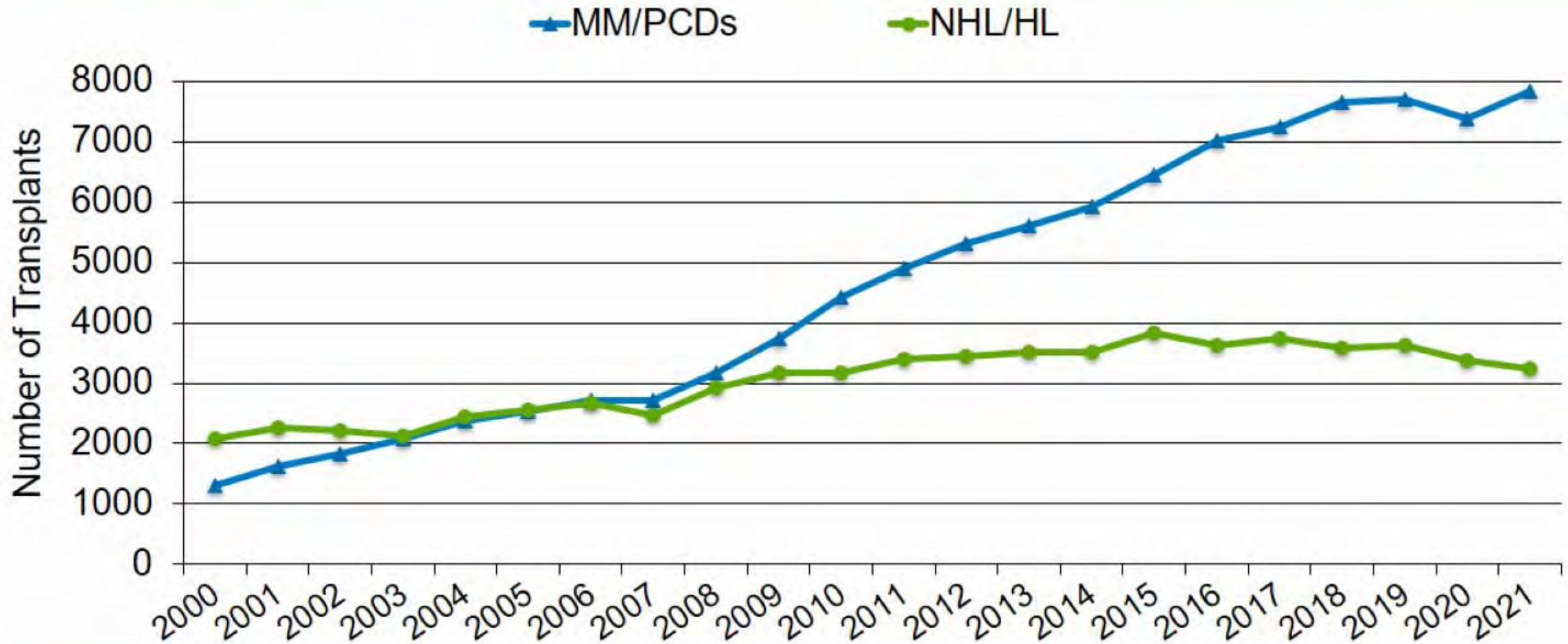


Replace a hematopoietic system that is deficient, insufficient or neoplastic for a normal one from a healthy donor.

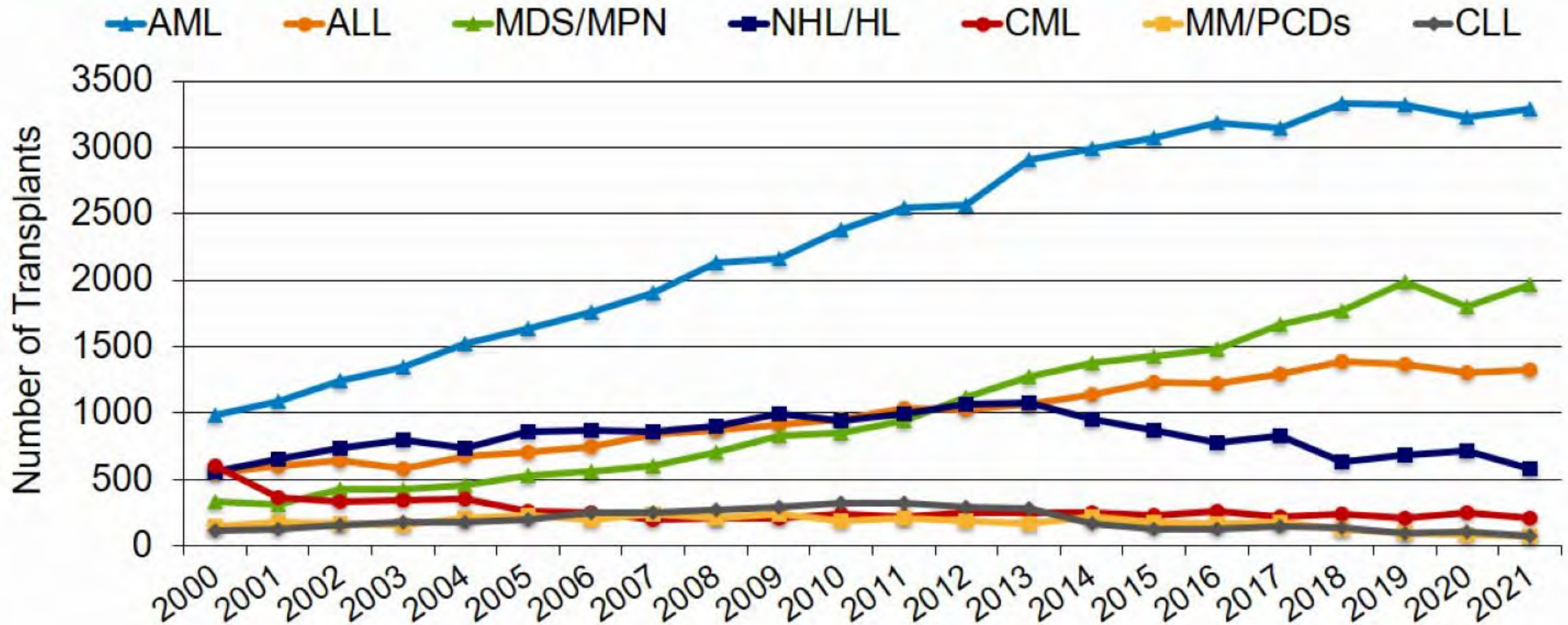




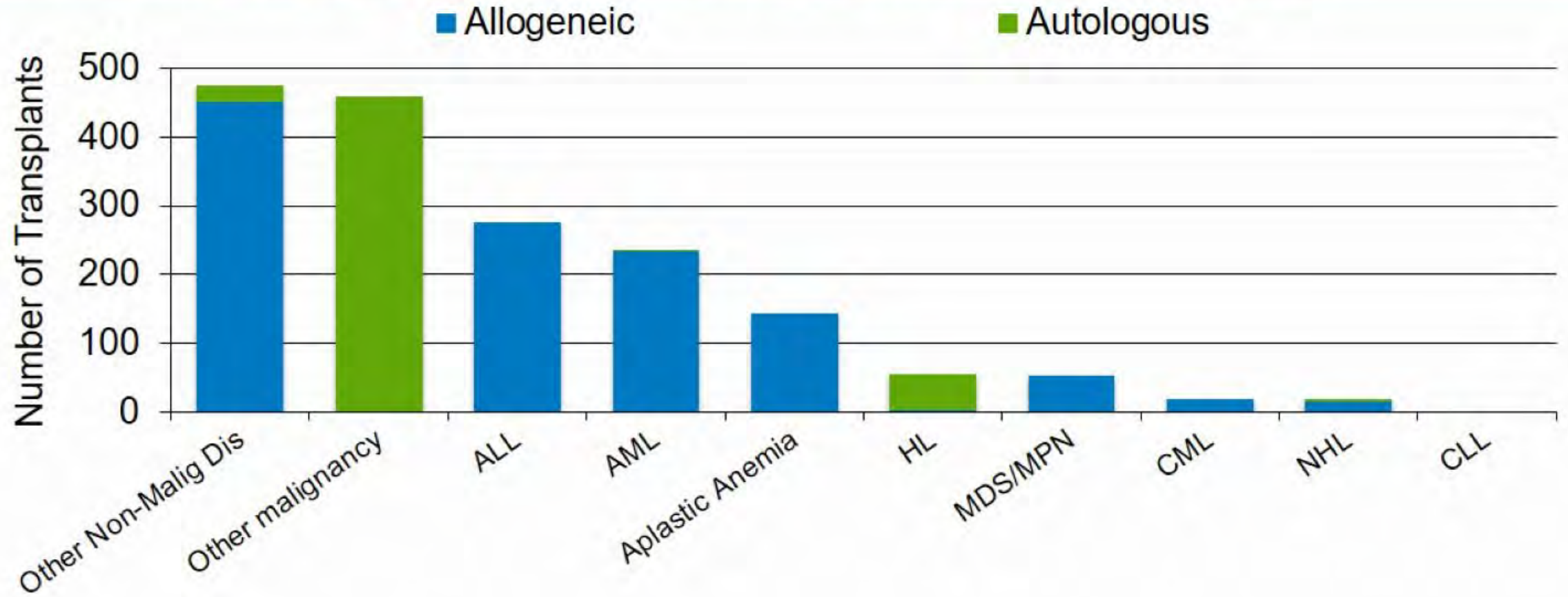
Number of Autologous HCTs in the U.S. by Selected Disease



Number of Allogeneic HCTs in the U.S. by Selected Disease



Number of HCTs by Indications in the U.S., Pediatric, 2021



Abbreviations –

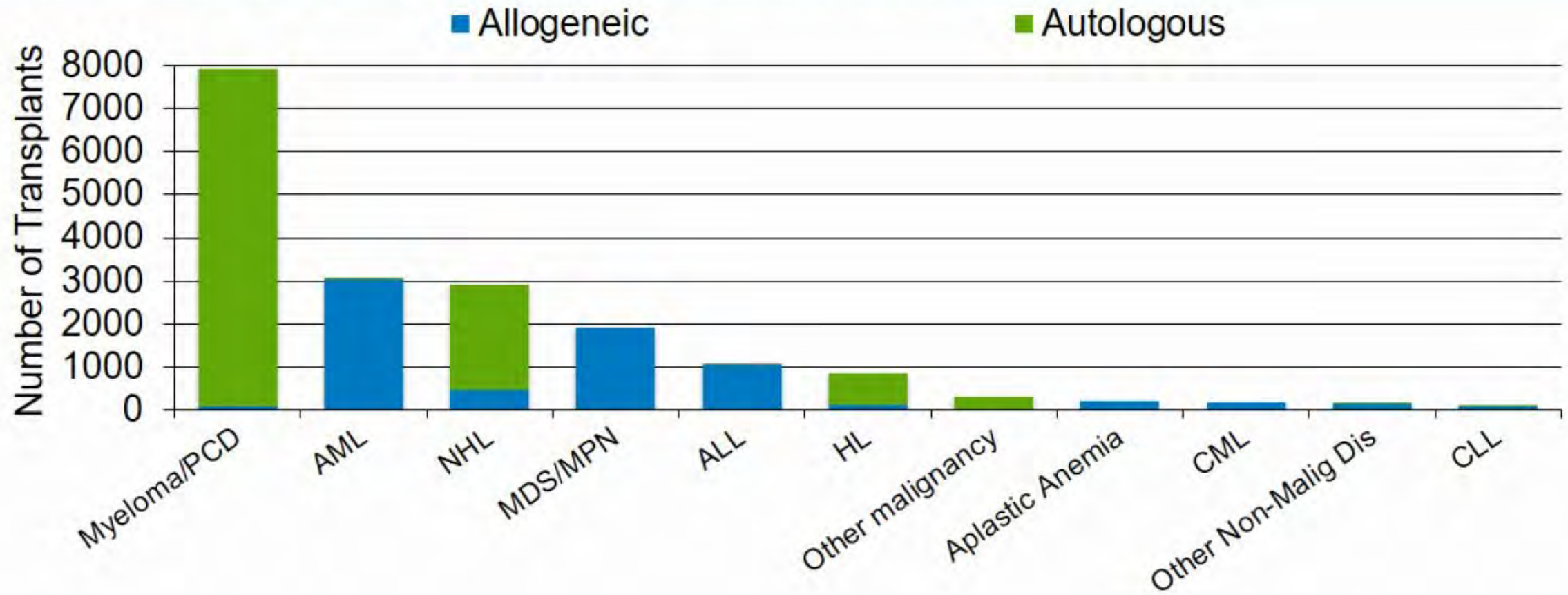
ALL: Acute Lymphoblastic Leukemia;
 AML: Acute Myeloid Leukemia;
 HL: Hodgkin Lymphoma;
 MDS: Myelodysplastic Syndromes;

MPN: Myeloproliferative Neoplasms;
 CML: Chronic Myeloid Leukemia.
 NHL: Non-Hodgkin Lymphoma;
 CLL: Chronic Lymphocytic Leukemia.

Non-malignant disease excludes Aplastic Anemia.

Pediatric: <18 years

Number of HCTs by Indications in the U.S., Adult, 2021





Puerto Rico

Cancer Incidence in Puerto Rico

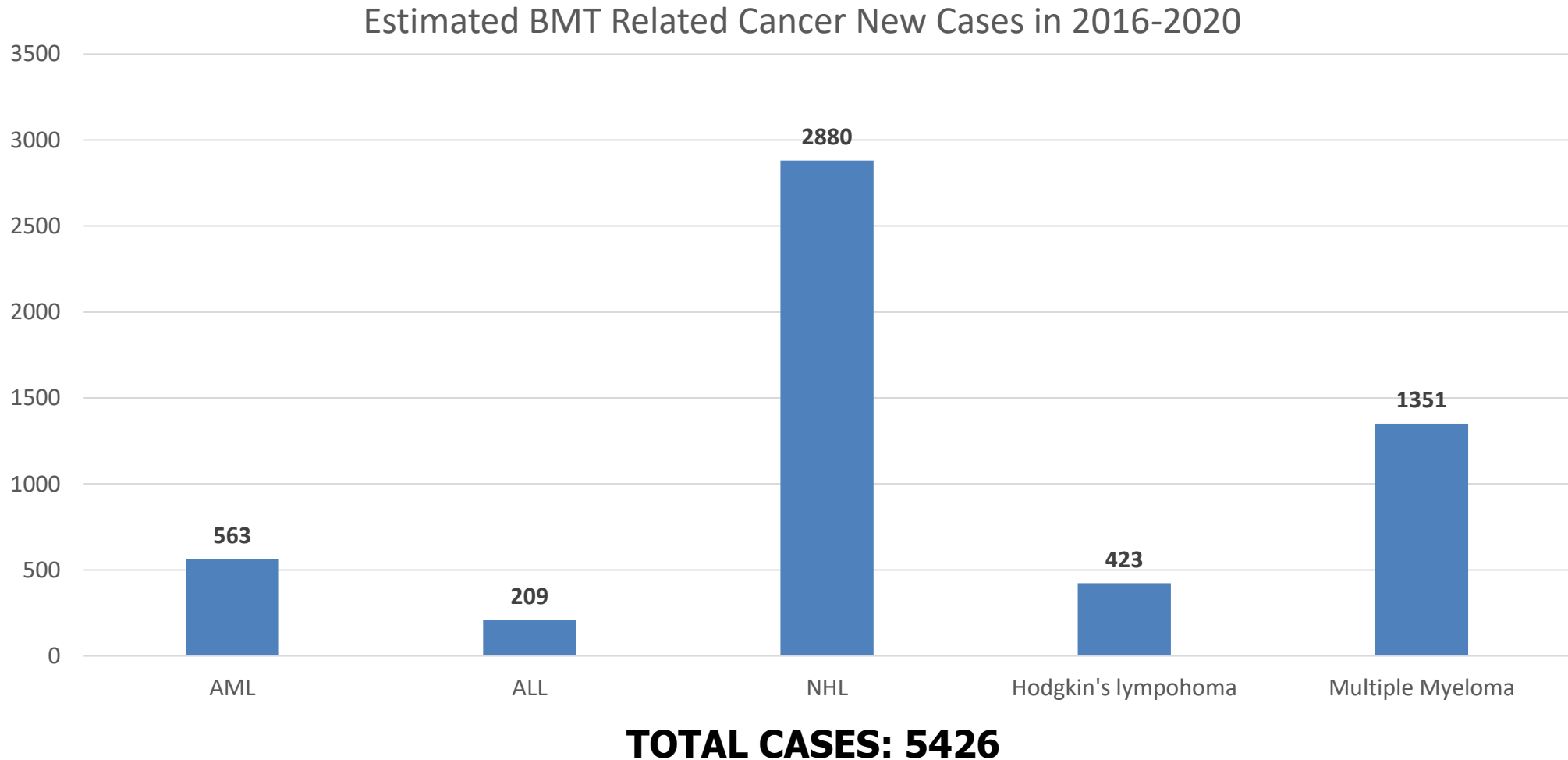
Figure 2. Top ten cancer sites (incidence) by sex: Puerto Rico, 2016-2020

♂ Male (N = 37,548)	%	AAPC ²⁰⁰⁰⁻²⁰¹⁹	♀ Female (N = 34,221)	%	AAPC ²⁰⁰⁰⁻²⁰¹⁹
Prostate	38.3	↑ 1.7*	Breast	30.5	↑ 1.7*
Colon and rectum	11.5	0.2	Colon and rectum	10.5	-0.1
Lung and bronchus	5.4	↓ -1.0*	Corpus and uterus, NOS	9.6	↑ 4.6*
Urinary bladder	4.4	0.1	Thyroid	9.5	↑ 9.0*
Non-Hodgkin lymphoma	3.9	↑ 1.8*	Lung and bronchus	4.0	0.4
Oral cavity and pharynx	3.5	↓ -0.7*	Non-Hodgkin lymphoma	3.9	↑ 2.1*
Liver and bile duct	3.5	↑ 1.9*	Cervix uteri	2.8	0.5
Kidney and renal pelvis	3.1	↑ 4.3*	Pancreas	2.5	↑ 3.1*
Leukemia	2.8	↑ 2.2*	Leukemia	2.4	↑ 2.7*
Pancreas	2.6	↑ 2.2*	Ovary	2.3	↑ 0.8*
Other sites	21.1		Other sites	21.9	

- According to the Puerto Rico Cancer Registry, during the 2016-2020 period, 71,769 persons were diagnosed with cancer in Puerto Rico.
- NHL comprises 3.9% of cancer cases in PR for males and 3.9% for females.
- Leukemia comprises 2.8% of cancer cases in PR for males and 2.4% for females.

BMT related cancer cases in Puerto Rico

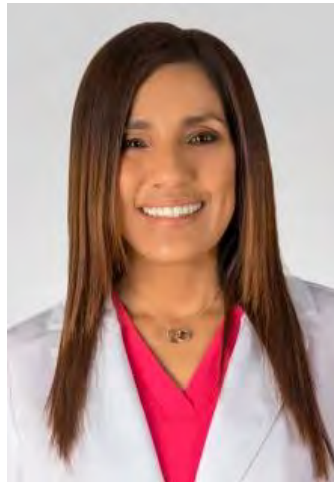
- Estimated Cases for year 2016-2020 derived from incidence rates per 100,000 persons (published by the PR Cancer Registry).
- NHL had the largest number of new BMT related cancer cases.



Pediatric BMT programs in Puerto Rico



Dr. Luis Clavell



Dr. Maribel García

- Two main Pediatric BMT programs:
 - **San Jorge Children's Hospital** (autologous and allogeneic, Closed in 2019)
 - **University Pediatric Hospital in Centro Medico** (autologous and allogeneic)
- Data from both centers collected from 1994 through December 2009:
 - **97** transplants performed to 87 children and young adults
 - 55 males and 32 females, aged between 12 months and 38 years
 - Source of HSCs:
 - **52 autologous** (5 BM, 47 PBSC)
 - **45 allogeneic** (23 MRD BM, 18 MRD PBSC, 1 syngeneic PBSC, 4 Haploidentical BM)
 - Diagnosis: Acute leukemia, chronic leukemia, MDS, aplastic anemia, histiocytosis, neuroblastoma, lymphomas, PNET, Wilms tumor, and desmoplastic round cell tumor
- **HIMA-San Pablo Hospital – Caguas, PR**
 - Dr. John Guerra (4 Autologous, 1 Allogeneic)



Adult BMT programs in Puerto Rico



- **University District Hospital - Centro Medico**
 - Founded in **1997** by Dr. Justiniano Castro
 - Autologous HCT
 - Approximately 25 transplants per year



- **HIMA-San Pablo Hospital – Caguas, PR**
 - Founded in **2010** by Dr. Norma Salgado Vila
 - Autologous HCT
 - Approximately 35 transplants per year (Total 453)



- **Hospital Español Auxilio Mutuo – San Juan, PR**
 - Founded in 2015 by Dr. Alexis M. Cruz Chacón
 - Autologous HCT



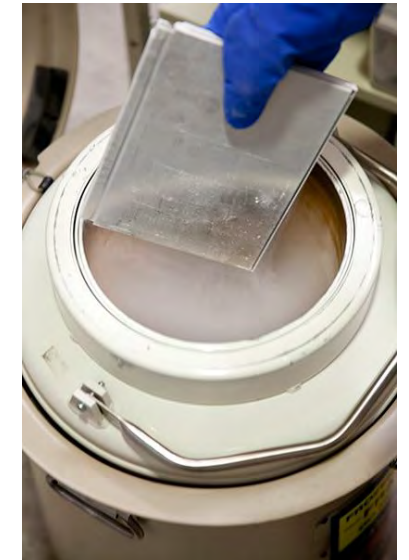
Hematopoietic Stem Cell Collection and Processing



- HSC collection, processing, cryopreservation and administration in Puerto Rico performed by the American Red Cross (ARC).



- ARC is the only provider of these services for all BMT Programs in Puerto Rico.



HSCs from Puerto Rico Donors saved lives around the World



- Approximately 100 matched unrelated donors collected for NMPD during the year period from 2011 to 2020.



Dra. Maribel García Colón, hematóloga oncóloga pediátrica y director médico de la Unidad de Trasplante del Hospital del Niño San Jorge.

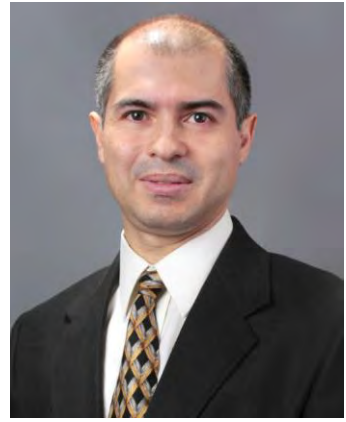
Puertorriqueños donan células madre de la médula ósea a pacientes con leucemia en todo el mundo

Por: Servicio de Noticias Científicas de Medicina y Salud Pública de Puerto Rico (MSP)

18 de octubre de 2016 12:00 am noticiasmsp@editorialmundo.com

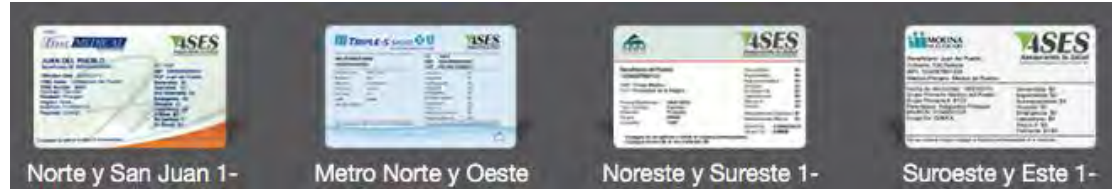
The Road to Adult Allogeneic HCT for Puerto Rico

- Adult BMT Programs in Puerto Rico only performed Autologous HCT
 - Around 40 cases per year on each adult program
 - Adult patients in need for Allogeneic HCT must travel to USA
- In 2011 Moffitt Cancer Center BMT program (Tampa, FL) established a monthly clinic in Bayamon, Puerto Rico for initial evaluation of patients with indications for BMT (allogeneic and autologous)
 - Dr. Melissa Alsina and Dr. Leonel Ochoa Bayona
 - Patients still needed to travel to US to receive Allogeneic HCT



Allogeneic HCT was still a NECESSITY for Adult patients in PR

A good reason to have Allogeneic HCT done locally in PR



1.6 million patients

NO COVERAGE FOR BMT



MAXIMUM APPROVED FUNDS PER CASE

\$340,000.00



MINIMAL COST OF MUD HSCT IN USA

\$450,000.00

2014: A Door Opened



Why Hospital Auxilio Mutuo?

- One of Puerto Rico's biggest Hospitals.
- Successful solid organ transplant program.
- Accredited Histocompatibility and Immunogenic Lab.
- Medical faculty with over 700 specialists and subspecialists.
- Wide range of diagnostic and treatment services with multiple specialized centers and units in the same place.
- Significant population of patients with indications for BMT referred to Auxilio Cancer Center.

Optimal Institution to start an Allogeneic BMT Program

Collaboration with Moffitt Cancer Center

- Counseling for design of BMT program with the standard of care.
- Education and training of BMT unit nurse manager and BMT coordinator.
- Assistance and counseling for development and implementation of BMT specific nursing educational curriculum and clinical competencies in our institution.
- Consult of difficult or challenging cases with team of experienced and renowned BMT physicians.



AUXILIO MUTUO BMT PROGRAM

OUR FIRST STEPS

September 2014

Construction of BMT Unit
Started

March 2015

Opening of BMT Unit
Started evaluation of BMT
Candidates at Clinic

October 2014

Training of Manager and
Coordinatot at Moffitt

May 2015

First Autologous HCT



5/27/15

AUXILIO MUTUO BMT PROGRAM

OUR CRAZY DREAM CAME TRUE



2/7/17



February 2017

First Two
MRD Allogeneic HCTs



2/16/17



March 2018

First Haploidentical HCT
First BM Harvest



3/23/18



AUXILIO MUTUO BMT PROGRAM

JOINING FORCES TO BUILD A SOLID TEAM AND PREPARE FOR THE FUTURE

August 2019

Dr. Joel López
Multiple Myeloma Clinic



June 2020

BMT Ambulatory Clinic
Facility Inaugurated

August 2020

Dr. Carlos Perez
BMT Infectious Diseases



March–May 2020

COVID-19 Pandemic
15 Autologous HCT
3 Allogeneic HCT

July 2020

Dr. Cristian Rodríguez
BMT-CI Specialist
CART



October 2023

Dr. Carlos Bachier
BMT-CI Specialist
CART, Research



**Where are
we now?**

TILL YEAR 2023

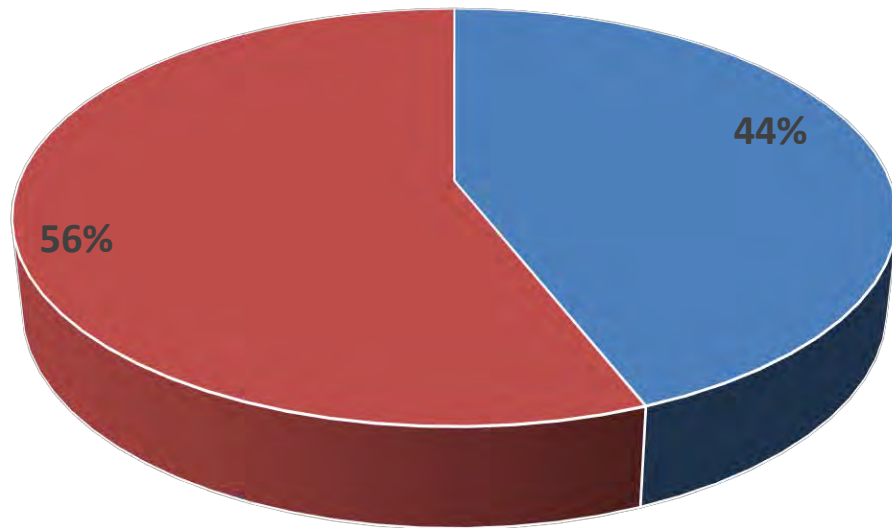
478 TRANSPLANTS

359 AUTOLOGOUS

119 ALLOGENEIC

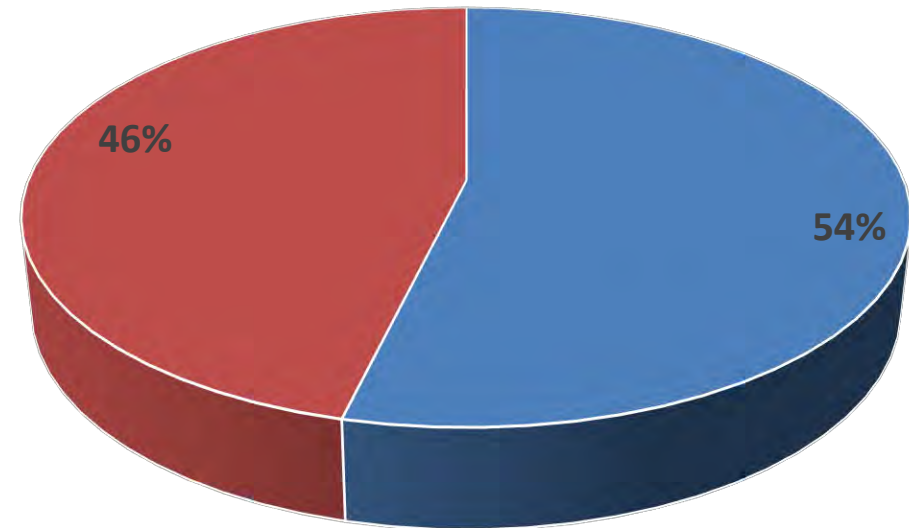
Total HCTs by Sex, BMT-HAM 2015 – 2023

AUTOLOGOUS



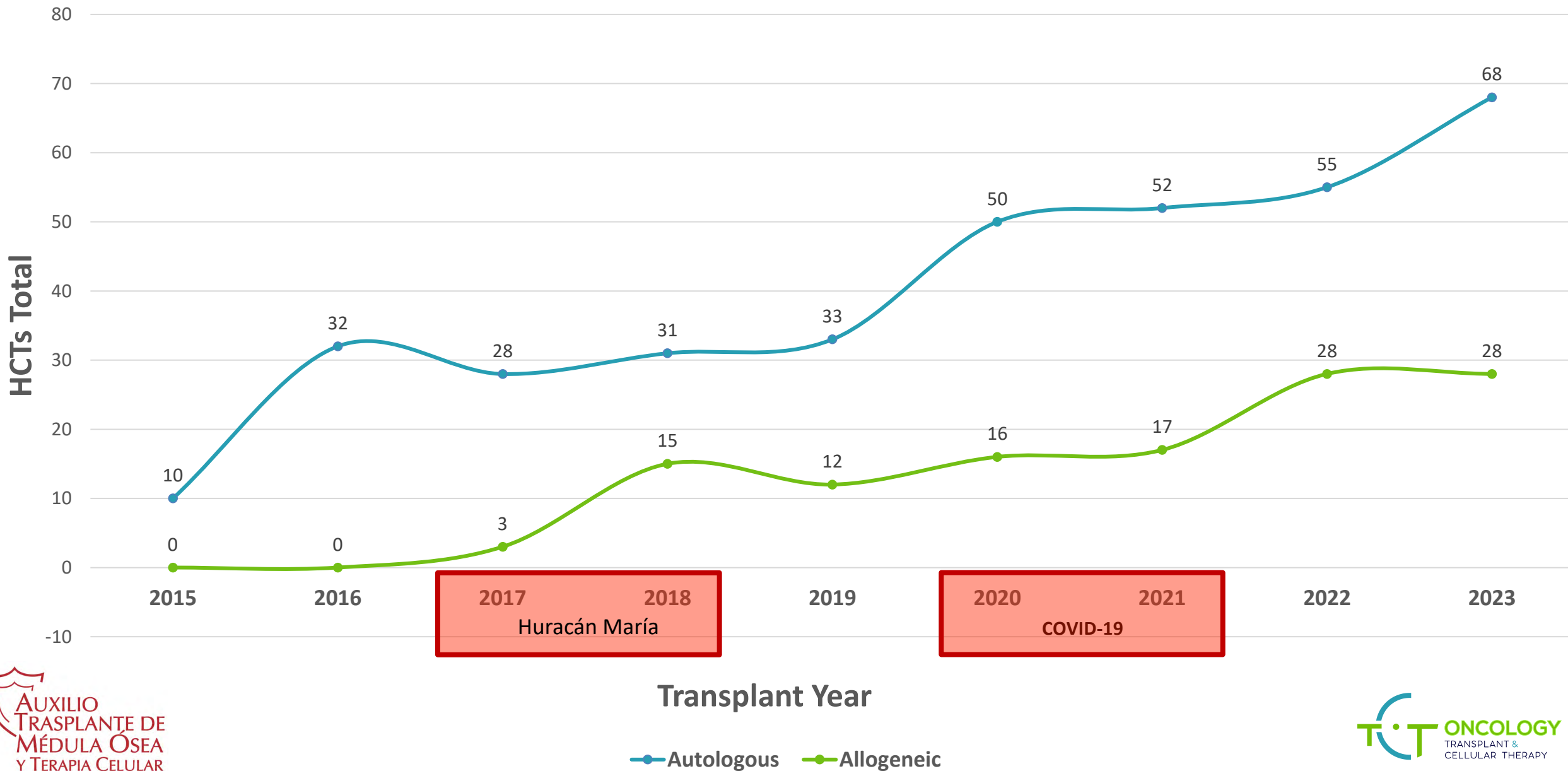
■ Female ■ Male

ALLOGENEIC



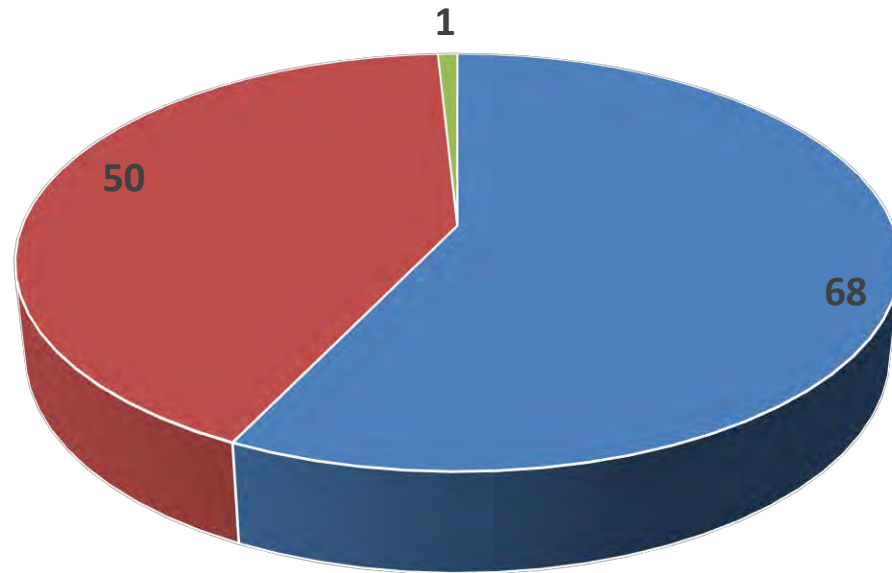
■ Female ■ Males

Total HCTs by Type, BMT-HAM 2015 – 2023



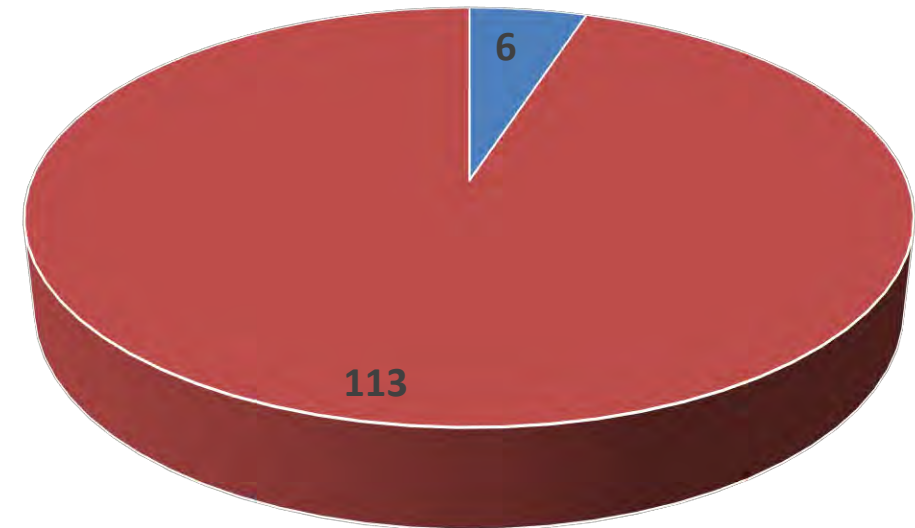
Total Allogeneic HCTs by Donor and Source Type , BMT-HAM 2015 – 2023

DONOR TYPE



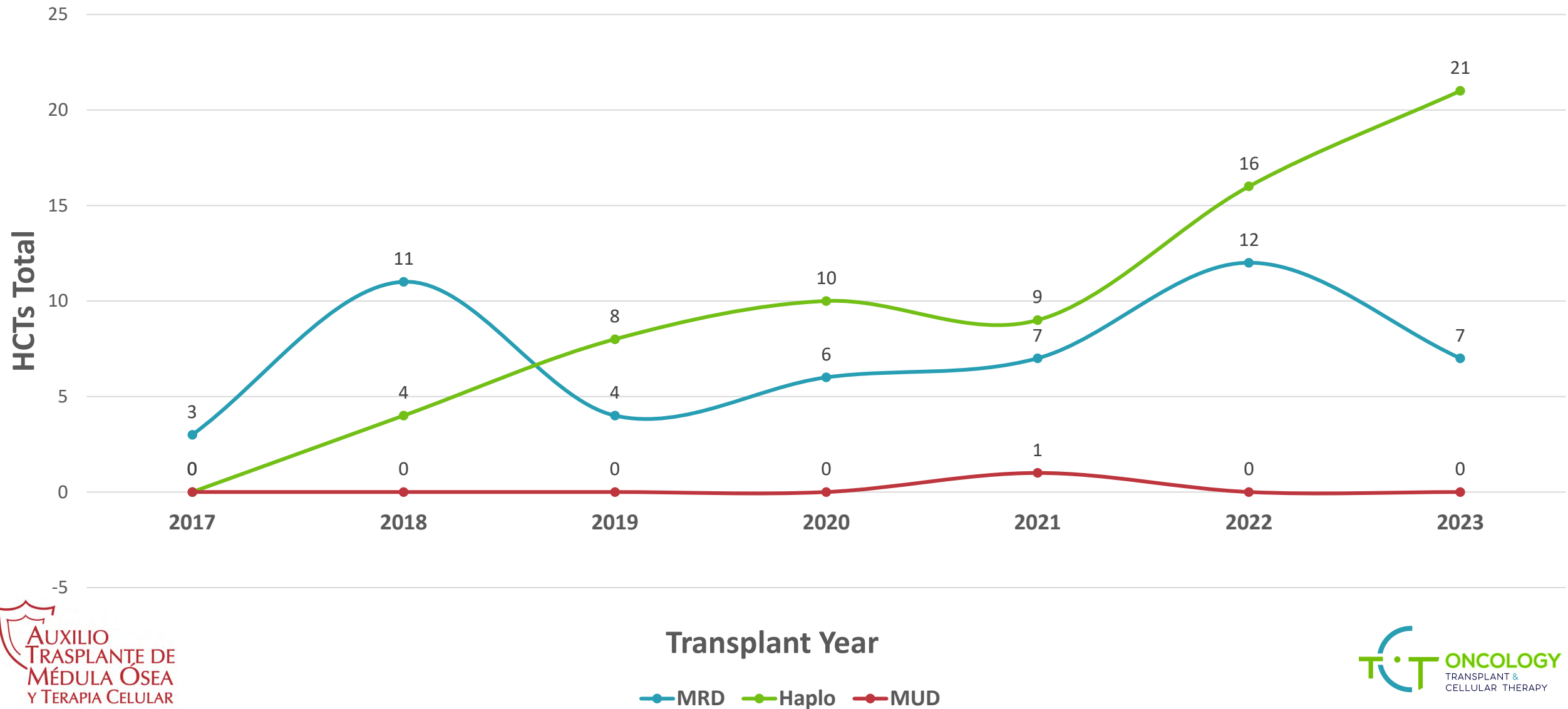
■ HAPLO ■ MRD ■ MUD

SOURCE TYPE



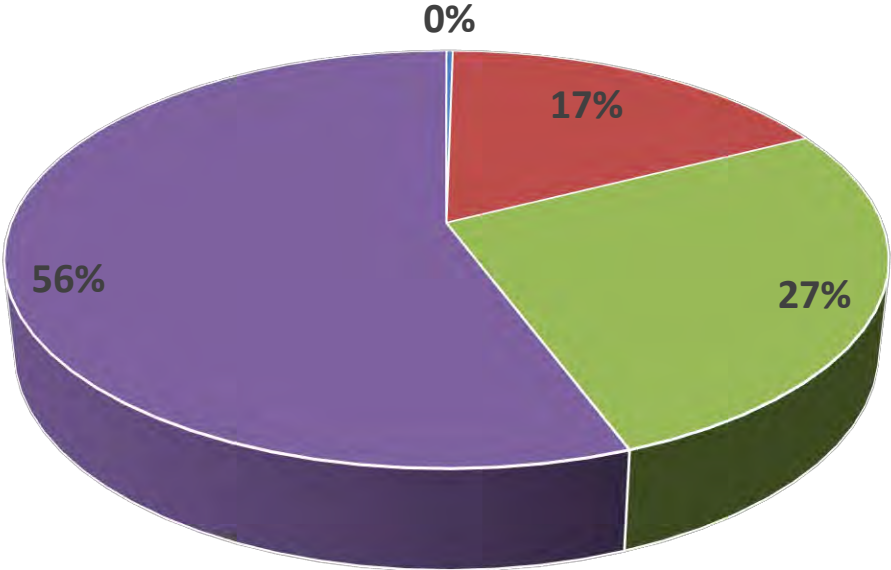
■ BM ■ Peripheral

Total Allogeneic HCTs by Type, BMT-HAM 2015 – 2023



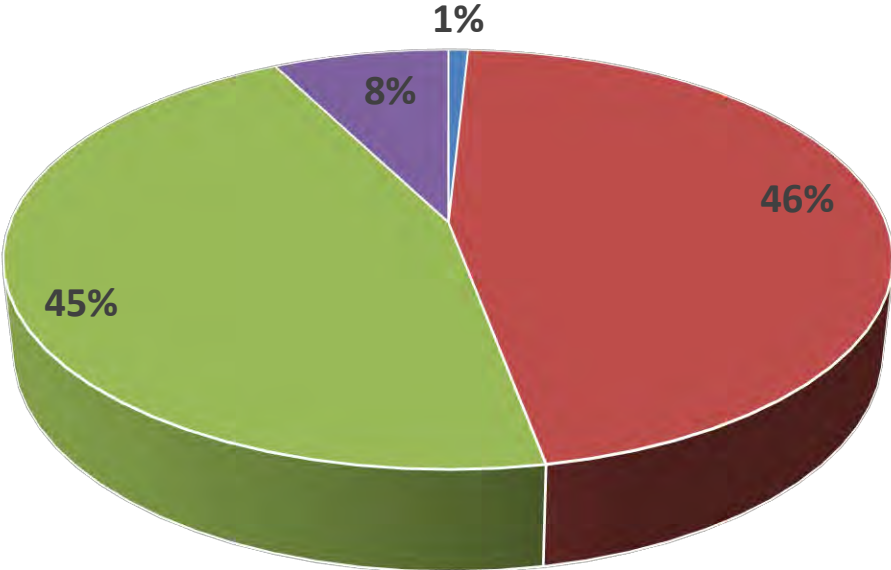
Total HCTs by Age Group, BMT-HAM 2015 – 2023

AUTOLOGOUS



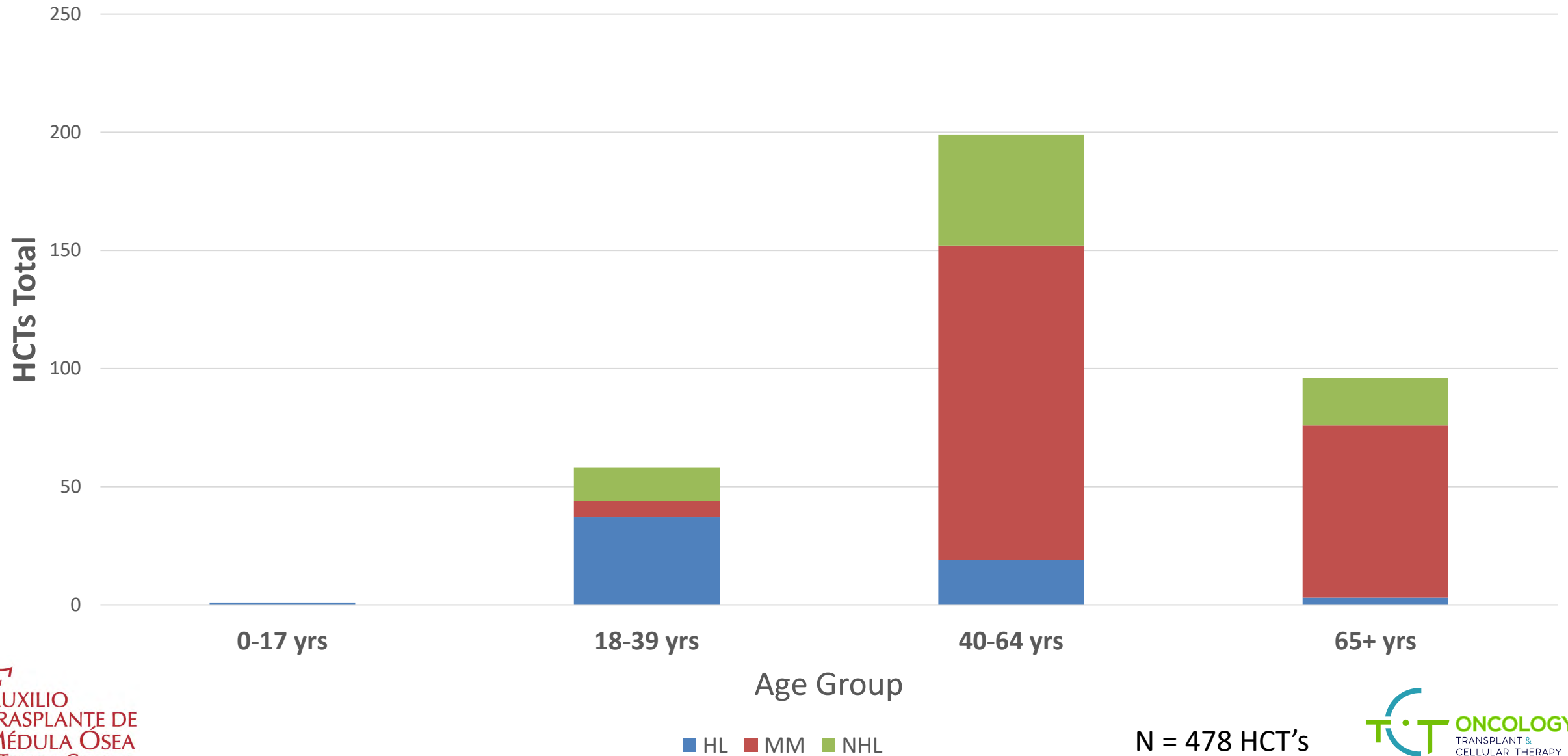
■ 0-17 yrs ■ 18-39 yrs ■ 40-64 yrs ■ 65+ yrs

ALLOGENEIC



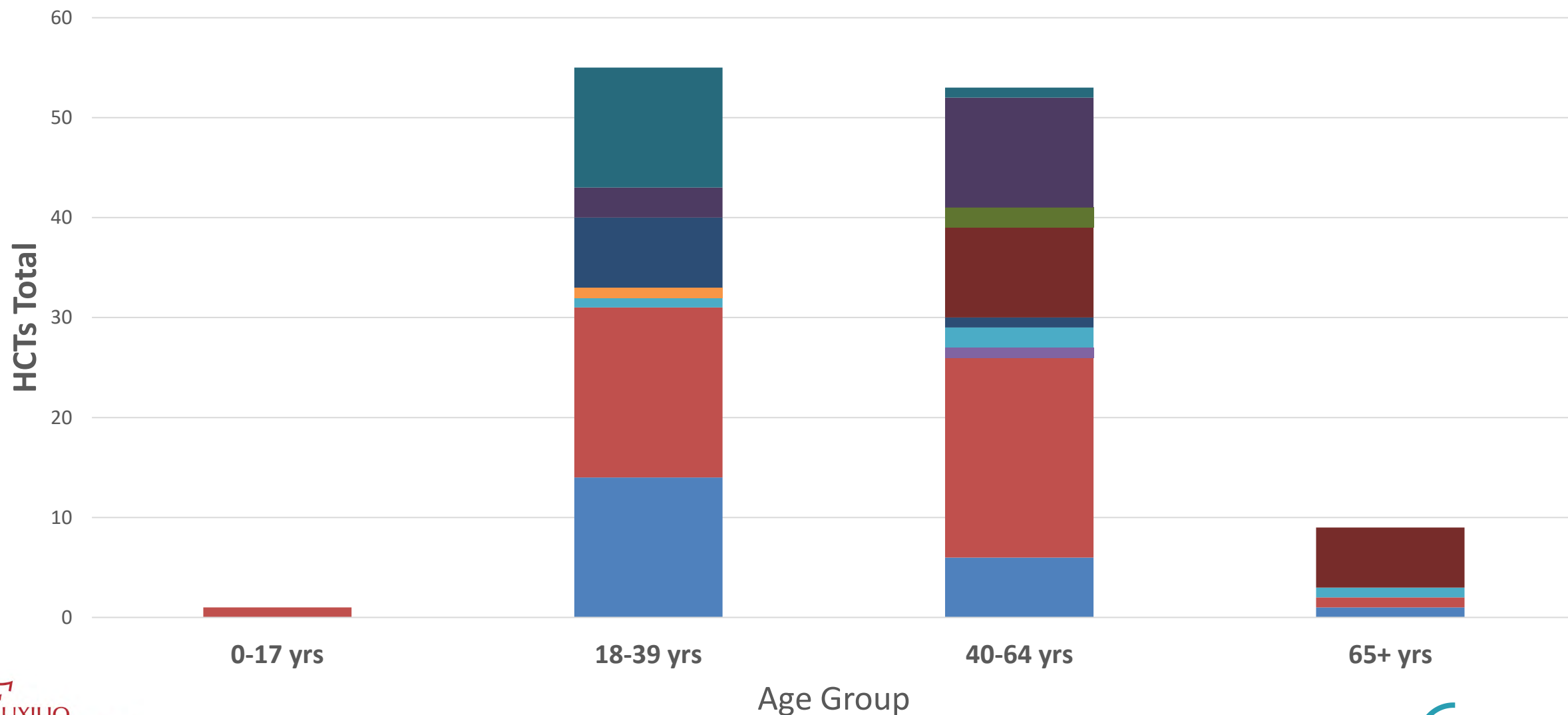
■ 0-17 yrs ■ 18-39 yrs ■ 40-64 yrs ■ 65+ yrs

Total Autologous HCTs by Age Group and Condition, BMT-HAM 2015 – 2023



N = 478 HCT's

Total Allogeneic HCTs by Age Group and Condition, BMT-HAM 2015 – 2023



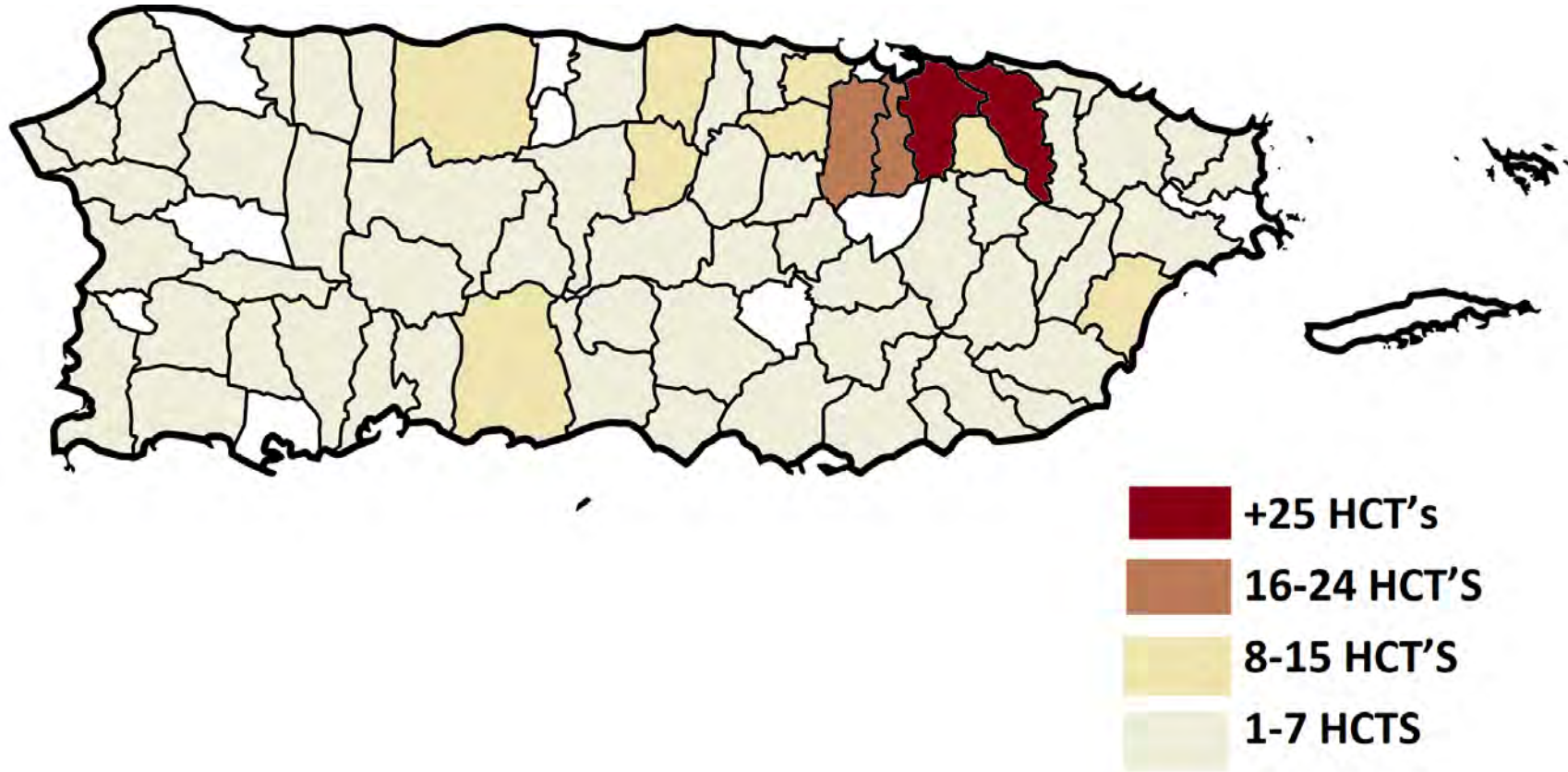
■ ALL
 ■ AML
 ■ CML
 ■ CMML
 ■ BMF
 ■ HL
 ■ MDS
 ■ MF
 ■ NHL
 ■ SAA

N = 478 HCT's

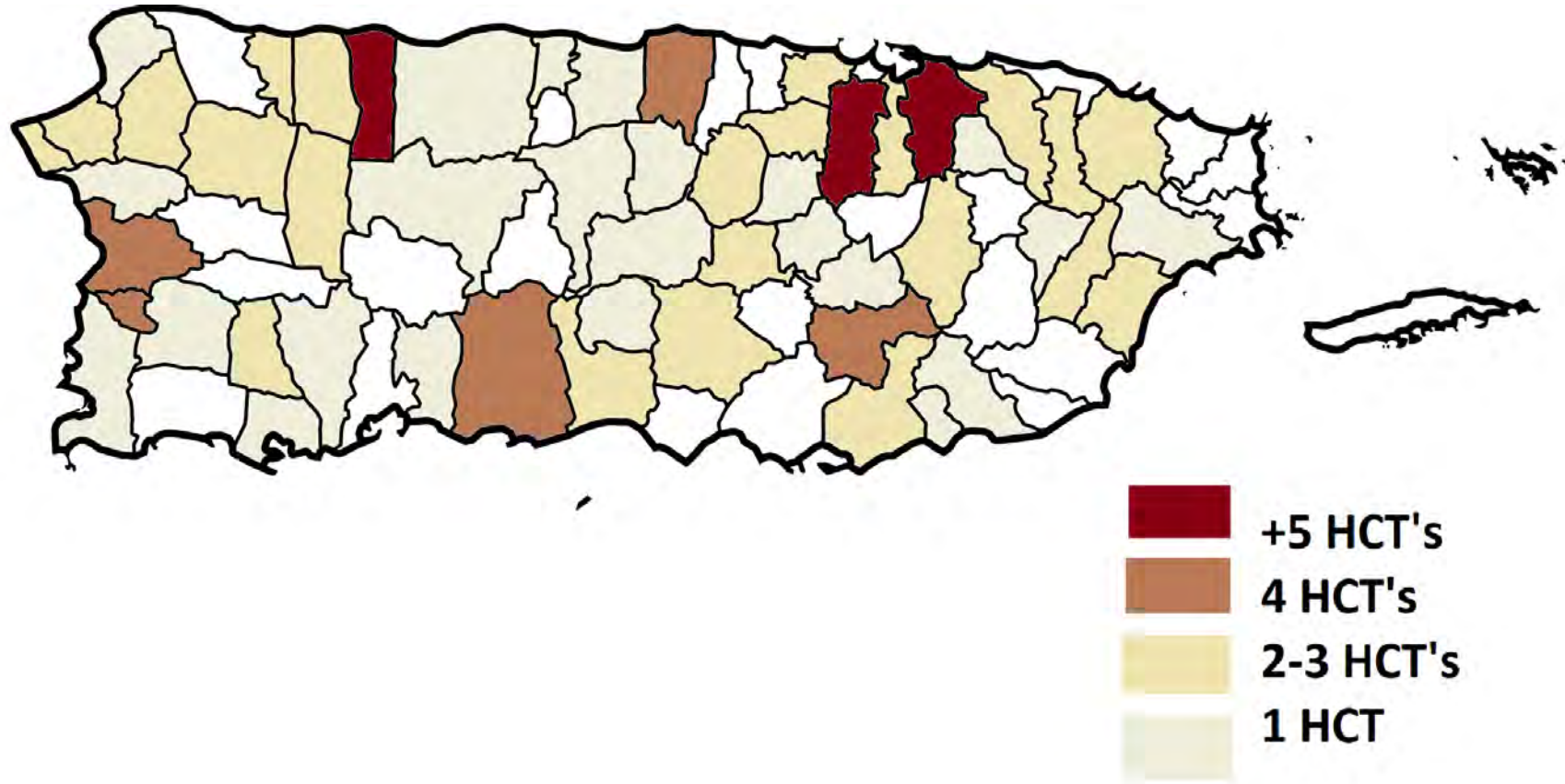
Survival 2021-2022

	2021 Survival %			2022 Survival %		
	+30 days	+100 days	+365 days	+30 days	+100 days	+365 days
Auto HCT	52/52 = 100.0%	52/52 = 100.0%	52/52 = 100.0%	54/55 = 98.2%	54/55 = 98.2%	54/55 = 98.2%
Allo HCT	14/17 = 82.3%	13/17 = 76.5%	9/17 = 52.7%	25/28 = 89.3%	24/28 = 85.7%	17/28 = 60.7%
Total HCT	66/69 = 95.7%	65/69 = 94.2%	61/69 = 88.4%	79/83 = 95.2%	78/83 = 93.9%	70/83 = 84.3%

Total Autologous HCTs by Municipality, San Juan P.R. 2015 – 2023

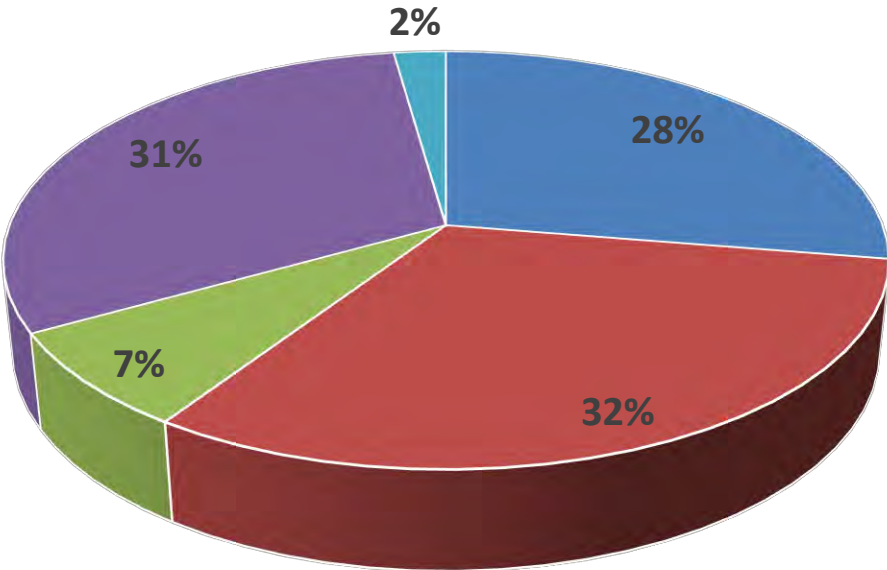


Total Allogeneic HCTs by Municipality, San Juan P.R. 2015 – 2023



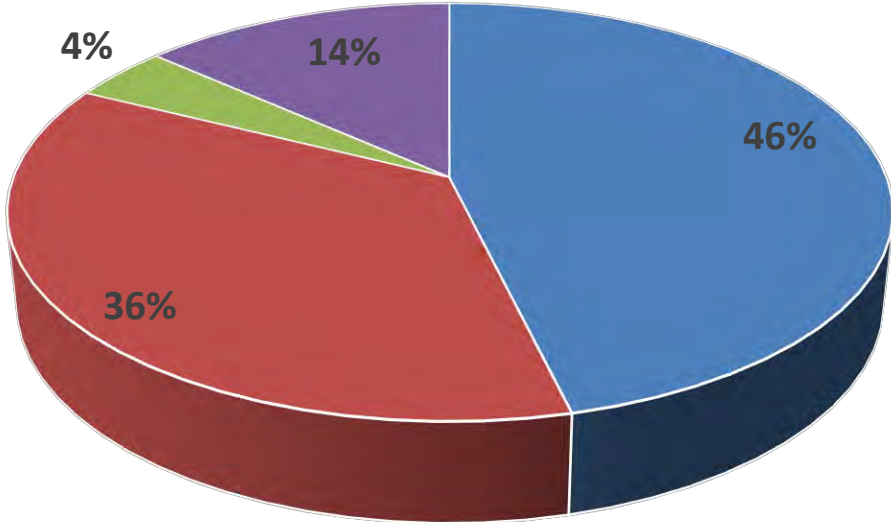
Total HCTs by Healthcare Plan, BMT-HAM 2015 – 2023

AUTOLOGOUS



■ Vital ■ Comercial ■ Medicare
■ Advantage ■ VA

ALLOGENEIC



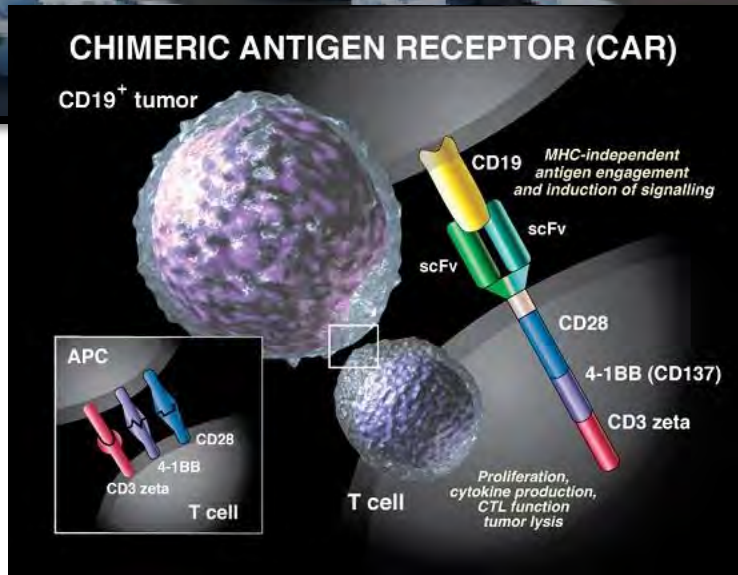
■ Vital ■ Comercial
■ Medicare ■ Advantage

What's Next?



2024: Ten Years Later

YES, WE ARE STILL DREAMING



ACADEMIC OPPORTUNITIES

HEMATOLOGY & ONCOLOGY

San Juan City Hospital
VA Caribbean Healthcare System

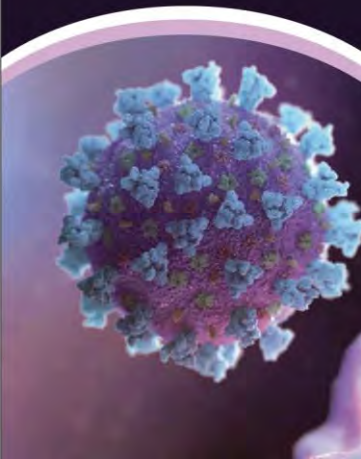
Hematology - Oncology Section
UPR School of Medicine



3 YEARS AGO

Centro de Cáncer Auxilio Mutuo

POST ASCO
VIRTUAL REVIEW 2020



Can we give CAR T cells in PR?

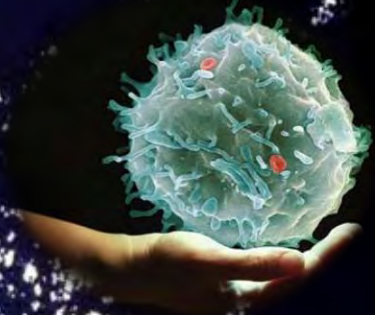


- 179 Auto-HCT
- 39 Allo-HCT (17 Haplo-T)
- >60% patients with Government Insurance

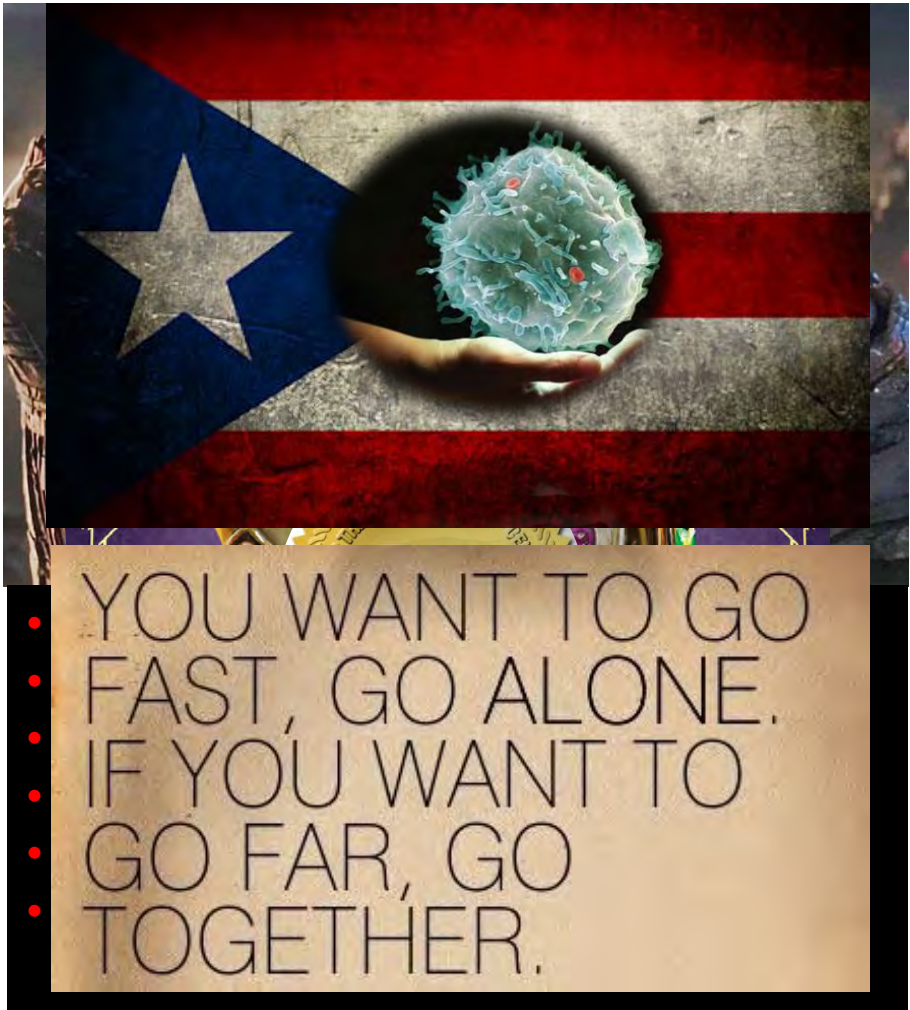
- Multi-disciplinary teams and infrastructures to manage logistics and patient care
- Robust quality processes and infrastructure



YES



REALITY: The road to CAR T in PR isn't an easy one.



In 2024: Can we still give CAR T cells in PR?

YES!!!

THANK YOU

Choose a job
you love
and you will
never have to work
a day in your life

*In the middle
of difficulty,
lies opportunity*



Caminante, son tus huellas
el camino y nada más;
Caminante, no hay camino,
se hace camino al andar.
Al andar se hace el camino,
y al volver la vista atrás
se ve la senda que nunca
se ha de volver a pisar.
Caminante no hay camino
sino estelas en la mar.

