



# Workshop of the WBMT

in cooperation with the

**World Health Organization (WHO)**

**Hanoi, Vietnam, November 10 – 11, 2011**



Sao Paulo  
Brazil

Adriana  
Seber

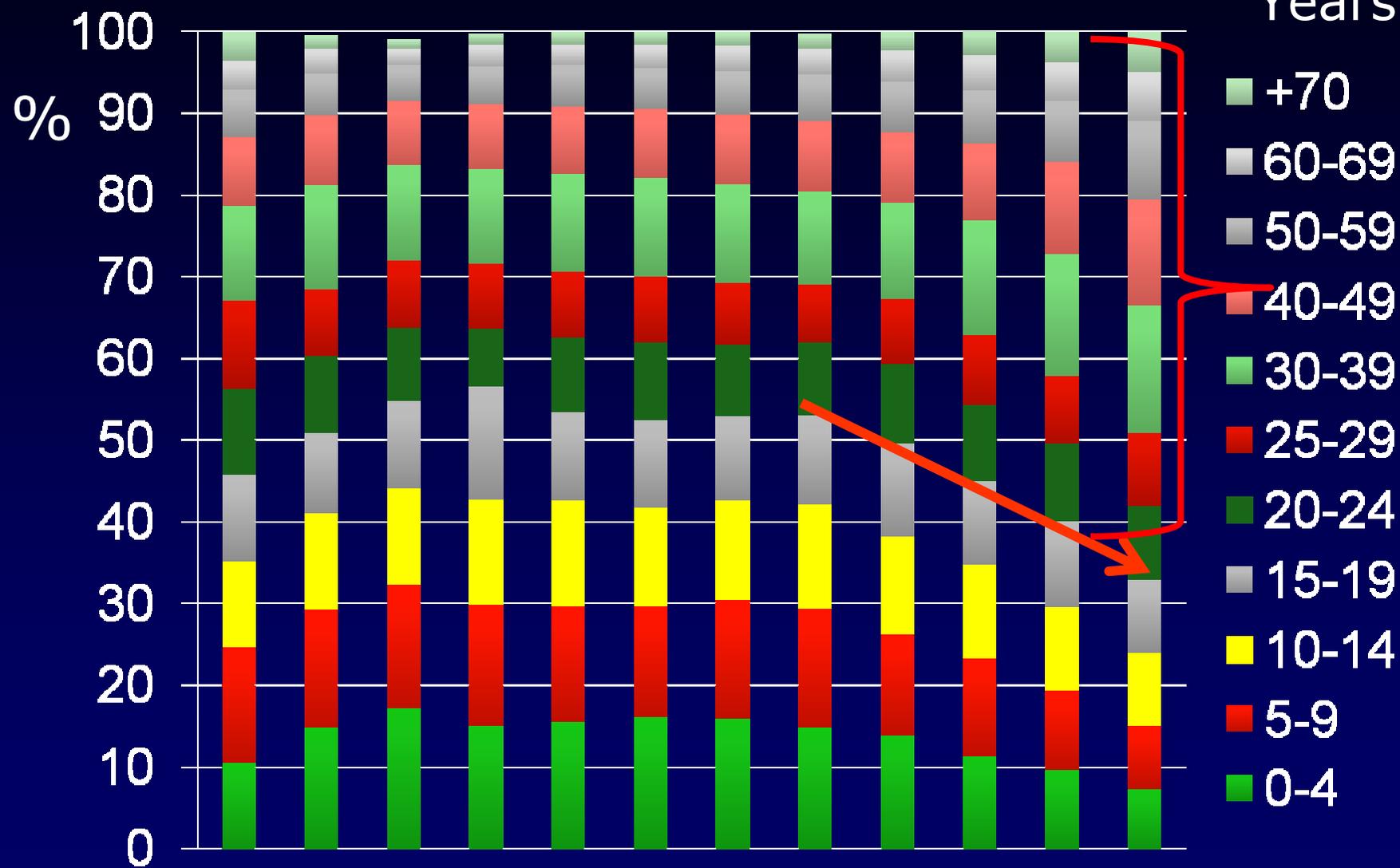
Hanoi  
Vietnam

# Brazil

- Population: 191 million
- 33% < 20 years of age

[www.censo2010.ibge.gov.br](http://www.censo2010.ibge.gov.br)  
[www.abtmo.org.br](http://www.abtmo.org.br)

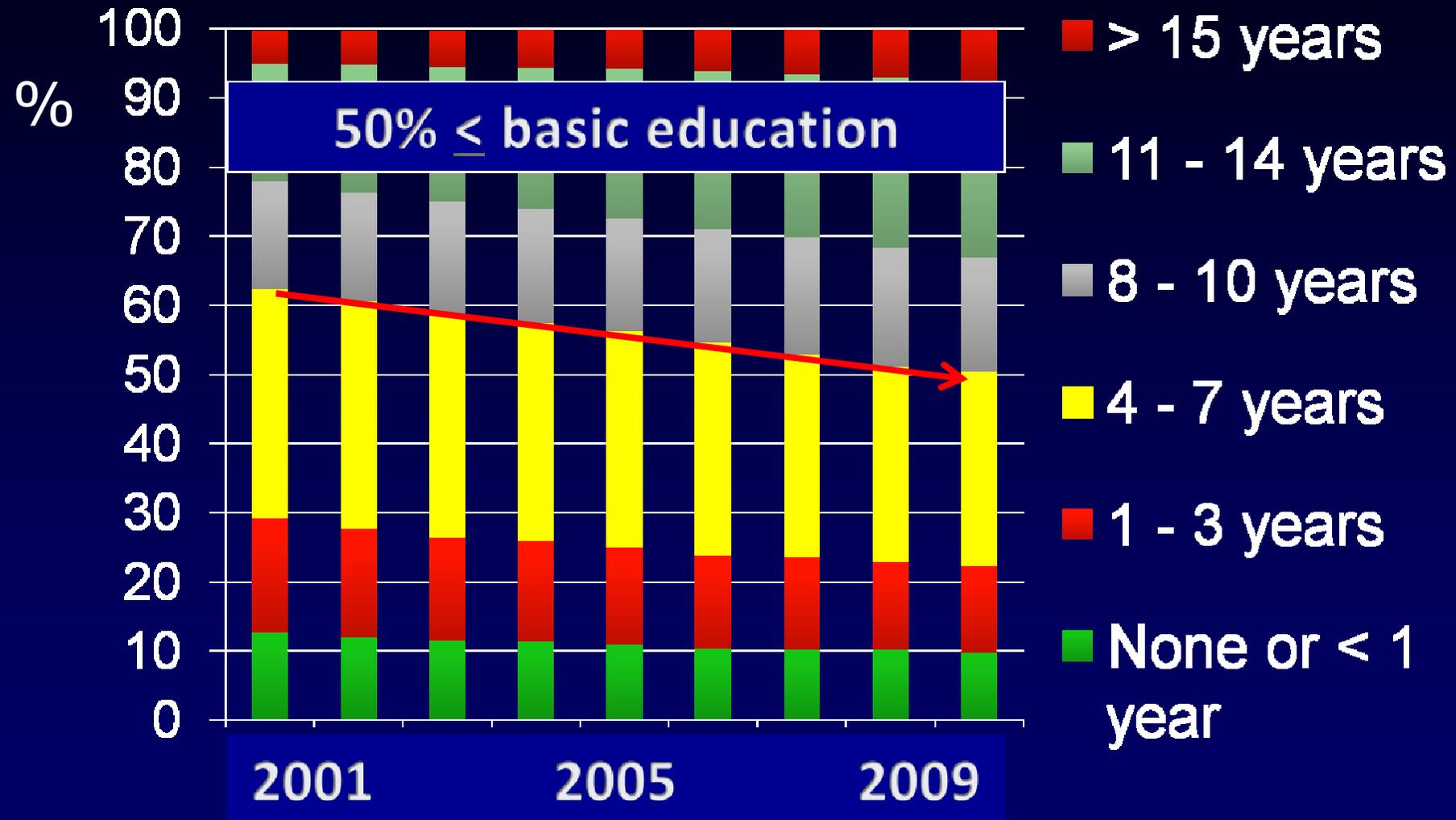
# Age (1890 - 2010)



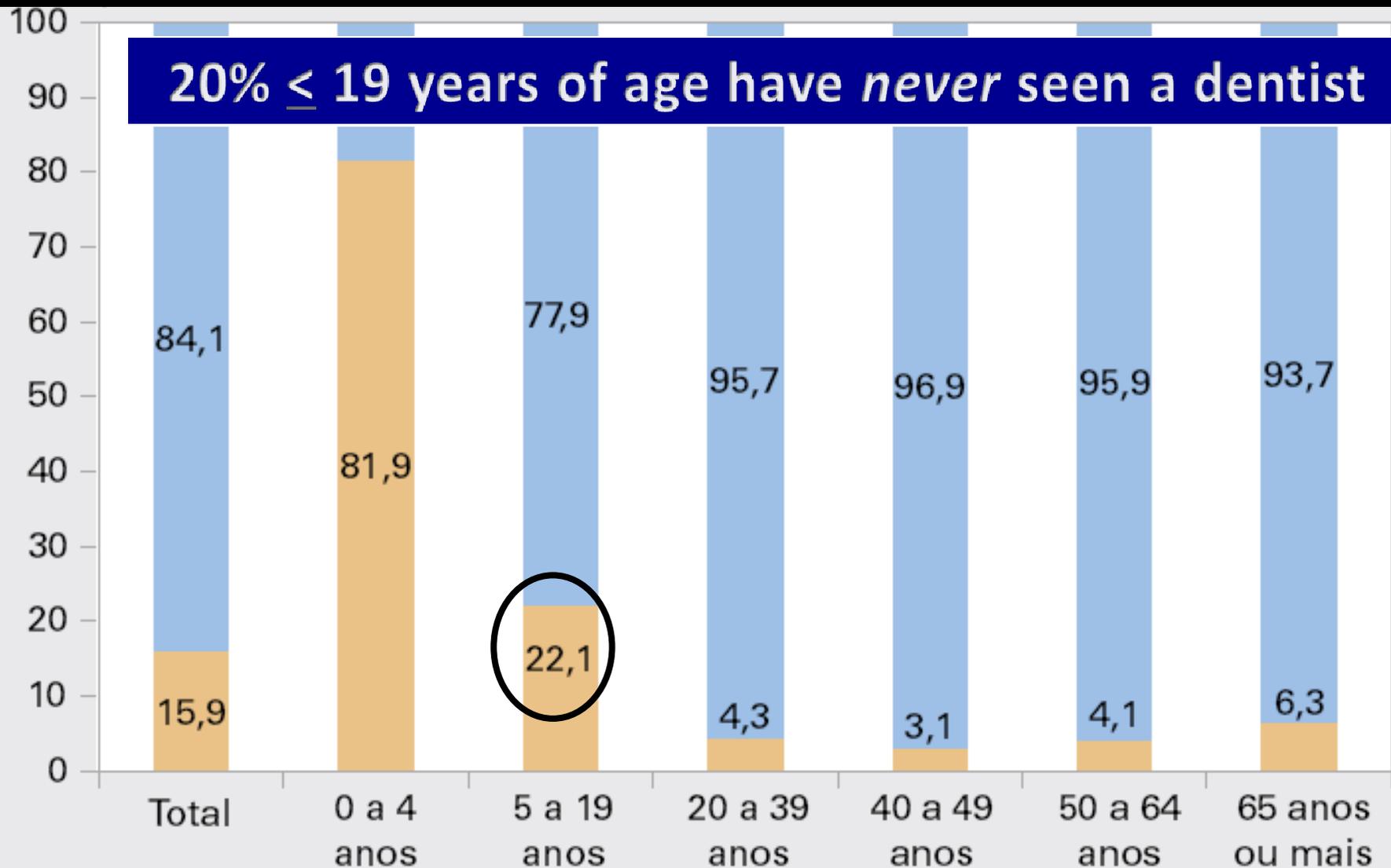
**33% < 19 years**

<http://www.ibge.gov.br>

# Years of Education



# Access to dental care



Já consultou

Nunca consultou

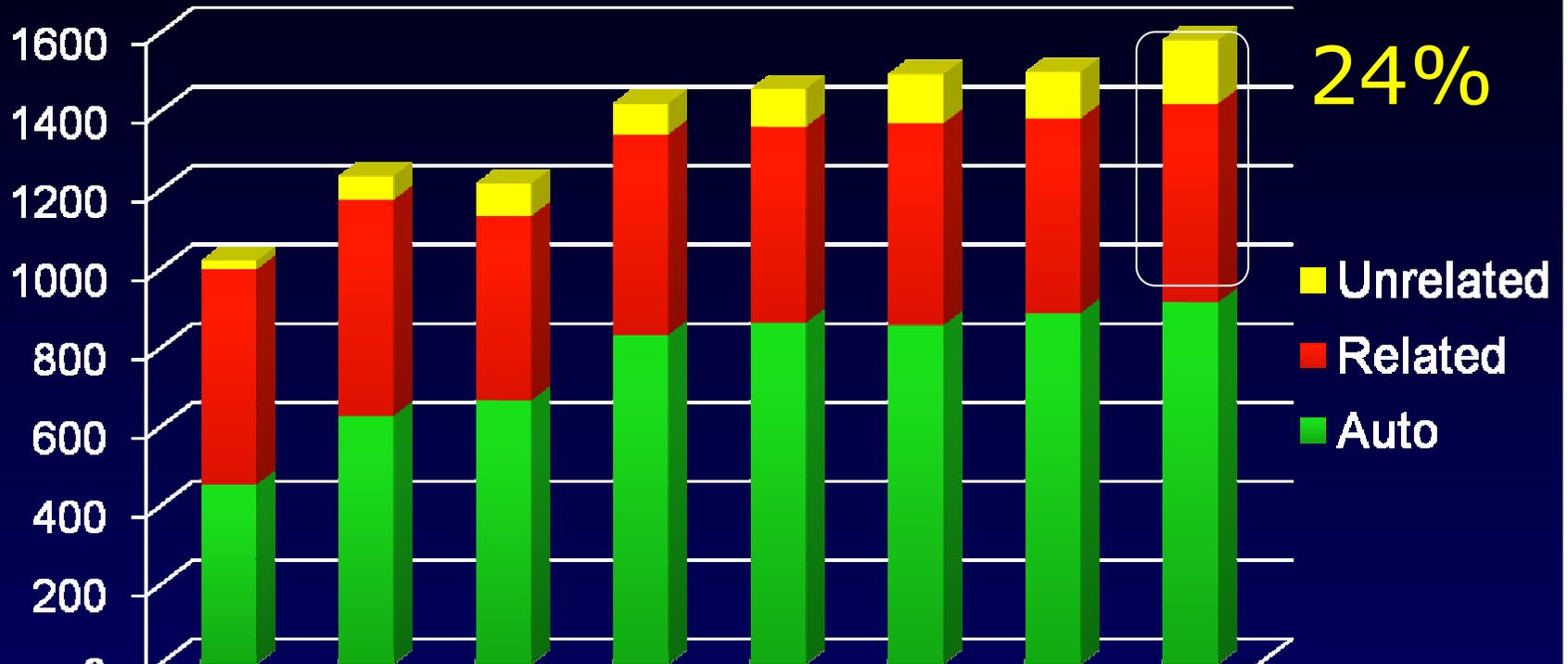
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# Brazil

- ✓ Population: 191 million
- ✓ 33% < 20 years of age
- 1 500 transplants/year
  - 78 transplants/10 million inhabitants
    - 60% autologous

[www.censo2010.ibge.gov.br](http://www.censo2010.ibge.gov.br)  
[www.abtmo.org.br](http://www.abtmo.org.br)

# Hematopoietic Stem Cell Transplants in Brazil



Year	2003	2004	2005	2006	2007	2008	2009	2010
Auto	454	628	667	833	864	858	889	916
Related	545	548	468	509	497	512	493	504
Unrelated	22	60	82	78	96	124	118	161

Allos: 65

# Starting a Hematopoietic Cell Transplantation Program

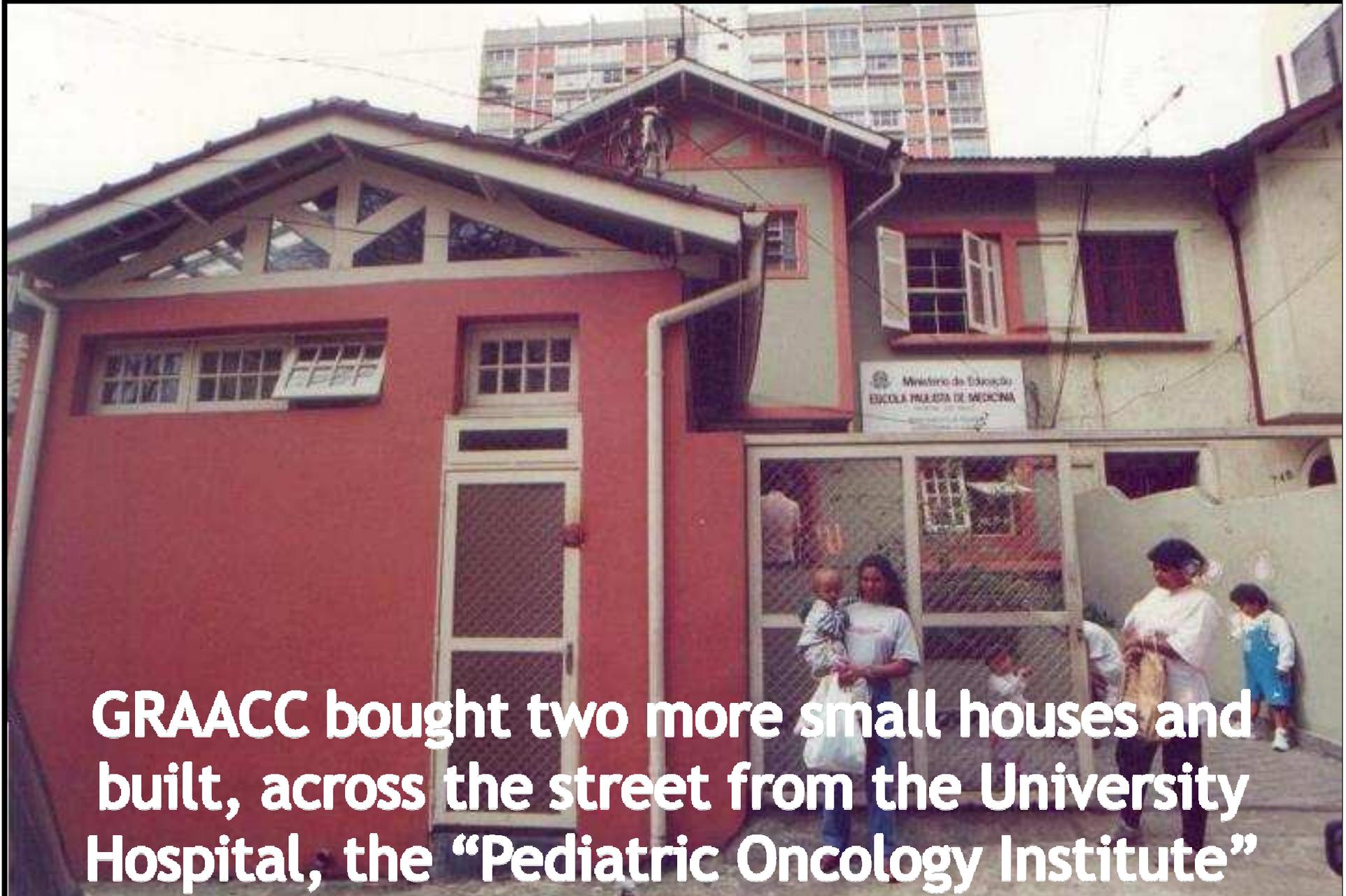
## A Perspective from the Frontline

- How the program was started
- What barriers were encountered
- How these challenges were overcome

# Pediatric Oncology Program

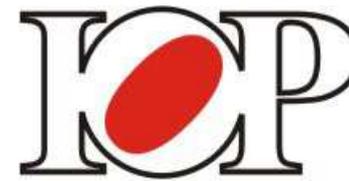
- 1987 – Two beds at the University Hospital São Paulo
- Chemotherapy administered in the corridor
- 1991 – **GRAACC** (Support Group for Children and Adolescents with Cancer) was founded by physicians, volunteers and patients' families.
- **GRAACC** rented a house for the children to receive chemotherapy

**1992**



**GRAACC bought two more small houses and built, across the street from the University Hospital, the “Pediatric Oncology Institute”**

1998



Instituto de  
Oncologia Pediátrica

# Pediatric Oncology Institute

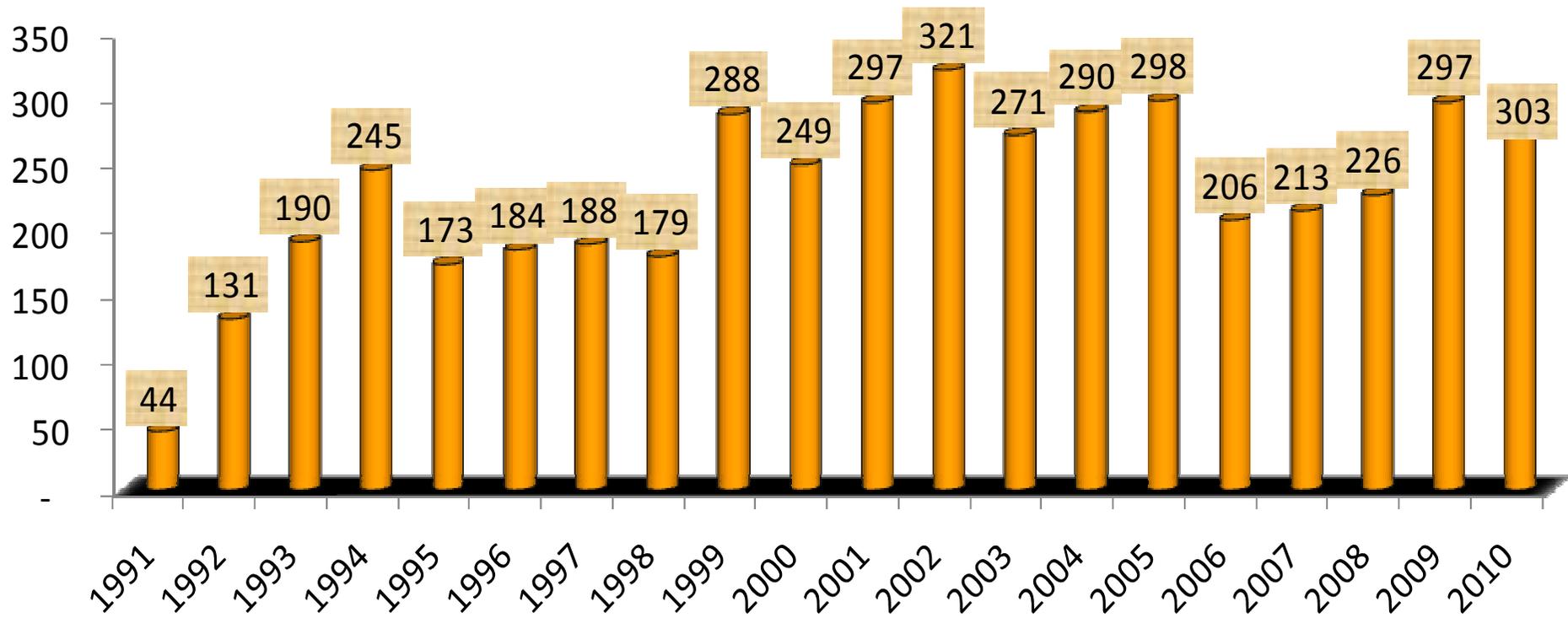


UNIFESP/EPM  
PEDIATRIA



# IOP-GRAACC-Unifesp

**Approximately 300 new pediatric oncology patients/year**



# History

- 1987 ✓ Pediatric ward at the university hospital
- 1991 ✓ Grupo de Apoio ao Adolescente e à Criança com Câncer was founded
- 1998 ✓ Pediatric Oncology Institute
- 1999 ✓ Pediatric BMT Unit**

**First transplant in May 21, 1999**

CENTRO DE TRANSPLANTE DE  
MEDULA ÓSSEA

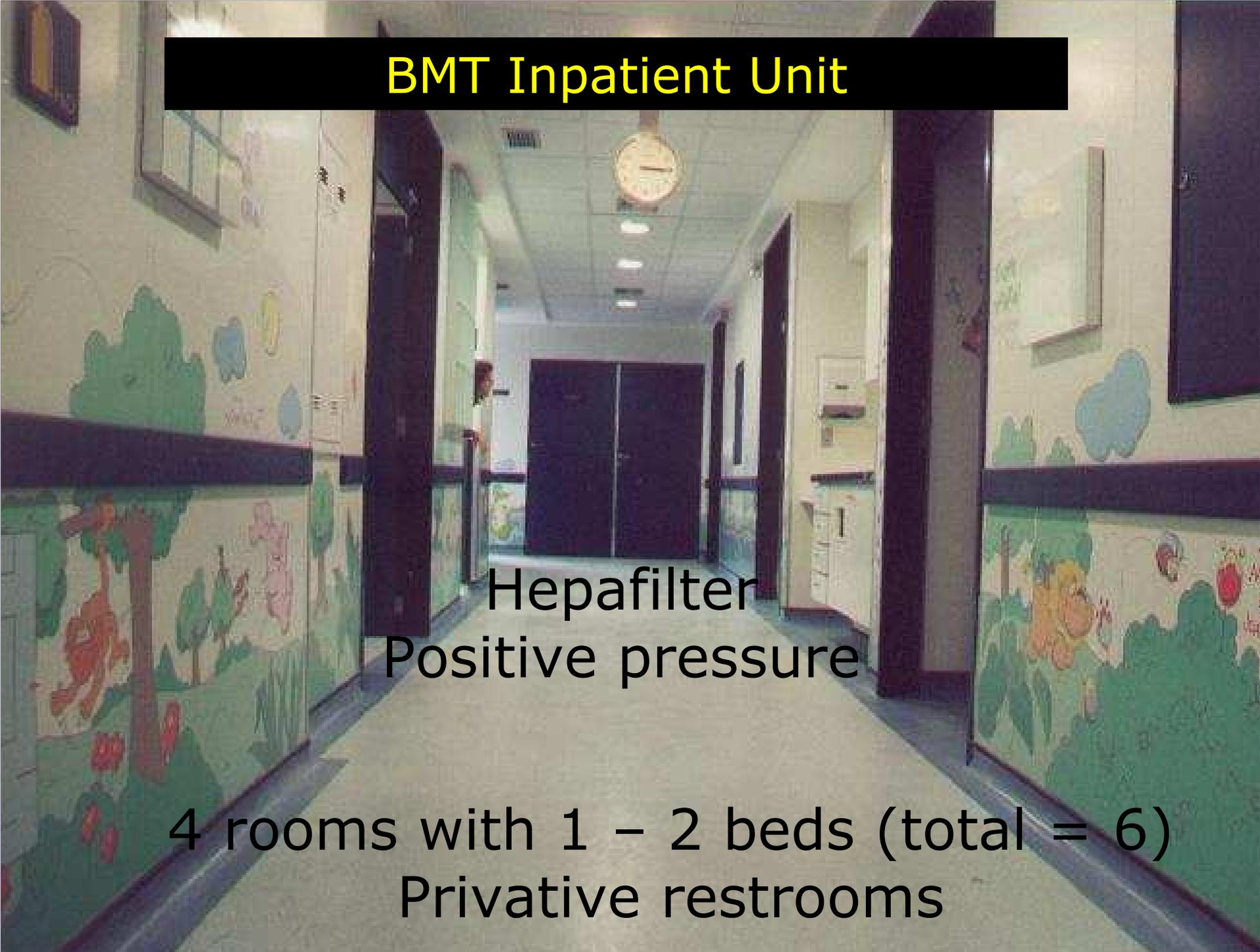


GRAACC  
COMATENDO E VENCENDO  
O CÂNCER INFANTIL



INSTITUTO RONALD McDONALD





## BMT Inpatient Unit

Hepafilter  
Positive pressure

4 rooms with 1 - 2 beds (total = 6)  
Privative restrooms

# BMT Laboratory



Biol. Olga Oliveira Félix  
Pharm. Paulo Simões  
Dr. Valéria Ginani

# Bone marrow collection

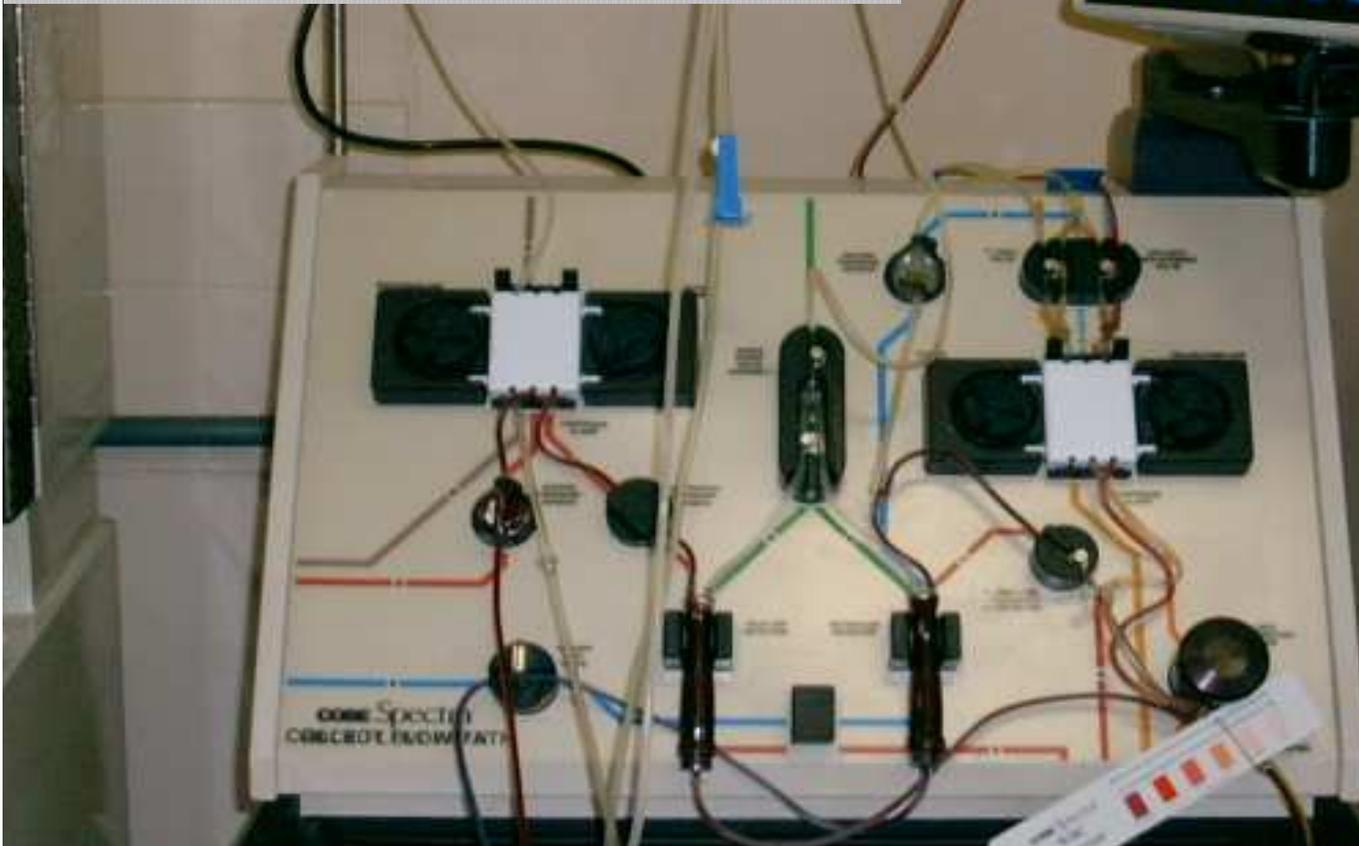
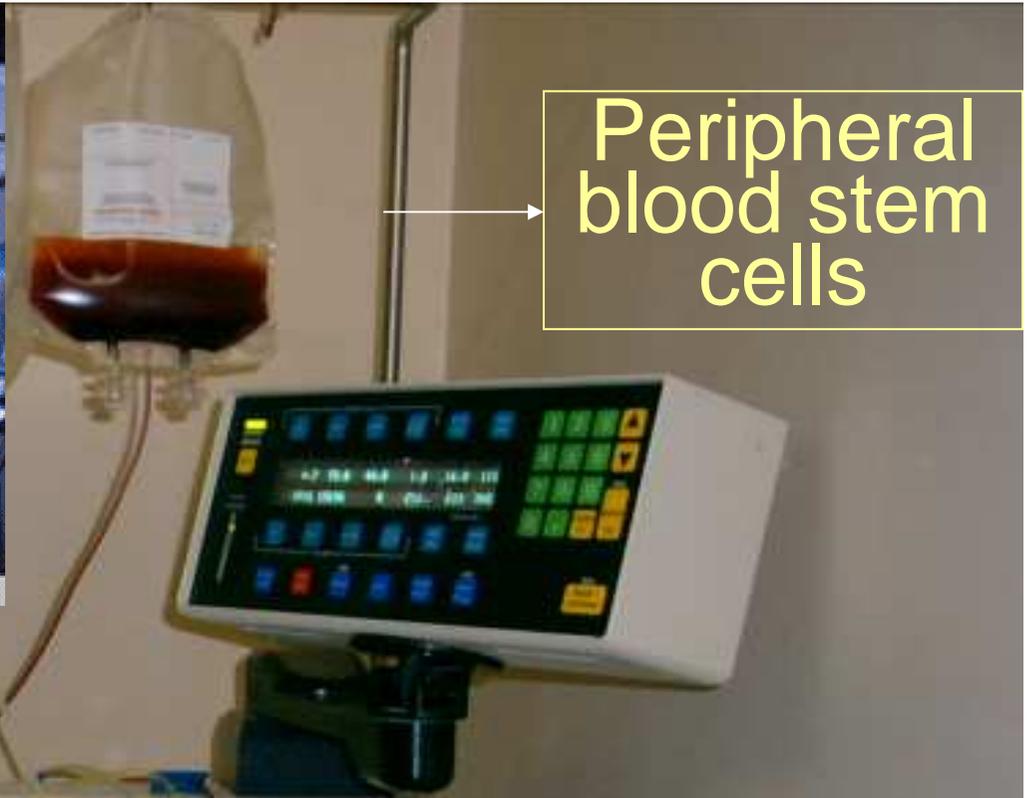


General anesthesia



15 ml/kg =  $5 \times 10^8$  TNC/kg





Dr. Valéria  
Ginani

# Day Hospital



# Ronald McDonald Family House



# Pediatric Hematopoietic Stem Cell Transplantation

IOP – GRAACC – Unifesp

April 1999 – October 2011

Total = 329 transplants

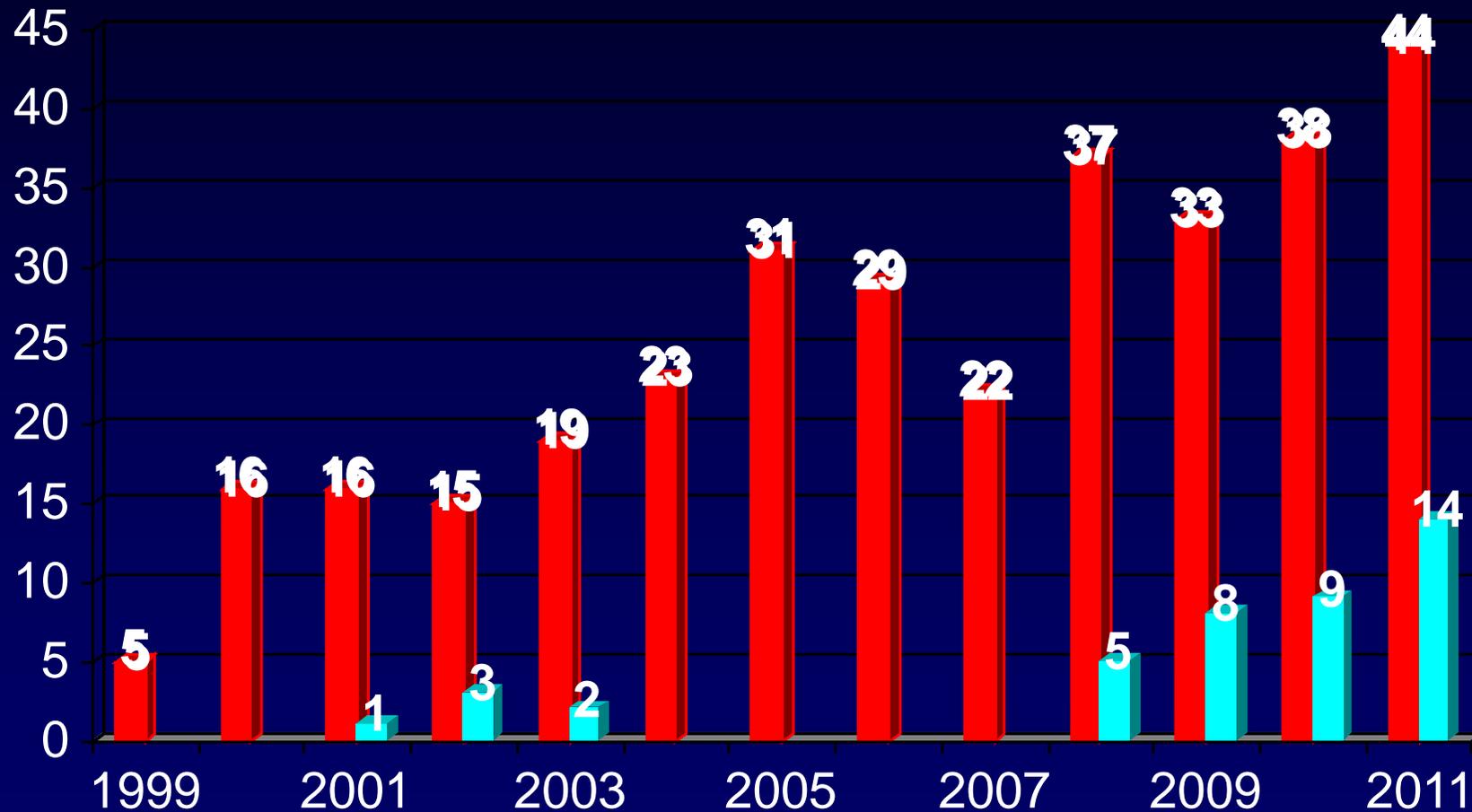
- Autologous N=158
- Allogeneic N=171
  - HLA-compatible sibling N= 120
  - Other family donors N= 9
  - Unrelated N= 42

40 pediatric only transplants/year

# Number of Transplants

TMO IOP – GRAACC – UNIFESP

\* Unrelated donor

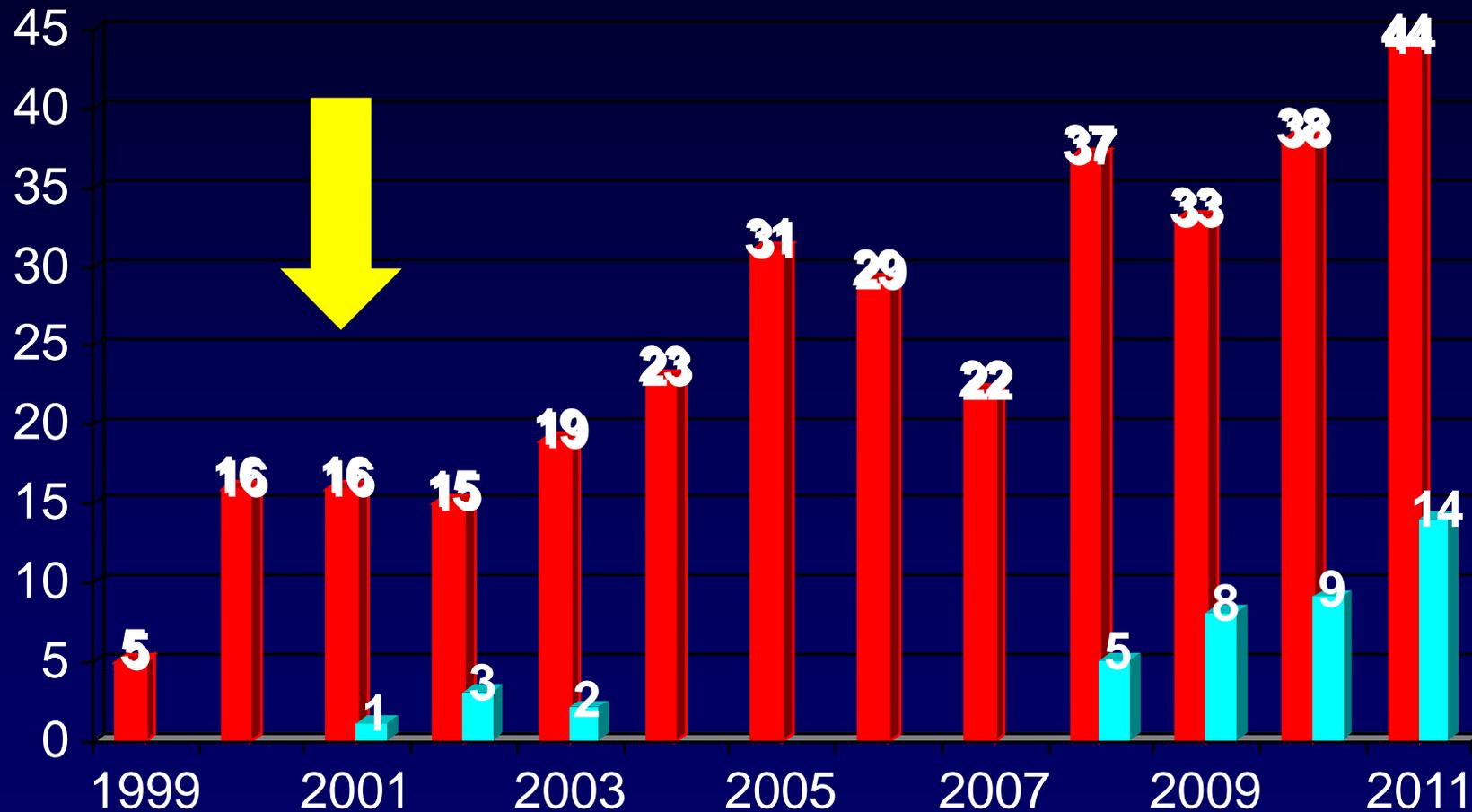


\* 21/07/2011

# Number of Transplants

TMO IOP – GRAACC – UNIFESP

\* Unrelated donor



\* 21/07/2011

# Challenges

- Start from the ground in a new hospital
- No team
- No routines
- No infra-structure
  - laboratory tests, imaging (X-Ray and Ultrassound)
- Fair blood bank support
- No platelet apheresis
- No trained staff

# Overcoming the initial challenges

- ✓ Huge dedication - nobody to rotate with for three years....
- ✓ BMT fellowship program – kept the best
- ✓ Continuous training

# Celebration of 100 transplants in May, 2005



# Overcoming the initial challenges

- ✓ Cryopreservation laboratory

# Overcoming the initial challenges



Cryopreservation  
laboratory

- Supplies
- Equipment

# Cell Processing Laboratory

- All equipment is imported
- No adequate local maintenance
- No assistance during holidays (at all)
- All parts are imported and may take a month to get to Brazil
- Supplies are imported, overtaxed
- Companies have no interest to register the products in the national “FDA equivalent” because it is a small market

# Cell Processing Laboratory

## Solutions

- Duplicate all essential equipment – centrifuge, freezer, nitrogen storage tank
- Local staff is always checking functioning and laboratory technicians are always on call
- Research projects to import supplies and equipment under lower prices

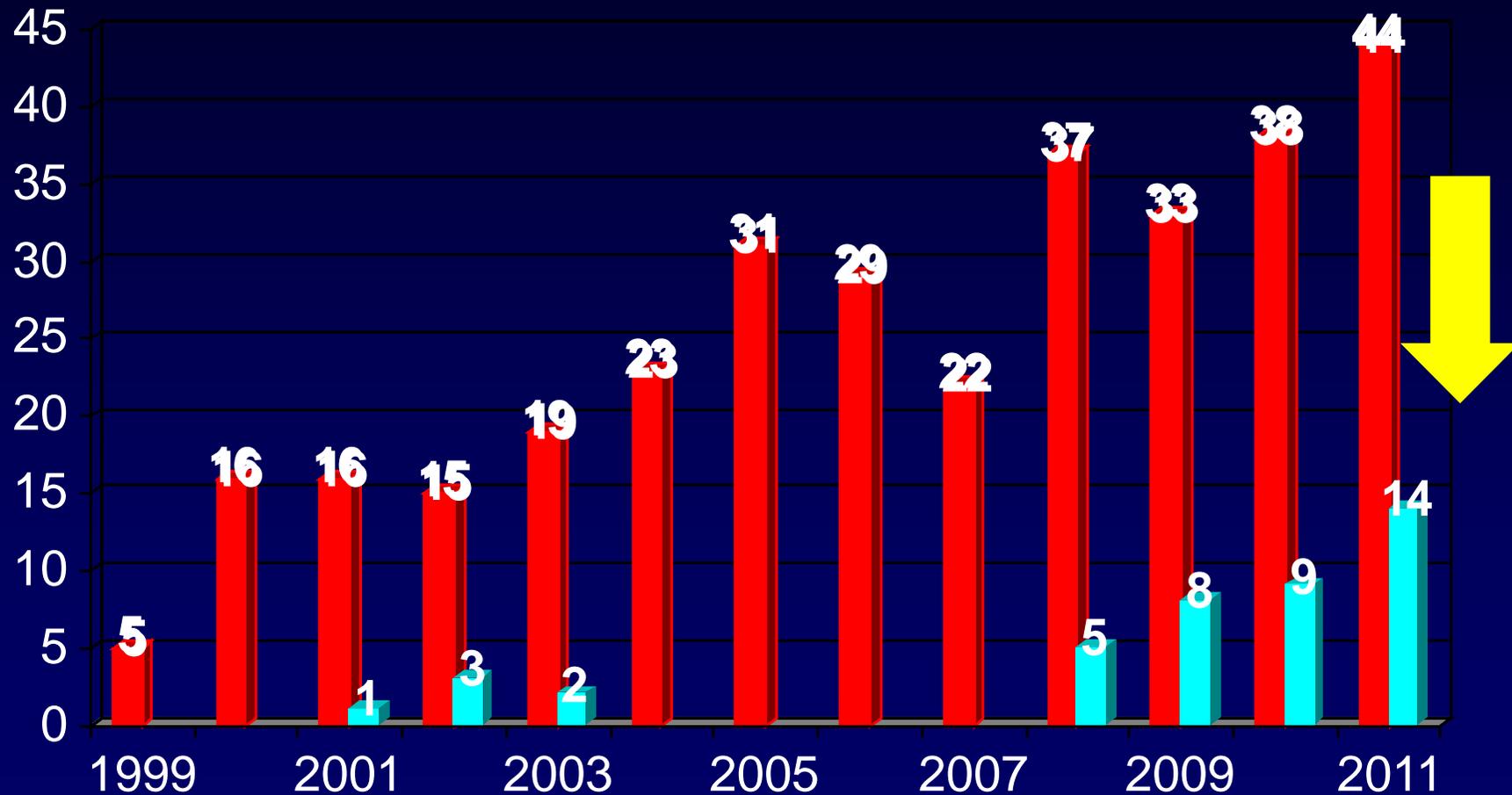
# Overcoming the initial challenges

- ✓ Established routines
- ✓ Imported non-available key medications
  - Defibrotide, cidofovir, foscarnet...
- ✓ Contracts for specific tests
  - CMV, chimerism (VNTR/STR), respiratory viruses, drug levels (CsA, antibiotics, phenytoin)
- ✓ Donated extracorporeal photoapheresis procedures to treat refractory acute GVHD
- ✓ New imaging center: CT, MRI (PET)
- ✓ Independent blood transfusion service

# Number of Transplants

TMO IOP – GRAACC – UNIFESP

\* Unrelated donor



\* 21/07/2011

# Unrelated donor transplants

- Patients are much sicker than after HLA-identical transplants
- Chronic graft versus host disease consultations
- Infectious disease specialist
- Contract with viral laboratory
  - EBV, BK, HHV-6
- Contract with mycology laboratory for galactomanan testing, identification and sensitivity to (expensive) antifungals

# Unrelated donor transplants

- Fusarium outbreak in the transplant unit
  - City water system has Fusarium! – outbreaks in many hospitals
  - Intensified cleaning in the restrooms
  - Increased the frequency of changing the filters of the air handling system
  - Took off all shower heads from the transplant unit – dry baths
    - no further cases

# Unrelated donor transplants

- Unrelated stem cell collection (obligatory)
  - Only young donors (< 40 years of age)
  - One dedicated physician with > 10 years experience in marrow and peripheral stem cell collections and ~~central line insertions~~ (strongly discouraged)

# Unrelated donor transplants

- New BMT physician
- New intensive care specialist
- 2nd nurse practitioner
- First data manager 😊
- Cost analysis
- Quality program and accreditation ....
- Haplo (post-transplant Cyclophosphamide)
- Transplants for sickle cell disease
- New 15-bed transplant unit

# Public health care reimbursement – flat rate

- Autologous
  - R\$ 23,000 = U\$ 14,000
- Allogeneic
  - Related
    - R\$ 55,000 = U\$ 33,000
  - Unrelated
    - R\$ 71,000 = U\$ 43,000

Fund raising (50% of the hospital cost)



4.100 m<sup>2</sup>



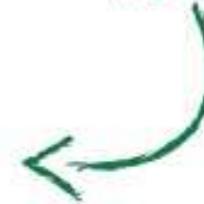
# SONHOS REAIS



**GRAACC**

Março 2012

4.200 m<sup>2</sup>



Área Total  
8.300 m<sup>2</sup>

Rua Pedro de Toledo

SONHOS REAIS



O próximo passo...



Imagem meramente ilustrativa

Área Total  
32.000 m<sup>2</sup>

...um grande complexo hospitalar.



# Future

- Clinical pharmacist
- Radiation therapy
- Blood bank
- Biochemistry laboratory
- Continuous training for our staff
- Inpatient-Outpatient Unit
- Hospice

# Thank you!!!





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