



# Costa Rica's notable health indicators are a result of historical and political commitments

1920	1940	1950	1960	1970	1980	1990	2000	2010
Secretary of Hygiene	Social Security Fund (CCSS)	↑ Health Coverage	Mobile units program	Rural health program	National Health System	Health sector reform	Food fortification	†Chronic diseases
National Insurance Institute	University of Costa Rica	Fundamental Education Law	Vaccination program	Latrines Hospital without walls	Comprehensive care	Transfer of Primary Care Ministry of Health-CCSS	<ul><li>Flour</li><li>Rice</li><li>Sugar</li><li>Salt</li><li>Milk</li></ul>	Strenghthening of healthcare provision
Public Health Protection Law	Mandatory Insurance	National Nutrition Census	Acqueducts and Sewage Institute	In-hospital births Anti-Parasite	Integration of services	EBAIS		Tobacco Law EDUS
Malaria, TB and Leprosy	Health Fund	CEN-CINAI	Medical School at UCR	treatment Universalization	Primary Healthcare model	Increase in elderly population		
control	Pension Fund	Folic acid and iron in flour	INCIENSA	Transfer of Hospitals Non- Contributory coverage	IAFA			

Costa Rica has seen rapid changes in health paradigms towards rare and congenital diseases

Deficiency-related disease paradigm

Through 1970

**Diachronic Approach** 

Infectious disease paradigm

Through 1980
Synchronic or Holistic
Approach

Chronic disease paradigm

From 1990

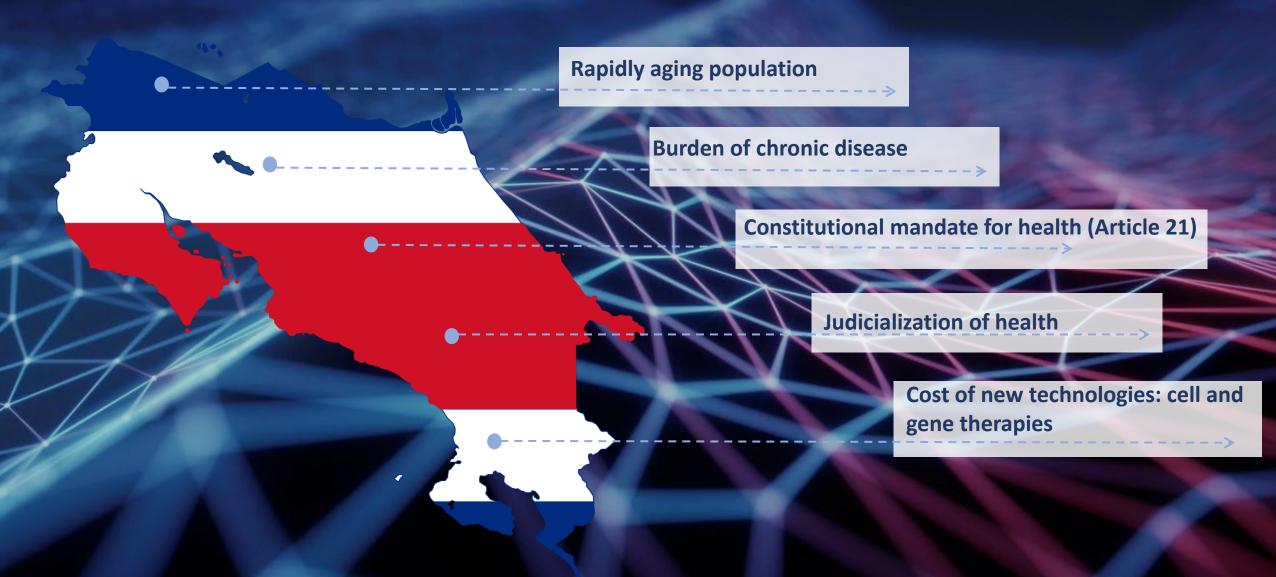
**Holistic Approach** 

Congenital and rare disease paradigm

From 2000

**Precision Approach** 

Costa Rica's health system faces serious challenges for sustainability and access to health services



### Costa Rica has 1-2 possible pediatric candidates for CAR-T cell therapy per year

Year ———	Leukemia Cases	B-Cell ALL # (%)	T-Cell ALL # (%)	Other	Refractory
2016	66	51 (77.2)	2 (3)	13 (19.7)	2
2017	63	51 (81)	4 (6.3)	8 (12.7)	2
2018	60	50 (83.3)	2 (3.3)	8 (13.4)	1
2019	69	53 (76.8)	4 (5.8)	12 (17.4)	2

# Collaboration with the University of Pennsylvania and the Children's Hospital of Philadelphia is strategic for CAR-T implementation in Costa Rica

- Initial visits to UPenn and Dr. June's Lab by Costa Rican Embassy in the U.S. (2015, 2016, 2017)
- Visits to Costa Rica's National Children's Hospital by delegations from UPenn and CHOP, including Dr. Carl June, Dr. Bruce Levine, Dr. Glen Gaulton and Dr. Stephan Grupp (2016, 2017, 2018)
- Memorandum of Understanding between UPenn, CHOP and CCSS (Pending)
- Wharton students' Field Application Project, members of Dr. June's Lab and Dr. Stephan Grupp (CHOP) visit Costa Rica in February 2020



#### Before COVID-19, implementation of CAR-T was planned in three stages

### **Initial Stage**The Index Case

- CHOP-UPenn-CCSS
   Memorandum of
   Understanding
- Index case(s) (1-2)
- Training visits for index cases

# Mid-Stage Implementation and local accreditation

- Accreditation of apheresis
- Certification of post infusion care
- Cell transformation abroad

### Advanced Stage Consolidation and growth

- National Apheresis and Cellular Therapy Center
- Local apheresis, transformation, infusion and hospital care
- Adult pathologies
- National and international research

The COVID-19 pandemic has meant a hard reset on the timeline

## Leukemia patients require access to more therapeutic options and a higher standard of care

Equity and Equality are two of the seven principles of the "Caja Costarricense de Seguro Social"

#### **Objectives**

- Improvements in infrastructure; better isolation conditions
- Improved access to drugs
  - Busulfan IV

- Midostaurin
- Mitoxantrone
- Procarbazine

Thiotepa

- Monoclonal antibodies
- Improvements in Hematopoietic Stem Cell Transplantation (HSCT) programs
- Planned access to therapies not offered today
  - CAR-T cell therapy
  - Therapeutic photo-apheresis
  - Total Body Irradiation

#### Challenges

FACT-JACIE accreditation for apheresis

(National accreditation plan for apheresis?)

Cell transformation facility (GMP accreditation?)

The National Children's Hospital of the CCSS aims to offer the highest standard of care in pediatrics, including precision medicine, research and innovation

Future vision considers cell and gene therapy, a genomics center, and biomedical research

National Neonatal Screening Program founded in 1990 currently screens for 51 congenital diseases





### Published/Presented Results in ALL

Sponsor	NCT	Age	Antibody	Co-stim	Integration	CR rate	Durability
SCH n=43	02028455	1-26 y	FMC63	4-1BB	<u>Lenti</u>	93%	1 year EFS 50.8%
FHCRC n=29	01865617	≥ 18 y	FMC63	4-1BB	Lenti	94%	1 y DFS ~65% (flu/cy)
CHOP n=59	01626495	1-24 y	FMC63	4-1BB	<u>Lenti</u>	93%	1 year RFS 55%
UPENN n=27	01029366 02303847	21-72 y	FMC63	4-1BB	Lenti	56%	NR
Novartis n=75	02435849	3-21 y	FMC63	4-1BB	Lenti	81%	1 year EFS 50%
MSKCC n= 46	01044069	≥ 18 y	SJ251	CD28	Retro	83%	6mo OS 57% (>5%dz)
NCI n=51	01593696	Peds/YA	FMC63	CD28	Retro	60%	Median OS 13.3mo
CHOP n=22	02374333	Peds/YA	humanized	4-1BB	<u>Lenti</u>	100%	RFS at 12 months 82%

SCRI Seattle Children's Research Institute (Gardner et al Blood 2017); FHCRC Fred Hutchinson Cancer Research Center (Turtle et al JCI 2016); CHOP Children's Hospital of Philadelphia (Maude et al ASCO 2016); UPENN University of Pennsylvania (Frey et al ASCO 2016); Novartis (Maude et al NEJM 2018) MSKCC Memorial Sloan Kettering Cancer Center (Park et al ASCO 2016); NCI National Cancer Institute (Lee et al. ASH 2016)



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