My work as a Clinical Chemist in Uruguay

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29/04/25

Slides summary

- Presenting Uruguay (What is Uruguay? Where is it? How is it? Culture and fun facts about it)

- Educational system in Uruguay

- Clinical Biochemistry

- Uruguayan healthcare system

- IFCC Professional Exchange Programme and perspectives for the future

Uru… what?

Norway?

Paraguay?

Uru… what?

So… Lets learn what Uruguay is!!

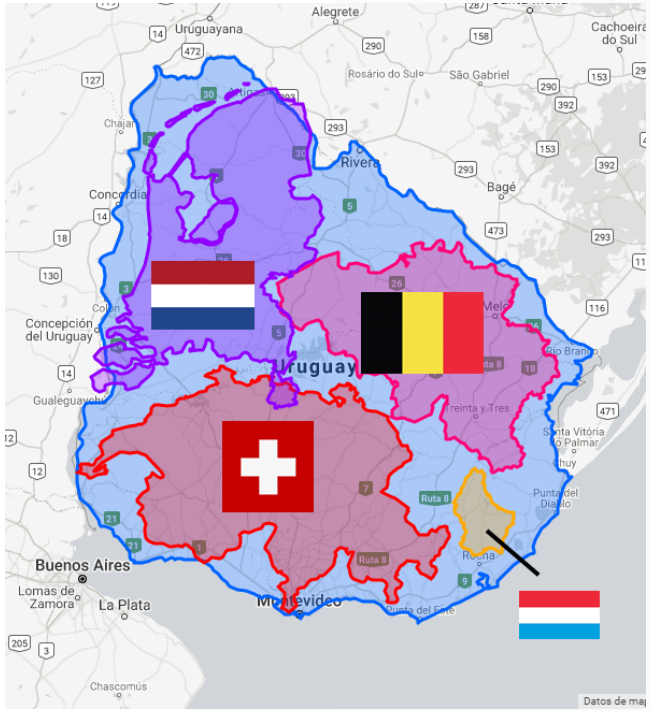
Facts

Fact №1

- Uruguay ≠ Paraguay

Fact №2

- Not that tiny country



Facts

Fact Nº3

- Mountains and jungles?
  - More like:

- But also:

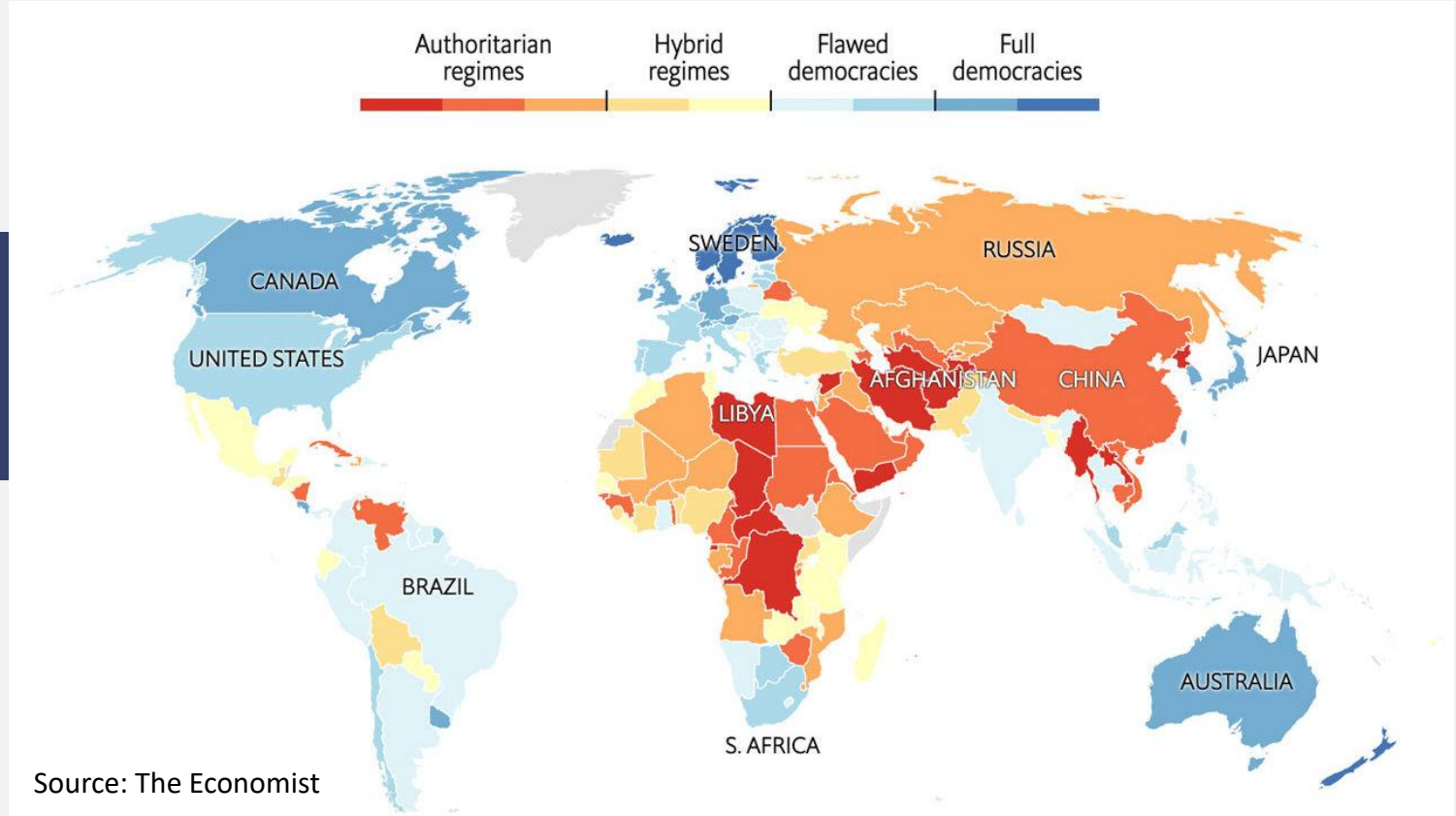
Facts

Fact №4

- Endless summer?
- I wish but the reality is:

FAQs

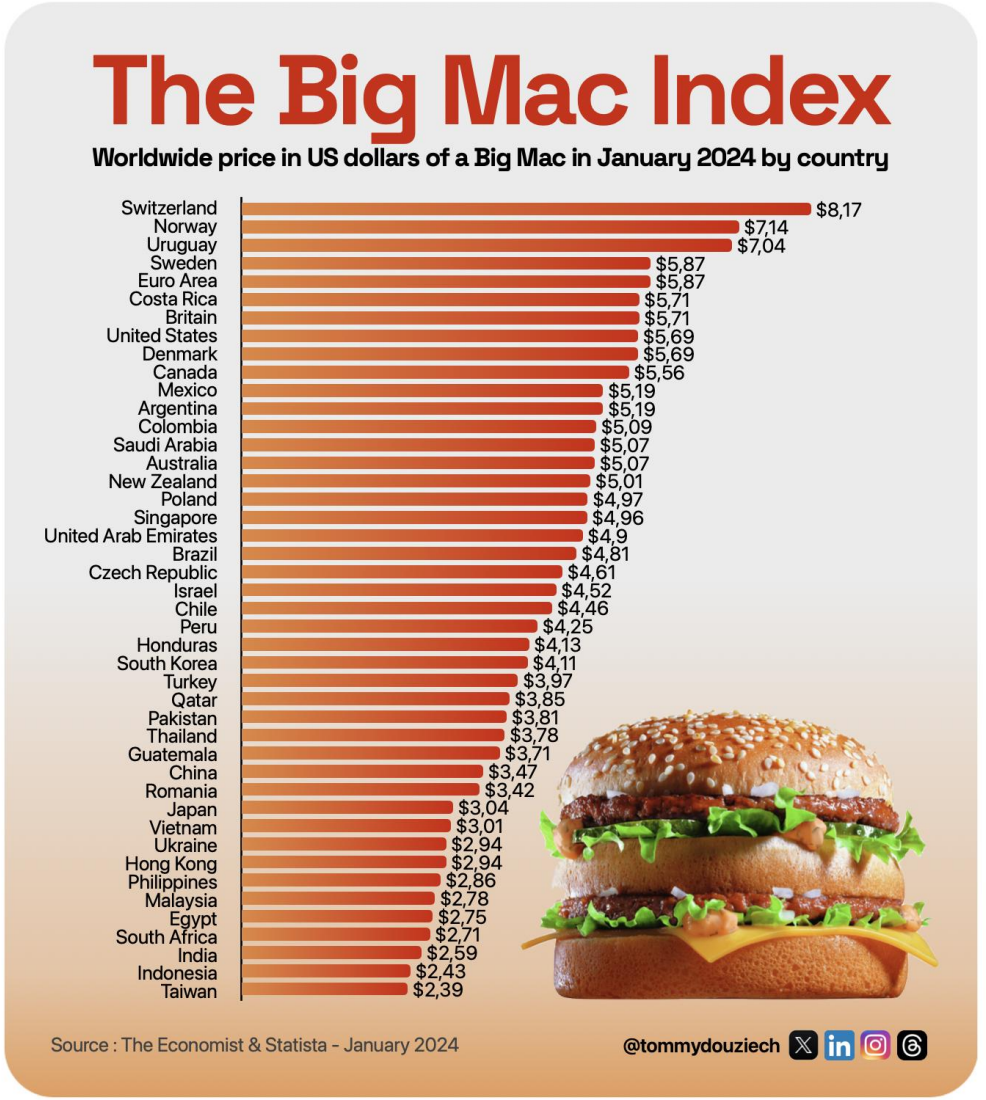
Is it a dictatorship? No…



Source: The Economist

FAQs

Is it a cheap country? Not for the region, and not for Uruguayans



FAQs

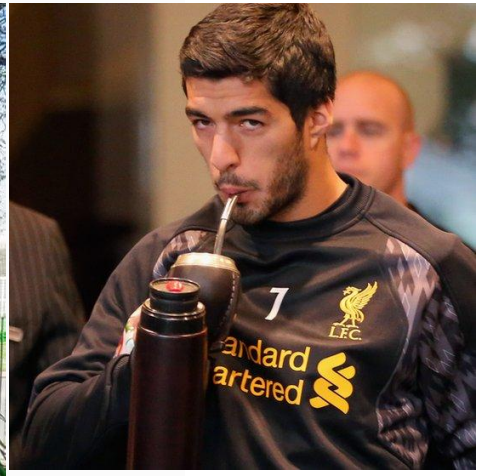
Does Uruguay have a big population? Population: 12 million cows, 3.38 million humans

FAQs

Is there a Fiesta/Siesta mentality?
Hospital personnel: 12 hours/day

How do we survive this???

Major cultural aspects: Mate



Major cultural aspects: Football

FOOTBALL

Major cultural aspects

TANGO

CARNIVAL: CANDOMBE AND MURGA

BEEF, DULCE DE LECHE, TORTAS FRITAS

Major cultural aspects

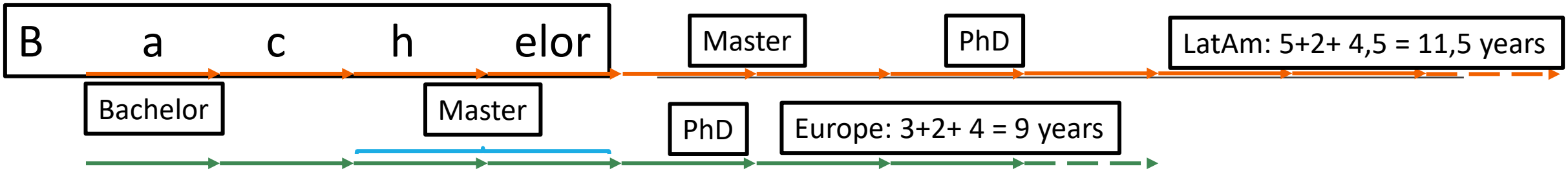
PROGRESSIVE COUNTRY

- Free, secular, and compulsory education (since the late 19th century)
- Divorce at the sole request of the woman (1913)
- Secular state (1917)
- Early women's suffrage (1932)
- Legalization of abortion (2012)
- Legalization of same-sex marriage (2013)
- Regulation of cannabis (2013)

THINKERS

- José Mujica
- José Batlle y Ordóñez
- José Pedro Varela
- Juana de Ibarbourou
- Mario Benedetti
- Eduardo Galeano

Education system in Uruguay



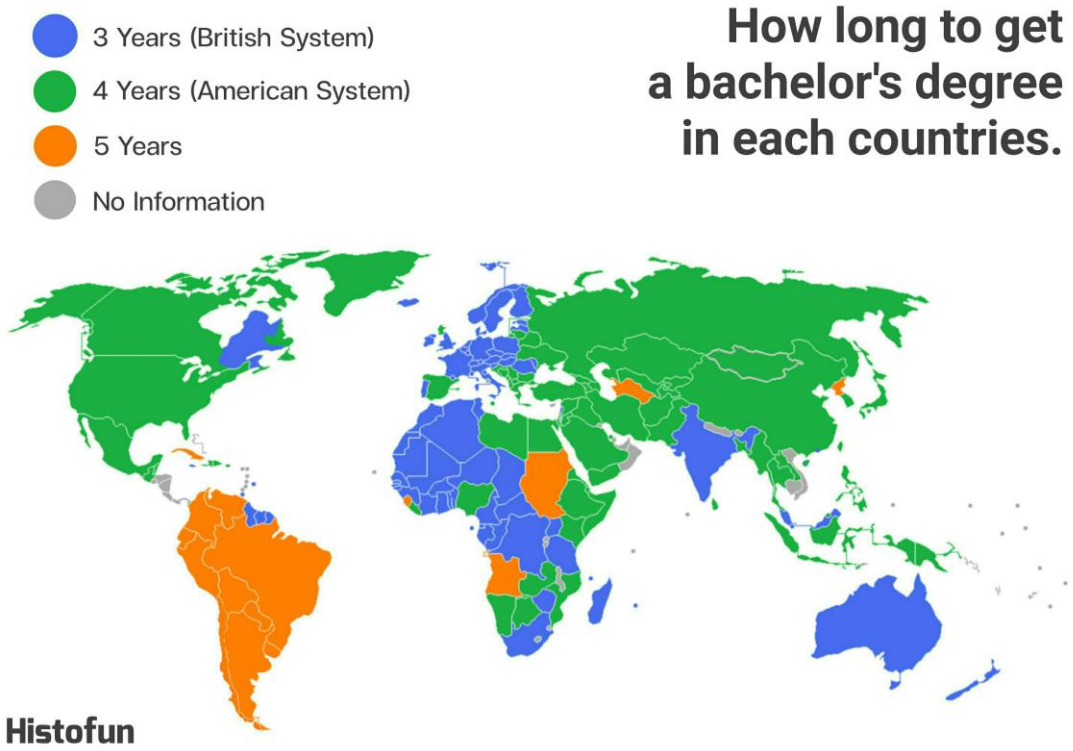
Starting at 6 years in School

4 years of “basic” high school

2 years of “specialized” high school or also called “Bachillerato”

1st year: “Biological sciences”

2nd year: “Medicine”



What bachelor’s did I choose?

Clinical Biochemist

- Clinical analyses: Biochemistry, microbiology, hematology, immunology, toxicology.
- Design, develop, plan, apply and interpret lab analyses to study living beings and their relationship with the environment.
- Physical-mathematical sciences, chemical sciences, biological and biomedical sciences and clinical analyses.
- 5 years

So, it’s kind of similar to a pharmacien parcours hospitalier or Biologiste médicale

Where does a Clinical Biochemist work?

HUMAN HEALTH AND PUBLIC HEALTH

- Sample collection
- Processing
- Performance evaluation
- Interpretation
- Quality control of clinical analyses and functional tests related to health status as well as validation.

SPECIALIZED LABS

- Forensic Labs
- Water Treatment
- Nuclear Medicine

BIOTECHNOLOGY

- Planning and design of methodologies and analyses.
- Design and Quality control of diagnostic reagents.
- Evaluation and control of processes.

What have I done so far?

HOSPITALS

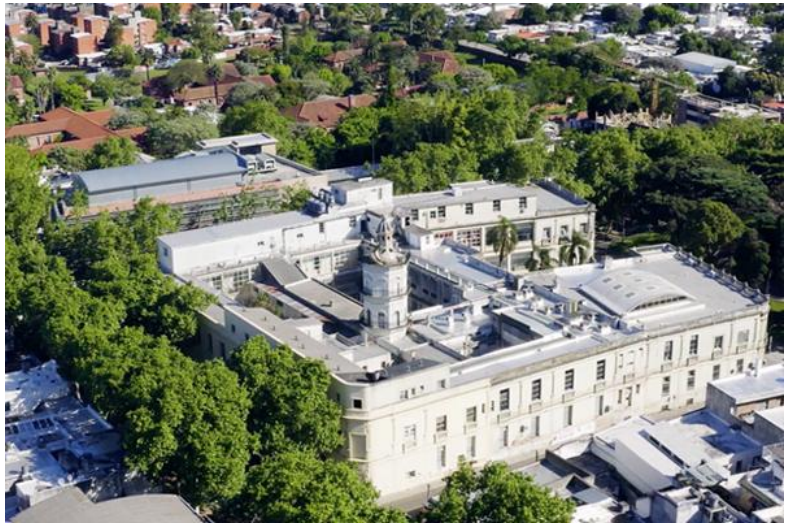
RESEARCH

ASSISTANT PROFESSOR

Hospitals and healthcare in Uruguay

Hospital de Clínicas
University hospital for the
Faculty of Medicine

Hospital Maciel
University hospital for the
Faculty of Chemistry



Hospital Pasteur
Main research hospital

National healthcare system (2007): System ensures universal access to healthcare, funded through a collective system, combining public and private providers

Hospitals and healthcare in Uruguay

MAIN CHALLENGES OF URUGUAYAN HOSPITAL

- Limited funding and resources
- Old hospital infrastructure
- Access gaps between Montevideo and the rural areas
- Slow technological innovation
- Management and administrative efficiency challenges

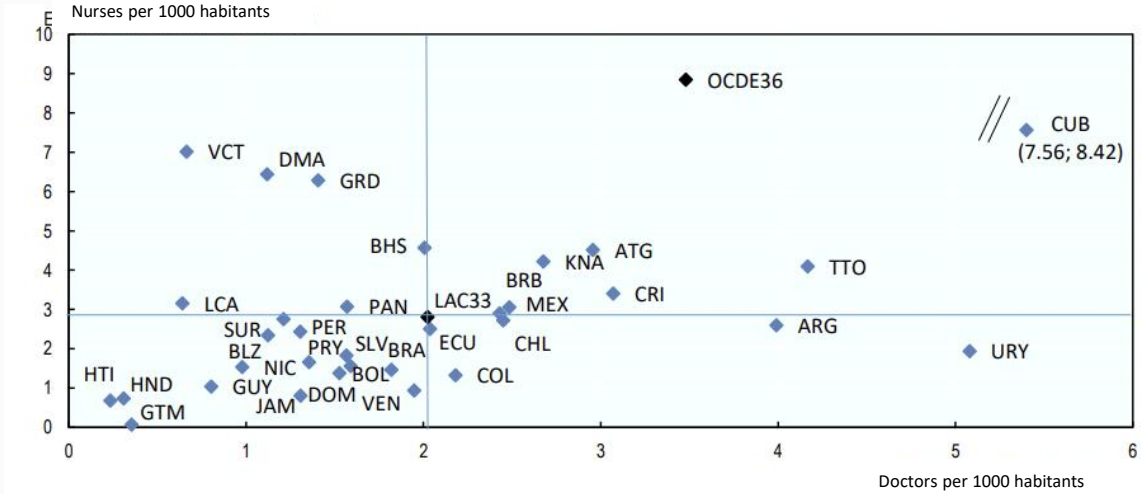
Hospitals and healthcare in Uruguay

Tabla 1.2. **State of health**

☑ Mejor que ◉ Cerca de ☒ Peor que....promedio de países LAC

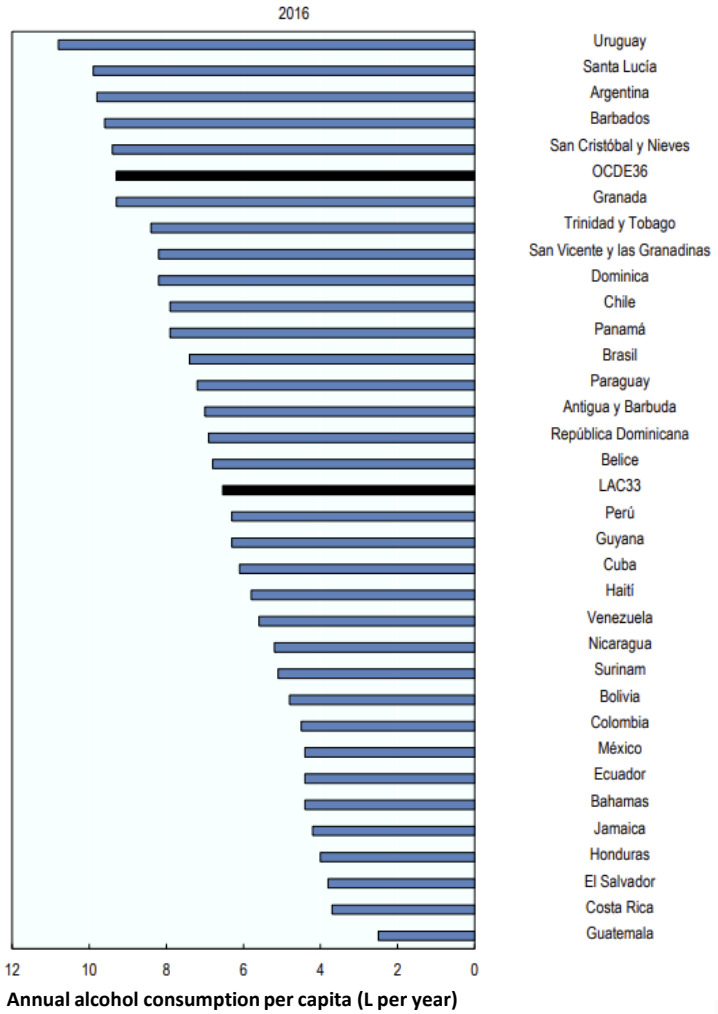
País	Life expectancy (Women)	Life expectancy (Men)	Survival until 65 years old (Women)	Survival until 65 years old (Men)	Mortality rate kids < 5 years old
	En años	En años	%	%	Per 1000 births
República Dominicana	77.3 ◉	71.0 ◉	81.5 ◉	71.1 ◉	29.9 ☒
Ecuador	79.3 ☑	73.9 ☑	85.9 ☑	77.4 ☑	14.5 ◉
El Salvador	78.1 ◉	69.1 ☒	84.3 ◉	67.1 ☒	14.5 ◉
Granada	76.3 ◉	71.4 ◉	84.2 ◉	72.6 ◉	16.7 ◉
Guatemala	76.8 ◉	70.4 ◉	82.1 ◉	71.1 ◉	27.6 ☒
Guyana	69.2 ☒	64.5 ☒	72.1 ☒	62.3 ☒	31.3 ☒
Haití	65.8 ☒	61.4 ☒	67.1 ☒	59.0 ☒	71.7 ☒
Honduras	76.3 ◉	71.2 ◉	81.2 ◉	73.7 ◉	18.2 ◉
Jamaica	78.5 ◉	73.7 ☑	85.0 ◉	77.4 ☑	15.2 ◉
México	77.9 ◉	72.9 ◉	86.4 ☑	78.8 ☑	13.4 ◉
Nicaragua	78.6 ◉	72.6 ◉	83.6 ◉	73.9 ◉	17.2 ◉
Panamá	81.3 ☑	75.3 ☑	87.3 ☑	78.6 ☑	16.1 ◉
Paraguay	75.5 ☒	71.1 ◉	80.2 ☒	73.8 ◉	21.0 ◉
Perú	77.9 ◉	72.6 ◉	84.6 ◉	76.3 ◉	15.0 ◉
Santa Lucía	78.4 ◉	73.0 ◉	83.7 ◉	75.1 ◉	16.6 ◉
San Vicente y las Granadinas	75.6 ◉	71.2 ◉	80.8 ◉	74.1 ◉	16.0 ◉
Surinam	74.9 ☒	68.4 ☒	80.7 ☒	67.6 ☒	20.0 ◉
Trinidad y Tobago	74.4 ☒	67.4 ☒	79.8 ☒	66.9 ☒	26.0 ☒
Uruguay	81.0 ☑	74.0 ☑	87.4 ☑	79.0 ☑	8.0 ☑
Venezuela	78.9 ◉	70.8 ◉	84.9 ◉	72.6 ◉	31.0 ☒

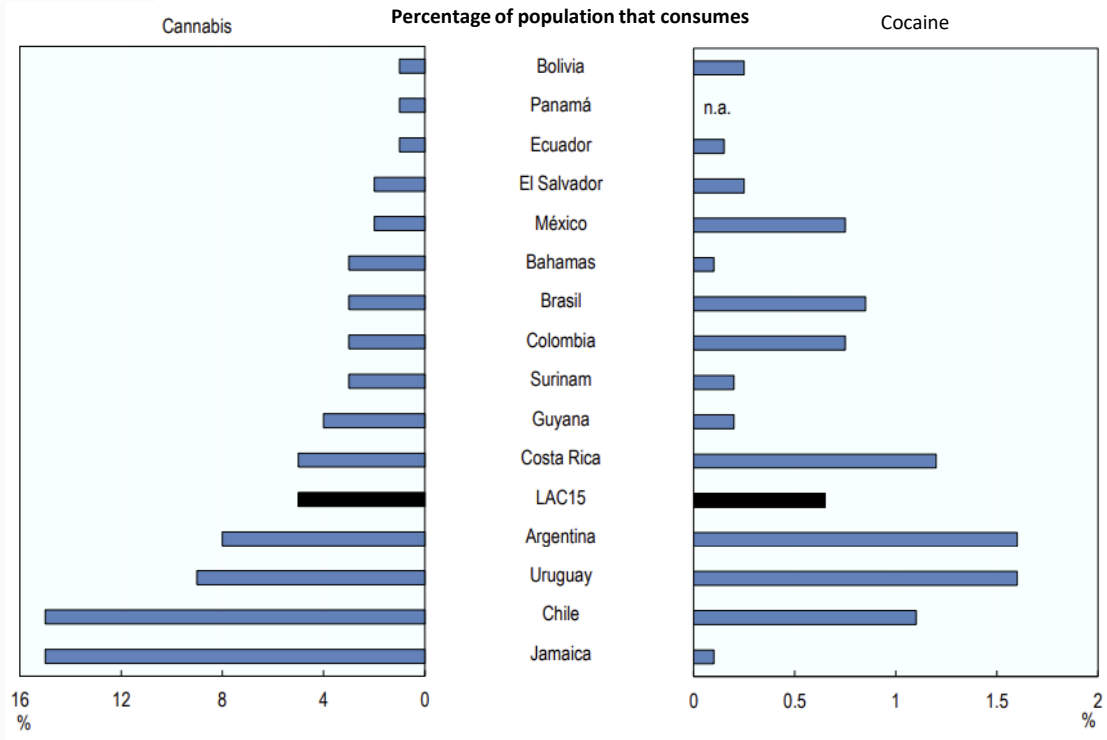
Uruguay is recognized in the region for the professionalism and high level of training of its hospital staff. Despite limited resources, hospitals manage to deliver high-quality care and maintain universal healthcare access.



Fuente: Estadísticas de Salud de la OCDE 2019; Observatorio Global de Salud, OMS 2020. Ver Capítulo 5.

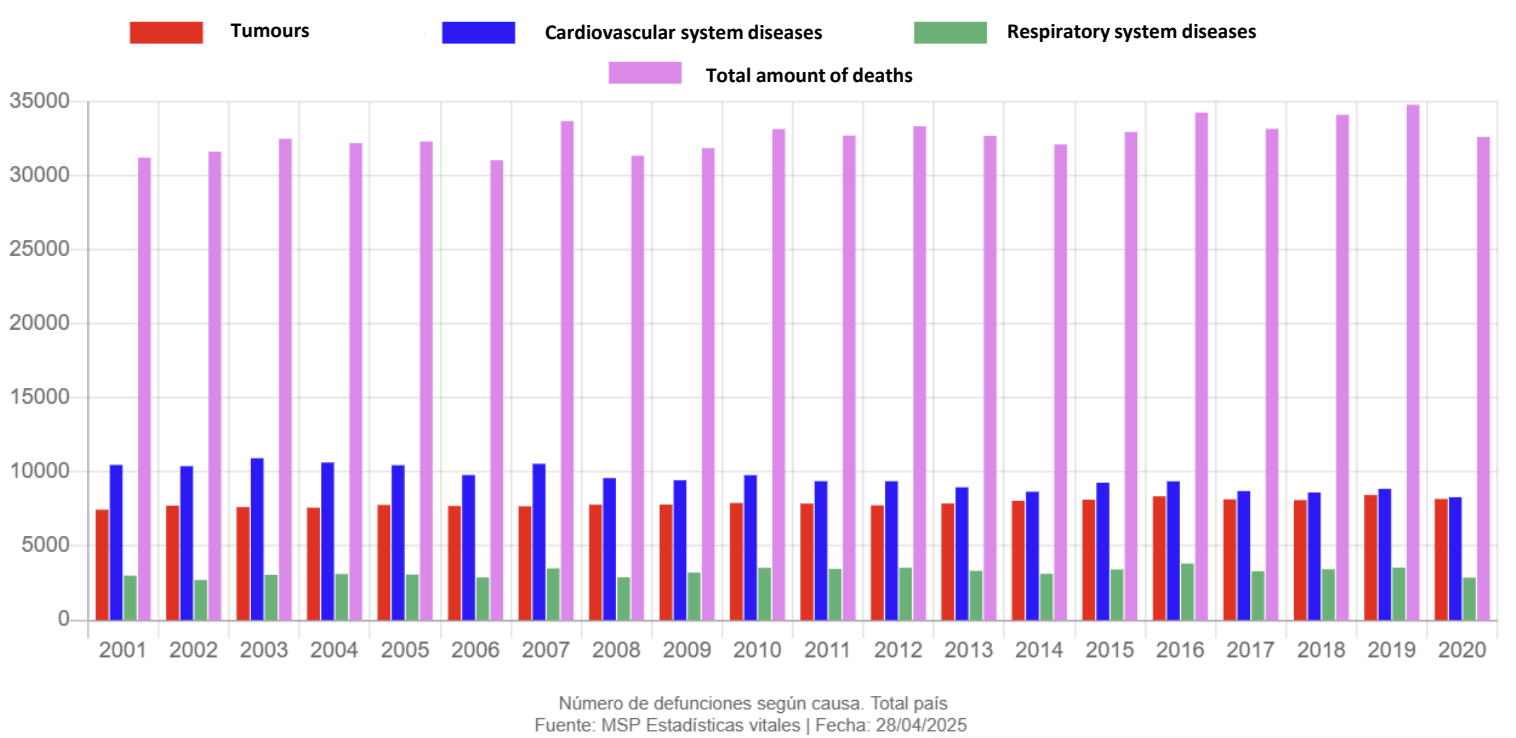
Hospitals and healthcare in Uruguay





We still need to overcome several societal challenges like drug abuse and combat the increase of non transmissible chronic diseases such as Diabetes, Cardiovascular diseases and respiratory system diseases.

Hospitals and healthcare in Uruguay



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What have I done so far? Hospitals

SERVICIO MÉDICO INTEGRAL

Private sector
Technology: Mainly Roche
They are currently specializing in the molecular detection of viruses

HOSPITAL MACIEL

Public sector
Technology: Mainly Werfen
Currently working in Nephrolithiasis and CVA patients' studies

What have I done so far? Research and assistant professor

Research:

- SARS-CoV-2 Ct relation with D-Dimers
- Fibrin Formation and Fibrinolysis in CVA patients

Assistant professor:

- Clinical biochemistry and hematology

Hemostasia y Trombosis

Estudios de fibrinoformación y fibrinolisis en plasma de pacientes con accidente cerebrovascular isquémico

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COLABIOCLI CUBRA FABA

Resumen

Este estudio tuvo como objetivo evaluar las diferencias en la formación y lisis de fibrina entre pacientes con accidente cerebrovascular isquémico (ACVi) y controles. Se buscó comprender la dinámica de la fibrinoformación y fibrinolisis, y cómo éstas pueden estar relacionadas con el desarrollo de un ACVi. Se realizaron estudios funcionales de fibrinoformación y fibrinolisis en el plasma de 41 pacientes con ACVi y de 58 controles utilizando un ensayo turbidimétrico basado en la medición de la absorbancia durante la formación y lisis del coágulo. El plasma se activó con factor tisular recombinante y calcio. (agregar coma despues de calcio) y se añadió activador tisular del plasminógeno recombinante para inducir la lisis del coágulo. Se analizaron parámetros derivados de las curvas obtenidas: tiempo de coagulación (Tc), absorbancia máxima (Amax) y tiempo de fibrinolisis (Tf) y se compararon entre los diferentes grupos. Los pacientes con ACVi presentaron un Tc significativamente mayor (915 ± 102 s) comparado con los controles con factores de riesgo (CCFR) (726 ± 95 s) y sin factores de riesgo (CSFR) (674 ± 105 s). Los pacientes con ACVi mostraron una Amax superior (0,768 ± 0,066 UA) en comparación con los CSFR (0,666 ± 0,053 UA), con significación estadística. El Tf fue significativamente mayor en pacientes con ACVi (1621 ± 180 s) que en los controles (borrar la palabra controles) CCFR (1340 ± 130 s) y CSFR (1373 ± 153 s). Estos resultados sugieren que los pacientes con ACVi tendrían una fibrinoformación más lenta y una fibrinolisis más prolongada, lo que podría contribuir a la patogénesis del ACVi.

Palabras clave: Accidente cerebrovascular isquémico; Hemostasia; Fibrinoformación; Fibrinolisis; Coagulación; Trombosis; Fibrinógeno; Fibrina; Plasma; Ensayo turbidimétrico

Studies on fibrin formation and fibrinolysis in plasma of patients with ischemic stroke

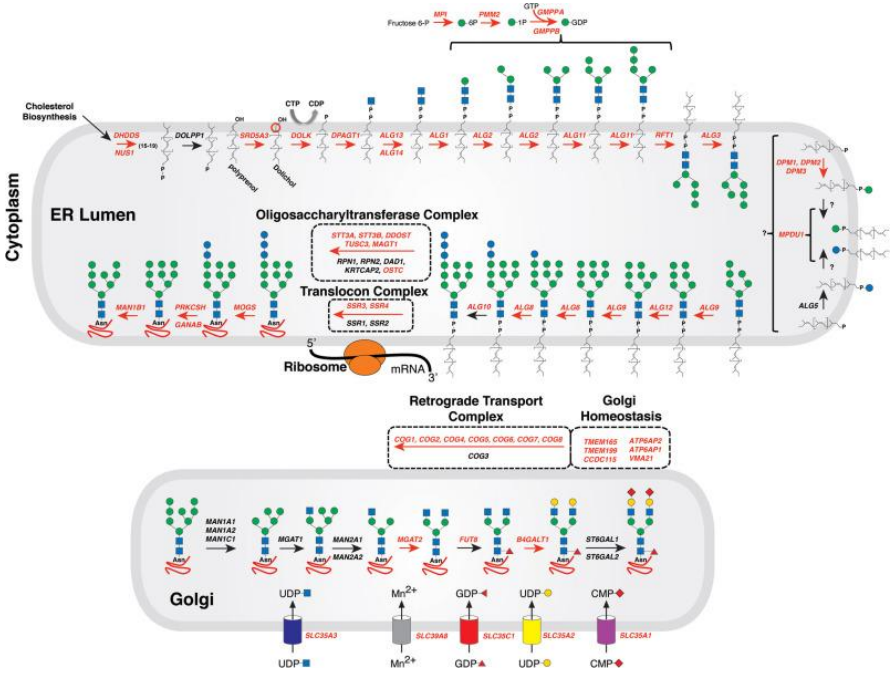
The study aimed to evaluate differences in fibrin formation and lysis between patients with ischemic stroke (IS) and controls. It sought to understand variations in the dynamics of fibrin formation and fibrinolysis and how these may be related to the development of IS. Functional studies of fibrin formation and fibrinolysis were performed in plasma from 41 IS patients

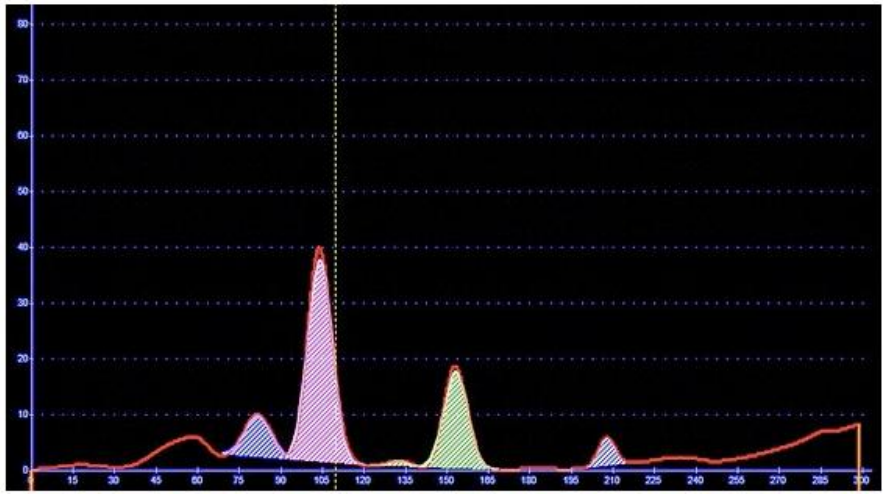
How did I get here?

- International Federation of Clinical Chemistry-Professional Exchange Programme. (IFCC-PEP).

Objectives:

- Promote international co-operation between laboratories
- Facilitate the exchange of young laboratory scientists between IFCC Member societies
- Share high level scientific or management skills
- Introduce new or improved scientific or management skills to the applicant's laboratory





Key objectives

- Gain expertise in advanced techniques for detecting Congenital Disorders of Glycosylation (CDG).
- Understanding the interpretation of capillary electrophoresis of CDT as a marker not only used for chronic alcohol abuse but also crucial in screening CDG.
- Introduce and participate in novel lines of investigation.
- Gain the knowledge necessary to propose establishing CDT analysis through capillary electrophoresis and related techniques as a new diagnostic tool in Uruguay.

My perspective for the future:

- Bring knowledge back to Uruguay about CDGs and propose establishing a methodology
- Improve Uruguay's healthcare capabilities
- Promote the participation of Uruguayan young scientists in programmes such as IFCC-PEP
- Continue my academic formation

Merci beaucoup!

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