

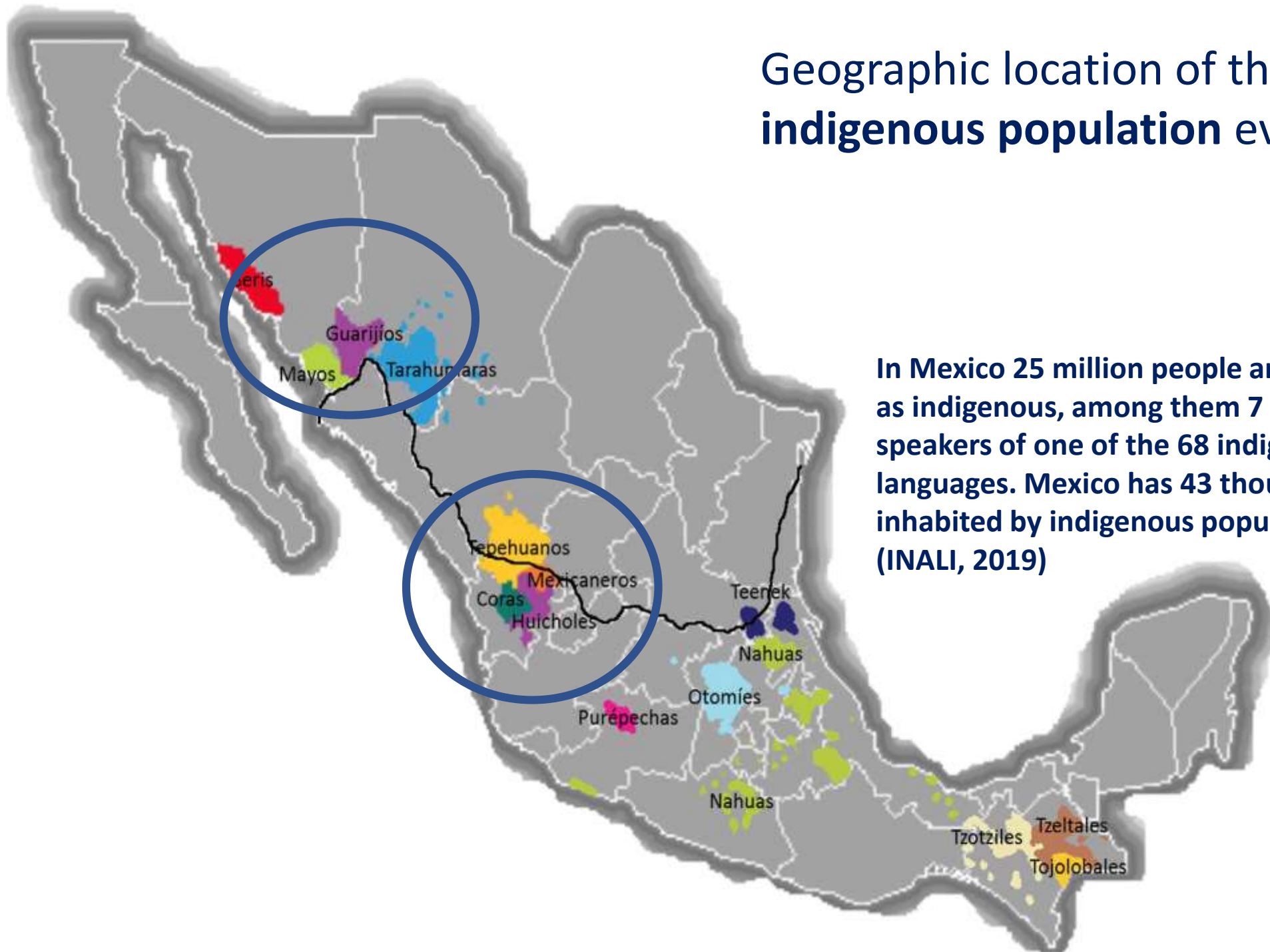
North America: Studies and initiatives in autoctonous Mexican population

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Geographic location of the **Mexican indigenous population** evaluated



In Mexico 25 million people are recognized as indigenous, among them 7 million are speakers of one of the 68 indigenous languages. Mexico has 43 thousand towns inhabited by indigenous population. (INALI, 2019)

Personalised Medicine to improve health in Native Americans

Objective

To identify genetic and environmental factors specific to Native Americans people that affect their responses to drugs.

Challenge

- Ensure that the results benefit the community
- Ensure that results are adopted in public health policies

Barriers

- Language
- Cultural differences
- Profound health disparities
- Mistrust of genetic research by the communities
- Communities situated in remote locations

Main result

The pharmacogenetic biomarkers identified in the European and North American population neither predict the response to drug therapy, nor avoid adverse effects in Native American.

Improvement proposals

- Partnerships with community leadership and health care providers.
- Return results in a culturally understandable format.
- Capacity to sustain collaborative research with the communities, focused on their health priorities.

Conclusion

Personalized Medicine strategies must be developed specifically for Native Americans based on their genetic and ethnic background, and its interaction with environmental factors. It is of critical importance to decrease morbidity and mortality rates in these populations.

Regulation

- To obtain approvation of study by the Ethics and Research and performed in accordance with the Declaration of Helsinki.
- Explain clearly both Indigenous community and its leaders, the potential health benefits that will has the research.
- All participants provide written and informed consent.

Central Americans (Nicaragua): Studies and Initiatives in Caribbean Miskito and Mestizo Population

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Central American Isthmus

Highly vulnerable
to natural disasters



High level of
inequality and
poverty

- Population : **48,34** Millions
- Amerindians: **21.1%**
- Gross National Income Per Capita: **6,412**. Thousand US \$ (2018)
- Mean years of schooling: **7.2** (years 2015)
- Mortality rates by communicable diseases: **106**(100,000 pop (2018))

Clinical trial research: result appropriated in some places might not be in others

Medical treatments need to reflect biological and non-biological in the variability to drugs response:

➤ Differences in cultures and perceptions: Traditional Medicine

➤ Ethnicity to be considered: population pharmacogenetic

Nicaraguan admixed population: Cytochrome P450 (CYPs) genetic polymorphisms

CYP2D6
6 % Poor Metabolizers

CYP2C9
23 % Diminished Activity

CYP2C19
15 % Ultrarapid Metabolizers

Adjustment dose



Antipsychotic drugs
Antidepressant drug

Anticoagulants
Antiplatelet drugs

Central American Isthmus

Barriers for conducting clinical trials

- **20% of clinical trials** listed on clinicaltrials.gov are conducted in the developing world (**172 in Central American**)
- **Barriers:**
 - Lack of financial
 - Human capacity
 - Lack of Research environment
 - Social and political problems: discrimination, violence, inequality, insecurity, poverty
 - Brain drain (emigration)

South Americans (Ecuador): Studies and initiatives in Kwitchua and Mestizo Population

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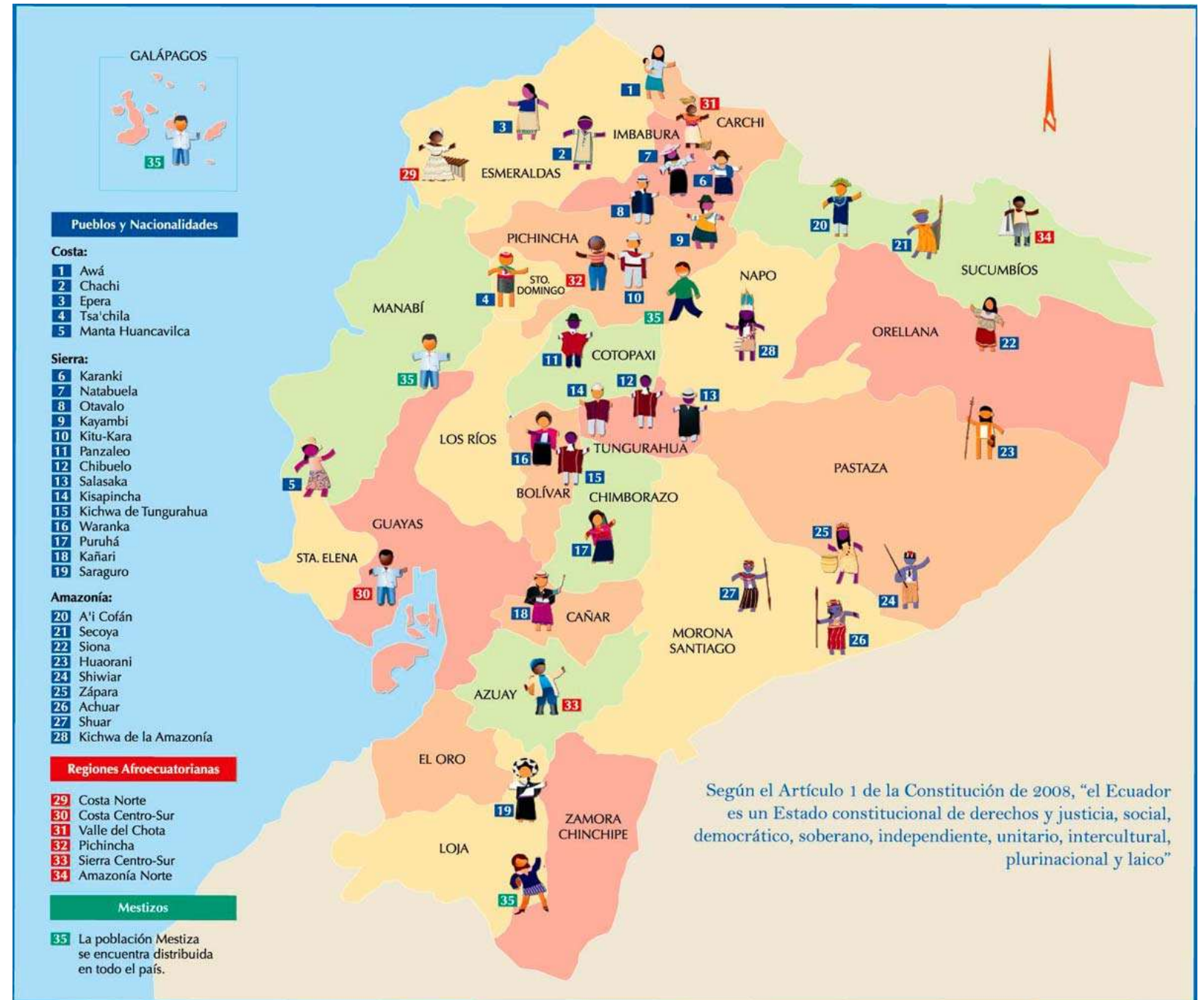


Ecuador

Population:
17.096.789 inhabitants
(INEC, 2018)



One million are indigenous people (7,3%) and 74% lives in Imbabura.



Personalised Medicine for mestizo and indigenous people

Objective

To characterize genetic and environmental factors affecting the response to different drugs both in mestizo and indigenous people in Ecuador.

Barriers

- Language & cultural differences
- Mistrust of health research by the communities
- Communities situated in remote locations
- Health disparities & traditional medicine

Main result

- Biomarkers identified in caucasian population are not suitable to predict the response to drug therapy, nor avoid adverse effects in mestizo population.

Regulatory framework

- Mandatory review and approval by an independent review board and performed in accordance with the Declaration of Helsinki.
- Explain and demonstrate, both indigenous community and their leaders, the potential benefits of these research on their Health.
- All participants provide written/verbal informed consent.

Improvement areas

- Partnerships with community leadership and health care providers.
- Return results in a culturally understandable format.
- Capacity to sustain collaborative research with the communities, focused on their health priorities.

