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*Tele-epidemiology in Chagas
Disease Prevention*

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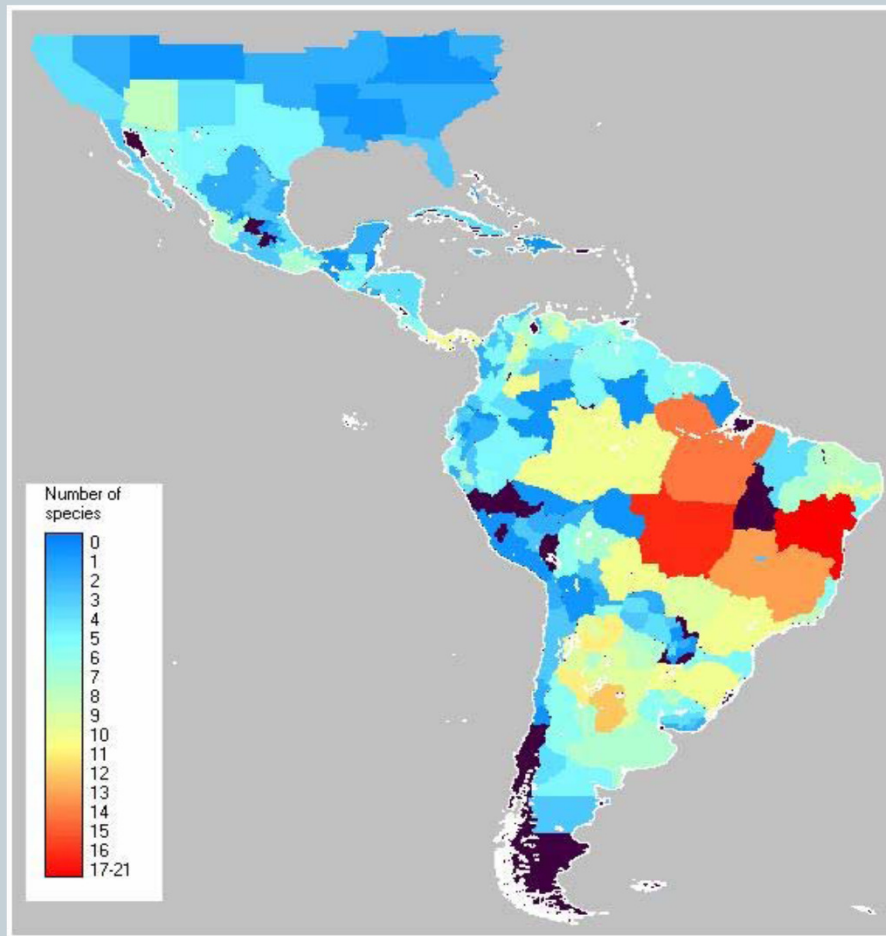
Introduction

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- Chagas is a parasitic disease
- About 18 million people are infected with *Trypanosoma cruzi*
- 100 million are in risk to get infected
- Transmission
 - Skin contact, mucus with feces of infected triatomines, transfusion, and congenital
- **World Health Organization**

Vector Distribution (Species of Triatimines in the New World)

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Epidemiology (International View)

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Epidemiological Parameters	1990	2000	2006
Annual Deaths	> 45,000	21,000	12,500
Human infection cases	30 million	18 million	15 million
New cases per year	700,000	200,000	41,200
Population in risk	100 million	40 million	28 million
Number of countries	21	21	21

Source: Modified from: "Report about the Chagas Disease", 2007, TDR/WHO, PAHO, WHO.

Clinical Manifestation

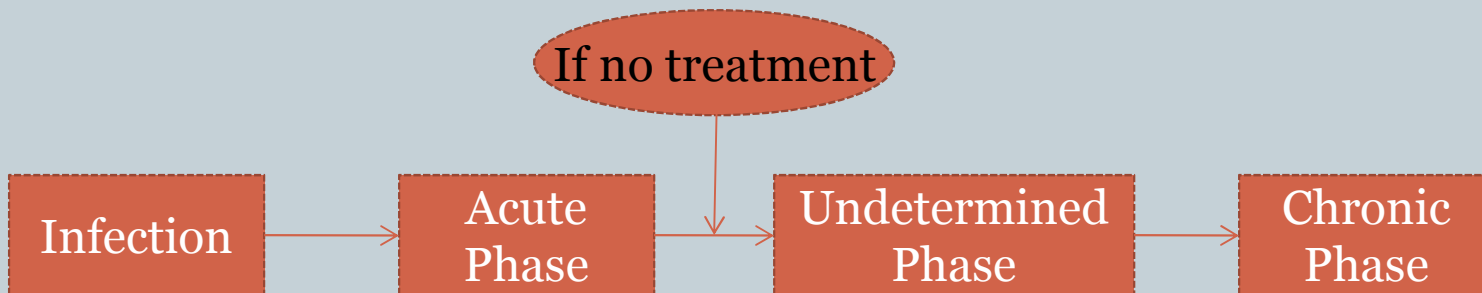
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- **Three Phases**
 - **Acute phase**
 - ✦ Asymptomatic in approximately 70% of infected cases
 - ✦ Incubation in 14 days
 - ✦ In the first 15 days may present
 - “Inoculation chagoma” at the sting site
 - In case of ocular inoculation may present the “Romaña Sign”
 - **Undetermined**
 - ✦ Asymptomatic of variable duration
 - ✦ Anatomic and functional anomalies
 - ✦ Sudden death
 - **Chronic**
 - ✦ 30% of patients in undetermined phase develop chronic way of disease
 - Chagas heart disease
 - Digestive tube

The Problem

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- Need for early detection
 - So that treatment can be given
 - Prevent death
 - FACT: 18 million people are infected with Chagas in Mexico



The Project

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- Requires a multi-disciplinary / trans-disciplinary workgroup
 - Epidemiology Physician
 - Tele-communications
 - Remote Sensing, GIS, Artificial Intelligence

Hyphotesis

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- The behavior of domiciliation of triatomines vectors of Chagas disease increases proportionally to the increase in temperature, seasonal variation and variation of the spot seeing population probably increased with the density and type of vegetation.

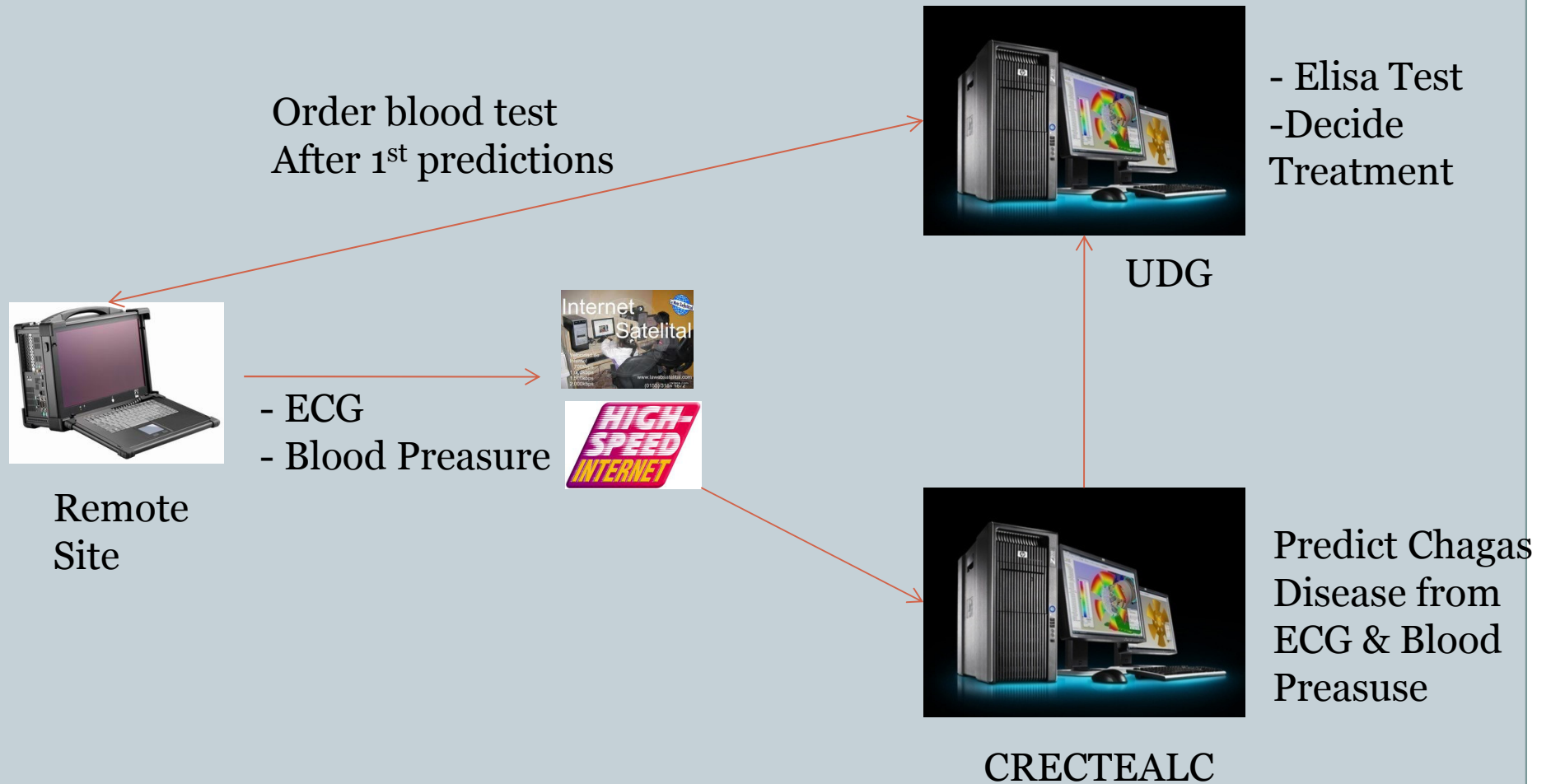
General Objective

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- The use of tele-epidemiology in order to discover the environmental characteristics and the location of the chagas vectors so that we can predict which are the places where it may migrate and adapt. We will use this information to control and decrease the number of infected cases and deaths.

Early Ideas

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Ideas to Develop

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- Remote Sensing and GIS to characterize and predict places where we can find each type of the Chagas vector
 - Characteristics: Temperature, altitude, vegetation type, etc.
- Training courses for physicians to accurately diagnose Chagas
- Medical support system to diagnose chagas
- Simulation system to study the behavior of the Chagas vector

Conclusion

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- Chagas is becoming a public health problem
- People really wants to join this project
- I think the reason for this is:
 - This is not only a research project, it is also a “cause”