



# **Aboriginal Telehealth in Brazil**



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- ★ Satellite and videoconferencing national network for distance education in health and telehealth
- ★ Consortium of 27 universities, research centres and medical associations for generating certified quality content and services
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# Origins



- ★ Ancient South Americans came more than 20,000 years ago from North America through the Panama isthmus
- ★ Genetically related to North American indians (Clovis Culture) and Inuit, Mayas, Aztec, Quichua, etc.

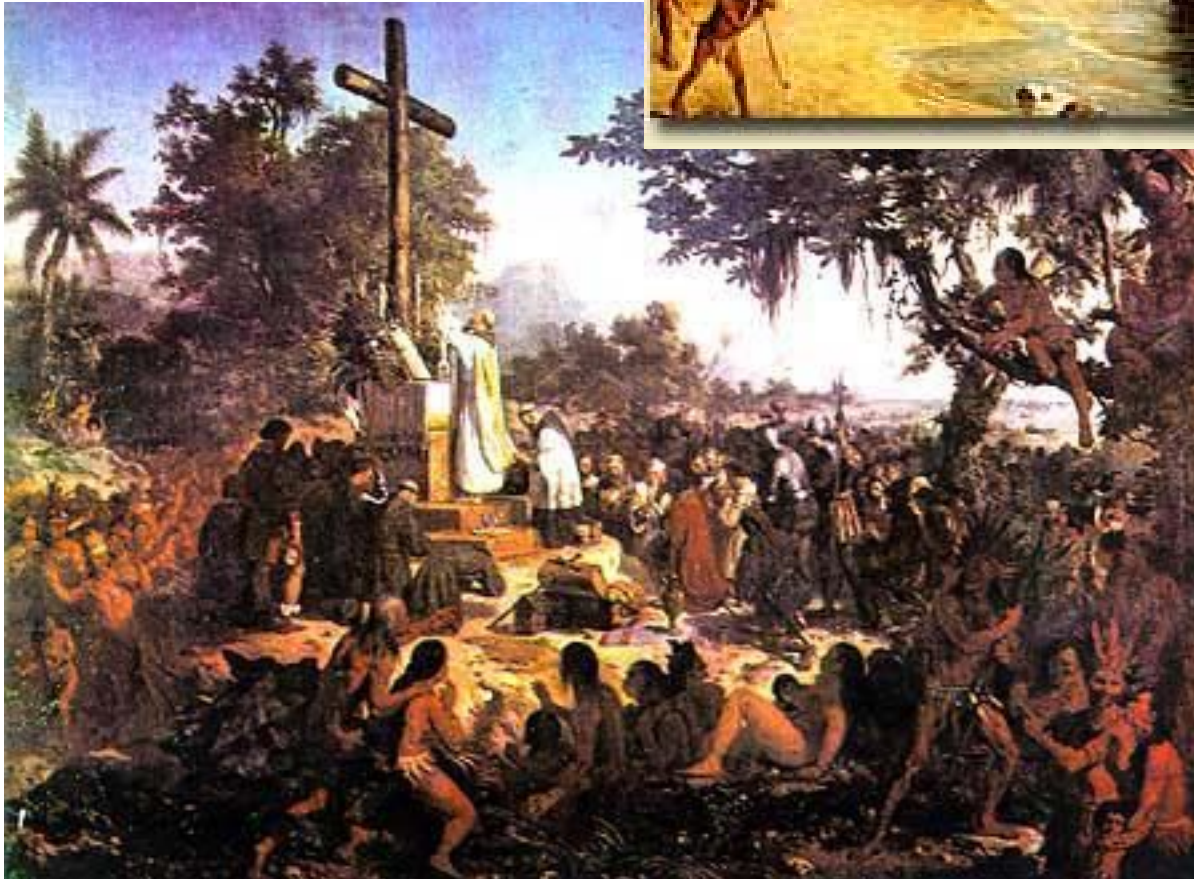
# Origins



- ★ Diversified with time into more than 300 different cultures, more than 1,000 nations and 1,300 languages
- ★ Came in contact with Europeans for the first time in 1500
- ★ Largely reduced to slavery and extermination by disease and genocide in subsequent centuries
- ★ Around 55 isolated tribes are believed to exist



**21th April 1500**  
**First contact with  
the Portuguese**



# Indian Nations of Amazonia

Aikanã, Amawára, Apalaí, Apiaká, Apurinã, Arapáso, Arara, Ashaninka, Atroari, Avá-Canoeiro, Bakairi, Banawá-Yafí, Baniwa, Barasána, Baré, Borôro, Cinta-larga, Deni, Desána, Diahói, Enawenê-Nawê, Erikbaktsá, Galibi, Guarani-Kaiwá, Guarani-Nhandéva, Hi-Merimã, Hixkaryána, Irantxe, Itogapúk, Jarawára, Juma, Juriti, Juruna, Kadiwéu, Kalapálo, Kamayurá, Kamba, Kambéba, Kanamari, Karafawyána, Karajá, Karapanã, Karipuna, Katawixí, Katukina, Kawahíb, Kaxináwa, Kayabi, Kayxána, Kinikináo, Kokáma, Korubo, Kubéwa, Kuikúru, Kulina, Kwazá, Maku, Makuráp, Manitenéri, Marimã, Marubo, Matipú, Matis, Maxinéri, Mayorúna, Mehináku, Menkü, Miranha, Miriti, Mundukuru, Múra, Nafuwá, Nambikwára, Naruwotó, Nukini, Ofayé, Palikúr, Panará, Paresi, Parintintín, Paumari, Pirahã, Piratapúya, Poyanáwa, Saterá-Mawé, Suriána, Suruí, Suyá, Tapayúna, Tapirapé, Tapúya, Tariána, Tenharin, Terena, Tiriyo, Torá, Trumaí, Tukano, Tükuna, Tuyúka, Txikão, Umutína, Waiãpi, Waikána, Waimiri, Waiwai, Wanináwa, Warekéna, Waurá, Wayána, Xavante, Xiquitano, Yabaána, Yamamadi, Yamináwa, Yanomami, Yawalapití, Yebá-Masã, Zoró.



# Indian Nations in Brazil

- ★ 218 nations exist today
- ★ 12 nations have less than 40 individuals, 148 nations have less than 1,000 individuals remaining
- ★ Total of less than 370,000
- ★ Were 2 to 4 million in the 16th century in more than 1,000 nations
- ★ 800,000 individuals were exterminated and more than 80 nations became extinct in the 20th century alone



# Indian Culture



- ★ Adapted to tropical and subtropical environment
- ★ Primarily hunter-gatherers and burn-and-slash restricted agriculture
- ★ Neolithic culture, warrior society
- ★ Rich religion, arts, artifacts, social life
- ★ Oral culture, no writing



After hunting and fishing











# Acculturation



Religion  
Clothing  
Culture  
Education  
Urbanization

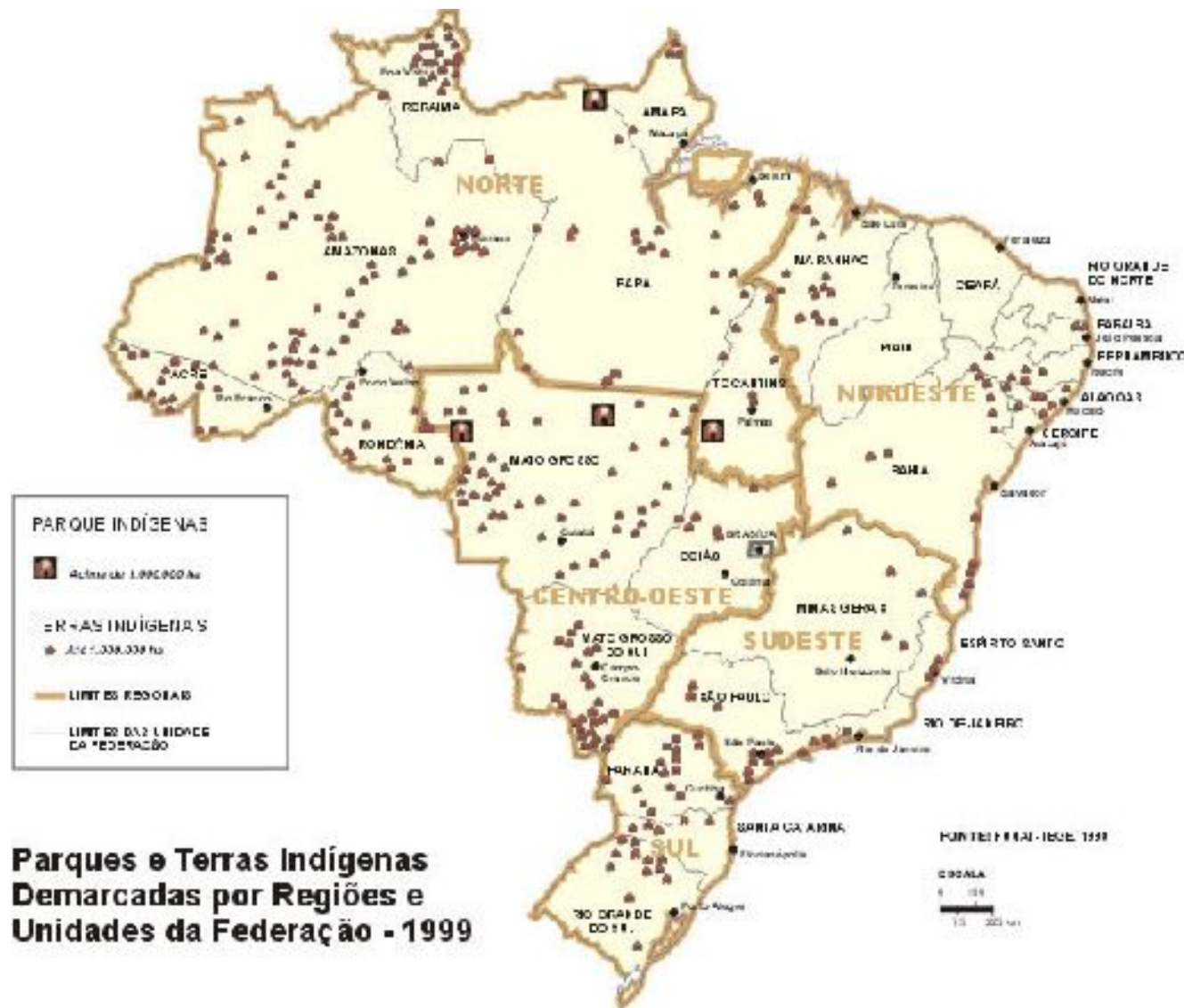


# Indian Reserves

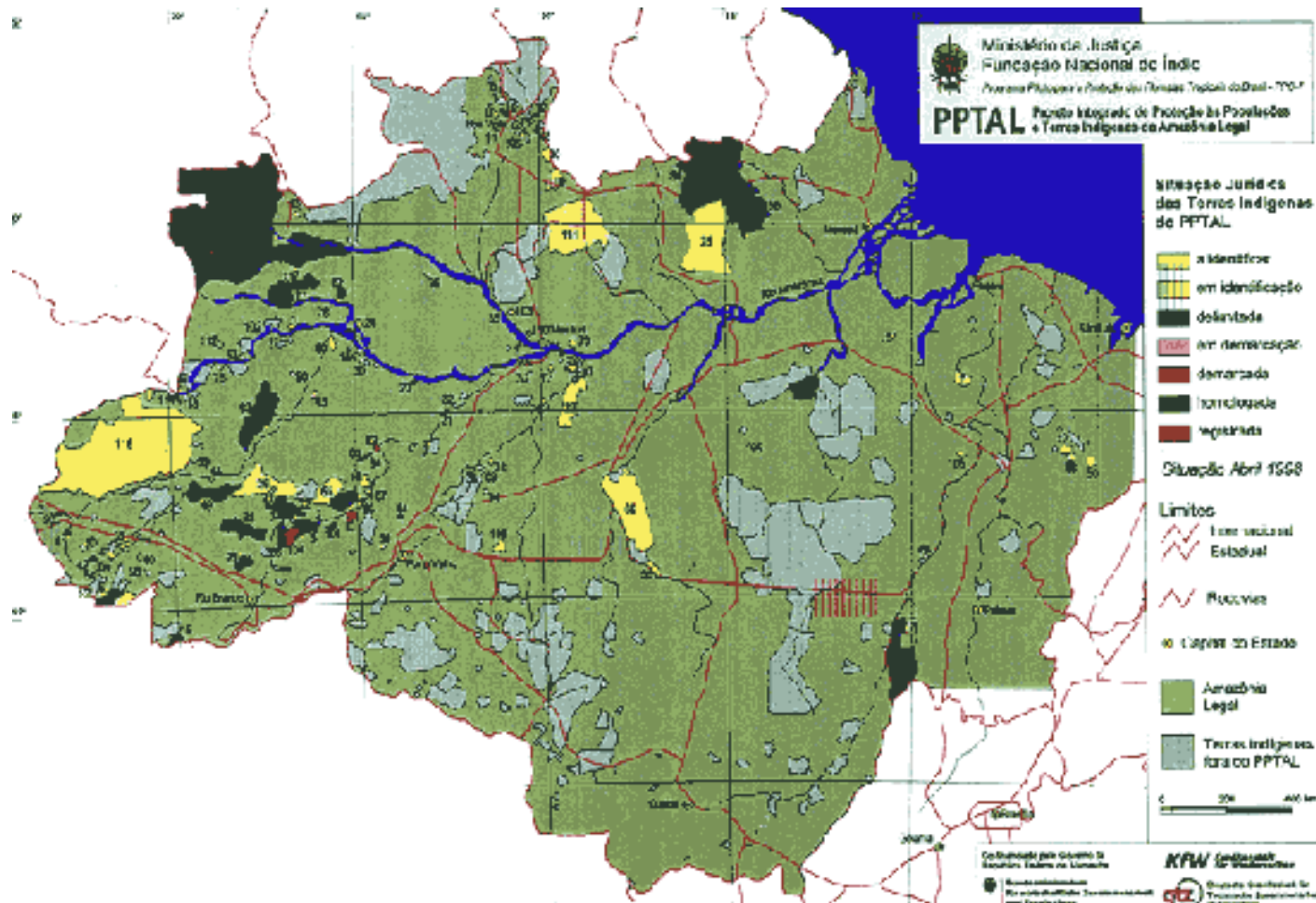
- ★ 12,33% of the Brazilian territory belongs legally to Indian nations, in 625 areas
- ★ 1,048,393 km<sup>2</sup> (twice the area of France)
- ★ Amazon region detains 1,034,381 km<sup>2</sup>, in 405 areas (20,7% of the territory) for 86,500 inhabitants
- ★ Very rich in natural resources (wood, minerals, water), largely unexploited



# Indian Reserves



# Indian Reserves



# Brazilian Indian Health System

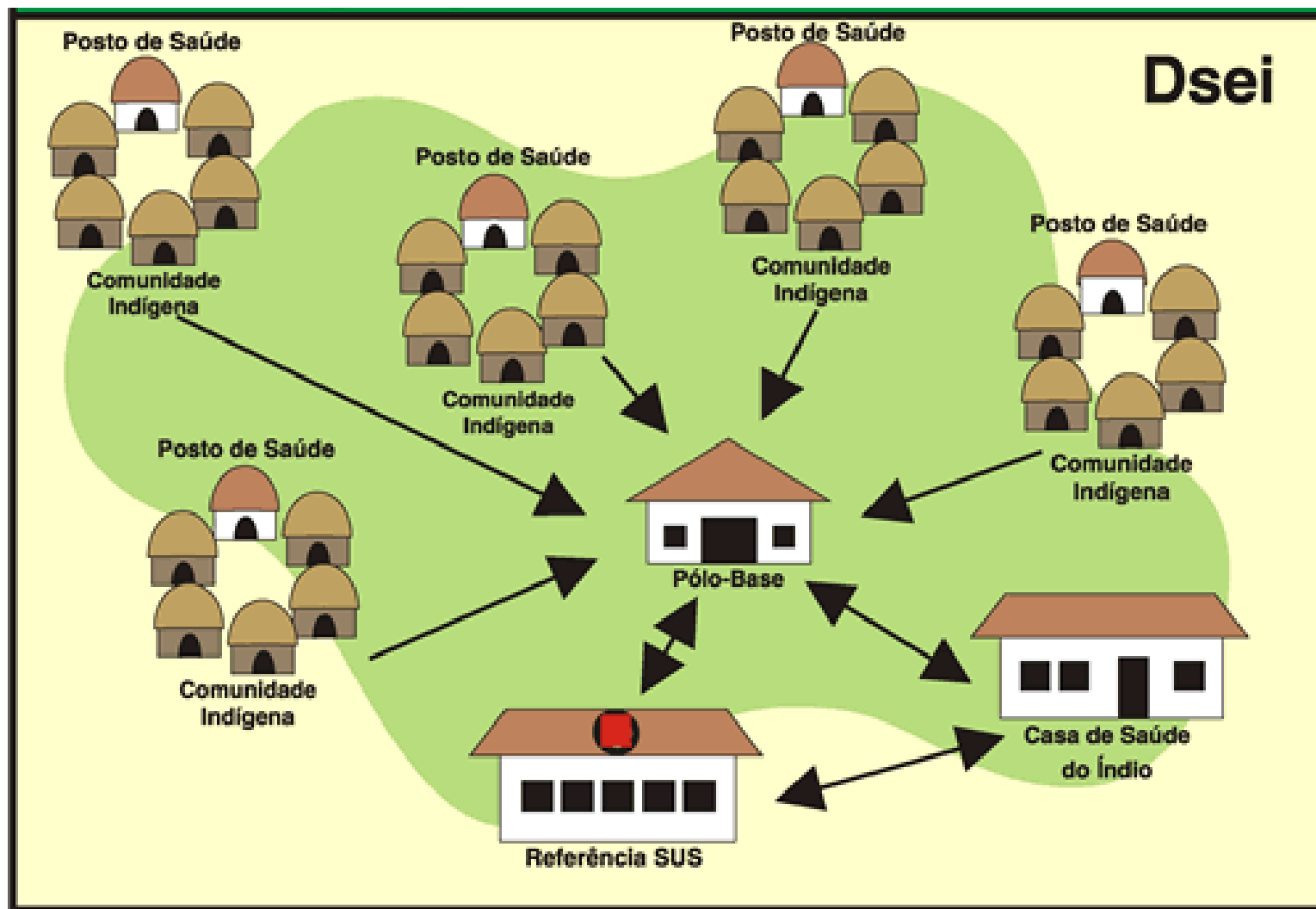


- ★ Public health system coordinated by the National Health Foundation
- ★ Organized into Indian Health Districts, Indian Health Houses and Aboriginal Health Community Agents

# Indian Health Districts



# Indian Health System



# Health Care Problems

- ★ Isolated Indians have no resistance to infectious diseases (tuberculosis, malaria, influenza, intestinal infections)
- ★ Acculturated Indians have acquired all diseases of the civilization, including the degenerative (obesity, diabetes, etc.)
- ★ Undernutrition, HIV and STD, alcoholism, are current severe problems
- ★ They are the poorest among the poor, health care is difficult and insufficient



# Environmental Degradation



Deforestation and logging, cattle raising and intensive agrobusiness, spread of urbanization and air and water pollution are affecting more and more the protected nations

# Technological Solutions



- ★ Indians are Brazilian citizens with special needs and with special protection and status under the law
- ★ Their demography and socio-economical situation require technological help
- ★ No telehealth programmes are in effect so far

# Conclusions

- ★ Native South Americans in the Amazonia are critical for the preservation of the original environment and for the continuity of ancient, ethnic knowledge about Nature
- ★ Their culture should be respected and preserved, as well as their dignity and welfare as human beings
- ★ Ultimately, their existence will affect ours
- ★ International know-how, solidarity and help are sorely needed





This project might give a unprecedented opportunity for Native North Americans to connect to and help out their blood relatives in South America

# **The Amazon First Nations Telehealth Project**

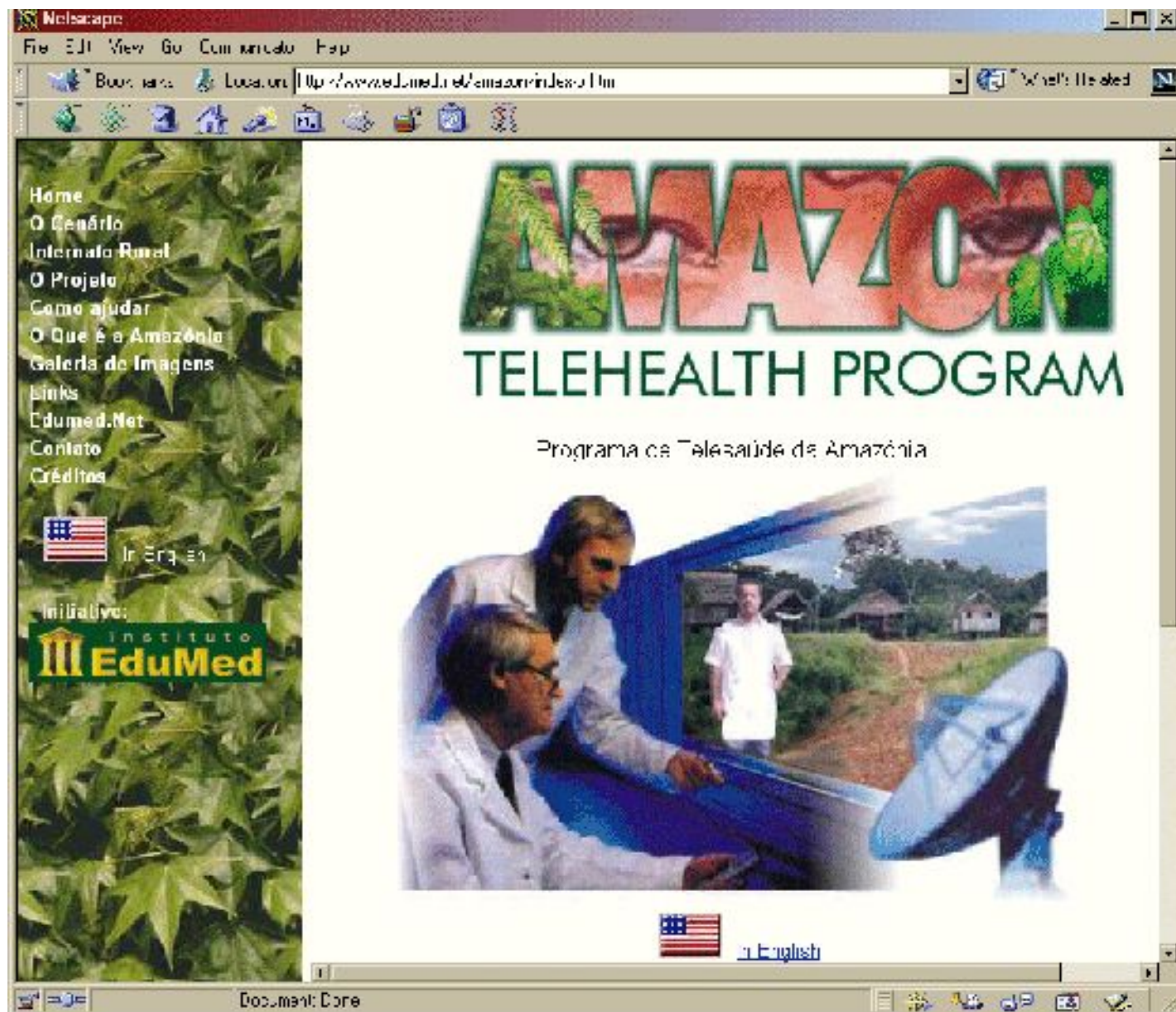
The Edumed Institute  
Brazil



# Brazilian Amazonia







<http://www.edumed.net/amazon>

# Project Coordination



**Silvia Helena  
Cardoso, RN, MSc,  
PhD**

- ★ Vice-president, Edumed Institute
- ★ Director for Distance Education



# Aims of the Project

- ★ To develop a pilot project with 5 Indian communities in the state of Amazonas, Brazil and two telehealth centers, one in Manaus and another in Campinas
- ★ Establish a model and guidelines for providing telehealth services to the aboriginal health programme
- ★ Integrate, test and refine a host of existing technologies for satellite-based videoconferencing, IP connectivity, store & forward and real time telehealth



# Main Applications

- ★ Patient triage and advice
- ★ Teleconsultation
- ★ Telediagnosis
- ★ Teleproctoring
- ★ Second opinion
- ★ Follow-up



# Additional Applications

- ★ Continued education of health care personnel
- ★ Training of aboriginal health workers
- ★ Patient health education and information
- ★ Electronic health record and aboriginal census information
- ★ Monitoring of diseases, early detection of outbreaks and public health programs
- ★ Management of aboriginal health network



# Additional Applications

- ★ IP Radio and TV with cultural, health and educational programs
- ★ E-democracy: interactive debating, plebiscites and e-voting in health and education issues
- ★ Access to networked health information
- ★ User support groups and virtual communities



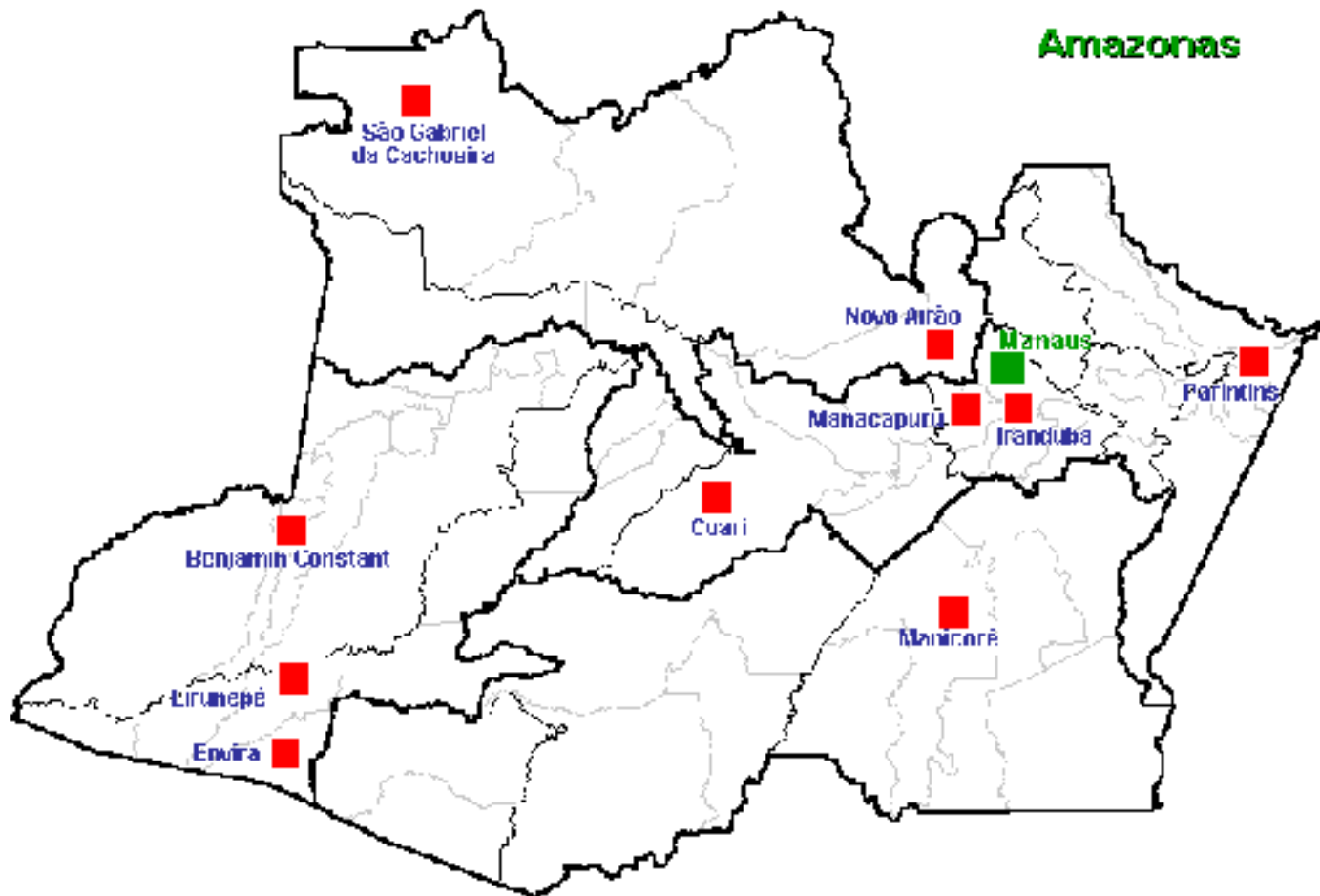
# Leveraging Factors

- ★ To increase viability, the aboriginal telehealth programme will be developed as a support tool for the rural internship programme of the Federal University of Amazonas
- ★ Two-month rotations of two last-semester students of each course (medicine, pharmacy, nursing and dentistry)



# Rural Health Internship Federal University of Amazonas

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# Portable Telehealth



*Simulated product*

- Biosignal telemonitoring devices (ECG, spirometry, stethoscope, etc.)
- Glucometer, thermometer, pulse oximeter
- PDA
- Teleconference software
- Internet-enabled mobile or satellite phone
- Wireless network enabled
- Satellite VSAT modem



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# **1st Brazil-Canada Symposium on Aboriginal Telehealth**

Manaus, Amazonas  
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**Thank you for your  
attention!**

