

# Environmental Epidemiology in the Peruvian Amazon



## Madre de Dios Peru

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Located in the Amazon rainforest, the Madre de Dios region of Peru has seen a dramatic increase in small-scale gold mining. Miners use mercury to extract gold from river sediment and release mercury into the environment by burning it off and dumping it into the river. People living in communities along the river are exposed to this mercury through environmental factors and consumption of mercury-contaminated foods such as fish. The overarching goal of this project is to study the health effects of mercury contamination in this area.

## PROJECT CONTEXT

### Project 1

- Leishmaniasis accounts for 2,357,000 Disability Adjusted Life Years (DALYs) lost
- Agent: *Leishmania* parasite
- Vector: Phlebotomine sandfly
- In 2012, 804 cases of Leishmaniasis were reported in Madre de Dios

### Project 2

- In 2012, 53.1% of children under 6 were anemic in rural Peru
- Specifically in Madre de Dios, 44.7% of children under 5 were anemic in 2010



**FIELD WORKERS COLLECT ANTHROPOMETRIC DATA**

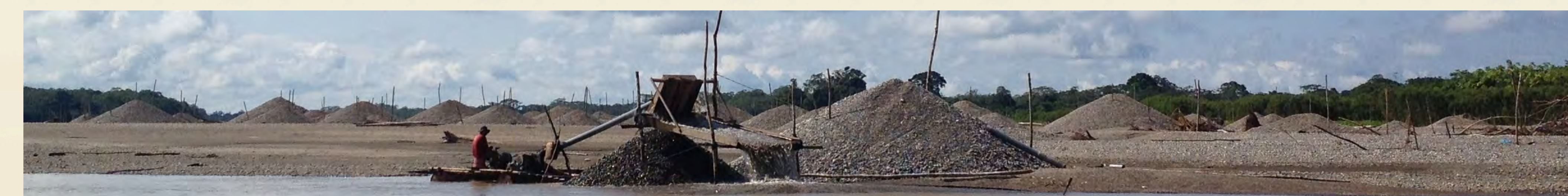
## PROJECT OBJECTIVES

### Project 1

- This project examines how different environmental variables such as land use and soil chemistry affect the distribution of sandfly species in Madre de Dios

### Project 2

- This project is a pilot to look at the potential link between anemia and mitochondrial DNA damage caused by mercury exposure



**SMALL SCALE GOLD MINING OPERATION**

## METHODOLOGY

### Project 1

- To collect insects, we set out four CDC light traps overnight. The next day we separated out the sandflies and sent them to our research partners at NAMRU-6 for identification.
- We used a small punch tube to collect soil at each trap site. We weighted it, dried it, and reweighted it to measure moisture content. We used a Munsell soil color chart to determine soil color and used a field test to analyze soil texture.

### Project 2

- To examine the blood, field workers collected samples from participants and processed them for serum.
- Samples were then frozen in Credo Cubes in the field then transferred to the NAMRU-6 research facility for shipment to the US

## SERUM ISOLATION, SANDFLY AND SOIL COLLECTION



Mining and Forestry Concessions in Madre de Dios, Peru

#### Legend

- Madre de Dios River
- Mining Concessions
- Forestry Concessions
- District of Madre de Dios

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