

IRIS - Imaging-based Risk Identification System.

Problem: Accelerated urbanization and climate change intensify the accumulation of water and waste in urban drainage systems, creating ideal breeding grounds for the *Aedes aegypti* mosquito. These risks often go unnoticed, leading to outbreaks that overwhelm public health systems. Current strategies are reactive and rely on insecticides that harm biodiversity without addressing the root cause of the problem. Furthermore, the lack of real-time monitoring prevents the early identification of critical areas, keeping cities trapped in recurring and avoidable dengue epidemics.

Solution: IRIS is an integrated technological solution that uses Computer Vision to transform epidemiological surveillance. Images captured both by citizens and by smart sensors installed in critical points (such as storm drains and trash bins) are analyzed in real time by artificial intelligence. The AI automatically identifies the accumulation of water and waste, classifies the level of risk, and generates geo-referenced alerts. These data feed into a control panel for health agents and sanitation departments, enabling teams to act preventively and precisely before larvae become adult mosquitoes.

Key Metrics: Reduction in the time between hotspot detection and elimination by agents, decrease in larval indices in monitored regions, reduction in hospitalizations and notifications of arboviral diseases in these areas, number of reports made by the population, decrease in the volume of insecticides used, and cost per hotspot eliminated.

Existing Alternatives: Traditional home visits by Endemic Disease Control Agents, devices that capture mosquitoes without monitoring the environment, and geoprocessing companies with software that maps already existing cases.

Reach: Digital campaigns will be promoted, along with partnerships with the Ministry of Health and State Secretariats. Additionally, app downloads will be monitored, as well as the number of hotspots reported and the rate of risk map views by the population, evidencing results.

Unique Value Proposition: Seeing the danger before it becomes an epidemic. Its differentiator is prevention instead of reaction.

Feedback: Used to refine the cost model, maintain or increase data security levels ensuring compliance with LGPD, and applied in the MVP to validate detection, effectiveness, and feasibility.

Target Audience: Urban populations directly affected by outbreaks, public managers who need to handle epidemiological crises, and health agents who require tools to direct their efforts more efficiently.

Initial Users: Public sectors such as the Ministry of Health and state and municipal secretariats will be the main users of IRIS, supporting sanitation performance and vaccination campaign results. The structure contributes to promoting smart cities, where technology supports local issues. City halls and Public Sanitation Secretariats will also benefit, as sewer maintenance will prevent flooding and waste collection will be intensified due to alerts of possible outbreaks in the app. Additionally, engaged citizens who want a direct and quick way to report hotspots are included.

Cost Structure:

- **Initial Costs:**
 - AI/Software – US\$ 4,000
 - Hardware – US\$ 3,000
 - Cloud Storage System – US\$ 2,000
 - Technical Validation – US\$ 1,500
 - Legal Items/LGPD – US\$ 1,000
 - Marketing – US\$ 1,000
- **Fixed Costs:** Server maintenance, technical support staff salaries, annual preventive camera checks.
- **Variable Costs:** Production and installation of new camera units, corrective maintenance if needed.
- **Profit Allocation:** Reinvestment in AI improvement and operational profit margin from government contracts.

Revenue Sources: The main source is Government SaaS (Software as a Service), offering subscription or licensing to municipalities, which will pay monthly for access to the monitoring platform and camera maintenance. Additionally, data collected can be sold to research institutions and companies interested in environmental/climate intelligence.

