

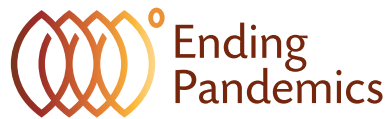
## Case Study:

PODD: Look Closely  
and You Will See

*Empowering  
Communities for Early  
Disease Detection*

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A partnership between  
**Ending Pandemics** and  
**Chiang Mai University**



# The Idea

Pronounced phonetically “**poh-dee-dee**” is Thai for “**look closely and you will see.**”



In 2004 Thailand and Vietnam were at the epicenter of a bird flu outbreak that killed more than 50 people, sickened hundreds, and resulted in an economic loss of roughly \$1.7 billion. Dr. Lertrak Srikitjakarn, former dean of Chiang Mai University's (CMU) College of Veterinary Medicine, believed that Thailand needed a new kind of disease detection system. Preventing a pandemic would require both the ability to detect an outbreak early and a coordinated plan for stopping its spread.

The system that Dr. Lertrak envisioned was the embodiment of a “One Health” approach, recognizing the deep interconnectedness of humans, animals, and the ecosystems they share. This system should make reporting and responding to both human and animal outbreaks routine and easy by empowering local citizens and their governments to play a leading role in these critical tasks.

For Dr. Lertrak, the task of creating these capabilities was daunting. Almost half of Thai citizens rely on backyard animal production for their livelihood, with millions of animals living outside the

formal agricultural system. Despite the 2004 epidemic, many people were also still consuming or selling chickens, cows, or other animals that died of unknown causes.

Dr. Lertrak's vision became a reality when he met Dr. Mark Smolinski, a staunch supporter of integrating the One Health approach into disease surveillance. Dr. Smolinski leads San Francisco-based Ending Pandemics, an organization that assembles cross-cutting teams of health experts, technologists, and public and private partners to design demand-driven, sustainable solutions that find and respond to disease outbreaks faster.

In March 2014 Ending Pandemics and CMU partnered with Opendream, a Bangkok-based technology social enterprise to host an epidemiology hackathon, or Epihack™, in Chiang Mai to explore what the PODD system might look like. Out of the event came numerous prototypes that were then further refined into a system design. Four months later, Ending Pandemics announced a two-year \$2m grant to Chiang Mai University to create and operationalize that system with Opendream's support.

# PODD Project Timeline

**FACT:** The majority of newly identified infections in humans that cause sickness and death come from wild and domestic animals. Early detection of these emerging “zoonotic” infections is essential, as they can cause severe outbreaks with high mortality, and in some instances lead to pandemics.



## PODD system launches

Within 16 months, 1,340 abnormal events were reported. Among those, a total of 36 incidents of dangerous zoonotic diseases were verified.

Ending Pandemics makes initial grant to Chiang Mai University

3/14

8/14

12/14

1/15

7/16

12/16

12/18

12/19

Ending Pandemics makes a second grant for scaling PODD to new provinces

EpiHack Chiang Mai launches PODD prototype

Local government and volunteer trainings begin with 300 trained local volunteers at launch, growing to more than 4,600 volunteers two years later

Ownership of PODD data transferred to local governments

Total number of trained PODD community volunteers reaches 19,400 across 31 provinces

“PODD Centre” launches at Chiang Mai University

**FACT:** Avian influenza, Ebola, and Middle East Respiratory Syndrome (MERS) are just a few of the emerging diseases that have made recent headlines. In 2018, for the first time, outbreaks of six WHO priority diseases were occurring simultaneously around the world, underscoring the growing need for more robust and effective disease surveillance.

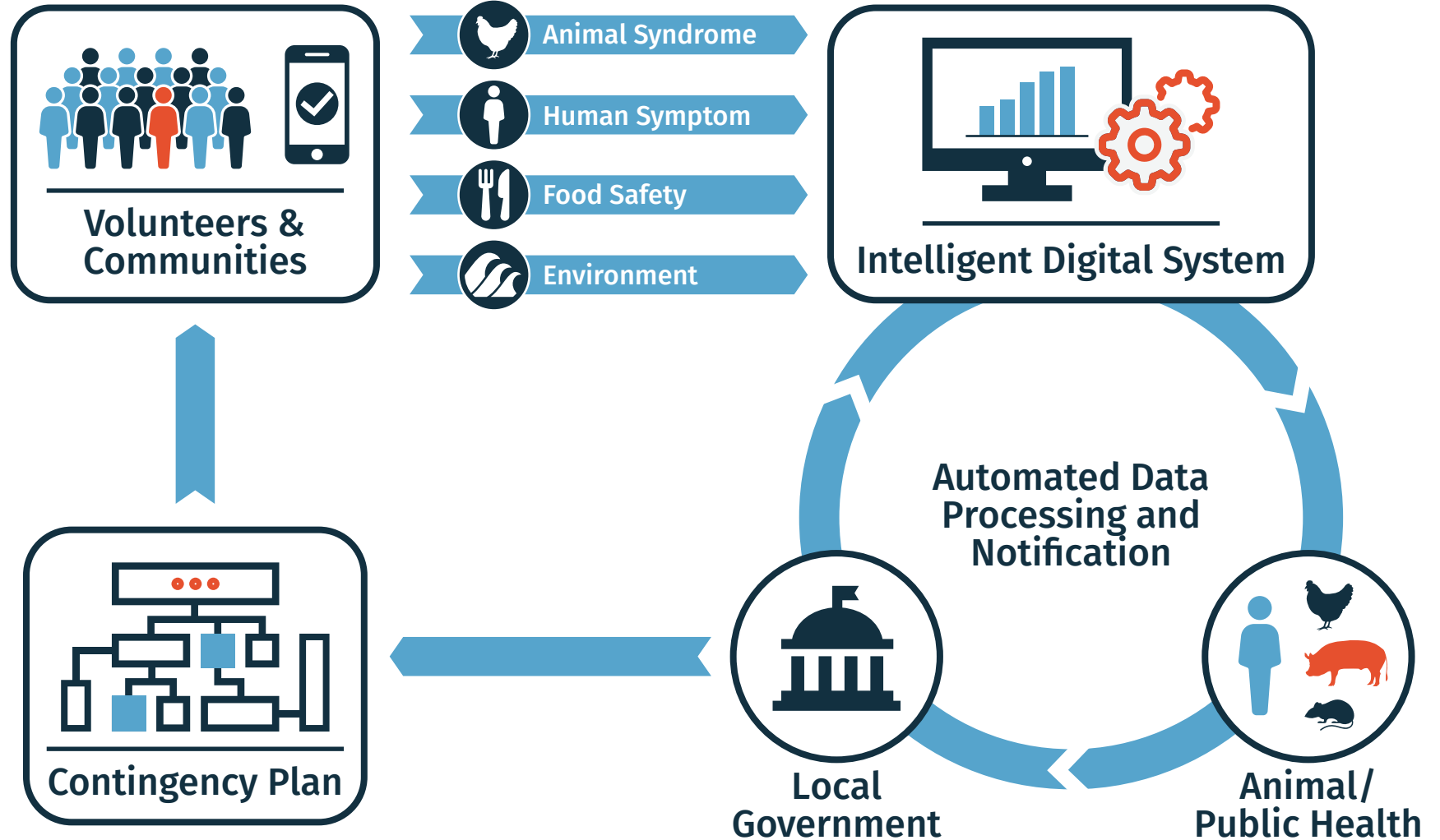
# How PODD Works

The PODD system leverages smartphone and web applications through trained village volunteers who are empowered to report unusual disease events in livestock, wild animals, and in humans.

The disease reports submitted by these local volunteers are then triaged by PODD analysts and lead to a local response from public health and livestock offices.

Local responders collect lab samples from the disease source and work with community members on preventative or outbreak control measures.

**FACT:** A recent user survey revealed that the PODD app was simple enough that **89% of volunteers** could use it agilely after basic training, even though half had never owned a mobile phone. On average, users required **less than 3 minutes** to submit a report.

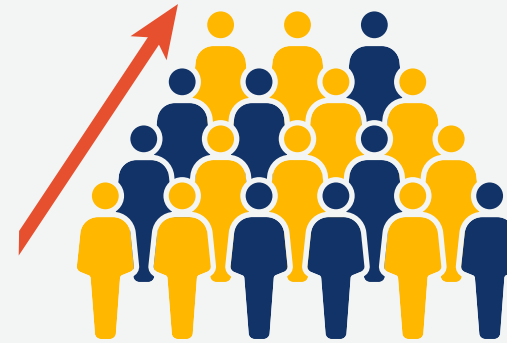


# Story Highlights



## Affordable

With an investment of **\$4 million USD** over the span of **5 years**, PODD has evolved from a concept to a community-owned surveillance system that local governments are now adopting **at their own cost**.



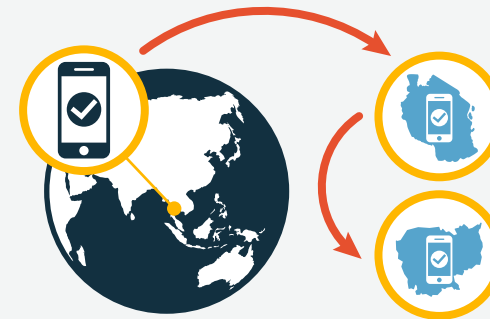
## Scalable

PODD has trained **19,400 people** across **31 provinces**, covering a population of nearly **3 million people** and is continuing to scale **nationwide**.



## Adaptable

The PODD system **has evolved** to also capture environmental health threats, counterfeit drug sales, and other health hazards.



## Replicable

PODD has been **replicated in Tanzania** with support from Ending Pandemics. **Cambodia has also requested** assistance to replicate the PODD system.

# Impact and Lessons Learned

In 2018 PBS NewsHour took its viewers to a remote village in Thailand, Huay Ton Chok, a place with more chickens than humans. Reporting from Thailand, PBS correspondent Fred de Sam Lazaro provides a deeper look at how intertwined animal and human health is and how one sick chicken can cause a ripple effect around the world. Local residents in this village however, are using technology to stop outbreaks before they start.

[Click here to watch the full story.](#)



In the subdistricts of Chiang Mai using the PODD app, volunteers reported more animal diseases within the first few months than had been reported over the entire previous year.



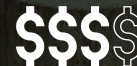
As of December 2018, 9,887 abnormal events have been reported through PODD. They include outbreaks in animals and humans, as well as other environmental hazards.



PODD has trained more than 19,400 community volunteers across 31 provinces on reporting through the PODD application.



A study of the PODD system found that 73% of confirmed poultry outbreaks were contained within the village of origin, with the remaining 27% contained within neighbouring villages before further spread.



In one instance, an outbreak of foot and mouth disease in domestic livestock was rapidly contained and estimated to have saved the local economy approximately US \$4 million.



Evaluations from public health field staff rated 70% of volunteers' performance between "good" and "excellent."

# Local Empowerment is Key to Lasting Change

## The Community's Reaction

### Help Comes Much Faster

*"I can just take a photo and get a very rapid response."*

### Community Engagement has Increased

*"It has brought the community together." Communities are building designated quarantine areas in their village and even asking how to do vaccinations themselves.*

### Community Trusts the Government

*Farmers who would not report problems before are willing to do so now because they trust that their local government will respond.*

### Government is More Equipped to Help

*"People in local government now can solve these problems by themselves, which makes them care more about these issues."*

# Unexpected Outcomes

In addition to infectious disease threats, PODD has added modules addressing other health risks like forest fires, floods, counterfeit drug sales, and food safety at the urging of participating communities.

*In August 2017 heavy rains in the highlands of Mae On district resulted in flash floods in nearby Ta Nue subdistrict. Local volunteers reported the situation and the PODD system automatically alerted surrounding subdistricts to the threat. The alert prompted an order to move people and possessions out of flood zone, helping prevent significant loss to villagers of Mae Ta subdistrict.*



# Looking Ahead

PODD serves as an example of how innovation in disease surveillance using available technologies such as mobile phones can permit communities to participate in their own disease prevention and control. This PODD approach is being replicated in Tanzania where it is showing similar signs of potential and scale. Other countries in the Southeast Asia region, such as Cambodia, have expressed strong interest in replicating PODD for their own use as well.



*No community is too hard to reach, no country is too poor to innovate, and curiosity outshines fear everywhere.*

**- Mark S. Smolinski, MD, MPH**  
President, Ending Pandemics