**Abstract from the article**

**“On the hunt for the next deadly virus”**

Searching for new viruses and tracking down the source of pandemics, scientists are laying the groundwork to defeat “spillover” diseases. There are as many as 1.6 million viruses. We know nothing about lurking in mammals and birds, and as many as half might have the potential to jump to humans and infect us. That’s an estimate, but the threat is clear. Six out of ten infectious diseases that strike us come from animals. Scientists identified the pathogens responsible for the most recent pandemics only after those pathogens started killing people.

Researcher Wacharapluesadee is a part of a dogged international effort to detect deadly viruses before they find us, in hopes of stopping lethal outbreaks. One can safely call her virus hunter. She and her colleagues captured 932 bats, drew their blood, released the animals, and returned to the lab to test for rabies-causing lyssaviruses.

For the past decade she has collaborated with PREDICT, a U.S. Agency for International Development Initiative to accelerate and coordinate global virus discovery and surveillance. The project has identified 949 novel viruses, created an extensive database of known viruses in wildlife, and trained nearly 7,000 scientists, lab technicians, and field workers in 30 countries to be on the lookout for emerging diseases. PREDICT also developed low-cost tools to test blood and other specimens from animals or humans for the genetic signatures of a virus family. Conventional tests look for a specific, known virus. These broader tests make it possible to identify a mystery virus by analyzing pieces of its DNA and matching the results to the genetic profiles of well-studied relatives.

In Wuhan, she tested people for 33 pathogens known to cause respiratory illnesses and for two virus families: influenzas and coronaviruses, which include the viruses responsible for the SARS pandemic and MERS. She detected a coronavirus, sequenced the genome and ran the results through GenBank, a go-to DNA database for identifying novel pathogens. The virus looked much like a SARS virus found in the Chinese rufous horseshoe bat, but it was unlike anything previously detected in humans. She alerted Thai health officials that a new coronavirus was on the loose – two days BEFORE China reported to the World Health Organization that a new coronavirus had sickened 41 people in Wuhan, killing one.

Who are the virus hunters? They are the swashbucklers of science, tromping through the wild and risking exposure to wretched diseases to unravel the mysteries of infectious nanoparticles. Viruses are ubiquitous. Add them all up and they’d weigh more than all plants and animals, though they are tiny. About 100 million particles of the new coronavirus, SARS-CoV-2, can fit on a pinhead.

An international collaboration of scientists has announced the formidable goal of finding, identifying, and mapping 99 percent of viral threats to human health and food security within 10 years. But their effort, the Global Virome Project, faces the equally formidable task of raising the estimated $3,7 billion it would need to reach such an ambitious goal.

Hunting down viruses is challenging, but it may be the easier part. The complicated part is figuring out which one to worry about. Which potentially dangerous viruses are most likely to jump from their animal hosts to humans? And where in the world would it be most likely to happen? In looking for answers, scientists have focused on two virus families: filoviruses, which include Ebola, and coronaviruses, which include several common viruses that cause sniffles or coughs. Remember, nobody recognized the coronavirus family as a big problem until severe acute respiratory syndrome (SARS) emerged in southern China, infecting nearly 8,100 people across 26 countries and causing 774 deaths.

Spurred by the discoveries, EcoHealth Alliance, a PREDICT partner, created a picture book, *Living Safely With Bats*, in 12 languages. PREDICT field teams used the book in education campaigns in villages in Sierra Leone and Guinea. The message: Don’t eat the animals or fruit they may have contaminated. But don’t exterminate them either, because they are important pollinators. The PREDICT effort reached thousands of people, but whether it changed behavior is unknown.

PREDICT ended in 2020, after more than a decade of work, and the U.S. government has kicked off its successor, STOP Spillover. The five-year, $100 million initiative is focused more narrowly on specific zoonotic viruses, such as Ebola, Nipah, and coronaviruses, in select high-risk countries in Asia and Africa.

Scientists who have dedicated their lives to discovering and understanding viruses say the knowledge is essential for reducing risk and averting the next pandemic. How can you persuade people to stop drinking bat blood or get governments to clamp down on wildlife trading if you can’t tell them what viruses are out there and how likely they are to harm us?