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Trapping rodents in the urban settlements of Nepal

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The urban settlements of Kathmandu have grown at a startling rate over the last few years. The population increase is due to unemployment and migration from Nepal's rural areas. A civil war between Maoist fighters and government forces, which lasted from 1996 until 2006, created insecurity in the countryside forcing many to flee into the city.

The war displaced between 100,000 and 150,000 people, many of whom live in the cities urban settlements. The living conditions are poor, and residents have little or no access to basic services.

Since January of 2013 a team of scientists from The Center for Molecular Dynamics, a non-profit organization established by dedicated, Nepali scientists, has been conducting research on infectious diseases in areas that have a high interaction between wildlife and humans.

The Bagmati river settlement in West Thapathali was selected as a suitable site for the research team's rodent sampling program.

"The people are more vulnerable here because their shelters are so makeshift," explains Priya Joshi, the project field manager. "There is nothing concrete. They are exposed to the wildlife. Rodents can go directly into their house[s]. There's no protection for them."

Priya and her field team have set rodent traps along predetermined transect-lines running through the settlement and along the river. Traps are set both inside and outside of the improvised houses.

Once the rodents are trapped they are processed in a temporary tent set up nearby. After they have been anesthetized, blood, saliva and feces samples are taken. The rodents are tagged and released a short distance away from the original capture point.

The samples will be analyzed for evidence of zoonotic diseases - those diseases that can be transmitted between animals and humans. The results will be compiled in a database that will be used to create predictive maps of potential disease outbreak.

The project is called PREDICT and is part of the U.S. Agency for International Development's Emerging Pandemic Threats Program, which builds on the understanding that humans, wildlife and the environment are inextricably linked.

“Before we started our program we talked to the residents about what we were doing and how it would help them understand disease transmission,” Joshi noted. “Although this slum is right behind a hospital the people have no access to healthcare. They have been abandoned by the government and are distrustful of outsiders.”

A recent UN survey reported that most people living in the settlements suffer from diarrhea, dysentery, fever, Typhoid, jaundice and respiratory problems. Thirty-three percent of children living in the settlements have not been immunized. There are twenty-eight settlements in the Kathmandu valley.

“The people have been quite happy because we are trapping rodents. They eat all their food so they are eager to take the traps and put them in their houses,” Joshi explained. “In fact now we have people complaining that they don’t have traps and we have to explain to them that we’re sampling along specific lines and we can’t give traps to everybody.”

Joshi’s project is one of many wildlife-sampling programs taking place around the world. PREDICT is active in twenty countries that are emerging, infectious disease hot spots.

In 2011, PREDICT wildlife veterinarians were sent to Kampala, Uganda to screen wildlife as a potential source of the Ebola virus after an outbreak killed a twelve-year-old girl. Their sampling detected the Ebola virus in animals during the outbreak.

The study (in combination with historical data) was used to develop a more effective Ebola outbreak response effort in an area with limited resources.

The early detection of Ebola is crucial for learning more about the virus, which can strike human populations with a mortality rate of more than eighty percent.

“The Emerging Pandemic Threats program is a visionary investment by USAID to protect and improve global health because it has made it possible for us to, on a global scale, identify novel pathogens in wildlife that could pose pandemic threats to humans,” said Dr. Jonna Mazet, Director of PREDICT. “This study is a great example of how PREDICT is using science to improve our ability to detect lethal diseases.”