

Bats exposed as main coronavirus carrier

Study suggests where viruses could jump to humans.

BY AMY MAXMEN

Bats are the major animal reservoir for coronaviruses worldwide, according to a survey of thousands of animals across Africa, Asia and the Americas. The animals had previously been linked to the coronaviruses that caused outbreaks of severe acute respiratory syndrome (SARS) and Middle East respiratory virus (MERS), but until now researchers were not sure whether that was a coincidence or a sign of a broader trend.

The latest findings suggest that researchers who study infectious diseases can improve their predictions of where coronaviruses are likely to leap from animals to people by looking at the geographical distribution of various bat species and the behaviour of the viruses that they carry.

“It’s time to stop being reactive,” says Simon Anthony, a virologist at Columbia University in New York City and lead author of the study (S. J. Anthony *et al. Virus Evol.* 3, vex012; 2017). “The point is to take a different approach and be more proactive by understanding the diversity of viruses out there before they actually emerge.” The research was funded by the US Agency for International Development through a programme that aims to pre-empt pandemics of viruses that pass from animals to humans.

Coronaviruses made headlines in 2002, when SARS appeared in China and spread to 27 countries, killing 774 people. In 2012, the coronavirus that causes MERS surfaced in Saudi Arabia; 640 people died.

To work out what coronaviruses are carried by different types of animal, Anthony

and his colleagues trapped and released about 12,300 bats, 3,400 rodents and shrews, and 3,500 monkeys. Their work took them to 20 countries in Africa, Asia, South America and Central America that had previously been identified as ‘hotspots’ for outbreaks of animal-borne disease.

Nearly 10% of the bats carried coronaviruses, compared with 0.2% of the other animals sampled. And the team found that the diversity of viruses was highest in places where multiple bat species lived, such as the Amazon rainforest.

Yet bat diversity alone is not an indicator of risk, because only a fraction of coronaviruses infect people. One hint that a pathogen may spill over into people is a history of jumping between distantly related species. Anthony and his colleagues observed that coronaviruses in Africa had spread among unrelated bat species four times more often than viruses in Mexico, Brazil, Bolivia and Peru had. This could be due to genetic differences in the coronaviruses in each region, or to how disparate bat species interact in different forests.

“It’s very interesting that the viruses in Latin America don’t jump around as much,” says Vincent Munster, a virologist at the US National Institutes of Health’s Rocky Mountain Laboratories in Hamilton, Montana. “It’s worth more study.” ■