Are there germaphobes among apes?

Japanese macaques changed eating habits after going through an epidemic. **Ryan Green** reports

Remember wiping down groceries before they went into the fridge? Or washing your hands to the tune of *Happy Birthday to You*? Even before scientists had determined exactly how the coronavirus spread, people were desperate to avoid contamination.

It looks like humans aren't the only ones who display that type of behaviour.

In a recently published study, Japanese macaques became significantly more cautious about food sources that appeared contaminated after experiencing a deadly outbreak of disease. The results suggest that primates' ability to avoid disease can be shaped by experience and learned socially, something researchers call a behavioural immune system.

As Covid-19 cases grew by the day in early 2020, a lesser-known epidemic was spreading at a sanctuary for macaques in South Texas. An HIV-like virus — spread through bites and scratches — swept through three of the sanctuary's four groups. Staff members responded by separating, testing and isolating the animals. Some macaques passed away quickly from severe haemorrhaging, while others became ill gradually. Many of the monkeys who didn't get sick had front row seats to their symptomatic neighbours.

Once the threat of disease had passed, the experiment began. The macaques received two pieces of food. One was placed on a clean surface. The other was placed on a board covered in macaque faeces (which was sealed with an epoxy material to eliminate any odour or actual risk of infection).

Poop doesn't always bother macaques. But in this experiment, the monkeys who had lived through the outbreak were far less likely to take food from the surface with faeces, which could potentially carry disease. They



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ate from it in 47 per cent of the trials; the monkeys who didn't experience the outbreak ate from it in 79 per cent of the trials.

"They're somehow adapting to a potential risk that they're perceiving," said Federico Rossano, who directs the Comparative Cognition Lab at the University of California, San Diego, US, and was an author of the study.

That's true even though the disease was spread through bites and scratches, not through contaminated food. "The monkeys see disease and sick individuals and increase their overall sensitivity, even for a transmission route that is completely unrelated to how the disease actually spreads," said Stephan Kaufhold, a researcher in cognitive science and an author of the study.

There was also a surprise. The monkeys who were never sick themselves but still experienced the outbreak also became more cautious. "The ones who used to live with the ones who were sick behaved exactly the same way," Rossano said.

The sanctuary macaques came from a variety of backgrounds — sanctuary-born, zoo-born, former lab animals and former pets. And those who had been reared by humans were more likely to eat the contaminated food, potentially because they had fewer opportunities to learn avoidance behaviours from their mothers or other macaques early in life.

"Many primate studies still fail to factor in the life history of primate participants, as if background or experience doesn't play a critical role in exhibited behaviours," said Elodie Freymann, a primatologist at Brown University, US, who was not involved in the research. "This paper does the opposite."

In the animal kingdom, avoiding things that could make one sick isn't new. Some studies even show evidence of social distancing in the wild. Across species, animals have been found to alter their behaviour, both to prevent falling ill and to steer clear of sick individuals. Some mandrills, for example, sniff poop to screen for parasites before they groom one another. Other species self-isolate when experiencing an infection. No one — human or primate — wants to get sick.

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