

Human Infection in Wild Mountain Gorillas

[Announcer] This podcast is presented by the Centers for Disease Control and Prevention. CDC – safer, healthier people.

[Maureen Marshall] Hello, I'm Maureen Marshall. Today I'm talking with Dr. Ian Lipkin, Director of the Center for Infection and Immunity and John Snow Professor of Epidemiology at Columbia University, and Gustavo Palacios, investigator in the Center of Infection and Immunity and Assistant Professor of Epidemiology.

[Maureen Marshall] Welcome, Dr. Lipkin.

[Ian Lipkin] Thanks, Maureen.

[Maureen Marshall] And welcome to you Dr. Palacios.

[Gustavo Palacios] Thank you for inviting me.

[Maureen Marshall] Doctors, why are gorillas able to catch human infection?

[Ian Lipkin] Maureen, gorillas share approximately 98 percent of their DNA with us, so it's not surprising that they're susceptible to human pathogens. Increased tourism and growing population densities around the national parks where gorillas live has increased the frequency with which these animals come into contact with humans. Their lack of immunity to human pathogens puts them at risk for disease. As we saw in our study, infection with human metapneumovirus, or HMPV for short, may make them more vulnerable to secondary bacterial infections, further compounding the problem.

[Maureen Marshall] Since gorillas can catch human infections, why are tourists allowed to be near them?

[Ian Lipkin] Good question. Ecotourism, and specifically gorilla tourism, generates jobs in resource poor communities in Rwanda, Uganda, and the Democratic Republic of Congo. It also helps to raise funds for conservation efforts and for park maintenance. Because of this, thousands of people come into contact with gorillas annually in Bwindi Impenetrable National Park and Virunga National Park.

[Maureen Marshall] Is anything done to try to limit the gorilla's exposure to infections in the parks?

[Gustavo Palacios] Well, the Congolese Wildlife Authority requires that visitors wear protective masks. Some parks also limit permits to enter the parks. The Uganda Wildlife Authority, for example, restricts the number of visitors to 24 per day at Bwindi Impenetrable National Park and eight at Mgahinga Gorilla National Park.

[Maureen Marshall] Tell us about the respiratory infection outbreak in the park in Rwanda in 2009.

[Gustavo Palacios] The outbreak we investigated occurred between June 28 and August 6th, in 2009 among Hirwa gorillas in Rwanda. Eleven of the 12 gorillas in that group had symptoms of respiratory disease, including coughing, runny nose, and lethargy. Two of the gorillas died – an adult female and her male infant. We examined samples from the diseased female and her infant using state-of-the-art molecular methods that we developed in our laboratory, including a sensitive multiplex technique that can screen for up to 30 pathogens in a single experiment, and high throughput sequencing. Our tests revealed metapneumovirus in serum, upper and lower respiratory and gastrointestinal tract, and vagina of the adult, and in the lung of the infant. We also detected streptococcus pneumoniae and Klebsiella pneumoniae in the respiratory tract of the adult. By pathology revealed inflammation consistent with severe pneumonia in the adult, as well as inflammation of the umbilical cord and the kidneys of the infant.

[Maureen Marshall] What conclusions have been made about this outbreak?

[Gustavo Palacios] Although the direct source of the metapneumovirus is unknown, genetic analysis indicates that the strain of the virus that we found in the lungs of the sick gorillas was closely related to strains found in South Africa, and that is more than 1,000 miles away, suggesting that visitors may have carried the virus into the parks. The adult gorilla likely succumbed to secondary bacterial pneumonia in the context of an acute metapneumovirus infection. Instead, the infant gorilla presumably died of renal failure due to infection with HMPV.

[Maureen Marshall] Is there anything that can be done to prevent future infection outbreaks?

[Ian Lipkin] Gorillas are clearly at risk for infection with human pathogens. Nonetheless, isolation is impractical given the need to support the parks and the communities that benefit from ecotourism. Therefore, risk must be managed by monitoring human-gorilla interactions and possibly by employing vaccines to induce immunity to human pathogens. An obvious example is measles virus vaccine, which has already been used in zoos to prevent disease.

[Maureen Marshall] Thank you. I've been talking with Drs. Lipkin and Palacios about an article that appears in the April 2011 issue of CDC's journal, Emerging Infectious Diseases. You can see the entire article online at www.cdc.gov/eid. If you'd like to comment on this podcast, send an email to eideditor@cdc.gov. That's eid editor – all one word - at c-d-c-dot-gov. I'm Maureen Marshall, for Emerging Infectious Diseases.

[Announcer] For the most accurate health information, visit www.cdc.gov or call 1-800-CDC-INFO, 24/7.