Rats may not have driven the black death plague after all

January 16 2018

(HealthDay)—It's thought to have killed between 30 and 60 percent of

Europe's population, but the Black Death plague may not have been spread by flea-infested rats, Norwegian scientists report.

Between its first devastating outbreak in the 14th century, and finally fading away by the 1800s, the plague caused by the *Yersinia pestis* bacterium sent millions of Europeans to early graves.

Scientists have long thought that the bacterium—which is transmitted by the bite of fleas—was spread directly to humans by the flea-ridden rats that lived in people's homes.

"When we hear or read of the plague, one of the first associations that comes to mind is rodents, and the role of overpopulation of rats in the transmission of the infection," said Dr. Sunil Sood, an infectious disease expert not involved with the study.

But the new research, based on European death statistics for nine plague outbreaks spanning five centuries, suggests the much-maligned rat may not be to blame.

Instead, "human ectoparasites"—meaning fleas residing on people, not rats —may have been the primary sources for spreading the illness, including the devastating Black Death of 1346 to 1353.

The new research is "ultimately challenging the assumption that plague in Europe was predominantly spread by rats," concluded Nils Stenseth, of the University of Oslo in Norway, and colleagues.

"As the authors point out, historical and archeological records do not support the presence of large rat populations at the time [of the Black Death]," said Sood, who heads pediatrics at Southside Hospital in Bay Shore, N.Y.

"It has long been hypothesized that there is another way that plague can spread between humans—that human fleas [such as *Pulex irritans*] and [body] lice can cause epidemics by biting humans serially, even if rats are not present in large numbers," he explained.

Still, Sood said, there's one "drawback" in the new study's logic: Where did the human fleas and lice contract *Yersinia pestis* to begin with?

"Even human fleas and lice would need to pick up *Yersinia pestis* from a rodent or other mammalian reservoir," he explained. "So it would be a mistake to conclude that rodents have nothing to do with the life-cycle of plague bacteria."

Sood noted that plague remains a concern, so the research has modern-day implications.

Based on the research, "it is easy to see, for example, how crowded conditions in a refugee settlement could result in spread of vector-borne infections such as plague," Sood said.

The study was published online Jan. 15 in the *Proceedings of the National Academy of Sciences*.

More information: Katharine R. Dean el al., "Human ectoparasites and the spread of plague in Europe during the Second Pandemic," *PNAS* (2018). www.pnas.org/cgi/doi/10.1073/pnas.1715640115

Find out more about plague at the U.S. Centers for Disease Control and Prevention.