

Researchers find bubonic plague fragments on NY subway

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A lonely commuter waits to catch the train at a subway station in New York on January 26, 2015

It is universally acknowledged that the New York subway is grubby. What may come as a shock is that it contains DNA fragments linked to anthrax and bubonic plague.

Researchers from Cornell University have provided the first map of the

subway's microbes, identifying more than 1,688 types of [bacteria](#) and one station that even supports a "marine ecosystem."

They say the vast majority of the bacteria is harmless to the 1.7 billion people who travel each year on 600 miles (960 kilometers) of track in passenger service in America's largest city.

But disease-causing bacteria that are resistant to drugs were found in 27 percent of samples.

Two were found with DNA fragments of anthrax and three with a plasmid associated with [bubonic plague](#), albeit at very low levels.

Yet there has not been a single reported case of the plague in New York since the PathoMap project began in June 2013.

The study's senior investigator, Christopher Mason, says the research shows the resilience of the human body and that the bacteria is not enough to pose a threat to our health.

"The presence of these microbes and the lack of reported medical cases is truly a testament to our body's immune system, and our innate ability to continuously adapt to our environment," he said.

Perhaps most striking is that 48 percent of the samples matched no known organism, which the study said highlighted "the vast wealth of unknown species that are ubiquitous in urban areas."

In October 2012, Hurricane Sandy caused havoc across the city and submerged South Ferry Station in Lower Manhattan in ocean water.

Two years later, the majority of bacteria at the station are "more commonly associated with fish species, marine environments or very

cold Antarctic environments," the study found.

It also found that Penn Station, one of New York's busiest transit hubs, has a vast bacterial ecology that shifts by the hour.

New York has the seventh largest subway in the world in terms of annual ridership, behind Tokyo, Beijing, Moscow and other cities in the Far East, but ahead of Mexico City, Hong Kong and Paris.

Human DNA was only the fourth most abundant species, behind two insects, the Mediterranean fruit fly and the [mountain pine beetle](#).

The researchers say they collected 1,457 DNA samples from all 466 open stations on all 24 lines.

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