Rocky Mountain National Park institutes new requirements for mountain climbers based on SPHTM-contributed research

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An interesting question can lead to interesting answers. For example, what might researchers find out when investigating the impact of human waste on an environment that typically doesn't house humans?

A new paper contributed to by Tulane School of Public Health and Tropical Medicine researchers published in high-impact journal Environmental Research -- "Leave No Trace? Ecological and anthropogenic determinants of antibiotic resistant bacteria in a recreational alpine environment" – suggests that the impact can be high.

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> *Laura Scott*

In the study, bacteria resistant to a variety of antibiotics (ARB) were detected in remote environments. The abundance of these ARB in both water and soil could be linked to increased human presence.

In the case of national parks, which aim to leave such areas as untouched as possible, that finding is significant. The results suggest that human activity -- particularly producing fecal waste and not disposing of it -- in national parks may contaminate the environment with antibiotic resistant bacteria.

As a result of this study and other related research that demonstrated to park management that fecal waste in busy portions of the park requires mitigation, Rocky Mountain National Park has implemented new requirements for mountain climbers to handle and remove their fecal waste.

The park has started requiring mountaineers to pick up and use "wag bags," which climbers can use in the middle of a climb, so that they are no longer free dumping fecal matter thousands of feet below.

Laura Scott, a Tulane SPHTM doctoral graduate, was lead author on the paper, with Tiong Aw, PhD, associate professor of Environmental Health Sciences advising and contributing.

"People have started to realize that it's out there way more than we think it is, so everybody wants to know how open is Pandora's box?" Scott said in 2021.

The latest research suggests the box is wide open.

“Although antibiotic resistance occurs naturally, human activities including misuse of antibiotics and improper discharge of waste is accelerating the process,” Aw said. “Antibiotic resistant bacteria have been demonstrated to be transmittable to humans in many different environments. Environmental contamination with antibiotics can facilitate the spread of resistant bacteria or resistance genes and the emergence of new resistance in pathogenic bacteria.”

Aw has called for more longitudinal study on environmental antibiotic resistance to identify potential public health risk, but he also praised the collaborative nature of the most recent study.

“This is an example of translational research which seeks to produce applicable results that benefit public health and the environment,” Aw said. “This is a research collaboration with the National Park Service … Collecting and processing environmental samples in remote areas such as parks can be logistically challenging. Without the support from the National Park Service, this research is not feasible.”