

Could the Power of the Sun Slow the Coronavirus?

A study suggests that ultraviolet rays could slow the virus, though not enough to wipe it out, and not as a treatment.



A sunbathing New Yorker on Sunday. Credit...Jeenah Moon/Reuters

By [William J. Broad](#)

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Will summertime slow the virus that causes Covid-19, as it has done with many other viruses that sow flu, colds and pneumonia? A new study finds that it may, though not enough to wipe out the pathogen or keep the pandemic from resurging in the fall.

The study, done by ecological modelers at the University of Connecticut, understands the main natural weapon against the novel germ to be ultraviolet light — an invisible but energetic part of the sun’s electromagnetic spectrum that’s well-known for damaging DNA, killing viruses and turning healthy human skin cells into cancerous ones.

“We found that ultraviolet light was most strongly associated with lower Covid-19 growth rates,” the scientists wrote in a publication that has not yet been peer reviewed and that [went online late](#) Wednesday. Projections of the overall effects, they continued, suggest that the disease “will decrease temporarily during summer, rebound by autumn, and peak next

winter.” But they cautioned that uncertainty about the study’s projected outcomes “remains high.”

Indeed, though the pandemic’s spread has varied widely among countries, it was spreading swiftly in some experiencing hot weather, including Australia and parts of Iran.

The new ecological analysis suggests that balmy days might aid — though not by themselves accomplish — the goal of social-distancing measures advised by public health officials.

Other groups have sought to see if seasonal change would affect the virus that has spawned a pandemic, infecting more than two million people worldwide. Early this month, a committee of the National Academy of Sciences [looked exclusively](#) at humidity and temperature and found that they would have a minimal impact on the virus. The panel’s assessment [contradicted popular accounts](#).

At the White House coronavirus task force briefing on Thursday evening, [President Trump](#) highlighted research at the Department of Homeland Security that found that sunlight and disinfectants — including bleach and alcohol — can kill the coronavirus on surfaces in as little as 30 seconds.

“Supposing we hit the body with a tremendous — whether it’s ultraviolet or just very powerful light,” Mr. Trump said, speculating on a possible means to fight the virus.

While such an idea is currently far from the realm of a safe treatment, life scientists have long been aware that the sun threatens the viability of many micro-organisms.

“Sunlight kills most pathogenic microbes quite rapidly,” John Postgate, a British microbiologist, [wrote two decades ago](#) in the popular book “Microbes and Man,” published by Cambridge University Press. The lethality, he continued, is principally the result of “the ultraviolet component of solar radiation. Ultraviolet lamps can be used indoors to sterilize the air in operating theaters and pharmaceutical and microbiological laboratories. Even in diffuse daylight there is an appreciable amount of light of the effective wavelength.”

During the pandemic, because of the shortage of protective equipment, some medical centers have been using ultraviolet light to [decontaminate masks](#) so they could be reused. A [small industry](#) that sells ultraviolet lamps as a germicide has arisen, but experts [warn of their potential dangers](#) for humans.

Many nonscientists — including President Trump — have noted the seasonality of colds and flu and hoped the novel coronavirus would act likewise. [Dr. Robert R. Redfield](#), director of the Centers for Disease Control and Prevention, told National Public Radio last month that he, too, expected an ebb and flow of disease.

“Most respiratory viruses have a seasonality to them,” [he said](#). “It’s reasonable to hypothesize — we’ll have to wait and see — but I think many of us believe as we’re moving into the late spring, early summer season, you’re going to see the transmission decrease.” But in [comments](#) this week to The Washington Post, he also pointed to the likelihood that the coronavirus would continue to be a problem in the fall, when it would coincide with the start of a new flu season.

Comparative studies of viruses suggest that, as a class, coronaviruses are especially vulnerable to ultraviolet light because of their relatively large genetic codes. “The more target molecules,” [one study noted](#), “the more likely the genome will be damaged.”

Even so, other aspects of sunlight's effects may also play important roles in whether viruses can easily infect humans — a main one being its promotion of [the synthesis of vitamin D](#), a nutrient that can strengthen the immune system and lower the risk of certain illnesses.

The Connecticut scientists — Cory Merow and Mark C. Urban — titled their paper “Seasonality and Uncertainty in Covid-19 Growth Rates.” It [was posted Wednesday](#) on [medRxiv](#), a preprint website for health scientists run by Yale University, the Cold Spring Harbor Laboratory on Long Island, and the company that publishes the British Medical Journal. The site notes that its preprints have not undergone peer review for accuracy and thus “should not be used to guide clinical practice.”

Dr. Merow said that although the lethal effects of ultraviolet light on viruses are well-known, he and his colleague were surprised to find a seasonal drop evident on a global scale.

Dr. Merow said he and his colleague had mined existing studies on how environmental and ecological factors correlate with virus infection rates and used them in ecological modeling of the global repercussions. Global data on temperatures, humidity, the penetration through the atmosphere of sunlight's ultraviolet rays, population ages and densities, and Covid-19 infection counts were combined into a computer model that mapped out the seasonal trends, he said.

Dr. Merow noted that the study's range of uncertainty was considerable, such that, depending on the location within the United States, the chance of seeing no viral slowdown in the summer ranged from 20 percent to 40 percent.

“There's a lot of uncertainty,” he said of the reported seasonality.

Even if coronavirus cases decline in the summer as his model projects, Dr. Merow said, social distancing and other health public measures would still be necessary.

In some circumstances, Dr. Merow noted, summer days would offer no protection at all. For instance, window glass blocks ultraviolet rays. “If everybody sits next to one another on the bus and coughs,” he said, “ultraviolet light is not going to protect you.”

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