

Surprising Ways COVID-19 Will Destroy Your Immune System

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✓ Fact Checked

STORY AT-A-GLANCE

- › The overuse of antibiotics, biocides and disinfectants to fight COVID-19 may “raise disastrous effects” for antimicrobial resistance (AMR)
- › The COVID-19 pandemic has accelerated the spread of AMR, as the majority of patients are treated with antibiotics, despite most not having a bacterial co-infection
- › The excessive and liberal use of antimicrobial products like household and industrial disinfectants, hand sanitizers and other cleaners is raising the risk of AMR in the environment
- › Your mitochondria, which play a role in antibacterial and antiviral immune responses, are an off-site target of certain antibiotics, thus antibiotic therapy may in turn may weaken your immune response
- › With proper “training” at regular intervals denied by COVID lockdowns, your immune system can overreact when triggered by ordinarily harmless substances, leading to allergies and inflammation

Antimicrobial resistance (AMR) has been declared one of the top 10 global public health threats to humanity,¹ and it didn’t disappear once the COVID-19 pandemic appeared. Instead, it’s gotten worse, as infection control measures and hand hygiene using antimicrobial gels have become ubiquitous.

AMR causes about 700,000 deaths globally every year, but researchers estimated in mid-2020 that an additional 130,000 AMR deaths would occur in 2020 due to the COVID-19 pandemic.² The number of AMR deaths will likely surpass the number of COVID-19 deaths by at least threefold – annually – by 2050,³ with some estimates suggesting AMR deaths may reach as high as 10 million deaths per year.⁴

Prior to the pandemic, antimicrobial stewardship programs⁵ had been set up worldwide to help stop the inappropriate use of antimicrobials in hospitals, long-term care facilities and other settings, but a review by scientists with Shahid Beheshti University of Medical Sciences in Iran, published in *Frontiers in Microbiology*, predicts that an overuse of antibiotics, biocides and disinfectants to fight COVID-19 may “raise disastrous effects.”⁶ Further, the overuse of antibiotics may also be directly harming immune response.

Antibiotics Given to COVID-19 Patients ‘Just in Case’

Now remember that COVID-19 is caused by the [SARS-CoV-2 virus](#), which means antibiotics are useless against it. Despite this, antibiotics have been used prophylactically throughout the pandemic for COVID-19 patients, typically using the logic that it could prevent bacterial co-infections.

However, the rate of secondary bacterial co-infections has generally been low, while the use of antibiotics has remained high. This isn’t a case of antibiotics being used strategically for patients who develop bacterial infections, but rather using them “just in case.”⁷ In a study of 38 Michigan hospitals, 56.6% of patients with COVID-19 were given antibiotics early in their stay, but only 3.5% of them turned out to have a bacterial infection.⁸

“For every patient who eventually tested positive for both SARS-Cov2 and a co-occurring bacterial infection that was present on their arrival, 20 other patients received antibiotics but turned out not to need them,” Dr. Valerie Vaughn, the study’s lead author, said.⁹ Other studies have revealed similar signs of rampant antibiotic overuse.

In a study of 99 COVID-19 patients in Wuhan, China, 71% received antibiotic treatment, but only 1% had bacterial co-infections.¹⁰ Overall, it’s estimated that 1% to 10% of

patients with COVID-19 contract a bacterial co-infection,¹¹ yet antibiotics remained a mainstay of treatment for the majority of cases.

Antibiotics Considered ‘Routine’ Part of COVID-19 Treatment

Despite decades of efforts to reduce the unnecessary use of antibiotics, one of the largest studies of antibiotic use in hospitalized COVID-19 patients revealed that such drugs are being used indiscriminately and inappropriately for COVID-19. More than half (52%) of the approximately 5,000 patients included in the study received antibiotics, and in 36% of cases, more than one antibiotic was given.¹²

Most of the time, in 96% of cases, the antibiotics were given before a bacterial infection was confirmed, either at admission or within the first 48 hours of hospitalization. As it turned out, only 20% ended up actually having a suspected or confirmed bacterial infection for which the antibiotics would be indicated. The rest received them unnecessarily. The *Frontiers in Microbiology* researchers explained:¹³

“It is noteworthy to be highlighted that the inappropriate use of antibiotics could considerably and silently lead to AMR development during this global outbreak. Unfortunately, recent studies reveal that, in several countries, common and extensive use of antibiotic treatment for COVID-19 hospitalized patients is considered as a part of the routine treatment package.”

Even the World Health Organization made it clear that countries were at risk of the accelerated spread of AMR due to the COVID-19 pandemic. They cited data showing antibiotic use increased throughout the pandemic. About 79% to 96% of people who reported taking antibiotics didn’t have COVID-19 but were taking them in the hopes of preventing infection, even though antibiotics don’t work against viral infections.¹⁴

Antimicrobial Overuse Could Damage Immunity

Antibiotics can cause a number of **serious adverse effects**, a little-known one being damage to your **mitochondria**, which are genetically closely linked to bacteria.¹⁵ Your

mitochondria are responsible for most of your cellular energy production and also play a role in antibacterial and antiviral immune responses – and they're an off-site target of certain antibiotics,¹⁶ which are known to inhibit mitochondrial activity, DNA synthesis and biogenesis.

“Thus, antibiotic therapy could be an important and not well appreciated cause of mitochondrial dysfunction. This in turn may weaken your immune response against the COVID-19 infection,” according to the featured review.¹⁷ In April 2020, scientists called for “urgent thinking out of the box” when it comes to antibiotics against COVID-19, as they noted:¹⁸

“... mitochondria are vulnerable to antibacterial treatments, interrupting their physiology. Inhibition of these processes by antibiotics might render the immune system less capable of fighting acute COVID-19 viral infections.”

Concerning Overuse of Biocides and Disinfectants

The COVID-19 pandemic is poised to send antimicrobial-resistant disease sky high, as along with antibiotics overuse came the excessive and liberal use of antimicrobial products like household and industrial disinfectants, hand sanitizers and other cleaners.

The ramifications are immense and only beginning to be understood. There are potential adverse effects to human health from inhaling disinfectants, as such chemicals are known to accumulate in the lungs, liver, kidneys, stomach, brain and blood.¹⁹ Exposures were certainly elevated during the pandemic for many people, who were exposed to disinfectants by inhalation and oral routes, as well as via the skin and eyes.

There are also significant environmental concerns due to the “unusual release and dissemination of higher concentrations of biocide-based products into the surface and underground waters and also wastewater treatment systems” during the pandemic.²⁰ When disinfectants and biocides enter the environment, they can wipe out beneficial bacterial species that are keeping drug-resistant microorganisms in check.

“[I]f the biocide concentrations reach the sub-minimum inhibitory concentration (sub-MIC), this event may augment the selective pressure, boost the horizontal gene transfer (HGT), and drive the evolution of AMR,” scientists warn.²¹

A team from the University of Plymouth in England also conducted a risk assessment to determine the potential environmental impact of prescribing COVID-19 patients antibiotics, which revealed, “The data for amoxicillin indicate a potential environmental concern for selection of AMR ... ”²² The team urged such assessments be carried out in the future to keep tabs on the potentially disastrous effects of pandemic prescribing habits on AMR.²³

Gut Microbiome Influences Immune Response to COVID

Antibiotics disturb your **gut microbiome**, which has far-reaching effects on your overall health, including your immune system’s ability to fight COVID-19 – marking yet another way that indiscriminate antibiotics usage is counterproductive.

When researchers with The Chinese University of Hong Kong analyzed gut microbiome compositions from 100 patients with COVID-19, they found gut commensals known to modulate the immune system were low compared to people without the infection.²⁴ The makeup of patients’ gut bacteria – including both the volume and variety – affected the severity of COVID-19 infection as well as the immune response.²⁵

Imbalanced gut microbiome could also contribute to the inflammatory symptoms associated with “long COVID,” in which symptoms persist for months after infection. According to the study:²⁶

“In light of reports that a subset of recovered patients with COVID-19 experience persistent symptoms such as fatigue, dyspnea and joint pains, some over 80 days after initial onset of symptoms, we posit that the dysbiotic gut microbiome could contribute to immune-related health problems post-COVID-19.”

In the study, 50% to 75% of patients received antibiotics, while less than 7% had bacterial infections. While the researchers found no difference in outcomes with or without antibiotics, the drugs were not linked to improved patient outcome and, they noted, “it is still possible that a higher prevalence of antibiotic administration in severe and critical patients could worsen inflammation.”²⁷

Isolation Disturbs Your Immune Response

Of all the **negative effects of social isolation** endured during the pandemic, those experienced by your immune system may be the last that come to mind, despite being among the most significant for your future health. What does staying home have to do with your immune system?

It alters your 24-hour light/dark cycle, on which your body is built to respond. With more time spent indoors, you have less sunlight exposure and less opportunity to produce vitamin D, which activates macrophages in your lungs that act as a first line defense against respiratory infections, among other immune activities.²⁸

It’s true that taking **vitamin D supplements** can somewhat compensate for this, provided your levels are optimized, but other ill effects of lockdown are less easily remedied. Take exercise, another crucial component of a well-oiled immune response, that can reduce stress levels and diseases like **heart disease and Type 2 diabetes**, which are linked to worsened outcomes from COVID-19.

But even beyond that, staying indoors means you lose out on regular exposures to the natural world, which come with their own set of immune benefits. Trees release phytoncides, which people inhale and are known to alter natural killer cells.²⁹ This is why, in Japan, shinrin-yoku, or **forest bathing**, is said to enhance immune function³⁰ — but it’s difficult to spend much time immersed in the forest if you’re locked down at home.

The other factor that cannot be ignored is the lack of exposure to everyday dirt and germs that is missed when people stay home, socially distanced and sanitized. “Our immune system needs a job,” Dr. Meg Lemon, a Denver dermatologist, told The New

York Times. “We evolved over millions of years to have our immune systems under constant assault. Now they don’t have anything to do.”³¹

What is perhaps most disturbing is that this comment was made in March 2019 – prior to the pandemic. Now, it’s exponentially worse, and your immune system is likely missing out on interactions with bacteria and other microorganisms that teach it, train it how to respond and keep it primed throughout your life.

Without proper “training” at regular intervals, your immune system can overreact when triggered by ordinarily harmless substances, leading to allergies and inflammation. Might a generation of children, kept isolated and masked, have immune repercussions when exposed to ordinarily routine childhood viruses post-pandemic?

Already, cases of respiratory syncytial virus (RSV), which normally circulates in the winter, have popped up in the summer months, suggesting possibly increased immunological susceptibility.³²

New Antibiotics Are Unlikely to Save Us

There are 43 antibiotics in clinical development, but none of them shows much promise for solving rapidly rising AMR, as innovation is stagnant – most “new” antibiotics brought to the market are variations of drug classes that have been around since the 1980s. Further, according to WHO’s annual Antibacterial Pipeline Report, antibiotics currently in development are insufficient to tackle AMR.³³

“The 2020 report reveals a near static pipeline with only few antibiotics being approved by regulatory agencies in recent years. Most of these agents in development offer limited clinical benefit over existing treatments, with 82% of the recently approved antibiotics being derivatives of existing antibiotic classes with well-established drug-resistance. Therefore, rapid emergence of drug-resistance to these new agents is expected.”

Also at issue, hospital reimbursement systems discourage the use of expensive new antibiotics, because they are only reimbursed up to a point. This means patients may be

given older drugs that won't work as well to protect the hospital from financial losses.

Legislation to reform this – the Developing an Innovative Strategy for Antimicrobial Resistant Microorganisms Act – has been introduced to help open up the use of new targeted antibiotics for superbug infections.³⁴ Preserving the efficacy of existing antibiotics is also important, and **agricultural antibiotics** overuse cannot be ignored in this equation.

Worldwide, most antibiotics are used not for human illness or companion pets, but for livestock.³⁵ Writing in the International Journal of Antimicrobial Agents, researchers stated, “the ongoing pandemic is stretching the limits of optimal antibiotic stewardship”³⁶ and called for an end to unnecessary use of antimicrobial agents.³⁷

So, be sure you always avoid antibiotics unless they are absolutely necessary. Additionally, choosing organic foods, including grass fed meats and dairy products, can help you avoid exposure to antibiotic residues in the food supply, while also supporting food growers who are not contributing to AMR.

You'll also want to be careful in your use of disinfectants and sanitizers, using them sparingly and only when truly necessary, which – if you're outside of a hospital – will be hardly at all.

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