

Pathogens in One Lesson, Courtesy of Sunetra Gupta

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Early last year, it became obvious that knowledge about viruses and society – we need urgently to think differently about this subject! – would remain at a premium for a while. It would be difficult to write about terrible policies without some capacity for countering disease panic.

This was because the lockdown lobby relied on argument by intimidation. They know about viruses. You do not. They know about public health. You do not. They have precise and complex models. You do not. They have university appointments and positions of power. You do not.

People who would normally favor the primacy of liberty, property, and law fell silent, as if intellectually outgunned. The public, lacking knowledge too, acquiesced to lockdowns. The politicians panicked, throwing out everything they thought they knew about good governance.

Much of this reason, it struck me, was the outlandish, complicated, strange, seemingly unprecedented excuse for doing terrible things to our society and economy. The pathogen was so terrifying, so they said, that nothing about American traditions pertained. We would have to go the China route.

Who was to say otherwise? These people called “epidemiologists” became our new masters. Our job was to submit.

In reality, science should not be this way. If you are going to upend life as we know it, it should not merely be on the assertion of power by experts. There ought to be a comprehensible reason, something that anyone can truly understand. If the policies the scientists seek to implement are effective, there is no reason they cannot demonstrate that to the public.

What precisely is the connection between lockdowns and disease mitigation? Where is the actual history when doing this achieved the goal? And is this really a germ without precedent? How is it that we have never done anything like this before despite the constant presence of pathogens in our lives?

I had to know. Thus did I embark on a long journey to learn about the history of pandemics, the cell biology of viruses and their interaction with the human population, the relationship between pandemics and the eventual endemic equilibrium, herd immunity and vaccinations, and all of the other features of infectious disease that have become so heavily debated this year. To take on a subject as fearsome as lockdowns, and despite my lack of formal training in the field, I felt as though I needed knowledge and that I had an obligation to pass what I learned onto others.

I’ve lost count of the number of books I’ve read, including even medical school textbooks on viruses (what a slog!) as well as countless papers, in addition to probably one hundred hours of lectures online. It wasn’t a waste of time. It’s been an intellectual adventure. I’ve come to regard epidemiology as nearly as fascinating as economics, especially now that the two disciplines have become intertwined.

Among all of those that I have read, I just finished one book that stands out, and that I wish I had read a year and a half ago. It’s brilliant, erudite, precise, evocative to the point of being visionary, and capable of completely shifting one’s view toward pathogens and the social order. It is a work of genius. If it is possible to mash together hard science, poetry, epidemiology, and sociology, it is this book. It is not a huge treatise but closer to an extended essay. Every sentence is pregnant with meaning. Reading it not only made my heart race but also caused my imagination to run wild. It’s both bracing and beautiful.

The author is the legendary Oxford University theoretical epidemiologist Sunetra Gupta, one of the signers of the Great Barrington Declaration. The title of the book I find rather regrettable because it sounds coldly clinical rather than literary: *Pandemics: Our Fears and the Facts*. It probably should have been called *The Science and Sociology of Infectious Disease* or *Pathogens in One Lesson*.

The book was written in 2013. I'm not sure who commissioned it, but I can guess the motivation for its composition. There was already fear in the air that a pandemic was coming. It had been nearly a century since the last truly deadly one, and the experts were on edge. Bill Gates was already doing TED talks warning that the next great threat would not be militarily based but rather emanate from the world of germs.

This paranoia was born in part of people's obsessions with digital warfare and computer viruses. The analogy of the computer harddrive and operating system, and the human body, was an easy one to make. We had spent vast resources securing our digital systems against invasion. Surely we should do the same for our own bodies.

Dr. Gupta, I suspect, wrote this book to familiarize readers with the normalcy of pathogens, and to explain why it is not likely that an entirely new and deadly disease will arrive to wipe out large swaths of the human race. She had solid reasons to doubt that there was a case for panic. In all human experience, taking on germs and minimizing their threat took place with marginal steps toward better therapeutics, medical attention, better sanitation, vaccines, and, above all else, exposure. Much of this text is about exposure – not as a bad thing but as a hack to protect the human body against severe outcomes.

With computer viruses, the way to deal with them is to block them. Our operating systems must remain perfectly clean and free of all pathogens. For the machine to work properly, its memory must be pure and unexposed. One exposure could mean data loss, identity theft, and even machine death.

Despite what Bill Gates seems to believe, our bodies are not the same. Exposure to milder forms of germs works to protect us against more severe forms. The cell memory of our body is trained through experience, not by blocking all bugs but by incorporating the capacity to fight them off into our biology. This is the essence of how vaccines work, but more than that, it is how our whole immune system works. Pursuing an agenda of zero-pathogenic exposure is the road to disaster and death. We did not evolve that way and we cannot live this way. Indeed we will die if we take the route.

I hesitate to put any words in Professor Gupta's mouth but I will try to summarize the one major lesson of this book. Pathogens will always be with us, their forms always changing, and thus the best protection we have against severe outcomes from those that threaten us is immunities built by exposure to milder forms of them. She explores this idea in great depth, applies it to past pandemics, and examines the implications for the future.

To illustrate, consider her fascinating observation about the Avian bird flu. “It is telling,” she writes, “that none of the human victims of highly pathogenic avian flu belong to the professions that are most exposed to avian influenza — chicken sellers and purveyors of swan blood curd. It is possible that their constant exposure to less pathogenic avian viruses has lent them some protection against death from the highly pathogenic variant.”

And this speaks to the deep origins of the smallpox vaccine:

The smallpox vaccine was first tested on the son of Edward Jenner’s gardener in 1796, long before ‘germ theory’ was firmly established as a reasonable scientific concept. Jenner had, some years ago, been admitted to the Royal Society in London on account of his seminal work on cuckoos. At some point, he decided to test whether the old wives’ tale of cowpox protecting against smallpox might account for the fair complexions of the Gloucestershire dairymaids who brought him his curds and whey every morning. So he persuaded James Phipps, his gardener’s eight-year-old son, to be inoculated with pus from cowpox blisters that he had obtained from a local milkmaid. Her name was Sarah, and the cow from whom she acquired the viral infection was called Blossom. This all happened in a modest Georgian Rectory in Gloucestershire, which one may visit today, to take in both the pleasant interior as well as the tranquillity of the small garden where Jenner’s somewhat grotesque Temple of Vaccinia still occupies a choice spot. When young James was ‘challenged’ with smallpox (the technical term for deliberately infecting someone) after he had recovered from the mild malaise of cowpox, he did not suffer any of the classical symptoms of smallpox. Nor did he, on any other subsequent occasion when he was ‘tested’ again, evince any aspects of the dreadful disease.

The applications of this general principle are wide. Why was the Spanish flu so virulent against young people while mainly sparing old people? She speculates that there had been a whole generation of young people who had lacked exposure to influenzas. The records indicate that for the 20 years prior, there had been no major flu outbreaks, so when this one hit following the Great War, it was particularly cruel against those with naive immune systems, most of whom were between 20 and 40 years old. By contrast, the elderly had been exposed to a flu earlier in their lives that imbued them with natural immunity from this more deadly one.

Does this mean that with every new pathogen we can and must expect widespread death before its harms are minimized? Not at all. With most pathogens, there is a negative correlation between severity and prevalence. Viruses with unimpressive performance kill their host quickly and thereby do not spread – Ebola is the classic case here. “Killing one’s host is not the most desirable outcome for a pathogen,” she writes. “In ecological terms, it constitutes a form of habitat destruction. When they kill their hosts, pathogens also kill themselves, and this is a disaster unless their progeny have already spread to another host.”

More clever viruses minimize severity and so they can spread more broadly through the population – the common cold would be a good example. “By being less destructive, a bug may also enhance its chances of transmission,” she explains. The interesting dynamic is subject to other conditions such as latency – the period of time in which the

infected person experiences no symptoms and can thus spread the disease. So we are not in a position to codify immutable rules of viruses; we must be satisfied with general tendencies that have come to be observed by science in the course of the centuries.

Based on these observations, we can map out a general trajectory of the life cycle of new viruses:

For the pathogen, the host is a resource; so, by killing its host or rendering it immune, the pathogen is actually eating into its own resources. However, widespread death isn't necessary before the pathogen population collapses and dies — there will come a point in the natural course of every epidemic when a non-immune host will become very hard to find, and most infections will have been cleared before they've had a chance to transmit. This is because the density of susceptible hosts will have fallen, either because they are now immune or dead. And so the epidemic will start to diminish and will eventually burn itself out. Once the disease has run its course, the host population can start to recover and attempt to return to its original density. In time, the proportion of susceptible individuals in a population becomes high enough for the disease to make a comeback, but — unless a disease does not revisit a population for a very long time — the second epidemic will always be smaller, and the third time, smaller still. This is because much of the population will still be immune each time another epidemic occurs. Eventually, an equilibrium is reached where the infectious agent kills a constant number of individuals every year, which is a very small proportion of what it could achieve in 'virgin soil'. At this stage, the disease is said to be 'endemic' rather than epidemic.

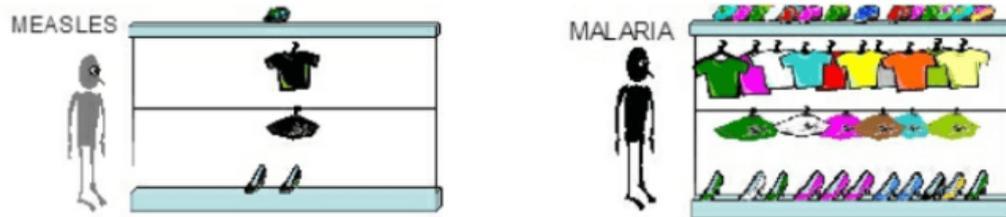
To be sure, the reaching of this endemic equilibrium does not mean that the virus is no longer a threat. When a virus encounters a generation or a tribe or a territory where immune memory is unprepared, it can indeed be wicked once again. The struggle between us and the bugs is unending but our bodies have well equipped us with huge advantages, so long as we are wise about its biological management.

As another fascinating observation, she speculates that the technology of travel has led to a wider exposure to pathogens in the 20th century than had ever been experienced in history. This might have made a major contribution to the astonishing extension of life spans in the course of the 20th century, generally from 48 years to 78 years. We are perhaps accustomed to crediting better diet and better medicine but this simple explanation neglects the major contribution of well-trained immune systems all over the world. I'll say it here: I find this insight to be nothing short of astonishing.

I cannot resist passing on her remarkably vivid description of the various "wardrobes" that each pathogen possesses. Imagine each comes with a closet full of clothes and disguises, with each outfit representing a strain or variant. Some pathogens come with a vast collection. Malaria is an example. It is always mutating and changing, and so it becomes extremely difficult to chase down and finally to destroy with a vaccine. For many decades scientists assumed that they could get it under control but it was not to be. It is also true for flu viruses, which "have a different uniform for every season. A snapshot of the virus population always finds them identically dressed, but over time

they change — in concert — from one outfit to another, causing successive new epidemics.” This is why the flu vaccine is not always effective year to year; scientists have to make their best estimate on the type and style of clothing this year’s strain will wear.

An example of a virus with an unimpressive wardrobe is measles. It has only one uniform so it was possible to identify and finally to manage to near perfection with a vaccine.



Now back to the original question that drove the writing of this book. How likely is it that we will experience a deadly pathogen that wipes out large swaths of humanity through uncontrolled spread in a manner in which our bodies are unable to withstand? She speaks not in absolutes but rather in probabilities. Her answer is: it is highly unlikely given the existing state of international travel and unrelenting broad exposure, all of which she regards as positive rather than negative.

Our later experience with SARS-CoV-2 confirms her observation. The bug did not vex China and its surrounding countries nearly as much as it did in Europe and America in part due to the 2003 spread of its predecessor SARS-CoV-1, because immunities had built up in the exposed population sufficient to provide a strong measure of protection. The immune profile of those populations became very different from our own due to this prior experience. Existing research [backs this up](#).

To be sure, many people today argue that Covid-19 is indeed the killer virus that had been predicted by Bill Gates and others 15 years ago. He certainly believes that to be true, and Dr. Fauci agrees. In truth, we are still waiting on clarity on that question. There are a number of factors that would argue that our experience with Covid-19 confirms Gupta’s observations. The median age of death from this pathogen is 80 – which in many countries is actually higher than the average lifespan. As for the inverse relationship between prevalence and severity, the latest global estimates of the infection fatality ratio put the disease much closer in range to the flu than had been believed at the outset of the illness.

In evaluating severity, we should be looking at severe outcomes, and not be alarmed at cases as clocked by PCR tests. No question that it is widespread but is it a killer? It carries with it a 99.9% survival rate in general and a death rate (IFR) for those under 70 years of age at 0.03%. If we lived only as long as we did in 1918 (56 years), this disease would have gone unnoticed.

There is a remarkable irony in that: the strength of our immune systems has granted us incredibly long lives, which in turn makes us more susceptible to bugs as our immune systems finally wear out near the end of life. That also raises a serious problem of classifying the cause of death, which is as much art as science. The CDC reports that fully 94% of people classified as having died from SARS-CoV-2 had two or more serious health problems besides the germ in question.

Likewise, 78% percent of severe cases in the U.S. were overweight or obese, a fact that ought to prompt reflection about American lifestyles rather than the conclusion that the disease is particularly deadly. It will be many years before we gain clarity on the question everyone was asking at the beginning of 2020: how severe will this be? It's probable, given all the confusions over data and demographics, that the final answer will be: not very.

The main import of this evocative book is to bring not panic about pathogens but rather a calming wisdom. We evolved alongside them. We understand them better than ever before. Our life experiences have granted us remarkable resilience. In nature's dangerous dance between our bodies and the bugs, we enjoy a greater advantage now than ever before in history.

That is not to say that there is not a scary aspect of this book. I left the text not with a fear of disease but with a different fear, that of a naive immune system. When viruses kill most efficiently it is when they find a host that is completely untrained to take them on. That is the terror that should keep us up at night.

The book nowhere discusses lockdowns as such. It is not a political book. But we know precisely where the author stands on the question thanks to her many interviews and writings over the course of this pandemic. She finds them to be disastrous, not only because they do nothing to mitigate the virus, and not only because they create vast collateral damage, but also because they take us in exactly the opposite direction of where we should be going.

What we need to confront a new pathogen is a global wall of immunity that comes from living with germs not running from them, hiding in our homes, forcing the burden of herd immunity on "essential" workers while the rest of us luxuriate in our germ-free domesticities watching movies and talking to other humans only through video, while masking up whenever we are in public.

After reading this book, I'm more impressed than ever at the incredible health dangers that are raised by the practice of fearing, hiding, isolating, sanitizing, masking, tracking and pretending to trace, stigmatizing the sick, and treating all pathogens as critters to destroy before they get to us rather than as indefatigable associates in the business of survival.

Why in the 21st century so many people have chosen to forget what we learned over the course of the 20th century is a true mystery. Fortunately, this book offers an elegant way back to recover our senses and pursue a more scientific approach to pandemics in the

future.

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Jeffrey A. Tucker is Editorial Director for the American Institute for Economic Research.

He is the author of many thousands of articles in the scholarly and popular press and nine books in 5 languages, most recently [Liberty or Lockdown](#). He is also the editor of [The Best of Mises](#). He speaks widely on topics of economics, technology, social philosophy, and culture.



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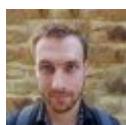


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