# 1918 ("Spanish Flu")

Why has it been kept a secret?

If you'd asked me before the bird flu scare, what epidemic killed the most people in history, the fastest—I'd have immediately said the bubonic black plague in Europe during the Dark Ages.

If not that, then the smallpox Spanish conquistadors brought to the New World, which killed millions of North American Indians.

But it wasn't either one.

It was something I'd heard of, but which I'd thought was only a relatively small problem. I'd always had the impression the "Spanish" flu epidemic of 1918 was big for a flu epidemic, but still, just—a…flu epidemic. A bad flu season.

OK, a lot of people died—for a flu epidemic. But a flu epidemic is still small potatoes compared to REAL diseases, right?

And it couldn't happen again. It couldn't happen now. After all, that was before antibiotics. That was when the science of medicine was far more primitive than today.

That was before I was born!

How come—until recently—nobody ever wrote about 1918 as it really was—the most deadly disease outbreak in human history?

Not smallpox, not the black plague, not typhus, not malaria, not Ebola—the flu.

## From August Through December 1918, One Half of the World Fell Sick With That Flu

At least 20 million died. Some estimate the total death toll at closer to 100 million. Nobody really knows. It killed Eskimos living in remote villages in the far north, both Allied and German soldiers in the trenches of Europe and rice farmers in rural India.

By the end of the Great War, before modern record keeping, in the hinterlands of Asia and rural Middle East—who was there to keep an accurate tally of the corpses stacked in the streets?

Nobody.

More American "doughboys" were killed by the 1918 flu (most of them while still in training camps in the U.S.—they never got to go "over there.") than died on the battlefields of Europe.

More Americans—half a million—died in those 3 months in 1918 than died in combat in World War I, World War II, the Korean War and the Vietnam War—combined.

Some estimate 20 million people died just in India.

20% of Western Samoans died.

American Samoa escaped because, hearing of the deaths on Western Samoa, they refused to allow anyone onto their island. Australia did much the same. So did some small Eskimo villages. I've heard that some small American towns also survived by isolating themselves. They had trucks stop outside town, put their loads down and drive away.

However, few communities are now self-sufficient enough to survive on their own for 3 or more months.

Since about 15 million people died in World War I, the most conservative death toll estimate for the 1918 flu has it killing 5 million MORE people during those three months than the entire four years of the most brutal war in history!

If bird flu or any other pandemic flu strikes, it'll kill more people in one year than heart disease, cancer, strokes, chronic pulmonary disease, AIDS and Alzheimer's combined.

# If Bird or Swine Flu Kills the Same Percentage of People As Died in 1918, That Would Mean The Death of 1.5 Million Americans and 150 Million People Worldwide

Gina Kolata, author of FLU: The Great Influenza Pandemic of 1918 and the Search for the Virus That Caused It, remarked although she majored in microbiology and took a course in virology, she never learned of 1918 in the classroom. She was interested in American history, but never heard of the greatest American plague.

The symptoms were not like any other flu we've heard about. Your blood circulation breaks down—your face turns a dark brownish purple and your feet black. Bloody saliva flows from your mouth. You choke to death, gasping for air with lung full of reddish liquid.

Sometimes people were sick for days. Sometimes people were seemingly healthy…until they dropped dead.

All flu viruses infect the lining of the main respiratory tract. This one also penetrated the alveoli deep in the lungs— the air sacs where oxygen and carbon dioxide are exchanged. Thus, many 1918 flu victims died by drowning, as their immune systems sent blood to these alveoli to fight the invader.

The virus also affected the brain of many victims. Some died of encephalitis, which is any inflammation of the brain. Others recovered, and told of experiencing strange hallucinations.

About 20 to 40% of 1918 flu deaths were caused by pneumonia following the actual flu. It killed the victims obviously most vulnerable—very young children and the elderly.

And it also killed the victims who should have been most resistant—young, strong men, such as American soldiers training to go to war in Europe.

That's because their own immune systems counterattacked the virus so ferociously. Many bird flu victims died of a kind of internal "friendly fire." The reaction of their own immune systems overwhelmed their lungs. That's what caused the unusual symptoms.

The 1918 flu killed 2.5% of its victims, making it 25 times more deadly than ordinary influenza.

Nobody knows where the 1918 flu came from. We know it was preceded in early 1918 by a non-lethal but severe flu that affected the war efforts of both sides in Europe. Many soldiers in Europe were sick for 3 days, then recovered. They didn't know it, but they were the lucky ones. Because they'd had that strain of flu and survived, they'd developed a vaccine-like resistance to the strain of flu which that type mutated into by August.

The German media charged the Allies with bringing the flu to Europe from China by using Chinese coolies. We know that most new influenza viruses do arise in China, and Chinese laborers were used in Europe during the war, so it's possible the flu did spread from these men to the soldiers.

Some people used to think the 1918 virus was an avian type A influenza, and people probably first caught it through exposure to pigs who'd caught the virus from birds.

Pigs can catch—and spread—viruses to and from both birds and people.

This belief in "swine flu" was one of the triggers of the decision of President Ford in 1976 to vaccinate every American against swine flu. In retrospect, it was a poor decision. But an American soldier in training had just died of swine flu, and President Ford did not want a repeat of 1918. I can't blame him for that.

He was criticized by his political enemies for his swine flu plan, but it would have been much worse if he had done nothing—and swine flu had gone on to spread to many more Americans.

We don't know where the virus lay low between March and August 1918. We don't know where it originated. We believe it went away simply because it killed off its victims so fast and then mutated into a less lethal strain of virus.

## The 1918 Flu Virus Has Been Reverse Engineered

Just a few years ago, a team of researchers succeeded in reverse genetically engineering the strain of influenza that caused the 1918 flu. That's an interesting story in itself (read Gina Kolata's book for the details.)

Some people are frightened by this—what if somebody could manipulate genetic material to recreate this killer 1918 virus and let it loose onto the world again, either accidentally or on purpose (Such terrorists would have to be very stupid, since they and their followers would also die horrible and fast deaths, but terrorists brag about loving death instead of life.)

The scientists hope pinpointing which genetic mutations allowed the 1918 virus to jump into people will allow them to recognize other bird flu viruses that could also trigger such a pandemic.

They have already identified 25 changes in the protein sequences of the 1918 influenza strain. All eight of the genome segments of the 1918 virus are different than ordinary flu sequences.

According to Jeffrey Taubenberger, one of the leaders, "It is the most bird-like of all mammalian flu viruses."

The purpose of discovering the secret behind the lethality of the 1918 virus was to enable medical researchers to learn better ways to prevent and cure similar deadly flus.

They haven't gotten that far yet.

We may wish we had the 1918 flu back again. After all, it killed just 2.5% of the people who contracted it.

So far, bird flu H5N1 has killed 60% of its victims. I don't have a percentage for swine flu, but it's killed over 9,000 worldwide, and probably many more who are unconfirmed cases.

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# The Influenza Virus

Nobody really understands viruses.

They occupy a twilight zone between life and death.

They're sort of like vampires or movie zombies. They can't be killed, because they're not really alive—they can only be destroyed.

Only, they're even MORE different from us than those creatures, because vampires need to consume blood and zombies need to consume brains. We can relate to the need to consume.

But viruses don't eat—they just take over our cells and command our own cells to make more viruses. So they're sort of like robots which can take us over so our cells manufacture lots more robots.

All forms of life we understand, from microbes to sperm whales, is based on cells.
Cellular life takes in nutrients. Processes them somehow. Gets rid of waste material. Reproduces and copies DNA blueprints. Eventually dies.

Viruses do none of the above.

They just take over cells and use them to replicate vast quantities of more viruses.

Viruses are tiny particles with a small core of nucleic acid—either RNA or DNA but not both.

They have a surrounding coat of protein called a capsid and some of them are surrounded by a fatty—lipid—envelope.

They have no life of their own. They are functionally inert unless they are occupying the cell of another creature.

Almost all cellular life on earth, from bacteria (yes, even infections can themselves be infected by viruses) to plants and people, has viruses which infect them.

Pox viruses—similar to smallpox but geared to infect different species—plague almost every creature, including insects. It's quite likely viruses are the main control on overpopulation of many various species.

When they're not actively occupying a cell, they are in an inert state and can remain in that condition seemingly forever or until they're physically destroyed.

There are around 4,000 known types of viruses, but not even 4% of them are well studied. And we keep finding new ones. It's likely that there's at least one strain of virus for every type of cellular creature on the planet. There's an estimated 30 million different species on Earth.

We know of about 150 types of viruses that can infect people.

Fortunately, the vast majority of viruses infect only a particular species. Therefore, it's particularly worrisome when a virus that infects one type of creature—chickens—begins to infect people too.

When viruses have been infecting one species for a long time, they have co-evolved. In practical terms, that means the virus does not do much harm to that creature. That ensures the long term survival of the virus. A virus that quickly kills its host is a virus that soon dies out along with that host.

Therefore, every virus has a host, or reservoir, and usually it not harmful to the host, or is only slightly harmful.

Therefore, when a virus begins infect a new species, it can be especially virulent, because the two have not co-evolved. If the virus kills its new hosts, so what?—it continues to live on in its old host.

For example, bird viruses have long lived within the intestines of wild ducks and other water fowl without making them sick. Probably every such bird in the world carries some influenza viruses in its intestines. However, bird flu kills creatures which are not wild ducks—including chickens and people.

We know viruses been around for a long time, because all cellular life—yes, including us—contains viral DNA in their own cellular DNA.

It had to have been put there in our ancestors by retroviruses.

Retroviruses contain the enzyme reverse transcriptase, and that converts the virus' genetic blueprint of RNA into a DNA copy that remains part of the host cell's DNA. That's sort of like your Internet browser program going to a website, downloading a file—and that file remains a permanent part of your browser program's source code.
All cellular life on this planet has inherited the DNA debris of viral pandemics that occurred millions of years ago!

I don't know about you, but I find that awfully creepy.

Yet, some of that viral DNA is useful—the placenta of mammals is kept intact by retroviral DNA.

Years ago, a theory circulated in science fiction stories the REAL intelligent life on Earth was DNA—the true function of all living (cellular) creatures was to provide a home for DNA.

Maybe that theory didn't go deep enough. All of us—and including our DNA—are here just to provide cells for viruses to feed on or, perhaps, a home for the retroviruses implanted in our DNA.

## Viruses Need to First Take Over One of Our Cells. This Is a Weakness We Can Use to Protect Ourselves from Them

Viruses are much smaller than bacteria.

If the average virus was as big as a man, the average bacteria would be as large as the Statue of Liberty.

That fatty envelope and coat of protein are what they use to attach themselves to cells, but the match must be exact. Once the virus successfully gets into a cell (such as the mucus lining of your lungs), it makes the cell churn out more viruses by manufacturing the proteins the virus needs.

In this way, the virus replicates 100,000 to 1,000,000 more viruses until the cell bursts open, releasing these viruses into the rest of your body.

These new viruses then invade the other cells of your body and the pattern continues until they're destroyed by your immune system or you're dead.

Viruses either have DNA or RNA (ribonucleic acid), which is not as stable as DNA. That's because DNA is a double helix. It has a built in "proofreading" mechanism which catches most errors. RNA does not.

Therefore, RNA viruses mutate up to 1,000,000 million times as fast as DNA viruses. This is the reason it's so difficult to make vaccines for RNA viruses. By the time the medical technicians figure out the vaccine for one strain of the virus, it's mutated into another strain.

That makes them known to epidemiologists as "constantly emerging diseases."

And the two RNA type viruses that mutate the fastest are—you guessed it—influenza and…HIV.

Influenza doesn't change only because of mutations, however. Because each individual virus consists of eight segments, it can trade RNA with other flu viruses. This is known as reassortment.

It can do this because different flu viruses can occupy the same cell (they're tiny in size in comparison to cells, so there's plenty of room). Therefore, a person—or pig—can be infected with both seasonal flu and avian flu at the same time, and those viruses can swap segments.

When the person—or pig—sneezes, they spread the new virus to others.

Novel A (H1N1) is a quadruple reassortment of swine flu from North American pigs, Eurasian pigs, birds and human season influenza.

Fortunately, other RNA viruses can't do this trick. It'd make fighting HIV even more difficult than it already is.

## There're 3 Broad Categories of Influenza Viruses—Types A, B and C

Influenza viruses make up their own family of viruses—the Orthomyxoviridae. Their cousins cause mumps and measles. They're about 100 nanometers in diameter—an average sized virus.

Type C influenza rarely causes flu in people.

Type B influenza viruses cause what, for purposes of this book, I'll call ordinary or seasonal flu—as opposed to deadly flus such as H5N1 and Novel A(H1N1).

It's the kind of flu we've all had at one time or another. From 1 to 7 days of chills, fever, coughs and sneezing that make life miserable.

Type B viruses are not directly life-threatening. They prefer to infect the cell receptors of your upper respiratory system—nose, throat and upper lungs. However, by overtaxing already weak immune systems, they can make you susceptible to more serious bacteriological infections such as pneumonia.

About 36,000 to 50,000 Americans die a year from ordinary flu, most of them elderly. And this number is growing each year. According to the CDC, the clinical attack rate of people who catch seasonal flu each year is from five to twenty percent of the population.

The case fatality rate of seasonal flu is from 0.2 to 0.35%.

In the United States, the Center For Disease Control (CDC) in Atlanta Georgia tracks flu activity and publishes its findings of key flu indicators on its site

( http://www.cdc.gov ) under FluView.

So Type B is a common illness we have learned to live with. For ordinary, healthy adults, it is a nuisance, but it doesn't kill us. It doesn't cause epidemics or pandemics.

Type A influenza viruses are in another class. Some of them cause what we can also call ordinary flu. We have adapted to those.

But others we have not adapted to, as we have to Type B. They are the viruses that can and do kill us directly—as well as leave us open to death by pneumonia and other bacteriological infections.

Generally, the avian viruses prefer to attack cell receptors common in birds but not in people—except for the lower respiratory system.

That deep in the lungs infection is what made the 1918 version of H1N1 so deadly —and H5N1 and some of the mutated forms of Novel Pandemic A(H1N1)/09.

The good news is when the virus is so deep in the lungs of its victims, it can't spread as easily as seasonal flus. The 1918 virus found a way to spread easily despite this problem, but H5N1 and the Novel A(H1N1) viruses have not—yet.

We catch the flu from viruses expelled through coughs and sneezes. So when the virus is deep the victim's lungs, their coughing and sneezing does not expel as many viruses as when they're infecting the nose and throat.

That's bad for the victims, good for the people around them.

Once expelled by a victim, they take at least 17 minutes to drift from ceiling to floor. You can pick them up directly through your nose or by touching your hand to your eyes. (Your hands can pick them up by touching them; they can survive for two to eight hours outside the host.)

Once in you, it occupies the epithelial cells that line your upper respiratory tract, bronchial tubes and trachea.

Type A viruses are also the kind which mutate at the fastest rate. In fact, they mutate as they multiply within your body. So you are occupied by several strains of flu at once—something which complicates the prospect for a cure for the flu.

Type A viruses are round spheres and have the protein envelope which helps disguise them from your immune system. They look like a fluffy cotton ball, two lipid (fatty) membrane layers enclosing 8 segments of RNA.

The eight segments are single strands of ribonucleoprotein complexes (RNPs) inside of which is a single RNA molecule with a nucleoprotein and bound with polymerase, which is required for its synthesis.

A matrix protein (M1) fills the remaining space of the virus to cushion the RNPs. Influenza viruses are protected from our immune systems by two layers of protein and fat—layers almost entirely made up of cholesterol. They have M2 proteins on their outer surfaces that are protein pumps - they adjust the acidity of the interior.

However, the virus cannot infect cells and replicate itself if it completely hides turtle-like behind these two layers of armor.

Therefore, they have two different types of glycoprotein spikes that protrude from on their surface like stakes in a ball—around 600 - 700. These spikes, like most offensive weapons, are also their weakness—since they what our immune

systems can detect as an antigen—or hostile invader. So they are what our immune system targets with antibodies that destroy the viruses.

The two kinds of spikes are called:

Hemagglutinin

Neuraminidase

So flu viruses are defined by the different types of hemagglutinin (H or HA) and neuramindase (N or NA) they have.

Hemagglutinin hooks red blood cells and pull them close together—hence its name.
There're 16 types of H and 9 types of N.

As flu viruses replicate, the patterns of proteins on the H and N spikes change slightly, and therefore make them more resistant to the antibodies the body knows how to produce.

When there's a dramatic shift in the H and N spikes, human beings have NO acquired immunity to that type, the foundation for a world-wide pandemic.

If these changes did not occur, the flu virus would die out, because every surviving human being would be able to resist its infection.

We know waves of flu pandemics have swept the world many times before. For example, one slowed Charlemagne's advances.
The H is a sharp spike that allows influenza viruses to attach themselves to the cells lining your lungs. They fit into a receptor of sialic acid on the surface of those cells. The sialic acid (neuraminic acid residues) is actually the cell's attempt to defend itself.

Once a spike of H fits a cell, other spikes act as grappling hooks to hold the virus onto the cell. Soon a pit called a vesicle forms in the cell's membrane, allowing the virus inside.

Once inside a cell, the virus produces a nonstructural protein (N51) which interferes with the cellular interferon-based immune response. Wrapped in the cell's own plasma membrane, the virus goes deeper inside it.

M2 channel protein pumps ions into the capsule called an endosome. The increased acidity dissolves membranes and releases the virus's RNPs into the

host cell. RNPs go to the nucleus and hijack it to replicate the virus and keep it from making the proteins you need—that is, from performing its normal, healthy functions.

The virus injects its own genes into the cell, seizing control of its DNA. It uses this to create 100,000 to 1,000,000 new viruses.

These new viruses created by the cell's nucleus then need to escape the cell so they can take over new cells in your body.

The N forms a thin stalk with a box-like head on top of it—with four 6-bladed propellers. While the virus is lodging itself in the cell, the N breaks up the sialic acid so when the new viruses are formed they can escape the cell without being caught by the sialic acid like flies by flypaper.

The entire cycle takes about 10 hours. You don't even know you're sick yet.

## Bird flu is a Type A Influenza Virus. It's H5N1. Swine flu is also a Type A Virus—H1N1

The complete World Health Organization naming system for viruses references the type of flu virus, the host of origin, the geographical site where it was first isolated, the strain number and year of isolation.

The 1918 flu virus is H1N1. The Asian flu pandemic of 1957 was caused by H2N2. The Hong Kong flu pandemic of 1968 was caused by H3N2—and various strains of this one are still circulating.

There are other Type A viruses out there that may someday threaten us as much or more than H5N1.

There're 15 strains of Type A. Up until recently, scientists thought that people could catch only three of those—H1, H2 and H3.

Obviously they were wrong. H5N1 is the one we should now be most afraid of, but people have also caught and died from H7 strains, which are also types of bird flu.

Supposedly, H5 viruses cannot infect humans because the H5 type needs a NeuAc-2,3Gal receptor and human cells don't have one.

In May 1997, an H5N1 virus underwent one small mutation that changed a bit of protein—and presto! Now it could infect people!

Influenza viruses have 8 RNA strings for 10 proteins. As we've seen, two of those proteins, H and N, are on the surface. The other 8 are inside the lipid envelope. Since flu viruses mutate so quickly, most likely some small thing changed which allowed it to start infecting people.

As the disease changes over time, that is called antigenic drift.

This is part of the danger of H5N1 and pandemic H1N1.

It's possible H5N1 and Pandemic H1N1 could both infect a cell in a person or pig and there find "true love" with each other, or with a highly contagious ordinary flu virus. They could share genetic material and create an "offspring" with the worst qualities of both parents. The lethality of H5N1 and the easy contagiousness of Novel H1N1 or ordinary seasonal human flu.

If the infected creature then comes into contact with others, it can spread this new version and that's when we're in big trouble. Pigs sneeze. Chicken cough. And both of them spread excrement all around—and people can catch the flu from breathing in tiny particles of their excrement.

The first place bird flu inhabits is inside chickens, ducks and other birds. This is not a great danger, however, since birds are going to be infected only with other bird flus, not with human flu viruses.

## There's a Common Animal That Catches Flu Viruses From Both Birds and People—Pigs

Many of the same farmers in Southeast Asia who keep chickens, also keep pigs—often together. The chickens are kept in cages over the pigs, which feed on the bird droppings.

These pigs can therefore also catch bird flu. And since they are also in close contact with people and have the 2,6Gal receptor, they can also catch "ordinary" Type B people flu.

These pigs can therefore act as genetic "mixing bowls"—where bird flu viruses (especially H5N1) are introduced to ordinary human viruses.

So it is possible for cells in a pig to be infected by two different virus strains. One ordinary but highly contagious flu virus caught by the pig from its sick human being owner. A highly contagious H5N1 virus caught by the pig from droppings from an infected chicken.

The danger is the two different viruses will share genetic material and then produce a bird flu virus as lethal to people as H5N1 but which can pass from person to person as easily as ordinary flu does.

We can only hope that pig dies fast. Because if that virus then passes from the pig back to the farmer or someone in his family—we are all in deep pig manure.

And it may not happen inside a pig. We know H5N1 is now going from chickens to farmers and their children (who of course like to play with the chickens roaming freely through their villages). The genetic mixing could happen in the farmer if he already has an ordinary flu infection and then catches H5N1 from his own chickens.

We know Novel H1N1 actually does contain segments from not one, but two, types of pig flu, avian flu and human flu. We're lucky it is not more lethal than it is.

The World Health Organization (WHO) started The Global Initiative in 1948. This is a network of 110 laboratories in 85 countries that monitor strains of flu virus. The object was to watch out for a new pandemic such as happened in 1918.

An epidemic is a large increase in disease cases in a particular area. A pandemic is the same disease spreading out of control in many different places. Thanks to international air travel, it's difficult to contain epidemics. It's very easy for infected people to board a plane and spread a disease to new countries.

A woman carried SARS from Hong Kong to Toronto before anybody knew the disease existed.

There're three international laboratories which monitor flu cases. One is in the Center for Disease Control (CDC) in Atlanta, Georgia. Another is in London, England and the third in Melbourne, Australia.

It is these scientists who get together in February of every year to decide which strains are most likely to be a threat in the next flu season. It then takes 6 to 8 months to prepare and begin to distribute the vaccine.

In some flu seasons the vaccine is ineffective simply because a flu strain spreads the scientists did not foresee.

WHO has set up 10 special laboratories in China in hopes of monitoring flu cases in that country. I have not read anything about these laboratories in recent media stories on bird flu, so I have to wonder why these laboratories did not detect bird flu cases in China before it emerged in South Korea in late 2003.

In March 1999, two little girls, ages one and four, caught another type of flu that "should not" have infected human beings—H9N2. Later, the Chinese government admitted that five mainland residents had caught H9N2 before them. They all recovered, so it's not as deadly as H5N1, but it's another sign flu viruses can surprise us.

H5N1's high rate of mutation, combined with this tendency of viruses to share genetic material, is the reason so many microbiologists around the world are still so worried about bird flu, and now about swine flu.

To many, if not most, the question is not Will bird flu ever mutate to a form highly contagious to human beings?

It's—WHEN will bird flu mutate to a form highly contagious to human beings? And, if it does, can we detect and contain it in time to stop a worldwide bird flu pandemic?

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# The 7 Perimeter Immune Defense System

The foundation of protecting yourself and your loved ones from influenza and—with suitable modifications—other lethal diseases is the 7 Perimeter Immune Defense System.

"Perimeter" is a military term. It refers to an area where you meet or could meet an enemy in battle. The more an army controls its perimeters, the more successful it is.

I could have used the word "area," but I want to emphasize when it comes to you and the influenza virus—it is a battle!

You must win the war—because defeat could mean death.

I am emphasizing the flu, but 95% of this system applies to all other infectious diseases as well. Details of how to protect yourself at various points along the perimeter would change with the particular disease (for instance, flu viruses are transmitted differently than the HIV virus), but this system could be adapted to any infectious disease with just a little knowledge and thought.

To help you understand the concept better, pretend you're an island nation threatened by many invading armies. You are in charge of this island nation. Japan, Great Britain, Fiji—it doesn't matter. You—that is, your body—is surrounded by water. And you have enemies who want to invade, take over and destroy you. That is not far from the literal truth.

You do have trillions of real enemies who want to take over, feast on and destroy your body—hostile bacteria and viruses.

## The 7 Perimeter Immune Defense System:

1. In the ocean surrounding you—outside your body

2. The border (ports and the beaches where your land meets the sea)—where your body meets the outside (your skin)

3. Outlying, border areas of your island—beginning stage of an infection, where a virus has first entered your body

4. Outlying army outposts in your border areas—virus invading cells in the mucus lining of your lungs

5. Invaders using captured weapons to make a general attack on your country—viruses using your cell's protein to replicate themselves into millions more viruses that then spread disease through your lungs

6. All out counterattack by your army against invader-occupied areas, which may be so extreme it destroys your country—Your immune systems unleashes so many cytokines, along with fever and inflammation, that it destroys your lungs before killing all the viruses

7. With your armed forces decimated by the original invasion, another enemy invades you—secondary infections, especially pneumonia, take advantage of your weakened state and destroyed lung cilia to also infect and possibly kill you

Clearly, you're best off defeating the flu at the earliest possible perimeter.

This book will arm you with the available weapons to win the war against the flu —at all 7 perimeters.

A key part of the 7 Perimeter Immune Defense System is the Super Immunity Seven.

# The Super Immunity Seven

Not too long after beginning the research for this book, I made an overwhelming —and happy—discovery:

There are MANY ways to enhance your immune system!

This is good news indeed. We are not helpless before even a new and powerfully lethal virus such as H5N1 or Novel Pandemic A(H1N1).

After all, people AND plants and animals have been fighting viruses for hundreds of millions of years before the discovery of antibiotics. And remember, the first penicillin was discovered by Sir Alexander Fleming observing how some fungus killed bacteria in a petri jar.

If human beings were totally defenseless against all new infections, we would have become extinct before we discovered fire.

The only way to acquire "acquired immunity" is to defeat an infection the first time we are ill with it.

The inventor of the smallpox vaccine, Edward Jenner, learned to use the mild cowpox to inoculate people against the deadlier smallpox.

But it was already well known people who got smallpox and survived (and until recently, in Europe, the Middle East and Asia almost EVERYBODY got it at some point in their lives!), did not get it again.

## So We Can Defeat Bacteria and Viruses

Some of that resistance is genetic. Some comes from previous exposure to similar infections. You can't do anything about those things.

To protect yourself and your loved ones from disease, you want as much help from your immune system as possible.

As I said, you have a lot of choices—almost too many.

I summarize my findings in a concluding chapter.

Plus, since different immune enhancers should be taken at different points in the 7 Perimeter Immune Defense System I sum that up in a chapter close to the end.

There are so many different medicines, vitamins, minerals, herbs and superfoods you can take to boost your immunity you could spend a small fortune on them.

You could spend your entire day taking immune boosting supplements.

But I realize most people cannot and will not go out and spend thousands of dollars to buy every single supplement I've investigated.

Also, I realize many people around the world do not have access to every single supplement I've investigated.

So I decided to boil my recommendations down to a manageable number—seven.

## The Super Immunity Seven

You can argue with the ones I finally picked—I argued with myself a lot.

You could easily pick out a Super Immunity Ten, a Super Immunity 25 or a Super Immunity 50—but obviously nobody is going to understand, let alone go out and buy and take 50 different supplements.

I'd rather you take properly take ONE—than be so confused thinking about 25 you don't take ANY.

So in the end I chose a variety of immune enhancers based on:

1. Cost

2. Availability

3. Effectiveness

4. Fighting the flu virus at every stage (perimeter) of infection

I decided I would not be helping you much if I told you to buy Supplement X if:

Supplement X cost $US 1,000 per person OR

Supplement X was available only in one part of the world OR

Supplement X was manufactured by a company that could make and sell only 1,500 bottles of it OR

Supplement X was highly effective against the flu at one stage of infection, but useless against it at another stage.

Now, I'm also not saying that you HAVE to get all seven of the Super 7. In fact, "one" of the Super Immunity Seven is actually one of two supplements—take your choice depending on cost and what you can find. They both perform the same function in fighting bird flu.

But I think almost everyone in the world can get hold of at least ONE of the Super Immunity Seven. If you can take more than one—do it!

Also, you're certainly not limited to these seven. I write about many more immune enhancers. I encourage you to take as many as you can afford and can find.
Every immune system enhancement supplement is a weapon in humanity's arsenal in a war against a powerful enemy—the flu.

Arm yourself with all the weapons you can.

The safety of you and your family depends on it. If a severe flu pandemic never happens, that's great. You and your family's health will always be better the stronger your immune systems are.

## The Super Immunity Seven:

1. Garlic

2. Beta Glucan

3. Olive leaf oil OR Lysine

4. Curcumin

5. Vitamin C with bioflavonoids

6. Omega 3

7. Echinacea

I will explain the role of each of these and how they fit into the 7 Perimeter Immune Defense System, at each step of the way.

There're so many other immune enhancers you can use both to increase your health now and to help yourself and your family if a pandemic strikes to include them all in the chapters describing the 7 Perimeter Defense System would make those chapters too long.

Therefore, I'm adding additional Weapons to Add to Your Immune System Arsenal as individual chapters in the back of this book.

Please read these over too.

First, because you want as much protection as possible against a lethal virus such as bird or swine flu.

Second, because everybody's living situations are different. Maybe you cannot get a supplement available only in small American health food stores, but other powerful herbs are for sale in your local market.

Depending on your finances, the size of your family, your overall health and your location—I encourage you to stock up on as many different weapons as possible.

Remember—none of these supplements have yet been directly tested against bird flu. The much publicized Tamiflu works against seasonal flu, but the swine flu is developing mutations resistant to Tamiflu.

Maybe one supplement will not be strong enough to defeat a pandemic flu but another one will. Maybe it'll take both working together.

I want you to have all the weapons and ammunition you need.

First, you must get prepared.

# Agaricus

Agaricus is called the Mushroom of God. 30 years ago someone noticed the people of a small town near Sao Paulo Brazil—Piedade—enjoyed unusual health. They lived a long time and did not often become sick.

Researchers investigated and discovered the secret to the people of Piedade's long life and powerful immunity was a small mushroom everybody in Piedade ate regularly.

Its official name is Agaricus Blazei Murill but the locals call it the "Mushroom of God." It's often shortened to just ABM.

Or Himematsutake in Japanese (it's very popular in Japan).

Dr. W.J. Sinden from University of Pennsylvania and Dr. E.D. Lambert from Lambert Laboratory (USA) reported on agaricus in 1965. Other research was done by Dr. Tetsuro Ikegami from National Cancer Center and Dr. Shoji Shibata from Department of Pharmacy of Tokyo University, and Dr. Chiba from National Cancer Center.

Dr. Chiba reported polysaccharide of "Agaricus" activates the body's interferon production and strongly prevents viral infections.

That polysaccharide is a form of beta glucan, so agaricus is basically just another source of that Super Immunity Seven enhancer.

Agaricus stimulates the immune system by triggering the production of:

T-cells

Interleukin

Tumor necrosis factor (TNF

Macrophages

It's been a very popular health supplement in Japan, and the Japanese buy about 90% of Brazil's total supply of Agaricus. However, some is for sale over the Internet.

You have to be careful, however. Agaricus is Portuguese for "mushroom," so any mushroom can be labeled as agaricus. You want to make sure you're buying Agaricus Blazei Murill.

## References:

"Natural Killer Cell Activity and Quality of Life Were Improved by Consumption of a Mushroom Extract, Agaricus Blazei Murill Kyowa, in Gynecological Cancer Patients Undergoing Chemotherapy" International Journal of Gynecological Cancer, Vo. 14, No 4, July 2004

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# Coconut Oil

Coconut oils (cocos nucifera) are rich in short and medium-chain fatty acids (known as MCFA) of vital nutrients and the anti-microbials lauric and capric acids. These are of the same substance found in mother's milk that protects infants from infectious illnesses.

(Pacific islanders feed their babies with coconut water from young nuts as a natural infant formula. Pharmaceutical companies have made the MCFAs found in coconut oil form a primary ingredient in infant milk formulas.) One of them, lauric acid, is also found in mother's milk.

Until recently, coconut oil has been assumed to be unhealthy because it's high in saturated fat. When hydrogenated, it forms trans fats which are bad for your heart, and old studies of saturated fat were done with hydrogenated oils. But coconut oil is very resistant to this.

We're now learning it is a very healthy oil. Coconut oil helps your immune system and increases your metabolism.

In the 1980s, a clinical study of virgin organic coconut oil discovered the medium-chain fatty acids lauric (53% of coconut oil) and capric were effective in killing human immunodeficiency virus (HIV) in lab cultures.

Monolaurin (from lauric acid) is an antiviral monoglyceride the body can use to destroy lipid-coated viruses. These include HIV, herpes, cytomegalovirus—and influenza.

The medium chain fatty acids in coconut oil break the virus apart. Because they mimic the fatty acids of the virus's coating (called lipid membrane), the MCFAs

are readily absorbed by the virus, therefore weakening its protective membrane until it breaks apart—which kills the virus.

Coconut oil has the highest amount of MCFAs of any palm oil.

About 6-7% of the fatty acids in coconut oil are capric acid. That's another medium chain fatty acid, and in your body it's formed into monocaprin, which has antiviral effects against HIV.

Virgin coconut oil has been used to treat AIDS in clinical trials in The Philippines. This study has been carried out since 1989 by the government's San Lazaro Hospital and United Laboratories.

Several years ago, Health Secretary of The Philippines Manuel Dayrit announced virgin coconut oil could be used against SARS.

A gland very important to the immune system is the thyroid gland. It produces thyroid hormone.

One symptoms of low thyroid hormone is a poorly functioning immune system. Coconut oil enhances your immune system by supporting your thyroid gland.

The thyroid uses the action of a protein digestive enzyme to form thyroid hormone. Unsaturated oils inhibit that protein digestive enzyme. Similar protein digestive enzymes that help the immune system are also inhibited by unsaturated oils.

Coconut oil prevents this inhibiting effect of unsaturated oils on your thyroid gland. This allows the thyroid gland to produce more thyroid hormone which then keeps your metabolism and your immune system strong.

Virgin organic coconut oil is better as medicine than commercial coconut cooking oil such as Baguio because its nutrients and anti-microbial properties are at its most potent state when the oil is raw and unadulterated.

Virgin coconut oil does not have to be refrigerated. It has a shelf life of two years or more. But you should store it out of sunlight.

Dr. Conrado Dayrit (from the study done in The Philippines) recommends we take 4 tablespoonfuls of virgin coconut oil a day to prevent viral infections.

You can cook with it, and also use it as a salad dressing.

You can also drink it straight down. It has a light, non-oily taste mild and fairly pleasant.

The Philippines is the world's largest exporter of coconut oil—it accounts for 7% of Filipino exports.

Look for it in your local Asia food store, health food store or on the Internet.

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# Alpha Lipoic Acid

Alpha-lipoic acid is often called the “universal” antioxidant.

Also known as ALA or lipoic acid, it is the only antioxidant both water and oil soluble. This is unlike Vitamins C + Bs (which are water soluble only) and Vitamins A, D + E (which are fat soluble only). It can go anywhere and everywhere it’s needed in your body.

It’s also one of the few biochemicals that can cross the blood/brain barrier. So it can help your brain if and when necessary.

One of the most potent intercellular antioxidants is glutathione. ALA boosts the levels of glutathione in your cells.

This could be very important in cases of pandemic flu, because glutathione can help with inflammatory lung processes—one of the big killers of people with bird flu.

However, glutathione is not easily absorbed as a supplement. So taking ALA supplements is a good way to increase your body’s glutathione.

And glutathione is not the only antioxidant benefited by ALA. ALA increases the effectiveness of Vitamins C & E, and CoEnzyme Q10 by generating them. Plus, it can regenerate itself.

ALA performs many useful chores in your body. Most of them are outside the scope of this book. I couldn’t find much information about ALA and infections.

So I must conclude ALA strengthens your immune system partly through its own actions as an antioxidant—and even more so by increasing your levels of glutathione…which is vital in your fight against viral infections.

And by regenerating Vitamins C, E & Coenzyme Q10—making them much more effective and efficient.

Natural sources of alpha lipoic acid include: spinach, broccoli, peas, Brewer's yeast, Brussels sprouts, rice bran, and organ meats.

There are two kinds of ALA. One is synthetic. It works, but only half as well as the R-dihydro-lipo c acid. So when you buy ALA, make sure you get the R kind. If the bottle or ad does not specify it's the R kind, then you can assume it isn't.

The R kind of ALA is slightly more expensive, but it's twice as effective. Therefore, R ALA is a much better buy for your money.

Suggested dosage: Take two 250-mg capsules twice per day.

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