

CONFIDENTIAL

FOR SUBSCRIBERS ONLY

BIO/TECH NEWS

Inside Information on Breakthroughs and Innovations in Bio/Science and Technology

Superbugs: The Coming Deadly Global Pandemic

What You Need to Know (and Do NOW!) to Avoid Becoming a Casualty

EDITOR'S NOTE: Once again, the Bio/Tech News is way out front here. The alarm we're sounding in this Special Double Issue is the result of months and months of research and thoughtful reflection. What you read here will radically change the way you look at many of your life routines and practices. Although there has been much concern expressed over the possibility of pandemic influenza (see: "So, What About the Flu?", below), we're here to tell you that the subject of this Special Report is *far* more important than any flu virus, *per se*. In fact, *if the flu ever does turn deadly it will mainly be the kind of pathogens we examine here as the subject of this Report that will be the actual cause of widespread death, not the influenza virus itself*. But influenza pandemic or no, we are *still* facing a very dangerous and potentially very deadly threat which has been expanding rapidly over the globe and is already out of control in some places. Please read this important information *carefully*. There's a good chance it might save your life or the life of a loved one...

Although the word "prophet" is nowhere to be found in our job description, we do have the ability to put two and two together and get four. In other words, some things in this life are just plain obvious: If you walk onto a busy freeway, you're likely to get hit by a car or truck. If you act carelessly when you handle a sharp knife, you'll probably cut yourself (and/or someone else). Nothing complicated or mysterious here. Pretty straightforward, common-sense kind of stuff.

Along the same lines: 1) So long as medical doctors continue to overuse and over-prescribe antibiotics; and, 2) So long as the agricultural industry continues putting antibiotics in animal feed and using incredible amounts of herbicides, pesticides and synthetic fertilizers in order to produce high crop yields from nutrient depleted, sick soils, it is only a matter of time before we end up being overwhelmed with a veritable bushel-basket full of various antibiotic-resistant, deadly germs ("Superbugs") capable of producing a *worldwide* epidemic of nightmarish proportions. After watching this gathering global storm over the past 10-15 years, *it is our considered opinion that we have now crossed the threshold into a time which future medical historians will describe as the "Post-antibiotic Era"*. We have entered a period in which the arsenal of antibiotics modern medicine has been relying upon for generations has finally become *impotent*, incapable of providing the kind of broad-spectrum protection we need *now* and are going to *desperately* need in the days ahead.

Please see next page >>>

Contents

| | | |
|------------------------------------|--------------------------------------|------------------------------|
| Superbugs: The Coming Pandemic.. 1 | A Continuing Conversation..... 14 | How to Use Therapeutic Grade |
| The Post-Antibiotic Era: Emerging | The Emergence of NDM-1, KPC... 15 | Essential Oils 22 |
| Deadly Superbugs 3 | Death By Medicine 15 | Diffusion 23 |
| A Rogues Gallery 4 | "Jackpot Justice"..... 17 | Direct Application..... 23 |
| So, What About the Flu?..... 9 | And the Cavalry Isn't Coming..... 18 | Recommended Action..... 24 |
| How Did This Happen?..... 11 | An Essential Alternative 19 | A Final Word..... 24 |

COPYRIGHT 2010
BIO/TECH Publishing, Ltd.
www.biotechnews.com

Subscription rates:
Domestic - \$189 per year;
All others - \$239 (US Funds)

Editorial Office (West Coast):
Box 30568 • Parkrose Center
Portland OR 97294

If you are over 50, you can probably remember going to the Saturday matinees at your local theater. Most all of the movies were black and white in those days. And many of them were Westerns, a genre which most every kid knew as “Cowboys and Indians”. A fairly typical scene in these movies was the one where a handful of cowboys would be down in a valley or at the bottom of a canyon. As they looked up towards the hills or top of the canyon walls on either side of them, they would at first notice maybe two or three Indians in war paint, sitting on their horses. At first glance, not a problem, no cause for concern. They could easily handle a few Indians. Then, a few minutes later, there would be at least a dozen Indian warriors gathered above. The cowboys would then begin to get the sense that their situation might be turning serious. Pretty soon, fifty to a hundred more Indians would appear, all poised to swoop down upon the small band of cowboys. At this point, the cowboys knew they were up to their necks in sheep dip. Unless the cavalry came riding in to their rescue, they were toast. Of course, back in those days, the cavalry *always* arrived in the nick of time. And, the cavalry *always* won. There was no way the Indians with their bows and arrows, spears and knives, could overcome the far more powerful rifles and artillery of the soldiers.

As we’ve already mentioned, we have been keeping a wary eye on the growing number of pathogenic microorganisms which have managed to successfully develop resistance to antibiotics over the years. At first, and kind of like the two or three Indians which initially appeared on the canyon rim, the drug-resistant numbers were small. Besides, if they were resistant to one antibiotic, there was *always* another weapon in the medical arsenal which could knock them out. Now, however, the situation has become quite serious. In fact, we’re now getting close to the place where society will soon be hoping and praying for the “cavalry” to arrive. Unfortunately, even if the cavalry does show up, it no longer has the firepower it needs.

Unlike the Indians of childhood matinee movie days, these Superbugs have not only increased in number but have also increased in *strength*, to the point where the cavalry of “white coats” is now at a loss for a way to successfully prosecute this deadly battle. Many of these Superbugs have acquired the ability to resist just about any kind of antibiotic doctors want to throw at them. Therefore, if we hope to have a fighting chance as we see these pathogens spreading through our hospitals and making their way out into the general population, the bottom line is that it is *imperative* we look elsewhere to find the kind of protection we’re going to need.

Keep reading and we’ll explain why we’re so worried about this and why you should be worried, too. Most importantly, we’ll also tell you some specific things we think you can and should do to help insure that you and your loved ones don’t end up becoming casualties...]

COPYRIGHT 2010 — *BIO/TECH* Publishing, Ltd. — www.biotechnews.com

NOTICE/DISCLAIMER: The challenge for us at the Bio/Tech News is that we know our Subscribers don’t want to have to wait around on the “men in white coats” to verify what seems to be clear as crystal to a person with a bit of down-home, plain-folk, common sense. Our Subscribers not only have plenty of common sense, but they are also savvy enough and sophisticated enough to recognize that much in this life is yet unanswered. Nevertheless, they want what we’re able to come up with and report on despite the sometimes-obvious gaps in understanding; and, they want this information right now. They want to read about subjects now which might someday turn out to be “tomorrow’s news”...perhaps months or even years down the road, and which most people may never even hear about, even then. So...our Readers pay us for our considered opinion, speculation, guesses, intuition—you name it—based upon the homework we do as we research various breakthroughs in BioScience and Technology. We’ve been doing this kind of thing for more than a decade now and *thousands* of Subscribers have been more than satisfied to get what we can give them now, knowing that there is often a long lag-time before the explanations for various phenomena ever come around. Since much of our reporting covers material which is “cutting edge”, you need to know that if you are looking for all kinds of scientific documentation—the kind of thing you’d find in a stodgy, peer-reviewed scientific journal—then you’re going to be disappointed. Oftentimes, there’s just not a whole lot of this kind of “science” available. Sometimes, all we may have to go on is a little bit of theory, a bit of “common sense”...and a number of reported experiences. Often, we find ourselves having to “fly by the seat of our pants”, sometimes speculating about why or how a product may work, but not knowing for sure. But, if we waited around for all the “science” to be done, then most of us would end up dying of old age before the obvious could be confirmed!

The language of the actual Terms and Conditions of Subscription Agreement says, in part—

“...I am subscribing to the Bio/Tech News for information purposes only. I understand and accept the fact that the newsletter may contain not only opinion, but also a certain amount of speculation, conjecture and guesswork. But this is what I am paying you for! In addition, and as part of that information I am paying you to provide, I expect to be given advice and specific recommendations for various products and/or services and the names of specific vendors and/or service-providers who, in your opinion, can help me make my Life, my Health and my Financial Bottom Line only better and better from now on.”

The Bio/Tech News is unique. Our subscribers pay for and expect us to provide them with the most specific information and recommendations possible; and, this we strive to do. Nevertheless, although information printed in this newsletter is received from sources deemed reliable, no guarantees, express or implied, can be made regarding the accuracy of same. Therefore, readers are encouraged to verify for themselves and/or to their own satisfaction the credibility of all reports, recommendations, conclusions, comments, speculations, opinions or anything else printed within the pages of this newsletter before making any kind of decisions based upon what they have read herein.

Nothing contained in this Report has been evaluated by the FDA nor is it intended to be, nor should it be construed to be, any kind of recommendation of any product or service in the diagnosis, cure, mitigation, treatment, or prevention of any disease, nor should it be construed to be any kind of attempt to either prescribe or practice medicine. As always, it is our stated policy to encourage our readers to always, always, always consult with a competent, well-informed health practitioner before making any significant decisions regarding one’s health.

The Post-Antibiotic Era: Emerging Deadly Superbugs

“With more than 40 diseases in existence today that were unknown a generation ago, and about 1,100 epidemic events verified by the WHO [World Health Organization] in the past five years, it’s nearly impossible to keep up on the emergence of infectious disease events as they break...”

— **Larry Madoff, MD**, International Society for Infectious Diseases

“Our communities aren’t safe from these kinds of organisms, which creep in and go from person to person. Many of these threats are more important, more real, and more possible than the threats of bioterrorism. We are trying to alert both the scientific and the lay community, and especially our own government, to this threat to the homeland.”

— **Stuart B. Levy, MD**, Director, Center for Adaptation Genetics and Drug Resistance, Tufts University School of Medicine

“Over the decades the bacteria that antibiotics control have developed resistance to these drugs. Today, virtually all important, bacterial infections in the United States and throughout the world are becoming resistant.”

— **Centers for Disease Control (CDC)** [Emphasis ours]

“The global increase in resistance to antimicrobial drugs, including the emergence of bacterial strains that are resistant to all available antibacterial agents, has created a public health problem of potentially crisis proportions.”

— **American Medical Association (AMA)** [Emphasis ours]

The discovery of antibiotics and their introduction into medical practice was hailed as one of the most important events in the struggle against human infectious diseases. The “Antibiotic Era” began in earnest in the early 1940s, Penicillin being the first antibiotic introduced into clinical practice. Discovery after discovery of effective anti-bacterial drugs then followed and optimism ran high in anticipation of the soon conquest of infectious disease. So high, in fact, that in 1969, William H. Stewart, then Surgeon General of the United States, testified in Congress that, “the time has come to close the book on infectious diseases”. Since that premature, overconfident assertion there has been a powerful resurgence of infectious diseases, the single most threatening component of which has been the appearance of disease-causing bacteria which have become resistant to antibiotics.

Scientists began noticing that each time they developed a new class of antibiotics, it wasn’t long before pathogens developed resistance to them. In 1964, physicians began using new drugs called Cephalosporins, which were effective against many infections, including pneumonia; but *E. coli*, *Klebsiella pneumoniae*, and a genus of bacteria called *Enterobacter* soon developed a way to fend them off. Out of pharmaceutical labs came the Carbapenem and Fluoroquinolone drugs and, within a matter of just a few years, they began to lose their effectiveness against *Acinetobacter* species and other microbes.

The first penicillin-resistant *Pneumococcus* was discovered two years before the above-quoted “Mission Accomplished” statement by the U.S. Surgeon General. It was found in Papua, New Guinea. By 1977, an epidemic disease caused by *Pneumococcus* was being reported by South

African hospitals. The bug had not only become resistant to Penicillin but other antibiotics as well and an increase in its level of resistance by more than several thousandfold was reported. Since the early 1990s, this Multi Drug-Resistant (“MDR”) *Pneumococcus* has demonstrated its ability to spread from one country to another, reaching extremely high levels in some countries.

Pneumococcus is the culprit behind outbreaks of pneumonia in various communities worldwide. This bacterium is a major threat to public safety because it can be life threatening to certain ill or elderly patients (40,000-50,000 Americans die from exposure to *Pneumococcus* each year; there’s no telling what will happen if MDR *Pneumococcus* should gain a foothold). It also causes life-threatening infections of the bloodstream, and meningitis. It is the major causative agent of middle ear infections in children. The bugs have spread through day care centers “like a chain letter,” says one reporter and, according to the highly-respected, infectious disease researcher Dr. Alexander Tomasz, young children under age two are at high risk of acquiring diseases caused by *Pneumococcus*. He reported that “several day-care centers in the U.S. were shown to have particularly high frequency of carriage of multi drug-resistant pneumococcal strains.” *Pneumococcus* is responsible for nearly half of the visits to pediatricians each year.

The development of MDR (again, “multi drug-resistant”) *Staphylococcus aureus* well illustrates the battle between the agile pathogens and drugs. *S. aureus* is a bacterium that harmlessly lives in the human body but can cause various kinds of infections. After the clinical application of Penicillin in the 1940s, *S. aureus* soon adapted to the treatment mechanism of penicillin, and by the 1950s, almost half of *Staph* strains had be-

come resistant to Penicillin. A new antibiotic, Methicillin, was developed in the 1960s. Methicillin kills *S. aureus* by interfering with the bacterium's ability to form a cell wall. But somewhere along the line, the *staph* germ picked up a gene called *mecA*, and *mecA* reduced Methicillin's ability to interfere with the *S. aureus* cell wall by a thousandfold. Once the pathogen had *mecA*, it had become what is now known as MRSA (pronounced "Mer-sa"), or "Methicillin Resistant *Staphylococcus aureus*". No one knows how *S. aureus* managed to develop this genetic augmentation. By the late 1970s MRSA became widespread.

Today, MRSA has managed to transform itself into a major infectious agent that can only be effectively treated with Vancomycin, one of the few last killers of Superbugs. Unfortunately, in 1996, a Japanese hospital reported the first case of Vancomycin-resistant *S. aureus* (VRSA) during surgery on a four-month-old boy. The U.S., France and Hong Kong subsequently all reported VRSA incidents. A few years later in 2000, Linezolid was launched as a new antibiotic to combat both MRSA and VRSA. But only one year later, Boston researchers reported the first case of Linezolid-resistant MRSA in an 85-year-old man undergoing peritoneal dialysis. After failing to contain his MRSA by Linezolid, researchers tried five antibiotics (Ampicillin, Azithromycin, Gentamicin, Levofloxacin, and Quinupristin-Dalfopristin) but the unfortunate man eventually died from the uncontrollable infection.

As more and more physicians have prescribed more and more antibiotics, the number and variations of resistant pathogens have multiplied. Many bacteria have now clearly demonstrated their capacity to develop sophisticated mechanisms of resistance against almost every antibiotic invented thus far. They possess a remarkable ability to adapt to their environments and de-

fend themselves against drugs by a variety of means. What's worse, bacteria possess a deadly ability to swap DNA not only between "family members" but also between different "tribes", as it were. For example, after *Enterococci* bacteria developed resistance to Vancomycin, British researchers in 1992 watched in the lab as the *Enterococci* bugs passed this resistance to *S. aureus*. At that point, these differing species of *Enterococcus* and *Staphylococcus* became "pathogenic allies".

Dr. Tomasz comments, "...these resistance mechanisms can find their way from one bacterium to another through a variety of efficient microbial gene transfer mechanisms. Bacteria resistant to many of our drugs can also travel over large geographic distances and reach high incidence in certain parts of the world. A bacterial pathogen resistant to all chemotherapeutic agents is no longer science fiction."

We are now at a critical juncture where any number of deadly human

pathogens have become resistant to multiple antibiotic agents. Medical science is, at present, able to do nothing more than the equivalent of scrambling around trying to plug holes in a dike which is now showing signs of some very significant stress fractures all over the world. What's more, because of the extremely long time which elapses between the discovery of a new, more powerful antibiotic substance (assuming any have been recently discovered) and its development, testing and subsequent delivery to the marketplace, the prospects for an antibiotic solution to this coming microbial nightmare are grim indeed. It is therefore our considered opinion that we must look elsewhere for help and we'll get to that later in this Special Report. First, though, let's take a look at some of the dangerous Superbugs which are posing such a growing threat...

* * *

A Rogues Gallery of MDR Superbugs

"Despite many accomplishments in the realm of antibiotics and vaccines... It is now clearer than ever that the human species is in the midst of a war with the microbial world—a resilient foe that will never be completely defeated."

— **Anthony S. Fauci, MD**, Director, National Institute of Allergy and Infectious Diseases, National Institutes of Health

"I remember it clearly... I thought, 'Uh-oh, we have a problem.'"

— **Francoise Perdreau-Remington**, Director, Molecular Epidemiology Lab, SF General Hospital (Initial comments from the first person to see the genetic fingerprint of the MRSA clone that would become known as "USA300")

Staphylococcus aureus is the most common cause of skin, wound and bloodstream infections in hospitalized patients. According to Dr. Ferric Fang, professor of Laboratory Medicine and Microbiology at the University of Washington, "*Staph aureus* has already colonized about one-third of the world's population". The term "MRSA" or Methicillin Resistant

Staphylococcus aureus is used to describe those strains of this organism that are resistant to commonly-used antibiotics. Methicillin was an antibiotic used a number of years ago to treat patients with *Staphylococcus aureus* infections, but it is now no longer used except as a means of identifying this particular type of antibiotic resistance. Experts have so far uncovered

17 strains of MRSA; two of these (clones 15 and 16) are thought to be more transmissible than others and account for about 96 percent of MRSA bloodstream infections.

Symptoms of MRSA include redness, swelling and tenderness, as well as skin infections, boils, urinary tract infections, bone and bone marrow infections, heart valve infections, brain and brain membrane infections, pneumonia, blood poisoning, and Toxic Shock Syndrome. Without treatment or because of incorrect diagnosis and treatment, the MRSA infection spreads rapidly and can lead to respiratory failure, attacking vital organs like the lungs and heart. Survivors are not always returned to their pre-MRSA condition, with many losing limbs, hearing, and/or full use of organs which have become damaged by the pathogen.

In most hospitals, the only remaining line of defense against the spread of MDR *Staph aureus* is an antibiotic by the name of Vancomycin. How long it will hold is anybody's guess. Vancomycin is not yet exhausted for use when Methicillin and others no longer work, but cases of VRSA (*S. aureus* resistant to Vancomycin) have turned up and many infectious disease specialists believe that it's only a matter of time before VRSA becomes widespread.

Recently, in a single year alone, 94,000 Americans fell seriously ill after developing MRSA infections, which most picked up in healthcare facilities (hospitals, clinics, nursing homes, etc.). Previously limited to hospital and nursing home patients, MRSA now has a foothold in the U.S. general population and has begun to spread and kill in urban and suburban neighborhoods and communities across the nation.

The number of children in the U.S. being infected with the MRSA Superbug has increased a great deal over the past

few years. "*Staph aureus* lives all over your body, in your fingers, under fingernails, on your skin, but it also likes wet, moist areas of the body," said Dr. Ina Stephens, University of Maryland Hospital for Children. Research suggests that many children may be carrying the drug-resistant Superbug MRSA in their nasal passages. After obtaining nasal swabs from 1,300 patients in the St. Louis area, investigators at Washington University (St. Louis, MO) concluded that MRSA "is widespread among children in our community." Dr. Stephens confirms a rise in MRSA-related ear, nose and throat infections in children. "Their hands are continually in their mouth. They suck their fingers, thumb. We occasionally see a nose picker and the organisms are on the finger and under fingernails, so this puts a child at high risk," she said.

Recent deaths have included a number of school children and infections in schools are now in the dozens. Schools in at least eight states have reported confirmed cases of students being infected with MRSA following the death of a 17-year old Virginia student, and the deaths of a New Hampshire pre-schooler and an 11-year-old from Mississippi earlier. In addition to the cases in those states, schools in North Carolina, West Virginia and Connecticut have reported infections among their students, and a high school district in Tucson, Arizona sent a letter home to parents advising them that one student had been infected and another suspected case was awaiting confirmation.

In Chicago, there have been two cases of MRSA among football players at Naperville High School. MRSA has also infected players from four NFL teams, some NYC firefighters, and seems to strike people who are in close physical contact. Centers of Disease Control (CDC) estimates place a recent annual MRSA death toll at 19,000 Americans, with 2,000

of these people—*healthy* people—contracting what is now being called "community-acquired" MRSA. [Note: We decided to include the information above in order to give you a feel for the spread of Community-Acquired ("CA") MRSA. Please be advised, however, that the numbers are growing at such a rapid rate that this data was already understated, outdated and obsolete by the time we got to press — Ed.]

"USA300" San Francisco General Hospital researchers have been chasing a rogue strain of drug-resistant *Staph* called USA300 since they first isolated it from a patient specimen in 2001. USA300 is one of more than a dozen distinct varieties of MRSA now circulating here in this country. Although the various MRSA strains have been gaining strength as a public health menace for years, USA300 is shaping up as the worst of the lot. And the aggressive and persistent bug keeps getting worse. Now, a variant of this strain, resistant to six major kinds of antibiotics, has been spreading among homosexual men in San Francisco, Boston, New York and Los Angeles.

USA300 is as dangerous as they come; it can attack organs throughout the body, forcing doctors to amputate fingers, toes and limbs. Toxic proteins carried by USA300 have been implicated in infections which cause the frighteningly fast skin and muscle-tissue destruction known as "necrotizing fasciitis". Thus, the popular nickname which has been given to this bug: "flesh-eating bacteria".

When this drug-resistant *Staph* invades the lungs, it can cause a pneumonia that destroys lung tissue and kills a patient within hours. Historically, pneumonia due to MRSA has been confined to health-care settings, representing 10–20% of pathogens that cause hospital and ventilator-associated pneumonia. Now, however, "Community-Acquired" USA300

pneumonia is beginning to make the rounds outside of the healthcare environment. **The CA-USA300 strain of MRSA has emerged as a cause of pneumonia, generally after influenza or influenza-like illness and most often among previously healthy patients** [Be sure you see “So, What About the Flu?”, below — Ed.].

USA300’s most disturbing trait, however, is just how easily it gets around. “It stormed into town and just took over, displacing everything else,” said Dr. Chip Chambers, infectious disease chief for SF General Hospital. “USA300 has a tremendous ability to spread,” said Françoise Perdreau-Remington, Director of the Molecular Epidemiology Lab at San Francisco General, where the strain was first identified. “Now, more than 80 percent of MRSA infections in this hospital are caused by USA300,” Perdreau-Remington said.

Commenting further, the Director indicated, “It has been described in at least 44 states and is now spreading in European countries.” USA300 is now infecting suburban moms, executives, doctors, athletes and children. It has turned up in tattoo parlors and newborn nurseries. People with HIV infection seem especially prone to it, but it also strikes patients, heterosexual as well as homosexual, who have no previous health problems.

Vancomycin is an antibiotic of “last resort”, reserved for the most serious *Staph* infections. Some dangerous intestinal bacteria have already developed resistance to Vancomycin (see Vancomycin-Resistant *Enterococcus*, or VRE, below). Because both VRE and USA300 are circulating in hospital environments, some patients are no doubt battling both bugs at the same time. Given the propensity of *Staph* to swap genes, these patients have the potential of providing fertile ground for the development of an even more dangerous bug. Which is Perdreau-

Remington’s great fear: **If USA300 were to acquire Vancomycin resistance from VRE, the result would be a virulent new form of Staph, which would spread readily outside the medical setting and be nearly impossible to treat. “This is the horror scenario,” she said. “We have very little time left.”**

Dr. Nafsika Georgopapadakou, Editor-in-Chief of **Drug Resistance Updates**, believes MRSA is similar to a slow moving hurricane, gathering strength and resistance as it spreads. “Once the ‘Superbug’ hits a community or hospital,” asks Dr. Georgopapadakou, “are populations ready to cope?” The implied and obvious answer to this rhetorical question is a most emphatic and decisive “No!” Not by a long shot.

Enterococcus faecium has already acquired resistance to Vancomycin, as we’ve already mentioned above and has become more difficult to treat than MRSA. Vancomycin is an expensive and potentially toxic antibiotic which has been employed as a weapon of last resort when other antibiotics have failed. In 1992, Vancomycin-resistant *Enterococcus* (VRE) had become the third most frequent causative agent of hospital-acquired wound and urinary tract infections, as well as infections of the blood, brain and heart. In addition, VRE has presented a particular problem with transplant patients who have compromised immunity. As of this writing, some strains of *Enterococcus* are not killed by *any* available antibiotic agents. Dr. Tomasz somberly admits, “If you get the infection, you are in the Almighty’s hands.”

Pseudomonas aeruginosa is an opportunistic pathogen. The bacterium takes advantage of an individual’s weakened immune system to create an infection and this organism also produces tissue-damaging toxins. *P. aeruginosa* causes urinary tract infections, respiratory system infections, dermatitis, soft tissue infections, bacteremia,

bone and joint infections, gastrointestinal infections and a variety of systemic infections. *Pseudomonas aeruginosa* is also of grave concern to cancer and burn patients as well as those people who are immuno-compromised. The case fatality rate for individuals infected with *P. aeruginosa* approaches 50 percent.

Hospital acquired (“nosocomial”) infections of multi drug-resistant *P. aeruginosa* are increasingly recognized worldwide. Since 1998, *P. aeruginosa* isolates resistant to all commercially available antimicrobial agents have been detected. Multi drug-resistant *Pseudomonas aeruginosa* bacteria are responsible for a significant proportion of episodes of nosocomial pneumonia.

Within the hospital, *P. aeruginosa* finds numerous reservoirs: disinfectants, respiratory equipment, food, sinks, taps, and mops. This organism is often reintroduced into the hospital environment on fruits, plants and vegetables, as well by visitors and patients transferred from other facilities. Spread occurs from patient to patient on the hands of hospital personnel, by direct patient contact with contaminated reservoirs, and by the ingestion of contaminated foods and water.

Clostridium difficile is a bacterium normally found in the intestines of healthy and ill people alike, most commonly in the elderly and babies. It can cause uncontrolled bouts of diarrhea (up to 50 per day), fever, nausea and abdominal pain. *Clostridium difficile*-associated disease (“CDAD”) represents a considerable public health hazard. In the United States, it is responsible for more deaths than all other intestinal infections combined. One publication put it this way: “If you catch it, you’ll have the worst diarrhea of your life. Your guts will churn with pain, your temperature will soar, and if you’re elderly or infirm, you may die...and *even if you live, it can come back again and again.*”

Incidence, hospitalizations, and deaths related to CDAD have been on the rise and the emergence of hyper-virulent strains, which are resistant to multiple antibiotic drugs, has been reported. 253,000 hospitalized patients were affected by *C. difficile*-associated disease in 2005—more than *double* the number in 2000, according to the CDC. Also, some *C. diff* cases are emerging that do not seem to be originating in hospital settings, further confounding experts. A recent article in the **World Journal of Gastroenterology** stated, “Up to two-thirds of hospitalized patients may be infected with *C. difficile*. Asymptomatic carriers [i.e., those who show no symptoms — Ed.] admitted to healthcare facilities can transmit the organism to other susceptible patients, thereby becoming vectors.”

Although you have probably heard little or nothing about it, CDAD has now reached epidemic proportions in at least 38 states and there are no signs that it is abating. According to researchers Marya D. Zilberberg MD, et al. of the EviMed Research Group, “In view of the aging U.S. population, this rapid pace of growth is alarming. If this rate of rise, along with the increase in virulence and diminished susceptibility to antimicrobial drug treatments persists, CDAD will result not only in a considerable strain on the U.S. healthcare system but also in rising numbers of deaths related to this disease.”

Now, a new, more virulent strain called NAP1, has emerged that produces about 20 times the toxins of ordinary strains and can cause severe, repeated diarrhea that resists all but the most powerful drugs and can destroy the colon and lead to blood poisoning and death.

Clostridium difficile bacteria produce spores when they sense that they are under attack from antibiotics or when they encounter conditions unfavorable to their growth and development.

Transmission of infection is through the ingestion of these spores which can survive on hard surfaces and floors for years. Standard cleansers do not eliminate *C. diff* and traditional antibiotic treatments no longer seem to be working, especially in repeat cases. The dark irony here is that, because *C. diff* is typically kept in check by the healthy bacteria that live in the digestive tract, people often get *C. diff* infections *after* treatment with antibiotics, which kill both harmful and healthy bacteria. As it continues to develop resistance to various antibiotics, *C. difficile* promises to be a horrible scourge to the healthcare setting.

Escherichia Coli Generally, *E. coli* is a relatively common bacterium found in the human digestive tract and is normally harmless. Some strains, including those linked to food poisoning, can produce symptoms which typically include severe abdominal cramping, sudden onset of watery diarrhea (frequently bloody), vomiting and a low-grade fever. Most often the illness is mild and self-limited, generally lasting 1-3 days. However, some strains of *E. coli* can cause serious complications of fatal blood poisoning, bladder and urinary tract infection, cystitis, kidney failure, hemorrhagic colitis, Hemolytic Uremic Syndrome, or postdiarrheal thrombotic thrombocytopenic purpura. The elderly are most at risk, particularly those living in nursing homes. In the United States, *E. coli* is the leading cause of food-borne illness. About 73,000 people are infected by *E. coli* each year.

Although grapes, lettuce, and tomatoes may look safe and appetizing on your grocer’s shelves, a hidden *E. coli* toxin (“Shiga toxin”) could be in them and you’d never know until it was too late. Kansas State University food expert T.G. Nagaraja has spent the past decade researching *E. coli* bacteria and reports that, in addition to the notorious 0157 version which can cause fatal food poisoning in children

and the elderly, a new strain of *E. coli* (known as 026) could now threaten the nation’s food supply. Nagaraja said it “...comes through beef, water or vegetables.” In 2007 alone, over 22 million pounds of beef and vegetables were recalled due to *E. coli* outbreaks.

Several countries now report cases of antibiotic-resistant *E. coli* and health officials are particularly concerned about the drug-resistant strains reported in Spain, Israel, Italy, Greece, the UK, and Canada. In these cases, the infection was resistant to four key antibiotics. In Britain, BBC News reported blood poisoning cases caused by *E. coli* more than doubled in the ten-year period from 1995 to 2005. Canadian scientists are concerned that infections from an antibiotic resistant *E. coli* bacteria are spreading beyond hospitals into the greater population and have strongly urged global health officials to begin monitoring their spread.

Salmonella Up to 4,000,000 Americans per year suffer from *Salmonella* poisoning. Caused by eating contaminated food (meat as well as produce), it is characterized by sharp stomach pains, fever and diarrhea and usually lasts from two to five days. The risk of being infected by drug-resistant *Salmonella* bacteria is increasing dramatically.

One strain of the *Salmonella* bacteria, known as DT104, is quickly becoming resistant to a wide range of antibiotics. Laboratories across the United States are finding a greatly increased incidence of resistant bacteria when testing *Salmonella* samples for resistance to five common antibiotics. The drug-resistant *Salmonella* bacteria were found in just 0.6 percent of samples in 1979. By 1996 the prevalence had risen to 34 percent, researchers from the U.S. Centers for Disease Control and Prevention (CDC) reported.

Using data from three sources, Kathleen Glynn and colleagues discovered

that “in the past five years in the United States there has been widespread emergence of a strain” resistant to five major antibiotics. They estimated the resistant bacteria were infecting between 68,000 and 340,000 people each year. According to Stuart B. Levy of Tufts University School of Medicine, “The DT104 strain, whose frequency is rising in the United States, has been plaguing animals and people in Europe for the past decade. There, the organism has acquired resistance to seven drugs that are used to combat it.”

Acinetobacter baumannii Another threat is being posed by multi drug-resistant *Acinetobacter baumannii*. *Acinetobacter* is a type of bacterium present in the environment and can be found in drinking water, soil, sewage and food. *Acinetobacter baumannii* can cause bloodstream, wound and urinary tract infections, endocarditis, meningitis and respiratory tract infections and are dubbed “MRABs” when they become resistant to antibiotics. In the past few years, several cases have occurred among the U.S. military serving in Iraq. The *Acinetobacter baumannii* strain was discovered in the soil there and infections attacked their victims through dirty battlefield wounds.

Amid the recent attention focused on the growing impact of methicillin-resistant *Staphylococcus aureus* and multi drug-resistant *Pseudomonas aeruginosa* infections, the pathogen *Acinetobacter baumannii* has been stealthily gaining ground as an agent of serious nosocomial (i.e., “hospital acquired”) as well as community-acquired infection. *A. baumannii* is a remarkably hardy organism and it has been shown to be able to survive on dry surfaces for five months, posing a challenge to hospital infection control measures. It has been isolated from hospital equipment, bedding, furniture and hospital staff. Furthermore, contamination of hospital devices with MDR *A. baumannii* isolates has

been documented for ventilator tubing, suction catheters, humidifiers, multidose vials of medication, potable water, bedding and improperly sterilized arterial pressure transducers. The ability of *A. baumannii* to remain viable on hospital surfaces for extended time periods indicates that the hospital is the probable reservoir for MDR *A. baumannii* infections.

The last two decades have seen an increase in both the incidence and seriousness of *A. baumannii* infections. Although this organism appears to have a predilection for the most vulnerable patients, community-acquired *A. baumannii* infection is an increasing cause for concern. The increase in *A. baumannii* infections has paralleled the alarming development of antibiotic resistance it has demonstrated. The persistence of this organism in health-care facilities, its inherent hardiness and its resistance to antibiotics results in it being a formidable emerging pathogen. This organism is now considered to be a “major pathogen” and has become no small threat to both hospital and community settings.

Stenotrophomonas maltophilia Scientists in Britain say hospitals could be facing an increasing threat from yet another deadly bacterial infection with the potential to rapidly develop a resistance to drugs. Researchers at the Wellcome Trust Sanger Institute have found the bacteria *Stenotrophomonas maltophilia* (“Steno”) currently seen in under 1,000 cases, may ultimately prove to be more difficult to treat than Superbugs such as Methicillin-resistant *Staphylococcus aureus* (MRSA). The study warns the degree of resistance Steno has shown is alarming.

Steno poses a threat to people who are already ill and cases have soared by 40% between 2001 and 2006. The elderly, intensive care patients and cancer patients whose immune systems have been weakened through chemotherapy are among those most at risk.

Steno infections spread through wet areas such as taps and shower heads, and can cling to equipment such as ventilator tubes and catheters, growing into a “biofilm” coating which is difficult to remove.

Mycobacterium tuberculosis An estimated one third of the world’s population is infected with *Mycobacterium tuberculosis* and nearly 9 million people develop disease caused by this bug each year. Although tuberculosis (TB) occurs predominantly in resource-limited countries, it also occurs in the United States. Because TB is spread by the airborne route, anyone who breathes air containing viable tubercle bacilli is at risk for acquiring *M. tuberculosis* infection.

During 1985-1992, the United States was confronted with an unprecedented TB resurgence. This resurgence was marked by a substantial number of patients with TB who did not respond to treatment and who eventually died. Physicians and epidemiologists quickly determined that these persons had multi drug-resistant TB (MDR TB), which is defined as TB that is resistant to the two most effective *first*-line therapeutic drugs, Isoniazid and Rifampin. Although persons with MDR TB usually can be treated effectively by relying on *second*-line drugs, these have more side effects and are more expensive and less effective than *first*-line drugs and require regimens lasting 18-24 months. The cure rate for those who are afflicted with MDR TB is only 50%-60%.

If this wasn’t bad enough, we now find ourselves faced with a far more serious threat than MDR TB. Virtually *untreatable* strains of *M. tuberculosis* are emerging globally and have been given the name, “Extensively Drug-Resistant TB” (XDR TB). XDR TB is defined as MDR TB that is not only resistant to *first*-line, but also resistant to the most effective *second*-line therapeutic drugs used commonly to treat MDR TB: fluoroquinolones and

at least one of three injectable second-line drugs used to treat TB (Amikacin, Kanamycin, or Capreomycin). XDR TB has been identified in all regions of the world, including the United States. According to the CDC, "In the United States, the cost of hospitalization for one XDR TB patient is estimated to average \$483,000, approximately twice the cost for MDR TB patients. Because of the limited responsiveness of XDR TB to available antibiotics, mortality rates among patients with XDR TB are similar to those of TB patients in the preantibiotic era." In other words, if you should come down with a case of XDR TB, you might as well prepare to meet your Maker.

More than half the TB cases in the United States occur among immigrants who become infected before their arrival in the United States. Lack of continuity of care contributes to treatment default, ongoing transmission, and prolonged illness.

About 15 years ago, we published a Special Report for our subscribers, warning them about MDR TB. Due to the recent emergence of XDR TB we will probably need to revisit this issue. Back then, MDR TB posed a serious threat. Today, however, the situation has the potential to be far more grim: an outbreak of XDR TB would be a medical nightmare and could easily overwhelm major cities. Outside of the public health community, only limited awareness exists of the potential consequences of XDR TB for the United States and globally. We plan to keep an eye on this and suggest you check our website regularly for updates (www.biotechnews.com).

Don't Miss the Big Picture!

Keep in mind, this "Rogues Gallery" is only a *partial* listing of deadly Superbugs. For example, *Klebsiella Pneumoniae*, *Campylobacter* and *Streptococcus pneumoniae* are also important, pathogenic *bacteria* which have developed dangerous and often

deadly, multi drug-resistant strains which are also on the rise. And, there are others. Plus, we didn't even mention infections caused by drug-resistant *fungi* (*C. lusitaniae*, *C. krusei*, *C. neoformans*, *Trichosporon* spp., *A. terreus*, *S. apiospermum*, *Fusarium* spp., *Aspergillus*, *C. glabrata*, *C. norvegensis*, *C. albicans*, *C. dubliniensis*, etc.).

The objective here is *not* to provide you with a complete encyclopedia of drug-resistant pathogens. Rather, we are trying hard to make sure you see the big picture, which has become global in scale. When you see an article on the subject in the newspaper or a news clip on TV, the content is focused, usually mentioning a single type or strain of Superbug. One week you might read or hear about MRSA. The next week you may see something about CDAD. Then, another week you might hear about *E. coli*. So far as they go, these isolated snippets of information are fine. At the same time, however, they can be dangerously misleading. You must not get the false impression that hospitals and other healthcare settings are merely having to occasionally deal with only one particular strain of Superbug at a time. No, the battle is far greater than this. We are no longer in a war with a particular strain of either MRSA,

or *Pseudomonas aeruginosa*, or *Enterococcus faecium*, or *Clostridium difficile*, or *E. coli*, or *Salmonella*, or *Acinetobacter baumannii*, or *Stenotrophomonas maltophilia*, or *Mycobacterium tuberculosis*, etc. Instead, and we can't possibly emphasize this strongly enough, **we are now engaged in a war with all of these multiple microbial adversaries simultaneously and the battlefield is now worldwide.** When you enter a hospital or other healthcare setting these days, you should assume that many of these different pathogens may be present, each strain having the potential to cause serious harm.

To put it in terms of the matinee movies mentioned at the beginning of this Special Report, there are no longer merely one or two "Indians" in war paint, looking at us from the canyon ridge. There is now a whole multitude of them and they have already begun to charge the woefully outnumbered "cowboys" who are sitting helplessly on their horses down on the canyon floor. What makes this truly scary is that the cavalry the cowboys have always depended upon is not only in disarray but the soldiers are almost completely out of bullets.

* * *

So, What About the Flu?

*A 42-year-old Philippine seaman, who died last week with a **Superbug infection**, was **tested positive for the influenza A/H1N1** overnight, Hong Kong's Center for Health Protection announced on Thursday.*

*If confirmed, it would be Hong Kong's first fatality from influenza A/H1N1. **Earlier tests found community-associated methicillin resistant Staphylococcus aureus (CA-MRSA) in the man's blood sample**, the center discovered he also **tested positive for the human swine flu virus** on Wednesday night.*

*The man flew to Hong Kong from the Philippines on June 28 and left two days later on board a cargo ship. He came down with a fever, cough and chest pain on July 3 and was admitted to the Ruttonjee Hospital **with pneumonia** on July 8 when he was back to the city. He had respiratory failure and died on July 10.*

— Peoples Daily (China) [Emphasis ours]

The influenza pandemic of 1918-1919 killed somewhere between 20 and 40 million people, more than the total of those who died in World War I. It has been called the most devastating epidemic in recorded world history. More people died of influenza in a single year than in four-years of the Black Death Bubonic Plague. The 1918 influenza virus was a strain that is known today as H1N1. Interestingly, a variant of H1N1 is the “Swine Flu” strain circulating the globe today [Go to our website (www.biotechnews.com) to see an extract from a previous Report, “In Times Like These” where we provide extensive information on the subject of Influenza — Ed.].

The important thing to note about the 1918 flu pandemic is that it wasn't the flu virus *per se* which caused so many deaths. Rather, most died of bacterial pneumonia. A recent paper on the 1918 flu pandemic in the CDC's journal, **Emerging Infectious Diseases** states that the conventional wisdom underlying pandemic flu preparations is wrong. **Medical and scientific experts now agree that bacteria, not influenza viruses, were the greatest cause of death during the 1918 flu pandemic.**

“Government efforts to gird for the next influenza pandemic ought to take notice and stock up on antibiotics,” says John Brundage, a medical microbiologist at the Armed Forces Health Surveillance Center in Silver Spring, Maryland. Brundage's team surveyed first-hand accounts, medical records and infection patterns from 1918-1919. Although a highly virulent strain of flu virus swept the world, Brundage's team concluded that **bacterial pneumonia, which came on the heels of what were mostly mild cases of flu, is what in fact killed the majority of the 20 to 40 million victims who died.**

As a result of their study, Brundage, et al. conclude, “...deaths during the

1918-19 influenza pandemic are usually attributed to a hypervirulent influenza strain. As a result, preparations for the next pandemic focus almost exclusively on vaccine prevention and antiviral treatment for infections with a novel influenza strain. However, we hypothesize that infections with the pandemic strain generally caused self-limited (rarely fatal) illnesses **that enabled colonizing strains of bacteria to produce highly lethal pneumonias.** This sequential-infection hypothesis is consistent with characteristics of the 1918-19 pandemic, contemporaneous expert opinion, and current knowledge regarding the pathophysiologic effects of influenza viruses and their interactions with respiratory bacteria.” [Emphasis ours]

In a nutshell, what happens is that influenza, which is a *virus*, attacks your lung tissue and causes damage, but it doesn't usually kill you. What kills you is the *bacterial* pneumonia that comes on afterwards and then causes the problems that result in death. Therefore, when you have influenza, or you get influenza, you not only need to be treated rapidly for the influenza, but also and most importantly for the bacterial infection that occurs afterward.

The first antibiotic to be used successfully in the treatment of human disease was tyrothricin, isolated from certain soil bacteria by American bacteriologist Rene Dubos in 1939. It was later, during World War II and shortly thereafter, that the “antibiotic era” began. In other words, **in 1918, we did not have antibiotics.** During the 1918 pandemic, it took only 7-10 days from the onset of flu symptoms to the time of death. The “modern medicine” of that day stood helplessly by as the secondary infection of *bacterial* pneumonia took the lives of millions upon millions.

Now, please don't miss this: It is our considered opinion that the situation

we are facing today is eerily similar. We have just spent a lot of ink to demonstrate the fact that, even though we have lots of antibiotics at our disposal, the unyielding and relentless march of the growing army of multi drug-resistant Superbugs puts us very close to the place where we might as well have no antibiotics at all. In 1918, it was *Streptococcus pneumoniae* that was the culprit. Today, we not only have to worry about multi drug-resistant strains of this bug but as we've already mentioned, MDR *Staphylococcus aureus* (MRSA) is now turning up in both hospital-acquired and community-acquired cases of pneumonia. No doubt, other Superbugs will join the fray.

The exact “mechanism” of how the 1918 H1N1 virus was involved in preparing the way for the deadly pneumococcal pneumonia which followed is not known. However it happened, it decimated millions of young adults along with those who were weak and infirm. Whether it be our contemporary H1N1 (“Swine Flu”) pandemic, or the H5N1 (“Bird Flu”) virus, or some other strain of influenza which opens the door to MDR Superbugs, we can be almost certain that this will turn out to be one hellish nightmare.

But what about vaccines? At least two problems: First, in order to be really effective, a vaccine has to be “strain specific” matching the very same strain of virus which is causing the flu at any point in time. Matching the viral strain is an extremely difficult and complicated challenge which involves a bit of science and a whole heck of a lot of guessing. Often, the guess is wrong. And, should the virus mutate (which is likely), the vaccine would have little to confer in the way of immunity. What's more, the World Health Organization (WHO) has admitted that H1N1 vaccines are “using new technologies...which have not yet been extensively evaluated for their safety in certain population groups.”

Secondly, even if we could perfectly match the viral strain and even if it did not mutate (highly unlikely), we don't have the manufacturing capability to produce enough vaccines to take care of our population. Take the recent example of the scramble to stockpile vaccines for H1N1. The U.S. makes only 20 percent of the flu vaccine it requires. Great Britain has to import 100% of its vaccines. About 70 percent of the world's existing flu vaccines are made in Europe, and only a handful of countries are self-sufficient in vaccines. Since the U.S. has limited flu vaccine facilities, and because factories can't be built overnight, there is no quick fix to boost vaccine supplies. The WHO recently stated the production yields for pandemic vaccine viruses run 25-50 percent of those of normal seasonal flu viruses for some manufacturers. All of this boils down to shortages. Experts are now warning that during a global epidemic, governments may be under tremendous pressure to protect their own citizens first before allowing companies to ship doses of vaccine out of the country. Bottom line? We can't bet our lives on either the effectiveness, safety or availability of flu vaccines.

Then what about antiviral drugs like Tamiflu (Oseltamivir) and Relenza (Zanamivir)? In 2005 circulating strains of influenza viruses began developing resistance to one or more of the four licensed antiviral agents (Oseltamivir, Zanamivir, Amantadine and Rimantadine). The CDC's Advisory Committee on Immunization Practices recently stated this increasing resistance "has complicated antiviral treatment and chemoprophylaxis recommendations". This is a tacit admission that we've got a serious problem here. In fact, rather than seeing the situation as "complicated", other researchers have stated it more clearly, suggesting that "wide-scale use of antiviral agents in the event of an influenza pandemic is likely to promote the emergence of drug resistance, with potentially del-

eterious effects for outbreak control". In other words, we will soon end up having to deal with multi drug-resistant *viruses* in addition to the MDR *bacteria* we have been discussing in this Special Report. Now, in what we see as a signal of near desperation, instead of using just one antiviral, "cocktails" of two or more antivirals are being considered. This is nothing but a shot in the dark and we fully expect to see reports in the near future that this strategy will have proven itself useless and probably harmful and/or deadly in and of itself.

Tamiflu has a long record of failure and is worse than worthless. Viruses like H1N1 not only develop resistance to it, but the drug itself kills people. Japan has banned it. Even the FDA—after review of nearly 600 cases of neuropsychiatric events reported by patients on Tamiflu and 115 cases of

neuropsychiatric events by patients taking Relenza—has warned that Tamiflu's label be strengthened to note: "In some cases, these behaviors resulted in serious injuries, including death, in adult and pediatric patients." FDA staff has been quoted as having said Relenza, a drug in the same class as Tamiflu, should have a warning label of "reports of hallucinations, delirium and abnormal behavior" observed in some patients taking the drug. Even if they were effective, antivirals must be taken within 48 hours of the onset of flu symptoms. Most people don't recognize the symptoms and, if they do, many can't get to their doctor fast enough. Bottom line? Reliance upon antivirals would more than likely be a foolish and *deadly* strategy.

* * *

How Did This Happen?

"Antibiotic resistance comes mainly because of inappropriate or improper use of antibiotics by physicians. Some 150 million prescriptions are written annually in this country. And 60 percent of them — that translates to 90 million prescriptions — are for antibiotics. Of those, 50 million are absolutely unnecessary or inappropriate."

— **Dr. Philip Tierno**, Director of Clinical Microbiology and Diagnostic Immunology, New York University Medical Center

"Lapses in infection control and overuse of antibiotics are spawning drug-resistant germs that are spreading from hospitals into the community at unprecedented rates ... These new super germs—stronger, more elusive and deadlier—have multiplied for decades inside thousands of hospitals and now are hitching rides into outside communities on the clothes and skin of patients, workers and visitors."

— **Chicago Tribune**

"Despite numerous activities aimed at preventing foodborne human infections...progress toward the national health objectives has plateaued, suggesting that fundamental problems with bacterial and parasitic contamination are not being resolved...The lack of recent progress...and the occurrence of large multistate outbreaks point to gaps in the current food safety system and the need to continue to develop and evaluate food safety practices as food moves from the farm to the table."

— **Centers for Disease Control
Morbidity and Mortality Weekly Report**

There is really not much debate over how we've come to this threatening situation. In a nutshell, and as was mentioned earlier, the common wisdom is that there are two *direct*, primary causes: 1) the *overprescribing* and *careless* prescribing of antibiotics by doctors; and, 2) the heavy use of antibiotics in the poultry, livestock and aquaculture (i.e., fish farming) industries [There are other, less direct, yet extremely important causes as well, such as the agricultural use of herbicides and pesticides on sick, nutrient-depleted soils — Ed.].

When it comes to *overprescribing* and *careless* prescribing by physicians, Dr. Louis Rice, a Harvard-educated, Columbia-trained specialist in infectious diseases who is currently a professor at Cleveland's Case Western Reserve University gets right to the point: "We have behaved very badly... We have made a lot of stupid choices." In a keynote speech to the American Society for Microbiology, Rice indicted doctors and drug companies alike saying they are responsible for breeding resistance by "the indiscriminate dumping of antibiotics into our human patients."

Dr. Richard Besser of the CDC, in 1995, said the number of *unnecessary* antibiotics prescribed annually for viral infections was 20 million. Later, in 2003, he referred to tens of millions of *unnecessary* antibiotic prescriptions. Currently, the CDC estimate is a nice, round "50 million annually".

As far as *agriculture* goes, the widespread practice of giving subtherapeutic doses of antibiotics to prevent disease and promote growth dates back to the 1950s. Although no exact figures are available, the Centers for Disease Control & Prevention (CDC) estimates that 50 million pounds of antibiotics are produced each year in the U.S. and about 40% of that is used in livestock. Nearly 80% of farm animals—mainly cattle, pigs, and poul-

try—often receive subtherapeutic levels of antibiotics in their feed.

Ideally, antibiotics should be used in farming only when necessary to treat infection. However, farms have gotten bigger and animals live in more crowded conditions, which raises their risk of disease. Today's modern, high-production agricultural industry puts farmers under pressure to give their animals antibiotics or else risk massive losses. Due to the often weak and sickly nature of "factory farmed" animals, they are fed a constant supply of antibiotics from birth until the time of slaughter.

The theory is that, by giving them antibiotics to attack bacteria before the animals get sick, the animals won't have to expend extra energy to fight off disease, thereby allowing them to grow more quickly. Farmers are able to push them through the system more efficiently, more quickly and more profitably. Although this practice may make a certain sort of sense when considering the context of high-production agriculture, the undesirable and increasingly deadly consequence is that it stimulates and promotes the growth of antibiotic-resistant bacteria which can adversely affect human health.

It is also common practice in the fish farming industry, particularly in developing countries, to use large amounts of antibiotics to prevent infection. The antibiotics used are often non-biodegradable and remain in the aquaculture environment for long periods of time. This encourages the growth of bacteria which can survive in the presence of antibiotics. When antibiotics are mixed with fish food, residual antibiotics as well as resistant bacteria can end up making their way into fish products and fish meat. This makes people who eat these products more susceptible to bacterial infection. Dr Felipe Cabello of New York Medical College, an expert on this subject,

has commented, "If we don't curb the heavy use of prophylactic antibiotics in aquaculture, then we will ultimately see more and more antibiotic resistant pathogens emerging, causing increased disease to fish, animals and humans alike."

For more than a decade, researchers have warned that the practice of speeding animal growth by adding common antibiotics to livestock food was fostering the development of drug-resistant bacteria. These levels of antibiotics stimulate bacteria in the animals to develop resistance and then go on to threaten human health in a number of ways...

The antibiotic-resistant bacteria can be transmitted directly to humans when food is consumed, potentially causing a wide range of infections. Bacteria like *Salmonella*, *Campylobacter* and *E. coli* are commonly found in food animals and sometimes contaminate meat during the slaughter and packaging process. If the meat is not prepared properly, the bacteria can infect humans. [What's more, minute amounts of antibiotics are consumed whenever we eat meat or drink milk which comes from treated animals. Milk alone can contain up to 80 different antibiotics — Ed.].

Bacteria from animals can swap genes with other bacteria in our intestinal tract, creating more and more strains of drug-resistant bacteria that can multiply and cause numerous types of nasty infections.

Bacteria from animals also infect humans via the environment, i.e., animals excrete bacteria in manure, which can contaminate ground and surface water systems around large farms or contaminate produce if the manure is used as fertilizer. And here's a pleasant thought: Kansas State University researchers report that houseflies in food-handling and serving facilities carry and may have the capacity to transfer antibiotic-resistant and poten-

tially virulent bacteria. When houseflies grow in manure from cattle or poultry which have been treated with antibiotics, they pick up and can spread antibiotic-resistant bacteria to other locations, such as your kitchen! In another study, researchers cautioned, "...flies collected near broiler poultry operations may be involved in the spread of drug-resistant bacteria from these operations and may increase the potential for human exposure to drug-resistant bacteria".

An increasing percentage of the bacteria that move from agricultural animals to humans are now resistant to antibiotics. One growth-promoting antibiotic, Avoparcin, has stimulated growth of bacteria (*Enterococcus faecium*) resistant to the antibiotic Vancomycin and has been linked to the subsequent appearance of Vancomycin-resistant *Enterococci* in human intestines. Some antibiotic resistant *Salmonella* cases in humans have been traced back to meat from animals fed antibiotics.

Even more worrisome, once bacteria develop a resistance to one antibiotic, they rapidly learn to withstand the onslaught of others, according to Dr. Stuart B. Levy of Tufts University School of Medicine. "The DT104 strain [see section on *Salmonella*, above — Ed.], whose frequency is rising in the United States, has been plaguing animals and people in Europe for the past decade. There, the organism has acquired resistance to seven drugs that are used to combat it," he said. Already in the United Kingdom, DT104 now appears to be widely distributed in food animals, particularly cattle, and investigations have associated infections in humans with eating pork sausages, chicken and meat paste, and with contact with sick animals, according to CDC researchers.

One USDA study showed that 66 percent of beef samples were contaminated with antibiotic-resistant bacteria, and scientists at the Johns Hopkins

Bloomberg School of Public Health have reported that 96 percent of the chicken flesh they tested was contaminated with antibiotic-resistant *Campylobacter* bacteria. Another study conducted by the CDC indicated that chicken sold in supermarkets is often tainted with the potentially fatal bacteria *Enterococcus faecium*. This bacterium was not even affected by Synchronid, a drug commonly used to treat antibiotic-resistant bacteria. FDA's Center for Veterinary Medicine reports that 1% of beef, 8.7% of swine, and 20% of poultry are infected with *Salmonella*. *Campylobacter* is even more prevalent. It infects 4% of beef, 31.5% of swine, and 88% of broiler chickens. Also, data obtained by FDA's antimicrobial resistance monitoring system show that the levels of certain resistant bacteria in meat and poultry carcasses have increased over recent years.

A study which sampled packaged meats from three Arizona chain grocery stores revealed that over 40 percent of the samples tested positive for *Clostridium difficile*. Of the samples collected, nearly 30 percent of the contaminated samples were identical or closely related to a super-toxic strain of *C. diff.*, which suggests the possibility that *C. diff* infections may be transmitted through food. "These data suggest that domestic animals ... may be [a] source of *C. difficile* ..." said J. Glenn Songer, Professor of Veterinary Science at the University of Arizona. Songer looked at a wide array of meats sold in grocery stores nationwide and found that contamination ranged from 41 percent (pork), 44 percent (turkey), 50 percent (ground beef), and over 62 percent (braunschweiger, a type of liverwurst). Of the products contaminated with *C. diff.*, approximately 75% were of toxinotype V, a type that has been found in pigs and calves and, "increasingly," said Songer, in humans. Researchers in Scotland have also found *C. diff* in ready-to-eat salads.

A Belgian survey showed that MRSA has been found in 68 percent of the pig farms in that country. In 37 percent of the cases, the farmer and the farmer's family carried pig MRSA, a variant of human MRSA. The Soil Association in Europe estimates "40% of Dutch pigs, 13% of calves, a high proportion of chickens and 50% of pig farmers have been found to carry farm-animal MRSA". Further, the Soil Association quotes Dr C. P. Veerman, the Dutch minister for agriculture, in a letter to the Dutch parliament, where he said that in the Netherlands, farm-animal MRSA has been found in 20% of pork, 21% of chicken and 3% of beef on sale to the public. Richard Young, Soil Association policy adviser said: "This new type of MRSA is spreading like wildfire across Europe, and we know it is transferring from farm animals to humans with serious health impacts. Concerned scientists have referred to this as 'a new monster'".

Here in the USA, University of Iowa Department of Epidemiology researcher Tara Smith recently delivered preliminary results of a study linking the deadly, antibiotic-resistant MRSA to pigs in concentrated animal feedlot operations (CAFOs). Examining CAFOs scattered in Iowa and Illinois, Smith and her team found the MRSA strain in 49 percent of pigs and 45 percent of the workers who tend them.

In October 2008, an investigation by KOMO-TV in Seattle, in partnership with Fisher Broadcasting stations across the region, found the Methicillin Resistant *Staphylococcus Aureus* in 3 packages of ground pork bought at grocery stores in California, Oregon and Idaho.

Although cooking meat well helps to minimize the possibility of infection from the cooked meat, you can still become "colonized" simply by touching an object contaminated with MRSA. For example, touching your nose or having an abrasion on your

hands while preparing raw pork could potentially lead to colonization or out-right infection. [“Colonization” means the bacteria are present, taking up residence but not causing any immediate problems. Colonization of the nose and skin greatly increases your risk of an actual, full-blown MRSA infection, however — Ed.].

An expert panel of the World Health Organization has repeated the call for a ban on the use of human antibiotics to

promote the growth of livestock. The group also called for the careful use of antibiotics to stop diseases in food animals. Twenty or thirty years ago, this would have been timely. However, at this point, we’re afraid the “barn door” has been open far too long and the “horses” (cattle, pigs and chickens, too!) are already so far down the road we may not ever get them back.

* * *

A Continuing Conversation

As we mentioned above, the general consensus is that the widespread, frequent and indiscriminate practice of exposing microbes to antibiotics has, as an unintended consequence, provoked bacteria and other pathogens to ramp up their defenses in a fight for survival. But *how* do they manage to develop resistance? Is it just a raw numbers game, a product of chance that some undirected, random genetic mutation eventually confers resistance? Although this view has been popular, we think the answer is far more elaborate and perhaps even, in some sense, deliberate. To state it somewhat simplistically and yet still to the point, it is our contention that the *primary* way bacteria manage to develop drug resistance is by “talking” to each other!

In an effort to help make sense of this statement, let’s “consider the ant”. At any given moment, each ant in the colony has its own job description (forager, house-keeping, brood care, nest construction, etc.) but the ants can switch tasks if the colony needs it. For example, when the colony discovers a new source of food, an ant on housekeeping duty may suddenly take up the task of forager in order to help. No ant can possibly know how much food the foragers are collecting or how many foragers are needed to complete the harvest. Likewise, if a nest is damaged, some foragers will become housekeepers in order to restore the integrity of the nest. The amazing thing is that there is no top-down, centralized control in an ant colony. No one, including the misnamed “queen” (which is simply an egg-laying breeder), gives orders yet each ant somehow “decides” what to do next.

Deborah M. Gordon, Stanford University Assistant Professor of Biological

Sciences has been studying ants for years. Her experiments reveal that when it comes to task allocation, individual ants get some kind of signal from the collective *colony*. Again, no one tells an individual ant to change its job description. Scientists Bert Hölldobler and E.O. Wilson argue that we should think of the ant colony as an *organism* rather than simply a collection of a number of individual ants. There is some kind of “collective intelligence” involved in the life of a colony which is far more complex than that which belongs to individual ants by themselves. How all this happens is a mystery.

Now, let’s drop down a few notches towards something which, at first glance, seems far more simple and primitive (the more we learn about the Creation, the more we come to appreciate the fact that no life form is “simple” or “primitive”). Let’s consider the slime mold.

Slime molds are actually swarms of smaller individuals, they are colonies of tiny amoeba-like things that coalesce occasionally into a super-organism, which slowly oozes its way along, looking to find a place to feed or release spores. Once the task is complete, the mass changes back into individual organisms and disappears into the soil. Slime molds have no brain or nervous system of any kind, yet they are able to make complex decisions when they aggregate into these collective entities. Remarkably, researchers have even found the slime mold to be somewhat adept at solving mazes! The decision-making process is accomplished via some kind of flow of information between adjoining individuals, but exactly how this occurs is still a mystery. When all of the thousands of amoeba-like individuals come together to form one large slime mold, an information network emerges which creates a superior “collective intelligence” without the need for any kind of centralized command structure. Apparently, bacteria share this unusual characteristic of “collective intelligence”...

Bonnie Bassler, Ph.D. (Department of Molecular Biology, Princeton University) is one of a select group of researchers who has recently discovered that bacteria are not organisms which merely live individual, reclusive lives. Much to the contrary, they have observed that bacterial life is highly social, intricately networked, and involves multiple, ongoing interactions. In fact, bacteria not only communicate with members of their own species; many bacteria have the ability to “talk” to members of other species by using a universal chemical “language”.

Communication occurs when bacteria secrete special signaling molecules into their environments. This process was originally called “quorum sensing” but the term “cell-to-cell communication” has more recently begun to replace it since it more ad-

equately describes the various number and types of interactions which are constantly taking place. Researchers have discovered that bacterial cell-to-cell networking includes long- and short-range chemical signaling channels; one-way, two-way, and multi-way communication; contact-mediated and contact-inhibited signaling; the use and spread of misinformation and, more dramatically, even deadly information.

What's even more amazing, intercellular communication allows bacteria to synchronize and coordinate their behaviors, *enabling them to function as multicellular organisms* and to reap benefits they could never obtain if they always acted as loners. According to Bassler, we are only just beginning to appreciate the tremendous complexity in the extracellular chemical milieu that bacteria experience and which they interpret in order to garner information about: their growth status and potential; their cell numbers; those of their neighbors; and the presence or absence of other organisms, both friend and foe.

It is now clear that, for bacteria, cell-to-cell communication is not the exception; rather, it is the norm. Bacteria are able to collectively track changes in their environment, conspire with their own and other species, build mutually beneficial alliances with other types of bacteria, gain advantages over competitors, communicate with their hosts, etc. It should therefore not be too surprising that bacteria have collectively managed to come up with ways to counteract relatively simple, rather uncomplicated, man-made chemicals (antibiotics) by finding ways to resist and increase their virulence via some kind of collaborative effort which at present is incompletely understood.

Given the sheer numbers involved, i.e., *trillions* and *trillions* of bacteria "out there", having the ability to communicate and react both individually

and corporately when confronted with the comparatively limited, offensive capability of a handful of antibiotics, it's no wonder that virile, drug-resistant strains have emerged and continue to emerge, presenting a dangerous and powerful challenge to healthcare providers all around the globe...

The Frightening Emergence of NDM-1, KPC

“In many ways, this is it, this is potentially the end. There are no antibiotics in the pipeline that have activity against the enterobacteriaceae producing NDM-1...”

— **Timothy Walsh, PhD**, Professor of Medical Microbiology and Antimicrobial Resistance, School of Medicine, Cardiff University, Cardiff, UK

The **Enterobacteriaceae** are a large family of bacteria which include some of the more familiar pathogens (*Eschericia*, *Salmonella*, *Klebsiella*, *Enterobacter*, *Shigella*, etc.). The **Betalactams** are a group of antibiotics which, until recently, have been effective in combating the Enterobacteriaceae. Some of the better known Betalactams include the Penicillins and Cephalosporins. The highly-potent Carbapenems are also part of the Betalactam group. Carbapenems are typically used as weapons of last resort when other antibiotics have failed. Simply stated, the way Betalactams work is that they attack and kill bacteria by keeping them from being able to synthesize the materials they need to keep their cell walls intact.

However they've managed to do it, certain strains of *E. coli* and *Klebsiella pneumoniae* have now managed

to come up with particular enzymes which disable the Betalactams by "clipping" their molecular ring structure, thereby rendering them impotent and ineffective. The enzymes **New Delhi Metallo-betalactamase (NDM-1)** and *Klebsiella pneumoniae* carbapenemase (KPC) are two examples of this recent bacterial innovation. As a result, the anxiety among researchers has now been taken to serious, new levels as the emergence of these enzyme countermeasures on the part of pathogenic bacteria now poses the threat of a pandemic with few treatment choices.

Bacteria with NDM-1 and/or KPC capability have already arrived in European hospitals via patients returning from countries such as India, Pakistan and Bangladesh. What's more, as of this writing, some 50 cases have been identified in the UK alone and similar bugs have been seen in the US, Canada, Australia, France, Japan, Hong Kong, Kenya, Singapore, Taiwan, Israel, Greece and the Netherlands. A Belgian man recently became the first known fatality.

The fear is that the ability to produce NDM-1, KPC, etc. may soon be picked up by types of bacteria which typically spread quite easily from person to person in the community setting. NDM-1 pathogens have already demonstrated the ability to move from patient to patient in UK hospitals. Should this become widespread, then we will be confronted with the perfect storm: a lethal, fast-spreading infection which is impossible to treat.

* * *

Death By Medicine

“It is evident that the American medical system is the leading cause of death and injury in the United States.”

— **Carolyn Dean MD, ND, Martin Feldman MD, Debora Rasio MD, Dorothy Smith PhD, Gary Null PhD**

“The danger of acquiring hospital-borne bacterial disease, often by antibiotic resistant strains, is not restricted to the terminally ill, although patients with serious underlying diseases are at increased risk for all infections. Infection by antibiotic-resistant bacteria is a clear hazard for patients checking into the hospital for elective surgery.”

— **Dr. Alexander Tomasz**, Professor of Microbiology
Rockefeller University

“While you hear statistics and clinical terminology, you have to remember that behind every statistic is a life-and-death moment, when the doctor and patient realize that a deadly infection is not responding to the medicine that we thought we could rely on.”

— **Kathleen T. Young**, Executive Director
Alliance for the Prudent Use of Antibiotics

“The problem is that any of us could be an I.C.U. patient tomorrow. It’s not easy to convey this to people if it’s not immediately a threat. You don’t want to think about it. But it’s actually anybody who goes into a hospital. This is scary stuff.”

— **Dr. Louis Rice**, Louis Stokes Cleveland VA Medical Center

“We are on the verge of losing control of the situation, particularly in the hospitals.”

— **Dr. Chip Chambers**, Chief of Infectious Disease
SF General Hospital

A definitive review and close reading of medical, peer-review journals and government health statistics shows that American medicine frequently causes more harm than good. The number of people having in-hospital, *adverse* drug reactions to prescribed medicine is 2.2 million. The number of *unnecessary* medical and surgical procedures performed annually is 7.5 million. The number of people exposed to *unnecessary* hospitalization annually is 8.9 million. As we’ve already mentioned, CDC estimates of the number of *unnecessary* antibiotics prescribed is 50 million annually.

The total annual number of iatrogenic deaths is 783,936 [*Iatros* means *physician* in Greek; and *-genic*, meaning *induced by*, or *caused by*, is related to the Latin word, *genus*. Combined, they become *iatrogenic*, meaning *physician-induced*. *Iatrogenic disease* is disease which is caused by a physician or, more broadly, by medical treatment — Ed.]. When compared with

the 2001 heart disease annual death rate of 699,697 and the annual cancer death rate of 553,251 it is evident why the authors of the paper, “Death By Medicine” (Carolyn Dean, MD, ND; Martin Feldman, MD; Debora Rasio, MD; Dorothy Smith, PhD; Gary Null, PhD), conclude that “the American medical system is the leading cause of death and injury in the United States”.

What’s more, adverse events from antibiotics cause an estimated 142,000 emergency department visits per year in the United States, according to a study published in the September 15, 2008 issue of **Clinical Infectious Diseases**. “This number is an important reminder for physicians and patients that antibiotics can have serious side effects and should only be taken when necessary,” said study author Daniel Budnitz, M.D., at the Centers for Disease Control and Prevention (CDC).

Antibiotics can put you in the emergency room. Common antibiotics, the ones most frequently prescribed and regarded as safest, are the cause

for nearly half of emergencies due to antibiotics. People in the prime of life are especially at risk. The study authors reported that “Persons aged 15-44 years accounted for an estimated 41.2 percent of emergency department visits.” They also found that nearly 80% of antibiotic-caused “adverse events” were allergic reactions. Overdoses and mistakes, by patients and by physicians, make up the rest. Allergic reactions to antibiotics can be very serious, including life-threatening anaphylactic shock.

Whoever thought that there would come a time when one would run the risk of becoming more sick when *leaving* a hospital than at the time of entering? Unfortunately, in addition to the observations made by Dean, Feldman, et al. (see above), the situation has become even *more* of a terrifying reality due to the growing problem of hospital-acquired infections, many of which involve the drug-resistant bacteria we’ve already mentioned. The U.S. Centers for Disease Control (CDC) studied hospital-acquired infections recorded in 2002. These infections are known in the business as “nosocomial” infections [*Nosocomial* is from two Greek words which roughly translate to *disease while under care* — Ed.]. It found 1.7 million of these, resulting in 98,987 deaths. There is good reason to assume the possibility that these numbers have been underreported. And, there is good reason to assume the possibility that these numbers are much higher today than they were back in 2002.

Bottom line, hospital care is becoming hazardous to one’s health. Imagine being a physician having to face a situation in which your patient has gone into the hospital for elective surgery and contracts an infection caused by some Superbug which has made itself at home in and around the hospital and for which there is no known antibiotic cure!

Germ that once required moisture now survive on paper, dry fabrics, countertops and other surfaces. Germs once dependent on a living host can go dormant on inanimate objects for weeks before flashing back to life upon contact with human skin. Drug-resistant microorganisms now contaminate bedrails, catheter lines, blood pressure cuffs, monitoring equipment, ventilation systems, etc., including name tags and the unwashed or carelessly-washed hands of doctors, nurses and orderlies. Dr. Louis Rice has even gone so far as to describe Intensive Care Units (ICUs) in American hospitals as “toxic waste dumps”!

Take MRSA, for example: The **Journal of the American Medical Association** published a startling study of data from nine U.S. cities and estimated that in 2005, MRSA caused serious invasive infections in 94,360 hospital patients; 18,650 of them died. That means MRSA killed, or at least contributed to the deaths of more people in 2005 than HIV/AIDS, Parkinson’s disease, or emphysema! MRSA (as well as other bacteria we have mentioned) has become an *environmental* pathogen. It has now taken up residence in many hospitals here in the U.S., Canada, England and Australia, as well as hospitals in other locations around the world.

MRSA has been found to survive for 11 days on a plastic patient chart, more than 12 days on a laminated tabletop and 9 days on a cloth curtain. It has been shown that when a doctor or nurse enters a patient’s room, they can be carrying MRSA on their ID tags and nameplates. It has been cultured from hospital ventilation grills and can be distributed via the hospital’s ventilation system.

Research indicates Methicillin-resistant *Staphylococcus aureus* can survive for days and often weeks on common surfaces like keyboard covers, acrylic fingernails, even bed linen. Scientists inoculated two strains

of MRSA onto samples of such surfaces. Over the next eight weeks, the remaining bacteria were counted. It was found that MRSA can survive for five days on bed linen, six weeks on computer keyboard covers, and eight weeks on acrylic fingernails.

In a similar study, researchers from Chicago’s Northwestern Memorial Hospital contaminated keyboards with three types of bacteria: *Pseudomonas aeruginosa* (PSAE), Vancomycin-resistant *Enterococcus faecium* (VRE), and Methicillin-resistant *Staphylococcus aureus* (MRSA). Results showed that while PSAE survived for one hour, VRE and MRSA both survived up to 24 hours on keyboards. When volunteers touched the contaminated keys, PSAE spread 18% of the time, VRE spread half of the time, and MRSA spread to hands 92% of the time. Further testing carried out in the UK indicates that if someone has MRSA on their hands, the bacteria will be left on the next four surfaces they happen to touch.

Studies show that nearly 75% of patients’ rooms are contaminated with MRSA and 69% with VRE. In one study, 42% of gloves worn by hospital personnel who had no direct patient contact but who touched contaminated surfaces became contaminated.

A study in **Infection Control and Hospital Epidemiology** documents that if you’re placed in a room previously occupied by a patient with MRSA, your risk of infection increases because the bacteria linger on floors and furniture long after the patient carrying these bacteria is discharged [The same would apply to other Superbugs we’ve mentioned in this Report — Ed.].

What’s more, recent research has now shown that disinfectant wipes may actually *spread* drug-resistant, deadly Superbugs in hospitals, nursing homes and other health care facilities. Gareth Williams, a microbiologist at Cardiff University in Wales, said the wipes, which are routinely used in hospitals, killed some bacteria. However, the study of intensive care units at two Welsh hospitals showed they not only didn’t do a thorough job of killing pathogens but the wipes had a high risk of carrying them to other surfaces. The researchers found that instead of using a wipe only once on one surface, hospital workers routinely tend to clean several surfaces near patients, such as vital sign monitors, tables and bed, wiping all with a single wipe, which can move the infectious bacteria around rather than destroying them.

* * *

“Jackpot Justice”

Because they’re terrified of lawsuits, hospitals are reluctant to be completely transparent when it comes to providing reliable and accurate statistics concerning their almost uncontrollable problem with the growing variety of drug-resistant Superbugs. Experts on the subject suspect there is significant under-reporting of hospital-acquired (“nosocomial”) infections.

Never far from the smell of blood in the water, hungry legal sharks are becoming more and more aware that hospitals and other healthcare facilities provide them with a promising place to hunt for negligence lawsuit opportunities. In fact, this could be the biggest “Jackpot Justice” opportunity since asbestos litigation. Ac-

cording to Dr. Betsy McCaughey, former Lieutenant Governor of New York State and Founder/Chairman of the Committee to Reduce Infection Deaths, “Hospital infections could be the next asbestos, the next major cause of class action lawsuits”.

With nearly 100 million procedures performed at hospitals each year, litigation arising from nosocomial infections is increasing nationwide. Especially since many, if not most of these infections are often transmitted through direct contact as a result of breaches of hospital infection control practices and procedures. Despite their training, for example, many health care workers, including doctors and nurses, often fail to even wash their hands between patients, according to several studies. Most hospitals tell doctors and nurses to clean their hands, yet doctors break this fundamental rule 52% of the time, on average. Poor hygiene practices by the hospital staff, inadequately sterilized instruments, unclean environmental surfaces, aerosol droplets from other ill patients, or even the food or water provided at hospitals are all fair game when it comes to possible negligence lawsuits.

We are just seeing only the beginning of class-action litigation. Although hospitals will be a primary target, litigation is sure to spread to other areas. Because a significant and growing percentage of the U.S. population has already been colonized with various Superbugs, healthcare providers, clinics, health clubs, school systems, universities, prisons, etc. would be well-advised to prepare for a coming wave of lawsuits.

Winning a lawsuit is small consolation if you end up permanently damaged from a drug-resistant, nosocomial infection. **The bottom line here is that you want to do everything you can to keep yourself and your loved ones out of hospitals, medical clinics and other healthcare facilities. This includes some managed care retirement homes and, most certainly, nursing homes** (1.6 million people live in nursing homes; two out of every three nursing home residents receive at least one course of antibiotics annually; 250,000 nursing home resi-

dents have infections and more than one out of ten of these have antibiotic-resistant infections).

If you or a loved one have to enter one of these increasingly risky environments, you need to do what you can

to keep them from becoming a victim [Make sure you pay close attention to the specific recommendations we provide later on in this Special Report — Ed.].

* * *

And the Cavalry Isn't Coming...

“The pipelines of most Big Pharmas are bone dry; last year, the FDA approved the lowest number of new drugs (19) since 1983...”

— **Louis Basenese**, Contributing Editor, The Oxford Club

“Dutch research has shown that the development of permanent resistance by bacteria and fungi against antibiotics cannot be prevented in the longer-term. The only solution is to reduce the dependence on antibiotics by using these less.”

— **Siemen Schoustra**, Laboratory of Genetics
Wageningen University and Research Centre

“We are struggling, really struggling, to treat patients around the world. If something isn't done soon, more and more bugs are going to gain the upper-hand. There are simply not enough new drugs to keep pace with antibiotic-resistant bacterial infections. We are sounding the alarm, and hopefully the world will hear it.”

— **Barbara Murray, MD**, Director, Division of Infectious Diseases
University of Texas Medical School at Houston

Despite the increasing threat posed by bacteria resistant to standard antibiotics, the major pharmaceutical companies are withdrawing from research into antimicrobial drugs. The number of new antimicrobial drugs approved by the FDA, the U.S. agency responsible for authorizing the marketing of pharmaceuticals, has fallen significantly: 16 were approved between 1983 and 1987; 14 between 1988 and 1992; 10 between 1993 and 1997; and 10 more in the five-year period, 1998-2003. In 2003, the number of new anti-infection agents submitted to the FDA for testing fell by 10 percent from the year before, an indication that the long-term trend is likely to continue.

In 2001, Eli Lilly and Bristol-Myers Squibb stopped work on developing new antimicrobial drugs. Other major drug companies are reported to be

about to do likewise. The pharmaceutical companies have replied to the criticism of their research decisions by complaining about the costs associated with getting government approval to market new antibiotics. According to Dr. Henry Masur, “The cost of drug development is astronomical, the market is not nearly as enticing as markets that involve drugs that must be taken for a lifetime rather than days or weeks, and there is considerable pressure to reduce prices.”

Since experience to date has shown that pathogenic microorganisms will inevitably acquire resistance to any new antibiotic drug companies might introduce, it's only a relatively short time before sales volume and profits begin to fall off. What's more, new drugs that combat resistant bacteria are often held in reserve by doctors to treat only the most stubborn infec-

tions, so they aren't big earners, either. And unlike drugs which must be continually taken over the long-term for chronic illnesses, when an antibiotic proves effective the result makes for a very short-term customer. Because they can make larger profits by developing other sorts of drugs, the pharmaceutical companies are cutting back on antibacterial research. There is very little economic incentive for them to pursue research in this arena.

Meanwhile, however, the problem continues to grow. **And even though**

the forecast looks bleak for antibiotics, vaccines and antivirals, we're not ready to throw in the towel. We think there is good reason to believe that Therapeutic Grade, pure Essential Oils are an easily accessible, highly-effective alternative which could very well turn out to be a timely, powerful, complementary weapon for us to use in the escalating Microbe Wars. Keep reading...

* * *

An Essential Alternative

“Infectious microbes do not appear to become accustomed to the essential oils as they do to the many forms of treatment using antibiotics... Clearly, the administering of essential oils by fine aerosol spray should be common practice in sick rooms, operating rooms and clinics.”

— Jean Valnet, MD

Although the powerful medicinal value of Therapeutic Grade Essential Oils is only now being rediscovered by modern medical science, it has actually been known for centuries. In fact, essential oils were considered more valuable than gold by ancient cultures, due to their phenomenal healing properties. Dr. Jean Valnet, author of **The Practice of Aromatherapy: A Classic Compendium of Plant Medicines & Their Healing Properties** states, “In recent years both doctors and the public have re-discovered the medical value of essential plant oils, but the idea of using their properties to maintain or regain health goes back to antiquity... The Romans had their knowledge of essential oils from the Greeks, who in turn had received it from the Egyptians... Hippocrates, for example, tackled the plague epidemic in Athens by fumigating the whole city with aromatic essences of plant oils. Later, in the 19th century, it is known that perfumery workers always showed an almost complete immunity during cholera outbreaks.”

The plant kingdom has been and continues to be the subject of an enormous amount of research and discovery. At least 30% of prescription drugs in the U.S. are based on naturally occurring compounds from plants [When the “active component” of the plant is isolated, pharmaceutical companies modify it slightly in order to be able to patent it. Unfortunately, this modification is rarely, if ever, an improvement upon nature — Ed.].

Usually extracted through a distillation process and derived from the flowers, leaves, wood, bark, roots, seeds or peel of various plants, Therapeutic Grade Essential Oils are highly-concentrated, volatile, pure, aromatic plant essences containing the chemical principle of the plant, often possessing formidable antibiotic, antiviral and antifungal properties. The oils contain virtually *all* of the plant's healing nutrients, oxygenating molecules, amino acid precursors, coenzyme A factors, trace minerals, enzymes, vitamins, hormones and more. And **because es-**

sential oils are so highly concentrated, most of them are at least 50 times more therapeutically potent than the herbs or plants from which they are derived.

This is important information to grasp. When you consider, for example, the proven healing powers of various herbs, you can't help but see why pure essential oils are known to have even greater therapeutic properties. For example, when herbs are cut and dried for human therapeutic use, they can lose all the way up to 90% of the healing nutrients they originally contained. Not so with Therapeutic Grade Essential Oils. Essential oils are the healing life of the plant—but in concentrations 50 times more powerful than what you could get even if you ate the herb or plant raw! Incredible as it may seem, recent research shows that pure essential oils placed anywhere on the body will penetrate virtually every cell of the body within 21 minutes. This stands in marked contrast to the average of 13 to 23 hours for the therapeutic constituents of dried herbs to reach the cells of the human body after ingestion.

Dr. Valnet, the well-known French medical researcher and authority on essential oils, has pointed out that **pathogenic microorganisms such as viruses and bacteria do not become resistant to essential oils as they do to modern-day, synthetic antibiotic drugs.** He states, “Infectious microbes do not appear to become accustomed to the essential oils as they do to the many forms of treatment using antibiotics. This is very important. Antibiotics are certainly powerful weapons, but they can be dangerous and are easily and often misused... Indeed, quite apart from the abusive use of antibiotics, the dramatic increase recently in the resistance of pathogenic microorganisms to all types of antibiotics, sometimes even the latest ones, is well known. [However] we are finding that the effects of the same oils re-

main almost unchanged...The results remain the same; they do not lessen over any length of time.”

One reason viruses and bacteria cannot mutate and develop resistance to Therapeutic Grade Essential Oils is because of the many chemical constituents that make up essential oils. Synthetic antibiotics are made by isolating one or two single molecules and are thus far easier for a pathogen to negotiate than the multiple, chemical constituents which make up a Therapeutic Grade Essential Oil.

Unlike the relatively simple, one-dimensional, synthetic antibiotics, essential oils and oil blends are complicated, multifaceted mosaics of *hundreds*—sometimes, even *thousands*—of different, naturally-occurring compounds. Any given essential oil may contain anywhere from 80 to 300 or more different chemical constituents. While being able to attack pathogens simultaneously on multiple fronts, Therapeutic Grade Essential Oils provide no opportunity for pathogens to mutate around them because of this complexity.

What’s more, while many of the constituents of an essential oil exist in minute quantities, *all* of them contribute in varying degrees to the oil’s therapeutic effects. This is called *synergy*. It involves the working together of multiple components so that the dynamic effect of the whole is greater than the working “sum of the individual parts”. Increasingly, studies are finding that whole plant formulas exhibit synergistic actions in which certain compounds potentiate the effects of others. This is why there have been so many failed attempts to isolate single, active compounds from medicinal plants. Often, the “active ingredient” of a plant has to be activated by at least one or more other components contained in the same plant. Removing the active ingredient from its living context of other naturally-occur-

ring, chemical constituents can often render it ineffective.

According to Dr. Valnet, the essential oil from thyme literally destroys the anthrax bacillus, the typhoid bacillus, the glanders bacillus, staphylococcus, the diphtheria bacillus, meningococcus, and Koch’s bacillus, which is the bacteria responsible for tuberculous lesions.

He says, “The essence of lemon is second to none in its antiseptic and bactericidal properties. The works of Morel and Rochaix have demonstrated that the vapors of lemon essence alone will neutralize the meningococcus in 15 minutes, the typhus bacillus in less than an hour, pneumococcus in one to three hours, staphylococcus aureus in two hours and hemolytic streptococcus in three to twelve hours. Applied directly, the essential oil itself neutralizes the typhus bacillus and staphylococcus in only five minutes and the diphtheria bacillus in just 20 minutes.”

Until recently, the bulk of research on the therapeutic properties of essential oils has been carried out in Europe and the Middle East, most notably France, Egypt and Israel, each country having a rich, centuries-old history of the use of various essential oils for therapeutic purposes. It has been these scientific studies which have finally jolted a small number of far-sighted researchers within the American medical and scientific community to begin to take note of the incredible antimicrobial power of essential oils, particularly in light of the growing threat of today’s deadly, antibiotic-resistant microorganisms.

In tests conducted in France by Professor Griffon, Director of the French Police Toxicology Laboratory, the antiseptic effect of a blend of essential oils—including pine, thyme, peppermint, lavender, rosemary, cloves and cinnamon—was studied in order to test the ability of the oils to purify the air of harmful disease-causing bacte-

ria. First, Professor Griffon set up a number of Petri dishes approximately 15cm from ground level in an open room, allowing them to stand for 24 hours, the germs from the air being collected naturally as they settled into the open Petri dishes. After 24 hours he analyzed the dishes, finding them to contain 210 colonies of various microbes, including numerous molds and staphylococci. He then sprayed the mixture of essential oils in the form of an aerosol into the air in the room.

After only 15 minutes, only 14 colonies of microorganisms out of the original 210 were left alive. After 30 minutes, only four colonies of the original 210 were left. Importantly, all of the potentially harmful disease-causing molds and staphylococci had been killed within the first 30 minutes.

In another French experiment, the number of pathogenic microorganisms in various locations were measured. In a forest, there were found to be five pathogenic microorganisms in the air for every one cubic meter. In an average apartment, there were found to be 20,000 microbes in the air per cubic meter. In public stores, there were found to be 9,000,000 microbes in the air per cubic meter. On the top of a work table there were found to be 5,000,000 microbes per square meter. On a carpet, 9,000,000. And in the air of a large hospital there were found to be on average 10,000 microbes per cubic meter. According to Dr. Valnet, when an inquisitive doctor put some of the microbe-laden air from the hospital into a flask containing just a few drops of essential oils, **40% of the microbes were destroyed in only 20 minutes, 80% in an hour, and 100% in nine hours!** Dr. Valnet concluded, **“Clearly, the administering of essential oils by fine aerosol spray should be common practice in sick rooms, operating rooms and clinics.”**

Spurred by the French research, recent studies conducted here in the United States have confirmed the powerful antimicrobial actions of essential oils. In one recent research demonstration, Petri dishes were used in which the medium had been infected with various pathogenic bacteria. Then, three very small round pieces of paper [About the size you'd get from a hole punch — Ed.] were placed in the infected medium of each dish. One piece of paper in each dish had been infiltrated with Penicillin or Ampicillin. The other two pieces were infiltrated with the essential oils of cinnamon and oregano. When left to incubate, a dark shadow would appear around the pieces of paper where the bacteria in the medium were being destroyed. The diameter of the dark circle around each tiny piece of paper was indicative of the kill ratio of the antibiotic or essential oil. The test results were dramatic. In each case, the essential oils proved to be many times more effective at killing the pathogenic microorganisms than the antibiotics! Moreover, when the amount of antibiotics placed on the paper dots were increased, their effectiveness did not increase, but remained the same. But when the amount of oils placed on the paper dots was increased, their effectiveness soared!

Scientists at the University of Manchester in England have recently found that three essential oils destroyed MRSA. Dr. Peter Warn, who was involved in the research, told the BBC that when he tested the oils in the lab, "...absolutely nothing grew. Rather than stimulating bacteria and fungi, the oils killed them off."

In a paper titled, "**In Vitro Antibacterial Activity of some Plant Essential Oils**" researchers evaluated the effectiveness of 21 essential oils against strains of *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Proteus vulgaris*, *Bacillus subtilis* and *Staphylococcus aureus*. Out

of the oils tested, the paper reports "...19 oils showed antibacterial activity against one or more strains. Cinnamon, clove, geranium, lemon, lime, orange and rosemary oils exhibited significant inhibitory effect. Cinnamon oil showed promising inhibitory activity even at low concentration..."

A research paper out of Weber State University, Ogden, UT ("**Effect of a Diffused Essential Oil Blend on Bacterial Bioaerosols**") reports on a "proprietary blend of oils containing **cinnamon, rosemary, clove, eucalyptus, and lemon**" that was tested for its antibacterial activity against airborne *Micrococcus luteus*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*. The bacteria cultures were sprayed in an enclosed area and the essential oil blend was diffused for a given amount of time. Researchers observed an 82 percent reduction in *M. luteus* bioaerosol, a 96 percent reduction in the *P. aeruginosa* bioaerosol, and a 44 percent reduction in the *S. aureus* bioaerosol following only a brief, 10 minutes of exposure. In a similar experiment, one analysis showed a 90 percent reduction in the number of *Micrococcus luteus* organisms after diffusing for 12 minutes. After 20 minutes of diffusing, the kill-rate jumped to 99.3 percent. Another study against *Pseudomonas aeruginosa* showed a kill rate of 99.6 percent after just 12 minutes of diffusion. Researchers concluded that "Diffusion of the oil blend...can significantly reduce the number of aerosol-borne bacteria."

The Thieves Solution

The essential oil blend of cinnamon, rosemary, clove, eucalyptus and lemon mentioned in the research paper above is the well-known "**Thieves Formula**" and is based on an historical account of a small band of thieves in England who protected themselves with clove, rosemary, and other aromatics while robbing victims during the Black Plague. While the

plague was killing millions of people throughout Europe, these thieves had been entering the homes of victims, stripping the dead bodies of money, jewelry and anything else of value that could be found. Although the plague was highly contagious, not one of this morbid band ever contracted the dread disease, even though their thefts had put them in constant daily contact with the dead bodies.

When the King heard about this, he demanded to know how the thieves had avoided contracting the plague. A trap was laid and the thieves were apprehended. In exchange for more lenient punishment, they explained to the King and his court that they were all members of the same family, a family from a long lineage of apothecaries. Because of their intimate knowledge of the healing arts, passed down from generation to generation, they were familiar with a combination of specific plant oils that, when rubbed over the human body, would protect one from succumbing to this most feared and deadly disease. They told of a special concoction of aromatic herbs, including cloves and rosemary, that they rubbed on their hands, ears, and temples and gave the King the formula. With that vital information in hand, he was thereby able to protect himself and his family from the deadly plague.

It is said that the recipe for the "thieves oils" can still be found in the Royal English Archives to this day. What's more, this story is not at all that unusual. In fact, it is widely known that many perfumers and tanners in 17th century England were also able to escape the Black Plague due to the fact that the powerful, sweet-smelling plant oils used in the making of various perfumes and in the scenting of leather goods exhibit phenomenal antimicrobial properties. Both the perfumers and the tanners who traditionally scented their hand-made leather gloves with perfumes before

selling them, were protected by the antimicrobial actions of the plant oils in the perfumes they were constantly exposed to in their daily work.

History further reveals that virtually the entire village of Bucklersbury, England was spared from the plague, even while the residents of other towns in close proximity were dying in droves. Historians believe this was no fluke since the trade in medicinal plants, controlled by the Grocers' Company, operated out of Bucklersbury. The town was full of apothecaries. What's more, it was the center of

the European lavender trade. Lavender is a plant the essential oil of which is widely used in making perfume. But more importantly, the oil of lavender has long been known to have powerful disease-fighting properties. In fact, recent scientific and medical research has proven that the essential oil of lavender has immune-stimulating and antimicrobial properties that rival, and even surpass, many modern antiseptic chemicals and antibiotic drugs.

* * *

How to Use Therapeutic Grade Essential Oils

Today, the “Thieves Formula” is a proprietary blend of Therapeutic Grade, 100% organic, aromatic Essential Oils containing Cinnamon Bark (*Cinnamomum verum*), Clove (*Syzygium aromaticum*), Lemon (*Citrus limon*), Eucalyptus (*Eucalyptus radiata*), and Rosemary (*Rosmarinus officinalis* CT 1,8 cineol). It is this particular essential oil blend that we urge you have on hand and use daily from this point forward. We give you more details and recommendations, below...

There are a number of ways to use Therapeutic Grade Essential Oils the two most popular being **diffusion** into the air, and **direct application** onto the skin. Before we discuss these methods, we need to explain what we mean by “Therapeutic Grade” and how important it is that you only use this category of Essential Oil...

About 98% of essential oils produced in the world today are *not* intended for serious, therapeutic and/or medicinal use. Most are produced for the perfume, cosmetics and food industries. Therefore, criteria like purity, potency, organic, etc. are not important for these uses. Because the raw materials and the extraction process for Therapeutic Grade Essential Oils are so expensive, many oils on the market have been cut, diluted and adulterated in various ways. Sad to say, some marketers bottle these poor quality oils

and sell them for therapeutic purposes to unsuspecting consumers.

A Therapeutic Grade Essential Oil is more than a “certified organic” oil. It is an oil that is complete in the makeup of its constituents, having the fragrance, frequency and chemistry that are necessary to give it all of its unique, therapeutic qualities and effects. As we have already mentioned above, a quality, Therapeutic Grade Essential Oil is chemically complex and all of its sometimes fragile components need to be present after distillation of the final product. This requires not only a lot of understanding of the makeup of the oil on the production side but also a great deal of time and expense to care for the proper species of plant.

To insure proper potency, plants should be grown on virgin land, un-

contaminated by chemical fertilizers, pesticides, fungicides or herbicides and away from pollution sources. The plant materials must be kept free of petrochemical herbicides and pesticides, since these can react with the essential oil during distillation. The soil should be conditioned with enzymes, trace minerals, and organic bio-solids, since plants lacking in certain minerals and nutrients yield oils low in therapeutic value. Irrigation should be done with reservoir, watershed or mountain stream water. Plants need to be harvested at the proper time of the season to insure highest potency. Sometimes even a few hours can make the difference. For example, German Chamomile needs to be harvested in the morning since it then yields an oil with far more azulene than when it is harvested later in the day.

The steam distillation method of extracting the oils from the plants requires careful and proper low temperature and pressure monitoring. Too high of temperature or too much pressure can be deleterious to the fragile aromatic molecules of the plant. In addition, batch sizes need to be kept small and the distillation chamber must be made out of food-grade stainless steel instead of copper or aluminum to avoid reactions with the oils.

Producing pure, Therapeutic Grade Essential oils is a costly venture. The methods required are time-consuming and labor-intensive, and it often requires several hundred, sometimes even *thousands* of pounds of raw plant material to produce a *single* pound of essential oil. For example, it takes *5,000 pounds* of rose petals to produce *one pound* of rose oil, and it takes *three tons* of Melissa to produce *one pound* of oil [Which is why Therapeutic Grade Melissa Oil sells for more than \$10,000 per kilo — Ed.].

In view of the seriousness of the threat we've laid out for you in this Special Report, you simply don't

want to take the risk of using anything but the finest Therapeutic Grade Essential Oils. We would never want to take the chance of buying essential oils off the shelf of even some of the better retailers. Never. And neither should you.

Diffusion

Diffusion of Therapeutic Grade Essential Oils into the air of an enclosed space (such as a house or office) is popularly called aromatherapy. That's because the highly aromatic, sweet-smelling molecules of the essential oils are distributed throughout the room air and are subsequently breathed into the human body, at which point they trigger numerous immune-boosting, healing, relaxation or stimulation responses depending upon the specific oils being inhaled. Dr. Valnet points out that whether applied directly, or inhaled, essential oils have virtually the same therapeutic impact. **The body's response time to inhalation of essential oils can be as quick as one to three seconds!** This is why, for many people, diffusion is the preferred method of use of the Therapeutic Grade Essential Oils.

According to Gary Young, perhaps the world's foremost expert on the subject of Essential Oils, here's how inhalation of the essential oils works: "The integral part of the nose responsible for odor detection is the olfactory, consisting of two membranes, one on each side of the mucous membrane covering the bony extension of the nose. The olfactory membranes are very tiny and are well protected by the casing of the nose. They contain about 800 million nerve endings for detecting and processing odorous molecules. These receptors are so small, that they are only visible through an electron microscope on high magnification. The nerve endings are triggered from a signal from the genes along the inside passage of the nose. The olfactory hair-like nerves receive

the micro-fine, vaporized oil particles, carrying them along the axon of the nerve fibers, connecting them with the synapse of the secondary neurons in the olfactory bulb. The nerve from the olfactory bulb extends back toward the mid-brain, which is a direct extension of the limbic system of the brain. The impulses carried to the limbic system and the olfactory sensory center at the base of the brain pass between the pituitary and pineal gland, and then to the amygdala, and on to the gustatory center."

Throughout this complex route, the oil molecules trigger millions of electrical and chemical signals and impulses that form coded messages which are then dispatched to various areas of the body. This is one reason why oil inhalation tends to increase the production of endorphins (the body's natural pain relievers and mood elevators), as well as neuro-transmitters and antibodies, thereby dramatically boosting the immune system, creating an overall sense of well-being and increasing the general state of health for the entire body.

Moreover, when essential oils are diffused in a home or office, they purify the air itself by removing toxins, metallic particles and other harmful microscopic debris. They also increase the atmospheric oxygen of the air, and boost levels of beneficial ozone and negative ions which dramatically inhibit the growth and reproduction of airborne pathogens. Further, as the molecules drift to the various surfaces of each room (i.e., ceilings, floors, walls, tiling, curtains, countertops, furniture, appliances, etc.), they rapidly kill virtually all pathogenic bacteria, viruses, molds and fungi with which they come into contact. And lastly, they completely destroy odors from mold, cigarettes, household pets, and more.

Perhaps the most popular and effective method of diffusing oils is to buy

a small appliance called a **diffuser**, which distributes an ultra-fine mist of the essential oils of your choice into the air. The millions of tiny droplets produced by a high-quality diffuser are so fine they can hang in the air of your house literally for hours, spreading from room to room via the normal air circulation that occurs as you walk through your house.

Diffusing oils into a room where someone is sick with a cold or flu can cut their downtime by half or more. According to the experts, recovery can be accelerated by as much as 70%! And regular diffusion of essential oils can practically eliminate your normal change-of-season bouts with colds or flu. According to Dr. Valnet, "Many essences (e.g. cinnamon, pine, thyme, lemon) have marked effects on influenza, and patients treated with these essences seem to get through the winter without trouble."

Direct Application

As mentioned earlier in this report, direct application of essential oils to any area of the human body results in almost immediate penetration of the cells of the body [Believe it or not, in addition to the application of the oil or oil blend directly on or over the affected area, one of the most effective and efficient means of application of the oils is to specific areas on the bottoms of the feet — Ed.]. In as little as 21 minutes, virtually every cell of the body will have been penetrated by the oil, regardless of where the oil was applied. Furthermore, the essential oils carry their oxygen molecules and micronutrients right into the cells with them, nourishing and oxygenating in an extraordinarily efficient manner unmatched by any other product on earth. Of course, anytime your cells get the vital nutrients and oxygen they need, they become more robust, healthy and resistant to illness and disease.

* * *

Recommended Action

In light of the emergence of the growing host of multi drug-resistant pathogens and the decreasing, almost hopeless, ability of antibiotics to fend them off, it is our considered opinion that you should start purchasing and regularly use Therapeutic Grade Essential Oils. Do this as soon as possible. Do it NOW. You should diffuse essential oils into your room air (especially important if you or a loved one is in the hospital) and apply them directly on your body, daily.

In addition to a wide variety of individual oils and oil blends, a number of Therapeutic Grade Essential Oils distributors offer a whole line of products containing the **Thieves Formula** which, as we stated earlier, is a proprietary blend of Therapeutic Grade, 100% organic, aromatic Essential Oils containing Cinnamon Bark, Clove, Lemon, Eucalyptus, and Rosemary. Even though the ingredients in the **Thieves Formula** are, among other things, highly-potent anti-microbials, most people find **Thieves** to have a very pleasant aroma and welcome it.

We recommend that, at the very minimum, you start buying, stocking and using Thieves Formula products such as: Thieves Therapeutic Grade Essential Oil Blend; Thieves Foaming Hand Soap; Thieves Waterless Hand Sanitizer; Thieves Spray; and, Thieves Household Cleaning Solution.

There are lots and lots of applications for these **Thieves Formula** products that will help to protect you from many of the pathogens we have described in this report. Here are just a few examples—

Apply a few drops of the Thieves Therapeutic Grade Essential Oils to the bottoms of your feet, daily. Diffuse the oils into your room air. If you or a loved one are in the hospital, be sure to set up a diffuser in the room and diffuse the Thieves Oils off and on throughout the day (special Diffusers for essential oils are available which are ideal for this use). Place a bottle of Thieves foaming hand soap at your kitchen sink and near each bathroom sink (lay down the law with your

family, insisting that everyone practice frequent hand-washing). Carry a bottle of the Thieves hand sanitizer or Thieves spray in your pocket, purse and car. The hand sanitizer and the spray come in small, conveniently-sized bottles for this kind of application. Use the Thieves waterless hand-sanitizer throughout the day since you will be touching and handling all kinds of potentially contaminated surfaces. Use the Thieves spray on grocery carts, workout room equipment, restroom doorknobs, faucet handles,

toilet-seats, eating utensils and tables in restaurants, etc. Use the Thieves cleaning solution to clean countertops, bathroom fixtures and other hard surfaces; use it in your dishwasher along with your regular soap; put it in your washing machine when you run a load of clothes.

There are many other important ways to use these Thieves products and other particular Therapeutic Grade Essential Oils and Blends to help you insure your protection and continued health. Although space is limited here, subscribers can find more information (“**101 Uses for Thieves Antimicrobial Products**”) on our website plus a Special Report on critical things you need to do in order to survive a stay in the hospital (www.biotechnews.com).

* * *

A Final Word

We personally use a number of different Therapeutic Grade Essential Oils and Blends on a daily basis and would never want to be without them. They have become a daily routine of life for us for almost 15 years now and in a number of instances, they have already been real life-savers. **But now their importance to us is greater than ever.**

Hopefully, we’ve helped you to see that nearly *everywhere* you go these days and nearly *everything* you do potentially expose you to microscopic enemies that weren’t worth worrying about a generation ago. **Now, however, you should be concerned.** Hopefully, we’ve convinced you that **this threat is real, and soon it will likely overwhelm the ability of conventional medicine to deal with it.** And, hopefully, you now understand that placing your hopes on contemporary medicine to successfully handle the matter should you or a loved one become infected is wishful thinking at best. It’s time to look “outside the box” for additional help and protection. NOW is the time for you to take steps that may very well save your life

someday in the near future. We think it’s a solid bet that Essential Oils will once again turn out to be worth far more than their weight in gold. For the sake of your life and that of your loved ones, you should invest in Therapeutic Grade Essential Oils TODAY.

* * *

**Subscribe/Renew NOW
and SAVE \$100!**

**Click Here for More
Information**

www.biotechnews.com

Brought to you by

Aroma-Essence.com

Maria Schasteen

ID#54980