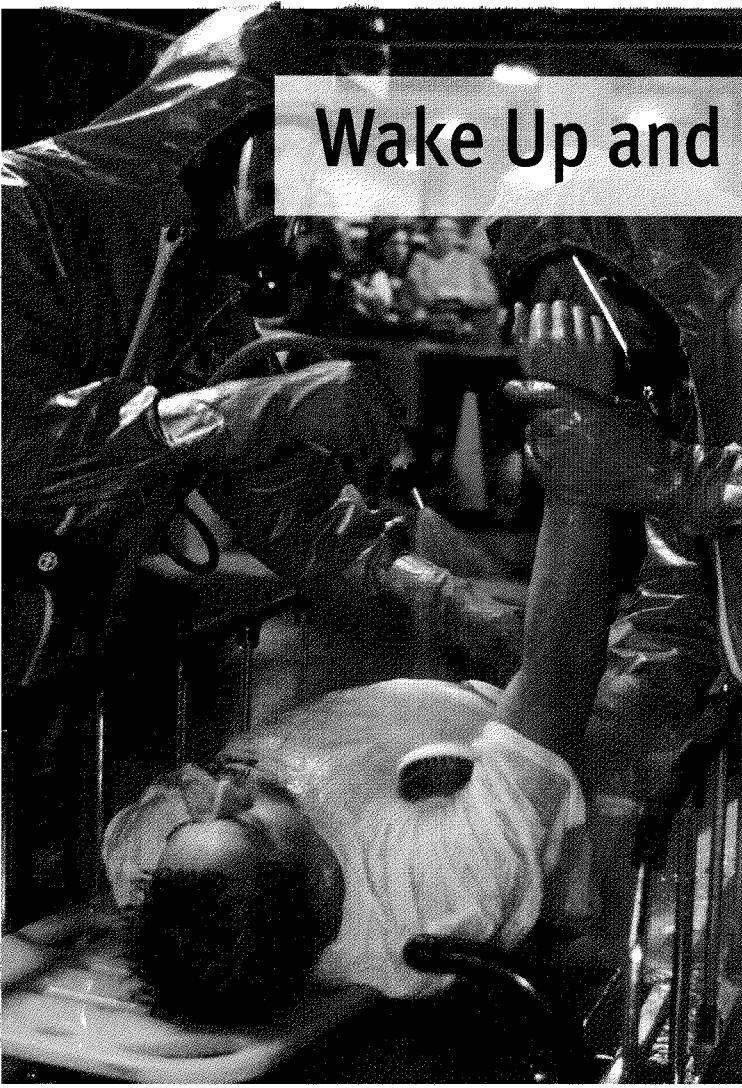# Wake Up and Smell the Bio Threat

By Scott Gottlieb

I n August 1999, four New York City residents showed up at hospital emergency rooms complaining of headaches and dizziness. A few became paralyzed. Doctors were stumped. Botulism? A rare nerve inflammation? Scans eventually revealed that the patients all had encephalitis—an inflammation of the brain.

Eight cases and another two weeks later, the Centers for Disease Control came up with a diagnosis: St. Louis Encephalitis, a viral disease transmitted by mosquitoes. Publicly, the CDC and local health agencies stuck with their diagnosis. Privately, scientists were skeptical: They tested mostly for standard diseases, not rare ones.

CDC scientists continued their research. Doctors didn't crack the case until birds started to die at the Bronx Zoo. An astute veterinarian sent a few bird brains to a friend at the Department of Agriculture. The samples ended up at CDC headquarters in

Atlanta, where scientists used genetic fingerprinting to discover that it was West Nile Virus—never before detected in North America—that was making people sick. By autumn, a total of 62 people had been diagnosed with the virus, and six had died.

But less than one of every 100 people infected with West Nile actually becomes seriously ill. Only mosquitoes can spread it. America's next viral outbreak, whether natural or an act of bio-terrorism, may not be so easy on us. The official response to West Nile instills little confidence that disaster could be avoided in the case of a bio-terror attack. Right now, everything America has that was designed specifically to counter bio-terrorism is old, expensive, and slow.

The greatest threat probably comes from viruses: They are relatively easy to engineer into designer bio-weapons. Technicians can produce viruses from a rather small collection of DNA. (In July of last year, scientists reported they had created the polio virus from recipes available on the Internet.) Many viruses can also survive for long periods of time outside living cells, especially in a dry state, where they can easily become airborne. There are no antiviral drugs that have the same striking effectiveness and broad attack range that antibiotics do.

Indeed, we might not even know that an attack had occurred for some time. Most bio-terror experts worry about the silent release of an infectious agent of which we have no hint until the incubation period has passed and the terrorists have fled. Then people would come to emergency rooms with non-specific symptoms that may not immediately trigger the right medical diagnoses. So what's required is a good early warning system. Right now, disease surveillance comes in two principal forms. Passive surveillance usually calls on doctors to take the initiative to report suspicious medical cases to state health authorities. Active surveillance asks public health officials to contact doctors directly to gather the data. Both methods share one inherent handicap: By the time people go to the hospital, an epidemic could have already broken out.

Except for food- and water-borne diseases, the U.S. has no comprehensive system for detecting outbreaks of infectious diseases before people start to get ill. Each state decides which diseases to report to the state health department and which information to pass on to the CDC. Often, chaos results. "There's so much noise, we can hardly pick up the signal," says Frederick Burkle of the Defense Threat Reduction Agency at Johns Hopkins University. Even worse, we don't even have the needed technology: About half of state labs can't do the type of genetic testing that ultimately unearthed West Nile.

A bit of progress has been made: The CDC is encouraging

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AP Photo/Nati Harnik

local public health leaders to develop systems for surveying the public for worrisome signs such as unusual diagnoses or spikes in doctor visits—a practice public health officials call syndromic surveillance. New York City has such a system in place: Emergency rooms feed data into a central computer system; software alerts public health officials when it finds clusters of symptoms in one geographic area, unusual combinations of symptoms, or inordinately high numbers of symptoms reported by a particular hospital. Health officials hope to couple these systems with databases that track over-the-counter drug sales (patients often purchase medicine before they decide to go to the emergency room).

Syndromic surveillance is swiftly becoming a mainstay of bio-terror preparedness nationwide. It has also prompted a rash of false alarms, as doctors, trained to spot these syndromes, leap to conclusions they would never have considered before 9/11. On August 4, an emergency room doctor at Beth Israel Hospital in Brooklyn decided that a patient with fever and a skin rash fit the description for smallpox. He activated New York's emergency response system over what turned out to be a mild case of contact dermatitis.

And there is much skepticism about the approach. "Syndromic diagnosis—that's nothing but a big charade," says Dr. C. J. Peters, former head of the CDC's top security lab. "By the time you start getting blips in emergency rooms, it's too late."

President Bush has pledged $11 billion over the next two years to reconfigure the infrastructure of the national health system. The federal government has already spent more than $3 billion to upgrade disease surveillance, expand laboratories, and improve communications abilities. But all of these measures won't much strengthen our ability to detect unusual microbes.

Health officials still focus on tracking downstream markers of disease, the things that happen after people get sick—medicine purchases, strange clinical syndromes, doctor visits. Instead, surveillance systems need to be geared to spotting the microbes themselves, before people have incubated and spread these germs. Some scientists want to develop means for routinely screening blood for the myriad viruses ranging from influenza to designer bugs terrorists might develop. If this kind of surveillance existed, it could provide a national trip-wire for new viral pathogens.

How would it work? Health officials would collect samples of serum from all the blood that ordinary diagnostic labs dispose of daily. A national lab would screen the samples for viruses. That way, health officials could detect infections before people develop symptoms, allowing for quarantines and early medical interventions to control impending epidemics.

This idea is the brainchild of Norman Anderson, a celebrated researcher in vaccine purification and clinical testing who heads the Viral Defense Foundation, and his son Leigh Anderson, the former chief scientific officer at the biotech firm Large Scale Biology. The technology already exists to sequence viruses' DNA—a technique called shotgun sequencing. It was pioneered by Craig Venter, the former chief executive of Celera Genomics,

which mapped the human genome in record time, and has become the mainstay of genomic research. The Andersons' proposal would involve checking each blood sample for viruses and then comparing them to a computer database of known viruses around the world. (It's a similar technique that ultimately led scientists to discover that West Nile Virus was behind the deaths in New York.) Computers could keep count of what has been found in a particular blood sample, and assemble a human virus index to monitor the ebb and flow of different diseases in the population. Any DNA sequences that the computer didn't recognize could be flagged for bio-terrorism monitors. If this technology sounds futuristic, it's not. Oceanic researchers already employ similar procedures to separate viruses from ocean water.

To get a representative sample, researchers would probably need to take blood only from a select group of labs, not all of them. Right now, CDC researchers call up a pre-selected group of doctors scattered across the country to check for any unusual medical cases. This system relies on doctors to spot the early signs and symptoms of something more sinister than ordinary

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influenza. West Nile proved this kind of surveillance slow, and too unreliable to thwart outbreaks. By going straight to blood, the CDC can have early and incontrovertible data.

Alas, public health officials by their very training are averse to such technological solutions, placing their faith in statistics and epidemiology. But these techniques suffer from poor sensitivity, lack of timeliness, and minimal coverage. America's public health establishment must realize that biological weapons exist. As biology moves from a laboratory to a digital science, even unsophisticated hacks can develop dangerous weapons. As terrorists bring increasing sophistication to their craft there's a growing disproportion between our defensive technologies—developed to thwart ordinary illnesses—and the bio-weapons.

The threat of smallpox looms large right now, and policymakers are debating how many vaccine doses to make available. Iraq and North Korea, among others, probably have smallpox samples that could be turned into weapons. If smallpox were released into our cities, officials might have only a few hours to react. By the time the virus is first detected, it could have already spread to hundreds or thousands of close contacts. Sick people will have boarded planes to distant locations, coughed their way through closed buildings, or ridden on subways. That's how pandemics start.

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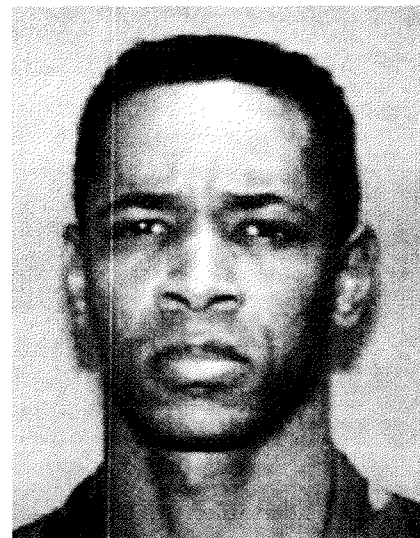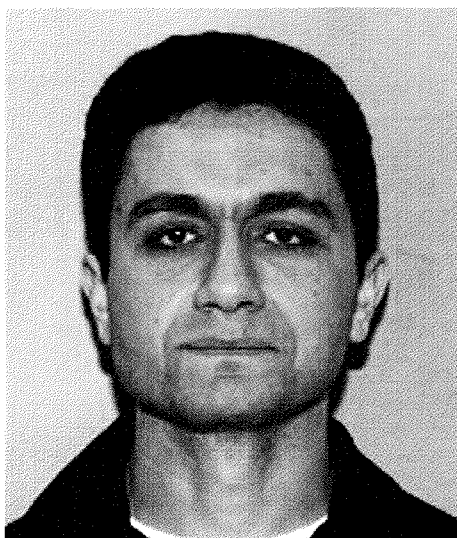
Better Unsafe Than (Occasionally) Sorry?

Meet one of the crusaders blocking intelligent profiling of terrorists

By Scott Johnson

David Harris is the University of Toledo law professor who provided much of the intellectual heft behind the war on racial profiling. His 1999 report for the American Civil Liberties Union, which has filed most of the anti-profiling law suits, was entitled "Driving While Black: Racial Profiling on the Nation's Highways." In 2002 he expanded his argument into a book.

The national ruckus Harris helped stir up has, among other results, made it hard for security personnel to use intelligent profiles to uncover potential terrorists in airports, at our national borders, and at visa offices abroad. That is a mistake that has already come to haunt the U.S. horribly (see sidebar). And so long as anti-profiling crusaders prevent law enforcement officials from carefully applying profiling tools, Americans will continue to be needlessly exposed to potential re-runs of September 11.

Harris and his compatriots are clever enough to present themselves as friends of law enforcement, who are just trying to help the police do a better job. Harris himself purports to object to racial profiling mostly because it's "ineffective." But the reality is that he has launched a broad and misguided attack on America's law enforcement and criminal justice systems. Like most of the activists who have turned the campaign against racial profiling into a crusade, Harris practices a shoddy form of racial politics with which we have become all too familiar.

The thesis at the heart of the anti-profiling complaint—that racial disparities in crime rates and arrests reflect racially biased policing—is torn to shreds by basic criminological

Minneapolis attorney Scott Johnson, an adjunct fellow of the Claremont Institute, has publicly debated David Harris on this topic.

data. David Harris argues that crime rates are equal among racial groups, and arrests, convictions, and incarcerations are unequal simply because police, prosecutors, and courts systematically pick on minorities because of the color of their skin. The logic of his argument ends in a demand for justice by racial quota.

The contention that crime is committed at equal rates by members of various ethnic groups is the central premise of the ACLU's anti-profiling argument. If that premise is false, their argument fails. And the stakes are high. The issue of alleged ethnic discrimination by police has taken on a heightened importance amidst the war on terrorism. Many of the profiling issues that began as farce over traffic enforcement stops are now replaying themselves in the war on terror as potential tragedies.

Contrary to the view of the world propounded by David Harris and the ACLU, racial disparities in law enforcement generally reflect racial disparities in *crime rates.* It is true that racial disparities exist at many stages of our criminal justice system. Blacks have been arrested, convicted, and incarcerated at rates far exceeding those of whites for as long as official data on the subject have been compiled. Middle Eastern Arabs have been disproportionately associated with air terrorism for more than a generation.

These disparities have been studied for evidence of systematic discrimination, and it is now widely accepted among serious scholars, such as Professor Michael Tonry of the University of Minnesota Law School, that higher levels of arrests and incarceration in the U.S. by ethnicity result substantially from higher levels of crime, not racial bias. Sometimes the magnitude of the racial disparities in crime rates is huge. The black murder rate is seven to ten *times* the white murder rate.

Harris claims that disparities in arrest and incarceration rates are a function of systemic law enforcement bias. Finding that the