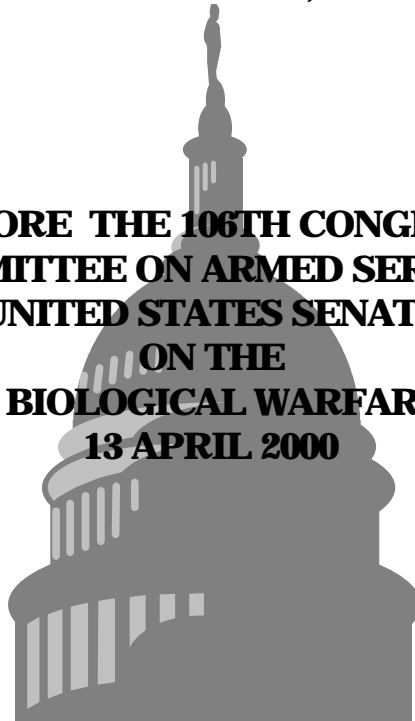




**STATEMENT OF
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**BEFORE THE 106TH CONGRESS
COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE
ON THE
ANTHRAX BIOLOGICAL WARFARE THREAT
13 APRIL 2000**



Mr. Chairman, distinguished Members of the Committee, thank you for inviting me to testify. I am pleased to present an unclassified intelligence overview of the anthrax threat.

Overview

The Intelligence Community assesses that anthrax is the leading biological warfare threat agent. The potential for terrorist use of this agent is also of concern to us based on the relative ease with which it can be produced. Anthrax is considered an anti-personnel biological warfare agent. However, it also has economic warfare applications for anti-agricultural use against livestock.

What is Anthrax?

Anthrax is a naturally occurring disease of herbivores like sheep, cattle, and goats. This disease occurs worldwide, and particularly in areas where animals are not routinely vaccinated, such as in Asia and Africa. A spore forming bacteria causes the disease. In the spore form, the bacteria are resistant to environmental effects and demonstrate a high level of stability.

There are three modes of exposure. One form occurs usually on the hands and forearms of persons working with infected livestock. Mortality rate ranges up to 25%. The gastrointestinal form is contracted by ingestion of insufficiently cooked contaminated meat. The mortality rate can range up to 70%. The third way anthrax is contracted is by inhalation of anthrax spores. The fatality rate is virtually 100%. Because airborne anthrax spores have the

ability to infect large numbers over a large coverage area, inhalational anthrax is the primary concern for biological warfare.

In inhalation anthrax, the spores are inhaled into the lungs and migrate to the lymph nodes in the cavity between the lungs. Once in the lymph nodes, the spores germinate and produce toxins, which cause massive internal tissue destruction and swelling. The bacteria can also enter the blood and cause blood poisoning. The first symptoms can appear one to several days after inhalation, and include general flu-like symptoms, fever and fatigue. Severe respiratory distress and then death will occur in 24-36 hours.

Anthrax - An Ideal Organism for Biological Warfare

Anthrax is an ideal organism for biological warfare use. Anthrax is 100% lethal if not treated before symptoms appear. There is no effective treatment available once symptoms have occurred. This is a critical issue for troops since there is no indication of exposure to anthrax until after the symptoms have appeared - and then it is too late.

Anthrax spores can be produced in large quantities with basic biological techniques. It grows easily and can be used as a dry powder or as slurry (slush) for aerosol spray. Anthrax spores can be stored for decades without losing their viability. They can be delivered by missiles, rockets, artillery, and sprayers. Anthrax can be stored in filled munitions, as well as in dry or liquid bulk.

Anthrax particles can be achieved in the 1-5 micron range, which is optimal for suspending absorbed biological warfare agent in an aerosol cloud

and carrying it over long distances. This range also represents the optimal particle size for inhalation exposure.

The equipment for anthrax spore production is dual use. Illegal production can be concealed in legitimate production industries. Additionally, legitimate public health and veterinarian needs for vaccines and bio-pesticides can camouflage agent production.

Anthrax is considered a cost-effective alternative to other weapons of mass destruction methods. A smaller quantity is required for the same area of coverage when compared to other weapons of mass destruction means. For comparison, for 120 square kilometers of coverage, you would need one-megaton yield of nuclear material, 158 metric tons of a chemical agent, and only 6.5 kilograms of anthrax. Anthrax is 100,000 times more lethal than chemical agents.

Vulnerabilities

With no advance warning of an anthrax attack, we will have no indication that the attack has occurred. Anthrax has no smell, no taste, no color, and no odor. The aerosol cloud of anthrax will not be detected.

Weaponization Conditions

In order for anthrax to be used as an effective biological warfare agent, it must be weaponized. Optimal delivery involves release of the agent in a particle cloud suspended in air (aerosol), light wind conditions and dispersion in non-daylight hours to minimize the dilution of the aerosol cloud and light induced degradation of the agent.

The aerosol anthrax particles would remain suspended in air and travel with the wind currents for a considerable distance. If disseminated at night near the ground or water surface, they can be expected to form a cloud with the potential to remain relatively intact for several hours while slowly moving across the terrain or water surface. Except for a short time in the immediate vicinity of the release, the aerosol will not be visible, and would be inhaled without the victim's knowledge. It is this profile which makes it impossible for our troops to assume a reactive protective posture.

Even with appropriate data to assess a cloud's predicted path of movement, it would be difficult at best given varying weather and terrain effects. Air stability, temperature, relative humidity, pollutants, cloud coverage, and precipitation all affect biological warfare agent duration and effectiveness. It is traditional to expect a biological warfare attack in the early morning and late evening when air stability is optimal and direct sunlight is minimal. As the agent aerosol is transported away from the site of initial dissemination, it is subject to gradual dilution by dispersion, as well as to decay resulting from the effects of sunlight and other environmental factors.

Dissemination Means

Anthrax can be disseminated by a wide variety of means. Missiles, rockets, artillery, aerial bombs, and sprayers mounted on aircraft, cars, boats, as well as hand-held sprayers, make effective dissemination means.

In the case of less efficient biological warfare delivery means, such as bulk-fill missile warheads or artillery shells that detonate on impact, the area

of coverage for each kilogram of agent will be reduced. Even though a significant percentage (as high as 95%) of the agent may not be effectively aerosolized by bulk-fill weapons, the resulting exposure hazard in the immediate area of the attack could have significant operational impact. Given this scenario, we would still expect an infected area of 1 square kilometer per kilogram, and some downwind exposure hazard for several kilometers.

Scenarios for Use

United States forces face a growing possibility of exposure to biological agents in situations over a wide range of contingencies. At one end of the spectrum is deliberate, high-concentration agent exposure resulting from an enemy missile attack on a military facility. At the other end is low-concentration agent release caused by an accident at a foreign biological warfare research and development facility that impacts our forces engaged in peacekeeping operations.

The Threat

At least 10 countries have or are developing a biological warfare capability. Several of these countries are suspected of developing anthrax as a biological warfare agent. As offensive biological warfare programs proliferate and expand, the exposure threat presented by some biological agents may well become comparable to that attributed to the endemic disease hazards (for example, diphtheria, influenza, and tetanus) for which our active-duty and reserve personnel are now routinely vaccinated.

Iraq

Iraq admitted to weaponizing anthrax. They declared 10 Al-Husayn Missiles, 50 R-400 bombs, and 3 MIG-21 with spray tanks. They also acknowledged research on 155mm artillery shells, artillery rockets, and aerosol generators. Iraq claimed to have destroyed these munitions, but to date UN monitors have not been able to verify these claims. Iraq also declared 8,500 liters (2,245 gallons) of concentrated anthrax, as well as several other biological warfare agents.

Al Hakam, a confirmed biological warfare Anthrax and Botulinum toxin production facility in Iraq, was destroyed in 1996 by UNSCOM. Iraq had maintained that it was a legitimate civilian facility designed to produce single-cell proteins and bio-pesticides. Al Hakam's remote location and the security involved in its construction suggested that it was intended to be a biological warfare production facility from the outset.

Experts conclude that Iraq retains sufficient technology components, data, and scientific expertise to resume development and production of biological weapons. Although the UNSCOM inspections severely curtailed Iraqi WMD programs, even a small residual force of operational biological warfare missiles would pose a serious threat to neighboring countries and U.S. military forces in the region.

Iran

Iran has a growing biotech industry, significant pharmaceutical experience, and the overall infrastructure to support its biological warfare

program. It continues to pursue dual-use biotech equipment and expertise from Russian and other sources, ostensibly for civilian reasons. Iran has had a limited capability to employ biological warfare agents since at least 1986.

Syria

We assess Syria is pursuing development of a biological warfare program and has the biotechnical infrastructure capable of supporting limited agent development. Syria's mature chemical warfare program likely is a source of biological weaponization technologies.

Libya

Libya's biological warfare program most likely has not advanced beyond the research and development stage, although they may be capable of producing small quantities of biological warfare agent.

North Korea

Although little is known on North Korea's biological warfare program, we suspect they are capable of producing and weaponizing several biological warfare agents, which include anthrax, cholera and plague.

Former Soviet Union

Since the inception of the biological warfare program prior to the Second World War, the Soviet Ministry of Defense systematically improved their biological warfare weapons characteristics and production capabilities for anthrax. During the peak of the cold war, the Soviet Union had the capability to produce thousands of tons of anthrax agent. Anthrax was considered the 'backbone' of the Former Soviet Union's offensive biological warfare program.

Biological warfare in the Former Soviet Union has received substantial press coverage over the past two years, to include a book entitled Biohazard by Dr. Ken Alibek, the Former Soviet Union's former Director of the premier anthrax facility located in Stepnogorsk, Kazakhstan. These books detail many events surrounding the capabilities of the Former Soviet Union with regard to biological warfare agents, facilities, and weaponization.

Former Soviet Union biological warfare scientists have detailed the Soviet research and development of anthrax as a biological warfare agent. The 1979 Sverdlovsk anthrax accident confirmed the Soviet Union's production on the bacteria, as well as the lethality of an anthrax aerosol cloud. Even prior to this accident, a leak from an alleged defective reactor in the Kirov bacteriological facility spread anthrax into the city's sewer system. Although no deaths were reported, an apparent new strain, more virulent than the original was isolated in the sewer rats several years later.

We also know that the research goals of the Soviet biological warfare program included the development of antibiotic resistance strains, and that this was likely accomplished by the early 1990's. To date, no information corroborates development of a vaccine-resistant strain of anthrax biological warfare agent.

Through scientific literature analysis, we have observed a continuing robust Russian research, development, and production effort on the anthrax organism. The difficulty is determining whether this ongoing effort at facilities

formerly associated with anthrax biological warfare agent work, is for legitimate purposes or a continuation of offensive related activity.

According to Russia's 1992 declaration of past biological warfare activity to the Biological and Toxin Weapons Convention (BWC), Russia admitted that anthrax was an agent researched at Soviet Ministry of Defense facilities and its 'effectiveness was evaluated'. While the declaration states that 'only models of biological ammunition and spray devices were ever developed', Dr. Alibek and others claim that by the mid 1980s, the Soviets had perfected delivery of anthrax as a biological warfare agent using a wide range of delivery systems, to include ballistic missiles.

Although the Former Soviet Union program has certainly been downsized and restructured from the era where thousands of scientists engaged in biological warfare development, the current status of all facilities is not known, nor do we know the whereabouts of former biological warfare scientists previously engaged in offensive activity.

China

China continues to maintain an offensive biological warfare program. They possess a sufficiently advanced biotech infrastructure to allow development of biological warfare agents. Additionally, its munitions industry is capable of weaponizing of biological warfare agents.

Terrorism

Anthrax is also a potential terrorist weapon because of its relative ease of production. It does not require conventional military equipment or personnel

for production or dissemination. Aerosol generators and spray equipment needed for dissemination is commercially available, as are easily concealed portable devices. These items could be used by terrorists in attacks against military or civilian targets. Devices as simple as insecticide spray cans can be used to introduce anthrax into heating, ventilating, and air conditioning systems. Nevertheless, terrorists contemplating anthrax attacks face technological challenges.

The Aum Shinrikyo sect reportedly had anthrax, and claimed to have attempted dissemination of anthrax during several 1993 attacks in Tokyo using improvised sprayers on buildings and trucks. They had difficulties with clogged sprayers and the anthrax itself, but demonstrated the scientific capability necessary to work with anthrax as a biological warfare agent.

Currently, while some international terrorist groups are interested in developing the capability to use biological agents, other than the Aum Shinrikyo's past incidents, there are no confirmed indications that other groups are specifically developing anthrax. International terrorist group activities have primarily focused on chemical rather than biological materials.

Conclusions

In conclusion, anthrax represents the primary biological warfare threat to United States forces and interests. It is the most widely adopted agent in foreign biological warfare programs. An attack will likely come with little to no warning with potential catastrophic impact. Because of this, anthrax deserves its reputation as an effective and deadly biological warfare agent.

Thank you again for the opportunity to testify before this committee. I will be pleased to respond to any questions you may have now, or may wish to provide later.