

# CRS Report for Congress

Received through the CRS Web

## **Iraqi Chemical & Biological Weapons (CBW) Capabilities**

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### **Summary**

The United Nations Special Commission (UNSCOM) has destroyed large amounts of CB weapons and materials in Iraq since 1991. UNSCOM has reported no firm evidence that Iraq still retains weapons or materiel, but the Iraqi government has not provided adequate evidence to support its claim all its CBW arsenal has been destroyed, nor has it accounted for CBW production materials known to have been in its possession. These factors, coupled with Iraqi obstruction of UNSCOM inspections has led to strong suspicions. U.S. and British intelligence agencies believe that Iraq still may possess tons of chemical warfare agents and the necessary materials to produce thousands of liters of biological agents. In addition, UNSCOM and U.S. intelligence believe Iraq may still have hidden from 2-10 warheads designed to deliver chemical or biological agents. UNSCOM and U.S. intelligence differ in their estimates of the number of missiles that may still be in Iraq. The Iraqi chemical warfare arsenal has included nerve agents (Sarin and VX), blister agents ("mustard gas"), and psychoactive agents (so-called Agent 15). Biological/toxin warfare agents produced by Iraq include anthrax, botulinum, aflotoxins, ebola virus, bubonic and pneumonic plague, ricin, and clostridium perfringens. Reconstitution of militarily significant production capability using materials unaccounted for to UNSCOM could take only a matter of weeks. During the week of February 23, the Senate is scheduled to consider S.Con.Res. 71, calling on the President to take all necessary and appropriate actions in response to the threat posed by Iraq's refusal to end its lethal weapons program.

### **Iraq's Chemical and Biological Arsenal**

In April 1991, the United Nations Security Council established the ceasefire conditions for the conflict in the Persian Gulf. Iraq accepted Security Council Resolution 687, which required the destruction or neutralization of 1) all nuclear, chemical, and biological weapons, and 2) all ballistic missiles with a range over 150 kilometers (90

miles). SCR 687 also prohibited Iraq from future development, production, or use of such weapons in the future. Subsequent Security Council Resolution 715 established the United Nations Special Commission (UNSCOM) to monitor and verify Iraqi compliance with these disarmament requirements. (See CRS Issue Brief *Iraqi Compliance with Ceasefire Agreements*, 92117)

Since 1991 UNSCOM inspectors in Iraq have overseen the destruction of :

- 38,000 chemical munitions
- 480,000 liters of chemical warfare agents and precursors
- 48 ballistic missiles
- 6 missile launchers
- 30 CBW missile warheads

During the last six years of inspections, the Iraqi government has made many declarations concerning the volume and deposition of chemical and biological weapons programs — all of which have been proven or judged to be inaccurate or incomplete. No admission, for example, of their extensive biological weapons program was made until Iraqi defectors forced acknowledgment. Iraq then claimed that all BW agents and materials had been destroyed — a claim rejected by both UNSCOM and Western intelligence agencies. As incomplete as they may be, Iraq declarations indicate a very extensive CBW program. UNSCOM guidelines require the confidentiality of its reports, and it is only recently that some details have been released by the U.S. and British governments. Information released so far indicates that prior to the Persian Gulf conflict Iraq produced (and claims to have destroyed):

- 4 tons of VX persistent nerve agent
- 19,000 liters of botulinum toxin
- 8,400 liters of anthrax spores
- unspecified amounts of the nerve agent Sarin and the blister agent “mustard gas”

Iraq has also acknowledged that prior to the Persian Gulf conflict it manufactured 100 botulinum bombs, 50 anthrax bombs, and 7 aflatoxin bombs. In addition, 16 missile warheads were filled with botulinum, five with anthrax bacillus, and four with aflatoxin.

U.S. and British intelligence agencies believe that Iraq has hidden stores of CBW agents, production equipment, ballistic missiles, and missile warheads. UNSCOM has reported no firm evidence that Iraq still retains weapons or materiel, but the Iraqi government has not provided adequate evidence to support its claim that all its CBW arsenal has been destroyed, nor has it accounted for CBW production materials known to have been in its possession. These factors, coupled with Iraqi obstruction of UNSCOM inspections, have led to strong suspicions. U.S. and British intelligence agencies believe that Iraq still may possess tons of chemical warfare agents and the necessary materials to produce thousands of liters of biological agents. UNSCOM and U.S. intelligence differ in their estimates of the number of actual missiles that may still be in Iraq. Again information is sketchy. In part, this is because much is classified, but even the classified information is reportedly incomplete. A recent report issued by the British government, however, provided some information [Foreign and Commonwealth Office — [<http://193.114.50.5/texts/1998/feb/04/iraqppr.txt>]].

- British intelligence believes that up to ten SCUD missiles capable of carrying CBW warheads remain hidden.
- UNSCOM reports that between 40-70 CBW-capable missile warheads are unaccounted for.
- Iraq possessed enough growth medium to produce over 16,000 liters more anthrax spores than has been acknowledged.
- 4,000 tons of CW precursor chemicals are unaccounted for; enough to produce several hundred tons of CW agents.
- 31,000 CW munitions remain unaccounted for.
- Essential CW production equipment remains unaccounted for.
- It is believed that Iraq may retain undetermined amounts of Ebola virus, bubonic and pneumonic plague bacteria, and the toxin ricin.

The current debate over the advisability of airstrikes has highlighted two significant challenges in the efforts to eliminate Iraq's CBW arsenal: 1) the great difficulty of locating and destroying CBW stocks, if they exist, through air power alone, and 2) the relative ease of reconstituting a CBW production program after such attacks, particularly if the goal is relatively small amounts suitable for terror attacks. The estimates have ranged from weeks to months, unless a close monitoring regime is maintained. Recent press reports indicate that even under the UNSCOM regime and the U.N. embargo on CBW-related equipment, Iraq may have been able to acquire equipment that could be used to produce biological weapons in a clandestine purchase from Russia.<sup>1</sup> Were such assistance to continue, reconstitution of a significant CBW capability would be relatively simple. Production of smaller amounts of CBW agents for terrorist use would be proportionately easier, and employment need not involve sophisticated delivery systems.

Another concern regarding airstrikes is the probability and effect of releasing CBW agents into the air as a result of bombing. There is a high degree of unpredictability in any such estimate. This has been exemplified by the difficulties that those investigating the so-called Persian Gulf War Syndrome have experienced in determining how many U.S. troops may have been exposed to some level of nerve agent after the U.S. destruction of an Iraqi munitions depot shortly after the Persian Gulf conflict. A variety of factors would affect whether contamination would be localized or widespread, temporary or long-term. These include: type of CBW agent, type of munition, target location, population density, wind, humidity, level of sunlight, and temperature. There are U.S. munitions in the experimental stages intended specifically to reduce collateral contamination by penetrating bunkers before detonating or by destroying CBW agents through incineration rather than explosion. It is not clear, however, whether these weapons will be deployed to the Persian Gulf while still under development.

For the purposeful use of chemical and biological weapons, predictive models of lethality do exist. In 1993, the Office of Technology Assessment developed the following estimate using the District of Columbia as the hypothetical target under three different weather conditions. The scenarios assumed aerosol agent distribution by an aircraft flying a line along the western city limit. Estimated *fatalities* resulting from the dispersal of approximately one ton of Sarin nerve agent or 220 lbs of anthrax spores were:

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<sup>1</sup>“Did Russia Sell Germ Warfare Equipment?”, *Washington Post*, February 12, 1998. P. 1.

	Clear sunny day, light breeze	Overcast or night, moderate wind	Clear calm night
Sarin	300-700	400-800	3,000-8000
Anthrax	130,000-140,000	420,000- 1.4 million	1-3 million

Source: *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, Office of Technology Assessment. 1993.

Press reports and commentaries which carry even more distressingly high fatality estimates are generally calculated simply by determining how many lethal “doses” of agent could be supplied by the Iraqi stockpile. This type of estimate does not take into account any of the factors affecting actual employment.

## Chemical and Biological Agent Characteristics

**Nerve Agents** — These agents disrupt normal functioning of the central nervous system. They are colorless, tasteless, and odorless. **Sarin** is delivered as an aerosol and evaporates rather rapidly. Inhalation of 100 milligrams is lethal. **VX** is a persistent agent (effective for days or weeks depending upon climactic conditions) Absorbed through the skin, 5-10 milligrams are lethal. Exposure to nerve agents results in nausea, diarrhea, pulmonary edema, and convulsions leading to death by respiratory arrest in within one to fifteen minutes, depending on the concentration.

**“Mustard Gas”** — “Mustard gas” is actually an oily brownish liquid with a smell similar to garlic. It is a vesicant or blister agent. It is generally severely incapacitating rather than lethal, though intense or prolonged exposure can lead to fatal pulmonary edema. An incapacitating dose is about 200 milligrams, and 1,500 milligrams inhaled is sufficient to kill. Mustard gas damages any tissue it contacts, causing extensive and large blisters which last several weeks. Permanent damage to the lungs and eyes can result.

**“Agent-15”** — The British government recently asserted that Iraq developed large stocks of an incapacitant gas dubbed “Agent-15”. It is apparently a glycollate similar in effect to the agent **BZ**, an incapacitant once produced by the United States. If this is correct, exposure to about 100 milligrams in aerosolized form would be sufficient to incapacitate. Symptoms, which begin within 30 minutes of exposure and may last several days, include dizziness, vomiting, confusion, stupor, hallucinations, and irrational behavior. The U.S. Army considered BZ to be too unpredictable in its effectiveness to be useful on the battlefield, and all U.S. stocks were destroyed.

**Anthrax** — Anthrax is a disease caused by the bacillus *Anthraxis*. Infection can result from inhalation, ingestion, or absorption through the skin. Most effectively dispersed as an aerosol, anthrax spores decay in a matter of days in sunlight, but can contaminate soil for decades. 10,000 to 20,000 spores is a lethal dose — “something smaller than a speck

of dust,” according to a DOD biological warfare expert<sup>2</sup>. Symptom onset occurs 3-4 days after exposure, and initially resembles that of a common cold. Symptoms do not become identifiable as anthrax until the fatal phase of the disease, when vomiting, severe head and joint aches, and respiratory distress lead to death within 1-3 days. Vaccines are available against some forms of anthrax, but their efficacy against abnormally high concentrations of the bacteria is uncertain. Antibiotic treatment can be effective, but only if administered prior to the onset of symptoms, otherwise the fatality rate can exceed 90%.

**Aflatoxin** — Aflatoxins are toxins produced by the *aspergillus flavis* and *aspergillus parasiticus* fungi. They occur naturally on moldy grains and foodstuffs. The toxic dosage for humans has not been determined, but one type is considered a potent cause of liver cancer.

**Botulinum Toxin** — Botulinum, produced by the *clostridium botulinum* bacteria, causes the food-poisoning “botulism”. In pure form, it is a white crystalline substance, that is readily dissolvable in water, but decays rapidly in the open air. The symptoms of botulism begin 12-72 hours after exposure depending upon whether it is inhaled or ingested. Symptoms include nausea, diarrhea, paralysis of the throat, and convulsions, followed by death due to respiratory arrest. Vaccines are available, but again, their efficacy against abnormally high toxin dosages is uncertain. Early diagnosis and palliative treatment can prevent fatality.

**Clostridium Perfringens** — *Clostridium Perfringens* is a widespread bacterium which causes gas gangrene if allowed to grow in wounds or damaged tissue, The bacteria produce gases that cause intense swelling and toxins that kill muscle tissue. If not treated the bacteria enter the bloodstream causing fatal systemic illness. Early antibiotic treatment is effective, if undertaken before significant amounts of toxins have accumulated in the body.

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<sup>2</sup>Transcript, Department of Defense press conference, November 14, 1997.