

CHAPTER 1

**MEDICAL THREAT AND NUCLEAR, BIOLOGICAL,
AND CHEMICAL WARFARE****1-1. General**

a. Since World War II, the Soviet Union has represented the principal threat to the national security interests of the US. During this period, the military capability of the Soviet Armed Forces grew enormously. Starting in the later years of the 1980's, the international security environment has undergone rapid, fundamental, and revolutionary changes. The Soviet Union has disintegrated with the collapse of Soviet communism as a viable economic and political system. The Warsaw Pact has dissolved as a political and military entity. The central Soviet government has been replaced by the Commonwealth of Independent Republics (CIR), currently dominated by the Russian Republic. The cohesion of Soviet strategic military capability has been fractured by—

- The dissolution of central Soviet control.
- The formation of the CIR.
- The unpredictability associated with uncertain loyalties and low morale.

The ultimate outcome of these events in terms of US national security interests is unclear. The military capabilities of independent republics like Russia, Ukraine, Kazakhstan, and Belarus remain formidable. The capabilities include strategic nuclear and impressive conventional, biological, and chemical warfighting capabilities.

b. From a global perspective, the economic power and influence of developing and newly industrialized nations will continue to grow. Centers of power (global or regional) cannot be measured solely in military terms. Nation states will pursue their own political, ideological, and economic interests; they may become engaged in direct or indirect competition and conflict with the US. More nations have acquired significant numbers of modern, lethal, combat weapon systems; developed very capable armed forces; and become more assertive in international affairs. In the absence of a single, credible, coercive threat, old rivalries and long repressed territorial ambitions will resurface, causing increased tensions in many regions. Political, economic, and social instability and religious, cultural, and economic competition will continue to erode the influence of the US over the rest of the world. This erosion will also reduce the US influence of traditional regional powers over their neighbors. This environment will encourage the continued development, or acquisition, of modern armed forces and equipment by less influential nations, including the spread of NBC weapons; thus raising the potential for internal conflict and armed confrontations in developing regions of the world.

1-2. Medical Threat

a. Medical threat is the composite of all ongoing or potential enemy actions and environmental conditions that will reduce combat effectiveness through wounding, injuring, causing disease, and/or degrading performance. Soldiers are the targets of these threats. Weapons or environmental conditions that will generate wounded, injured, and sick soldiers, beyond the capability of the HSS system to provide timely medical care from available resources, are considered major medical threats. Weapons or environmental conditions that produce qualitatively different wound or disease processes are also major medical threats. Table 1-1 presents medical threats from both environmental and adversary sources. Elements of medical threat are used to define the vulnerability of and the risk to the soldier associated with deployment outside the US.

Table 1-1. Medical Threat from Environmental and Adversary Sources

ENVIRONMENTAL RELATED	ADVERSARY RELATED
Naturally occurring diseases	Small arms and fragmentation ordnance and munitions
Environmental extremes	Biological warfare
Hazardous plants and animals	Chemical warfare
Other environmental hazards (dust, water, and air pollution)	Flame and incendiary
	Blast effect munitions
	Directed energy devices
	Nuclear warfare
Sustained operations/combat stress*	

*Applicable to both environmental and adversary related conditions.

b. Enemy combat operations that disrupt HSS operations, or threaten the HSS organizations survival are considered threats to the medical mission. These threats, however, are not considered to be “medical threats”.

1-3. Nuclear, Biological, and Chemical Threat—The Health Services Perspective

a. *Nuclear Weapons Threat.* Since the breakup of the Soviet Union, the number of countries with known nuclear capable military forces has almost doubled. Available information suggests that a number of countries in the Middle East, Asia, and Africa may have nuclear weapons capability within the next decade. Table 1-2 lists those countries known to have, or suspected of possessing, nuclear weapons. Planners can expect a minimum of 10 to 20 percent casualties within a division-sized force that has experienced a nuclear strike. In addition to casualties, a nuclear weapon detonation can generate an electromagnetic pulse (EMP) that will cause catastrophic failures of electronic equipment components.

Table 1-2. Countries Having or Seeking Nuclear Weapons

KNOWN TO POSSESS	SUSPECT OR SEEKING
United States of America	Iraq
Russia	North Korea
Ukraine	Pakistan
Byelorussia	India
Kazakhstan	Iran
People's Republic of China	Libya
France	Algeria
United Kingdom	South Africa
	Israel

b. Biological Warfare.

(1) Biological warfare (BW) is defined by the US intelligence community as the intentional use of disease-causing organisms (pathogens), toxins, or other agents of biological origin (ABO) to incapacitate, injure, or kill humans and animals; to destroy crops; to weaken resistance to attack; and to reduce the will to fight. Historically, BW has primarily involved the use of pathogens as sabotage agents in food and water supplies to spread contagious disease among target populations.

(2) For purposes of medical threat risk assessment, we are interested only in those BW agents that incapacitate, injure, or kill humans or animals.

(3) Known or suspect BW agents and ABOs can generally be categorized as naturally occurring, unmodified infectious agents (pathogens); toxins, venoms, and their biologically active fractions; modified infectious agents; and bioregulators. See Table 1-3 for examples of known or suspected threat BW agents. Also, Table 1-4 presents possible future agents in BW development.

Table 1-3. Examples of Known or Suspect Biological Warfare Agents

PATHOGENS	TOXINS
Bacillus anthracis (Anthrax)	Botulinum toxin
Francisella tularensis (Tularemia)	Mycotoxins
Yersinia pestis (Plague)	Enterotoxin
Brucella species (Brucellosis)	Ricin
Vibrio cholerae (Cholera)	

Table 1-4. The Future of Biological Warfare Agents

CURRENT THREAT	FUTURE
Pathogens	Modified Pathogens
Limited Number of Toxins	Expanded Range of Toxins (Organo-toxins)
	Protein Fractions
	Agents of Biological Origin

(4) Many governments recognize the industrial and economic potential of advanced biotechnology and bioengineering. The same knowledge, skills, and methodologies can be applied to the production of second and third generation BW agents. Naturally occurring infectious organisms can be made more virulent and antibiotic resistant and manipulated to render protective vaccines

ineffective. These developments complicate the ability to detect and identify BW agents and to operate in areas contaminated by the BW agents.

c. Chemical Warfare.

(1) Since World War I, chemical warfare (CW) has been publicly held in disrepute by most western political and military leaders. However, evidence accumulated over the last 50 years does not support the position that public condemnation equates to limiting development, or use of offensive CW agents. The reported use of chemical agents and toxins in Southeast Asia by Vietnamese forces; the confirmed use of CW agents by Egypt against Yemen; and later by Iraq against Iranian forces; and the probable use of CW agents by the Soviets in Afghanistan indicate a heightened interest in CW as a force multiplier. Mso, an offensive CW capability is developed as a deterrent to the military advantage of a potential adversary. Table 1-5 list the most common CW agents. Table 1-6 lists those countries known or suspected of having offensive chemical weapons.

Table 1-5. Common Chemical Warfare Agents

COMMON NAME	EFFECT	TIME TO EFFECT
Tabun (GA) Sarin (GB) Soman (GD) V-Agents	Lethal nerve agents	Inhalation: Seconds to Minutes Topical: Minutes
Hydrogen cyanide	Lethal blood agent	Minutes
Mustard Lewisite	Blister agents	1 to 12 Minutes Minutes
LSD and BZ	Incapacitating agents	15 to 60 Minutes
Phosgene Chlorine	Lung-damaging (choking)	Minutes

Table 1-6. Some of the Nations Known or Suspected of Having Chemical Weapons

United States of America	People's Republic of China
Russia	North Korea
France	Egypt
Libya	Israel
Iraq*	Taiwan
Syria	Burma
Iran	Ethiopia

* Following the Persian Gulf War (1990-91), the United Nations (UN) began destroying CW munitions discovered during inspection visits to Iraq by UN arms control inspectors. Included among the CW munitions discovered were some 2000 aerial bombs and 6200 artillery shells filled with mustard and several thousand 122mm rocket warheads filled with GB. Iraq also declared SCUD warheads filled with GB and GF.

(2) The Russian Republic of the former Soviet Union has the most extensive CW capability in Europe. Chemical strikes can be delivered with almost any type of conventional fire support weapon system (from mortars to long range tactical missiles). Agents known to be available in the Russian inventory include nerve agents (VX, thickened VX, GB, thickened GD); vesicants (thickened Lewisite and a mustard-Lewisite mixture); and choking agent (phosgene). Although not considered CW agents, riot control agents are also in the Russian inventory.