CBRN Agents
Core Concepts

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What is the definition of a ‘WMD’?
I did not ask for an enumeration, so what is the definition of a ‘WMD’?
Does ‘WMD’ pose a challenge to your activities? Why / Why not?
How does ‘WMD’ pose a challenge to your activities?
Core points to retain

- ‘WMD’ habitually comprises 4 distinct weapon categories
  - Chemical weapons
  - Biological weapons
  - Radiological weapons
  - Nuclear weapons

- ‘WMD’ has no internationally accepted legal definition
  - Each weapon category falls under a different (type of) legal regime
  - The respective legal regimes determine the *formal scope* of the weapon category
    - CW and BW formally defined in treaties (CWC; BTWC)
    - RW and NW lack universally accepted legal definitions
The CBRN spectrum
Understanding the spectrum – 1

**Chemical weapons**
- Ranges from irritants (e.g. lachrymatory agent) and incapacitants (e.g. BZ & fentanyl) to the most toxic nerve agents (e.g. sarin & VX) or toxins (e.g. ricin & saxitoxin)
- Core aspects of the CW definition in *Chemical Weapons Convention*:
  - Any toxic chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals (Plants not mentioned!)
  - Also covers precursors to such toxic chemicals
  - Delivery systems and specialised equipment
- CWC definition is based on the *General Purpose Criterion*:
  - Covers past, present *and* future toxic substances
  - Does not distinguish methods of synthesis or whether an agent may be naturally occurring

**Biological weapons**
- Ranges from incapacitating agents (e.g. salmonella) to lethal ones (e.g. anthrax bacteria or smallpox virus) or toxins (= overlap with CWC)
- Core aspects of the BW definition in *Biological and Toxin Weapons Convention*:
  - Microbial or other biological agents, or toxins (human, animal and plants)
  - Weapons, equipment or means of delivery
  - Understanding evolves through common understandings reached at 5-yearly Review Conferences (e.g. inclusion of subcellular particles and bioactive molecules)
- BTWC definition is based on the *General Purpose Criterion*:
  - Does not distinguish between origin or method of production
  - Covers any relevant development in synthetic biology, genetic engineering, etc.
Understanding the spectrum – 2

• **Radiological weapons**
  - Ranges from radioactive offal from hospitals or radiological centres to materials from the core of nuclear reactors
  - No formal international legal definition; there may be definitions of radioactive materials in national (criminal, environmental, health, etc.) law
    • With a few exceptions, RW were never really considered as a military tool
    • Impact of terrorist action with RW is seen as limited, even though one cannot ignore psychological or economic consequences
    • Decontamination would be complex and potentially costly (also in view of public concerns)

• **Nuclear weapons**
  - Ranges from portable nuclear demolition charges to the 50Mt Vanya hydrogen bomb (Tsar Bomba)
  - No universally accepted legal definition
    • Some definitions are included in regional **Nuclear Weapon-Free Zones** (but phrasing may differ)
      - Southeast Asia Nuclear Weapon-Free Zone Treaty and Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean define *nuclear weapon*
      - African Nuclear Weapon Free Zone Treaty and South Pacific Nuclear Free Zone Treaty define *nuclear explosive device*
      - Central Asian Nuclear-Weapon-Free Zone defines *nuclear weapon or other nuclear explosive device*
    • Legality of NW possession essentially regulated via **Nuclear Non-Proliferation Treaty**
    • Equipment and materials regulated via Safeguards Agreements administered by the **International Atomic Energy Agency** (different treaty from NPT) to ensure their application to peaceful purposes
    • Nuclear Weapon States as defined under the NPT have a different legal status from Non-nuclear Weapon States
The dual-use concept

• A CBRN weapon is a ‘single-use’ technology
  • It has no other purpose than being a weapon

• CBRN weapon development often rests on ‘dual-use’ technology
  • The core question is: when is the ‘single-use’ stage reached in weapon development?
  • For example:
    • CWC places certain toxic chemicals and their precursors in Schedule 1, meaning that they have no other purpose than being a CW (= single use)
      • But what about other precursor chemicals of past warfare agents such as chlorine and phosgene?
      • Would you consider the ‘Novichock’ agent used in an assassination attempt in the UK as single or dual-use in view of its absence in Schedule 1?
    • In contrast, the BTWC faces the problem that BW is the only arms category in which the active ingredient can be used for both attacking and defending the target
      • Activities in BW defence, protection and prophylaxis are permitted, but hardly distinguishable from BW offence
      • Raises questions about activities that may inadvertently contribute to BW development in the present and the future
    • RW: when radioactive source is fixed to an explosive device or upon release?
    • NW: when enrichment of nuclear fuel exceeds 20%?
Contexts for ‘dual-use’ debate

- **Dual-use issues arise** when the attempts to control a particular technology confront the non-military commercial and scientific interests in such technology.

- **Disarmament**
  - Total ban on development, production and possession of *a weapon* and preparations for *its* use in warfare (BTWC, CWC)
  - ‘Dual-use’ issue emerges when
    - Civilian facilities and installations need to be verified
    - Need to prevent the (inadvertent) assistance to development of banned weapon by another state or non-state entity
  - Ban of weapon (= single-use technology) is central; control of dual-use technology supports that central goal

- **Non-proliferation**
  - Control of access to technologies that may contribute to undesired weapon development in another state or non-state entity
  - Primary policy tool for weapon categories whose use in war or possession *have not been wholly delegitimised* (e.g., nuclear weapons, ballistic missiles)
How do these considerations affect your work?

- Consensus may exist about the prohibition of the weapon, but controversy exists about underlying technologies and processes because the final single-purpose phase in the weapon development process may be difficult to establish.
- Different threat perceptions among relevant societal constituencies (military, politicians, scientists, industry, etc.) may lead to different assessments of risks, and therefore of responsibilities.
- Limited awareness about potential contribution of their activities to future weapon development exists among scientists and industry representatives.