Dr Jean Pascal Zanders
27th International Training Course in Security Policy
Geneva Centre for Security Policy (GCSP)
Geneva, 17 April 2013

ASSESSING THE RISK OF PROLIFERATION: THE BIOLOGICAL DIMENSION

WHAT IS BIOLOGICAL WARFARE?

Biological warfare is the intentional application against humans, animals or plants for hostile purposes of

- disease-causing micro-organisms (e.g., bacteria);
- other entities that can replicate themselves (e.g., viruses, infectious nucleic acids and prions)
- toxins, poisonous substances produced by living organisms (and their synthetically manufactured counterparts), including
  - micro-organisms (e.g., botulinum toxin),
  - plants (e.g., ricin derived from castor beans), and
  - animals (e.g., snake venom)

TODAY'S ASPECTS OF THE BW THREAT

- **Deliberate use of disease in war**
  - Against humans
  - Against animals and plants
  - For economic and societal disruption
- **Terrorism and criminal activities**
- **Misuse of scientific and technological developments**

A LONG HISTORY

- **Probably as old as mankind**
  - In older literature often covered under ‘poison warfare’
  - However, no understanding of disease or methods of propagation
  - Yet, whatever conception of disease, humans exploited its characteristics for hostile purposes in ways consistent with that conception
- **Miasmic understanding of disease**
  - Telluric emissions infect the air
  - Ability of defenders to draw troops into disease-ridden areas in certain seasons
- **Environmental pollution**
  - Use of human corpses or animal carcasses to poison wells and rivers
  - Catapulting of corpses into besieged cities or fortresses
  - Insertion of plant poisons into water supplies (= toxin warfare)
- **Kinetic weapons**
  - Dipping of arrows, spears and bullets in plant or animal poisons (= toxin warfare)
  - Dipping of arrow and spears in putrefied blood or other remains of animals or humans

MODERN BIOLOGICAL WEAPONS AND WARFARE: CONFLUENCE OF SEVERAL TRENDS

- **The scientific understanding of disease**
  - Three critical characteristics of disease uncovered in 19th century:
    - Infectious disease is caused by an agent (pathogen)
    - The agent can be transmitted from one living organism to another (infectiveness)
    - One agent is responsible for one disease only
  - Manipulation of the pathogen
    - Isolation
    - Cultivation (while maintaining its infectiveness)
    - Production in large quantities
    - Effective dissemination
- **The new industrial revolution**
  - Biotechnology & informatics are the driving force
  - Major impact on all aspects of life in developed and developing countries
  - Biotechnology has accelerated development of societies (emerging economies)
  - Convergence with other scientific disciplines (e.g., chemistry, informatics, etc.)
- **Military application of new scientific and technological developments** has become commonplace (= exploitation of 'dual-use' potential)
  - Pressures to exploit new biology and biotechnology for military goals will grow
  - Many arguments in favour framed in humanitarian discourse (e.g., so-called non-lethal weaponry → convergence with chemistry for incapacitating agents)

PERSPECTIVES ON THE BW THREAT

- **Use of biological and toxin weapons has so far been extremely rare**
  - Since 1975, fewer than 100 persons have been killed through deliberate disease
    - Most cases involved toxins
    - Most cases were criminal in nature
  - Major terrorist BTW programmes have been total failures (Rajneesh Cult; Aum Shinrikyo)
  - However, anthrax letters demonstrate the potential for low-casualty – high-impact events
  - Most bioterror events do not involve actual agents (hoaxes)
- **Nature poses by far the greatest challenge**
  - Infectious diseases are responsible for
    - > 13 million deaths annually (≈ number of fatalities in the Twin Towers attacks on 9/11 every two hours)
    - ¼ of all deaths worldwide
    - ½ of all deaths in developing countries
  - 1918: Spanish Flu caused more fatalities worldwide than World War 1
  - Emerging diseases: SARS; West Nile Virus; Avian flu (H5N1 and H7N9)
  - AIDS in Africa: threat to social fabric of societies
  - Foot and Mouth Disease outbreak in the UK; Swine Fever in Taiwan, etc. (economic impact)
- **We have arrived in a post-proliferation stage**
  - Biotechnology (equipment, processes, products, knowledge) has become universal
  - Developing countries (Cuba, India, Indonesia, Iran, Malaysia, Pakistan, etc.) have become original sources of innovation and, in some cases, technology exports

POTENTIAL FOR FUTURE WEAPON DEVELOPMENT

- Biology and biotechnology allow for the manipulation of disease on the sub-cellular level (genes, biochemical processes, etc.)
  - May make the effects of biological agents more controllable
  - May produce agents with higher infectivity or ability to overcome medical defences
- Interference with the natural immune system rather than dissemination of pathogen may become new mode of attack
- Improvements in production processes: higher quality & higher quantities in smaller units
- Possible application of synthetic biology and nanotechnology in agent design or dissemination technology, as well as in defence, protection and prophylaxis
- May contribute to novel ways of agent dissemination
  - Aerosol techniques
  - Targeting of specific genes

SOURCES OF THE NORM AGAINST BW

- **International treaties**
  - 1925 Geneva Protocol
    - Bans the use of CBW in war
  - 1972 Biological and Toxin Weapons Convention (BTWC)
    - Bans development, production and stockpiling of BW and toxins
    - Ban on use explicitly referred to at 4th Review Conference (1996)
  - 1993 Chemical Weapons Convention (CWC)
    - Bans development, production, stockpiling and use of toxins
- **UN Security Council resolutions**
- **National laws**
- **Professional and scientific codes of ethics and conduct**
- **Industry standards and best practices**

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 has not been wholly delegitimised (e.g., nuclear weapons, ballistic missiles)

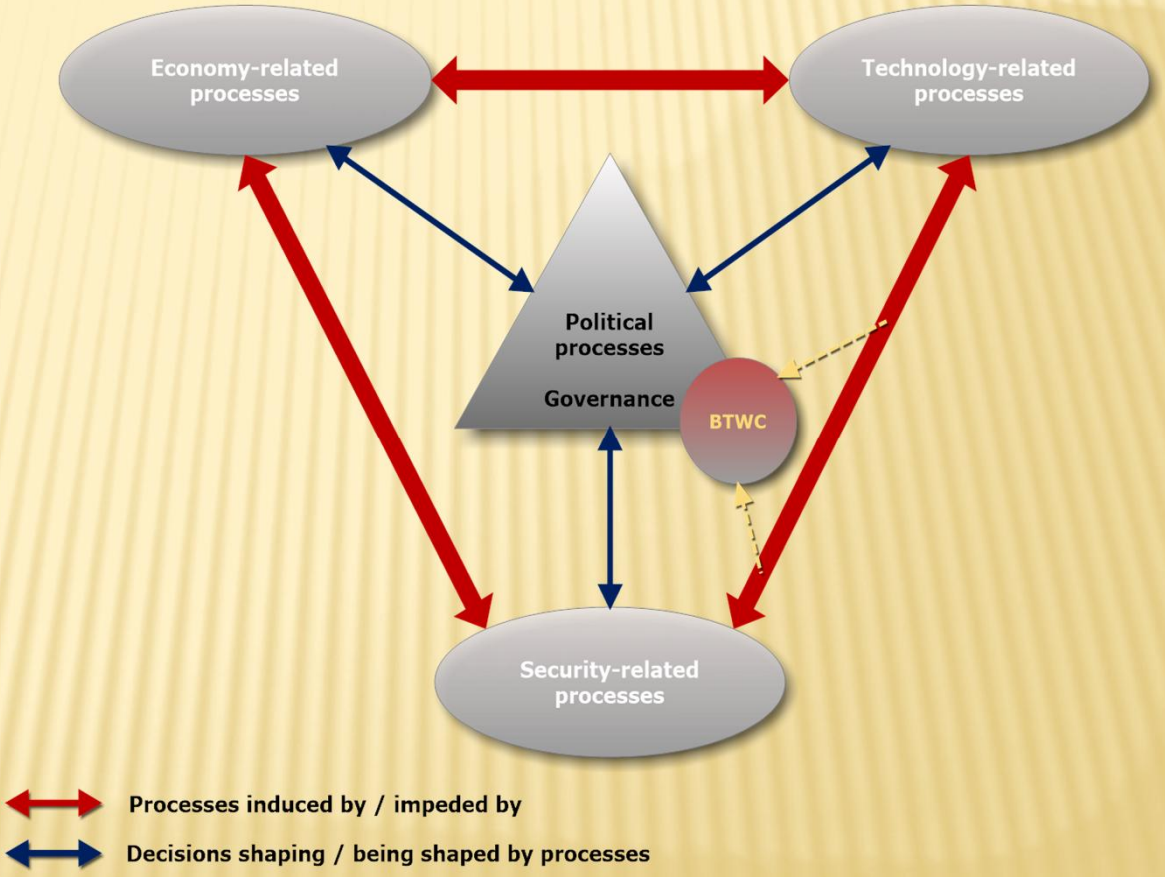
CHALLENGE

- **Since late 1980s, paradigm shift from disarmament to non-proliferation**
  - Different framing of issues puts strain on BTWC & CWC
  - Takes focus away from weapon and places it on underlying technologies or the possessor of such technologies (the so-called ‘rogues’ vs. rational, law-abiding actors)

- **However: today we are in a post-proliferation phase for biotechnology**

THE GOVERNANCE CHALLENGE

- No unified model for governance of weapon control anymore
- New stakeholders and security actors
- Increased role of non-state national & transnational actors
- Declining role of states in shaping developments
- Shifting relative balances of powers (economy, politics, military) and multiple power centres (polycentrism)
- Geographical decentralisation of business and industry activities
- South-south trade patterns and impact on technology diffusion
- Etc.



ADDRESSING GOVERNANCE OF BW PREVENTION

- **Disarmament/arms control community:**
  - Logical point of entry: weapons and their application
    - Biological warfare (states) / terrorism / crime
  - For BTW: Geneva Protocol + BTWC + CWC

- **Possible additional points of entry**
  - Prevention of disease (irrespective of origin of outbreak)
  - Preserving biology and biotechnology for peaceful purposes (societal advancement, economic development, health security, food security, etc.)
  - Environmental security (impact of accidental or purposeful introduction of organisms in new biotopes or of modified organisms)

A MULTI-LAYERED & MULTI-SECTORIAL GOVERNANCE MODEL?

- **Weapon control**
  - Multilateral agreements (Geneva protocol, BTWC, CWC)
  - Proliferation prevention arrangements (Australia Group, PSI, Global Partnership, etc.)
  - UN agencies: UNSC, UNODA, 1540 Committee, UNEP, UNDA, etc.
  - National laws and regulations (criminal, penal, trade, safety, etc.)
- **Disease prevention**
  - WHO, FAO, OIE + their regional organisations/initiatives
- **Crime and terrorism**
  - UNSC Resolutions (1540, terrorism resolutions, etc.)
  - Interpol, Europol, etc.
- **International transfers**
  - WTO, WCO, etc.
- **Economic actors**
  - Companies (national, multinational, transnational)
  - Research institutions
  - Individuals
- **Instruments of collective & individual governance**
  - Codes of conduct; Professional codes; Ethics
  - Awareness-raising & education
  - Whistle-blower protection schemes

EU-ISS

- *On the web*

  www.iss.europa.eu

- *E-mail*

  jean-pascal.zanders@iss.europa.eu