



Biological Weapons and the Challenge of Verification

Jean Pascal Zanders

Political Affairs Officer

United Nations Office for Disarmament Affairs (UNODA), Geneva

United Nations Programme of Fellowship on Disarmament

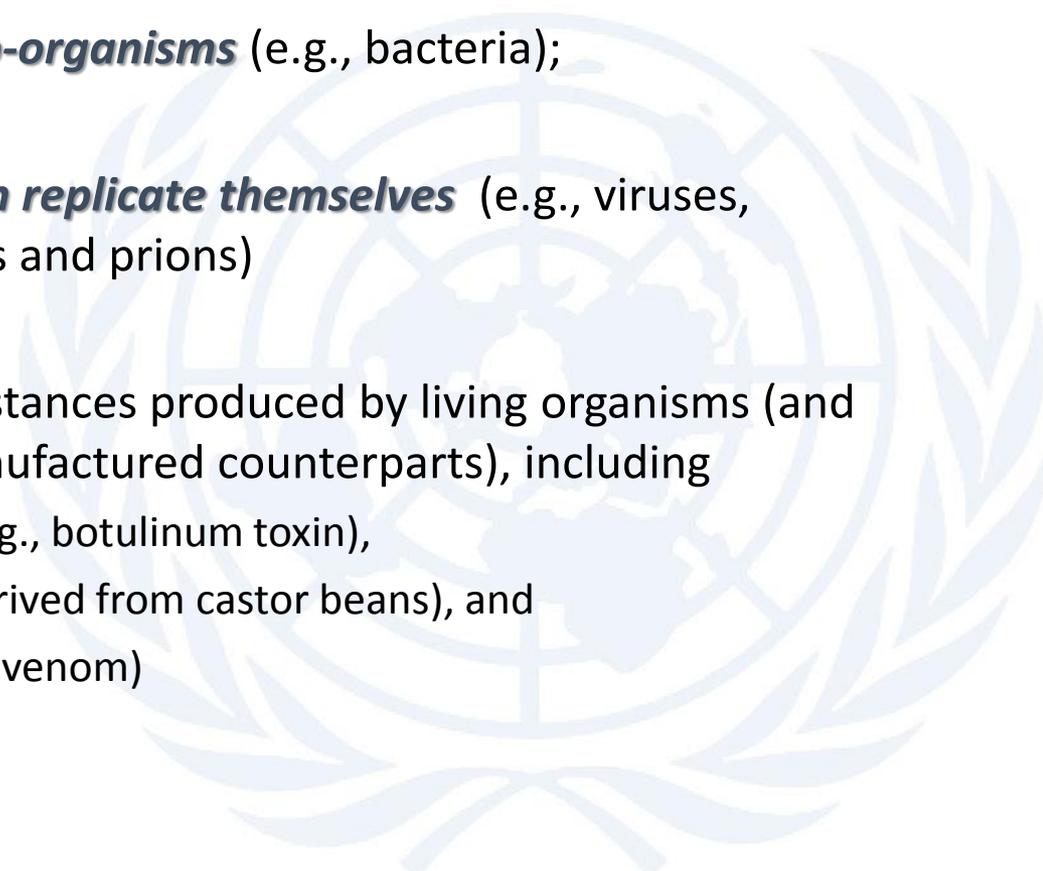
Geneva, 1 September 2016



What is biological warfare?

Intentional application against humans, animals or plants for hostile purposes of

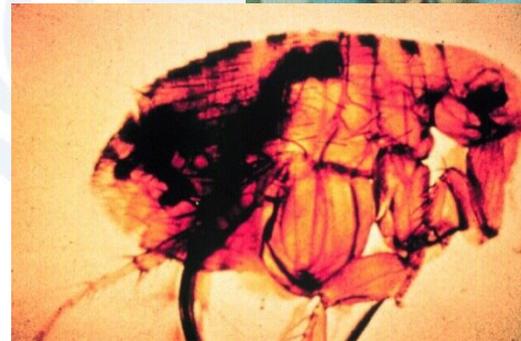
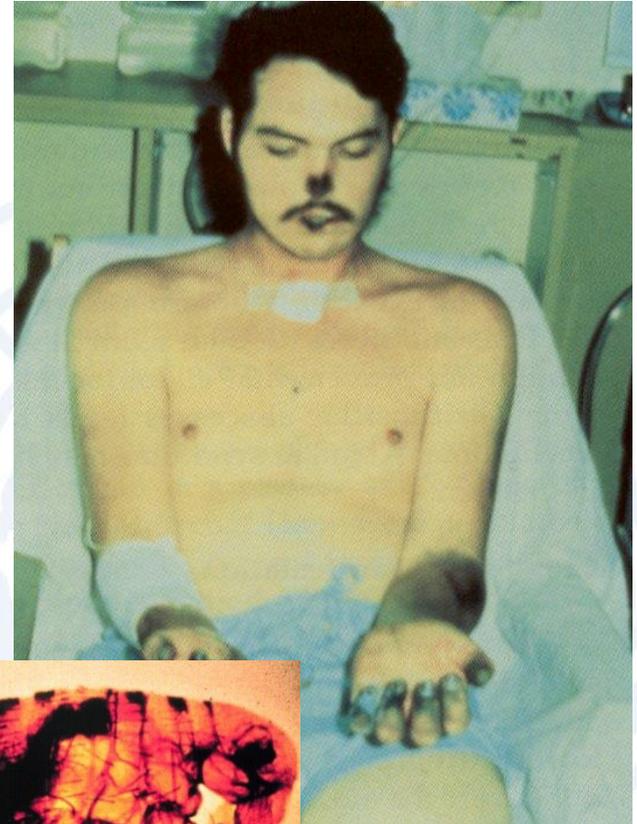
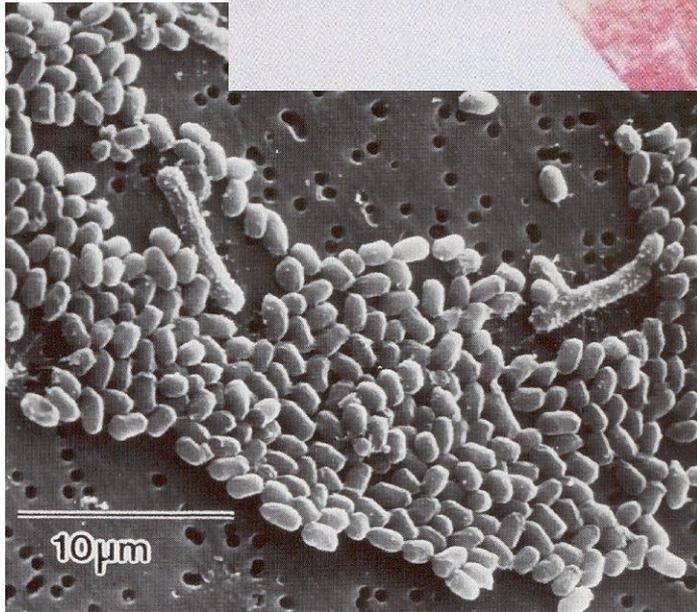
- ***Disease-causing micro-organisms*** (e.g., bacteria);
- ***Other entities that can replicate themselves*** (e.g., viruses, infectious nucleic acids and prions)
- ***Toxins***, poisonous substances produced by living organisms (and their synthetically manufactured counterparts), including
 - micro-organisms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





Visions of Biological Warfare – 1

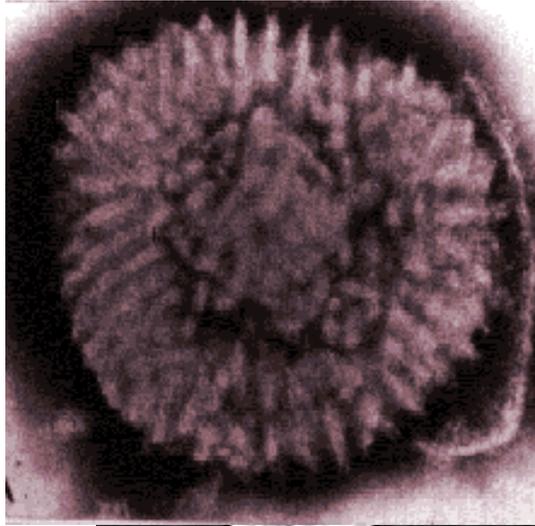
Anthrax



Plague



Visions of Biological Warfare — 2



Smallpox



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**





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 (2001) 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 (\approx number of fatalities in the Twin Towers attacks on 9/11 every two hours)
 - $\frac{1}{4}$ of all deaths worldwide
 - $\frac{1}{2}$ 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), Zika
 - 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



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)



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 analytical and production processes:**
 - Higher quality & higher quantities in smaller units
 - Technologies become common place (classroom equipment; bio-hacker laboratories)
- **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



Core treaties banning BW

- **1972 Biological (and Toxin) Weapons Convention (BWC)**
 - Bans development, production and stockpiling of BW and toxins
 - Ban on use explicitly referred to at 4th Review Conference (1996)
- **1925 Geneva Protocol**
 - Bans the use of CBW in war
- **1993 Chemical Weapons Convention (CWC)**
 - Bans development, production, stockpiling and use of toxins





The BWC as keeper of the norm

- **Strong norm**
 - Today, no state admits to BW programme & holdings
 - Quasi universality:
 - 175 States Parties → 3rd most successful weapon control treaty in force after CWC and NPT
 - Role in customary international law
 - States Parties committed to BWC:
 - Assessment of the state of the norm + updating at RevCons
 - Annual activities since 3rd RevCon (1991)
- **Intrinsically weak**
 - No formal verification & compliance enforcement mechanisms
 - No international institution for implementation oversight and enforcement
 - Implementation Support Unit (ISU) supportive of State Party activity, but no functional substitute for international organisation
 - Inability to incorporate verification tools into BWC
 - CBMs, VEREX (1992–93), Ad Hoc Group (1995–2001)
 - Slow process to deal with new challenges (scientific & technological developments; new actors)
 - On-going frustration over unmet expectations in areas of security or development



Shifting expectations from verification

- **The BWC is unverifiable**
 - Standard mantra, but why?
 - E.g., UK proposals of 1968-69: rejected in BWC, but now part of the broader regime against BW
- **Cold war understandings of disarmament and verification & related procedures**
 - Difficulties in dealing with dual-use characteristics of technologies
 - No verification substitutes (e.g., visible & countable delivery systems)
 - Unease with roles of multiple stakeholders in the process
 - State is often more protective of stakeholder interests than the stakeholders
- **Shift away from focus on weapon as a problem (disarmament) to focus on possessor of enabling technologies (non-proliferation)**
 - Rogue state discourse (no trust) + emphasis on regime change in rogue states
 - Addressing terrorism challenges
- **Shift away from parity in military arsenals (*adequacy*) to utility of weapons and hence capability to address challenges & threats (*effectiveness*)**



Adequacy vs. effectiveness – 1

- **Draft protocol as negotiated by the Ad Hoc Group**
 - Focus on compliance monitoring (was not a ‘verification’ protocol)
 - Enhanced transparency of relevant areas of dual-use civilian and military activities
 - New technologies & processes in research and industry made proposed reporting thresholds and action triggers irrelevant
 - Did not address new security challenges (e.g., terrorism, rogue state behaviour, etc.)
 - Therefore, did and could not produce greater confidence in treaty adherence
- **Relative relevancy of BW in security considerations has shifted**
 - BW disarmament was possible in the 1970s because of only marginal benefits of BW over nuclear and other weapons
 - Today: arms reductions and disarmament in many areas
 - CW banned; prospect of nuclear reductions / disarmament
 - In terrorism context, even minute amount of BW becomes highly relevant
 - E.g., anthrax letters

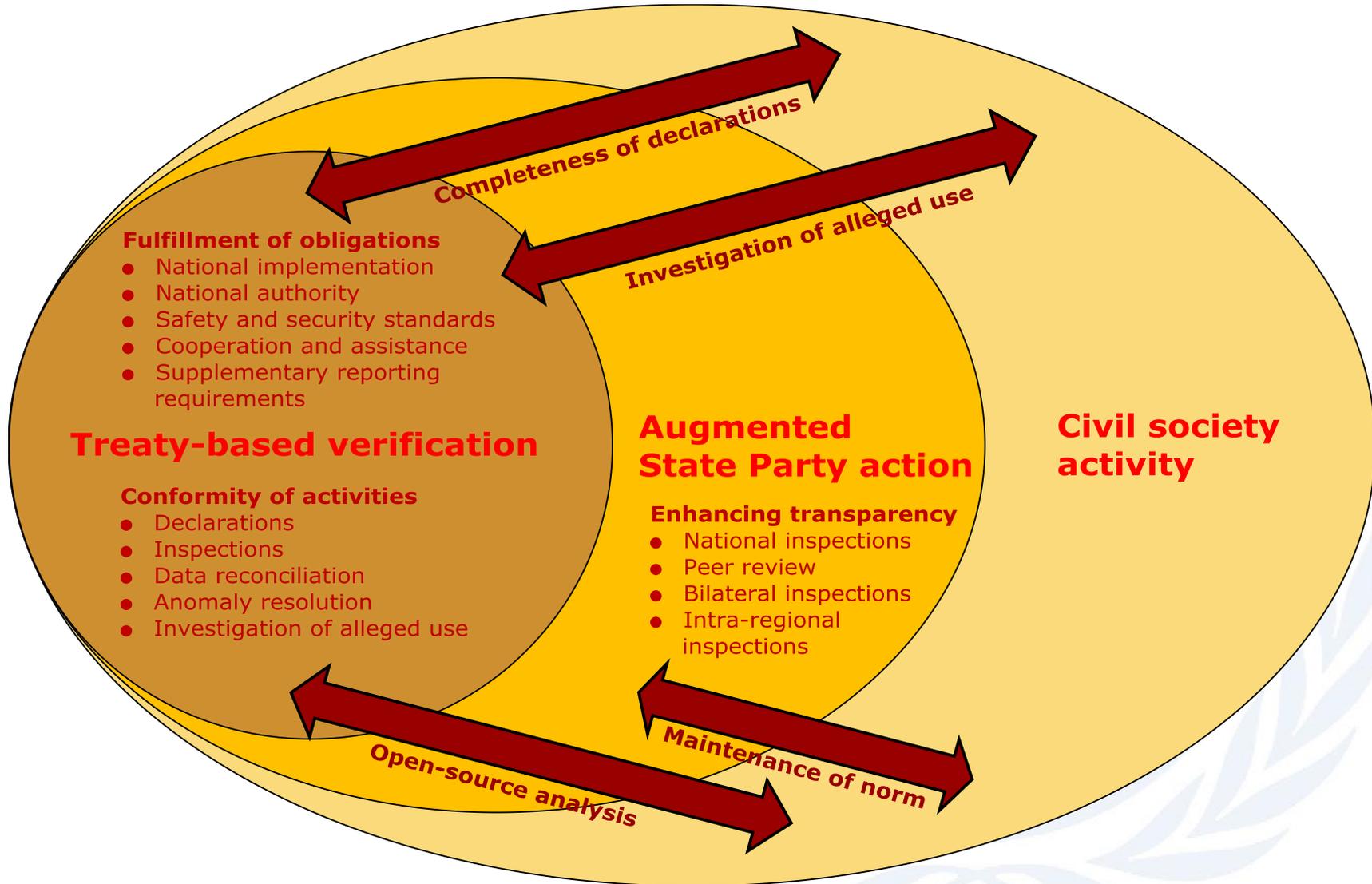


Adequacy vs. effectiveness – 2

- **Core question now being asked: How will security be guaranteed?**
 - How can a rogue state / terrorist be deterred?
 - What are my defences & protection? How adequate are they? How confident can I be in their adequacy?
 - **Biodefence & threat analysis produces circular logic:** must be kept secret not to reveal weaknesses, but how can I be sure that a potential adversary is not exploiting dual-use technologies for offensive purposes, if it also keeps that programme secret?
 - How does one know that a country's industry and research is not involved in BW-related activities?
 - How much risk to lose confidential information, etc., is one prepared to run with regards to one's own biodefence and civilian activities in order to get relevant data from other states?
- **US decision in 2001**
 - Focus on cause-based challenges; no scope for enhanced transparency
 - Termination AHG negotiations; new foci in intersessional activities
 - Better to compromise 'certainty' than 'security'
 - Consequently: rejection of equality & partnership at heart of any multilateral verification regime



Actor roles in a formal verification regime (e.g., CWC)



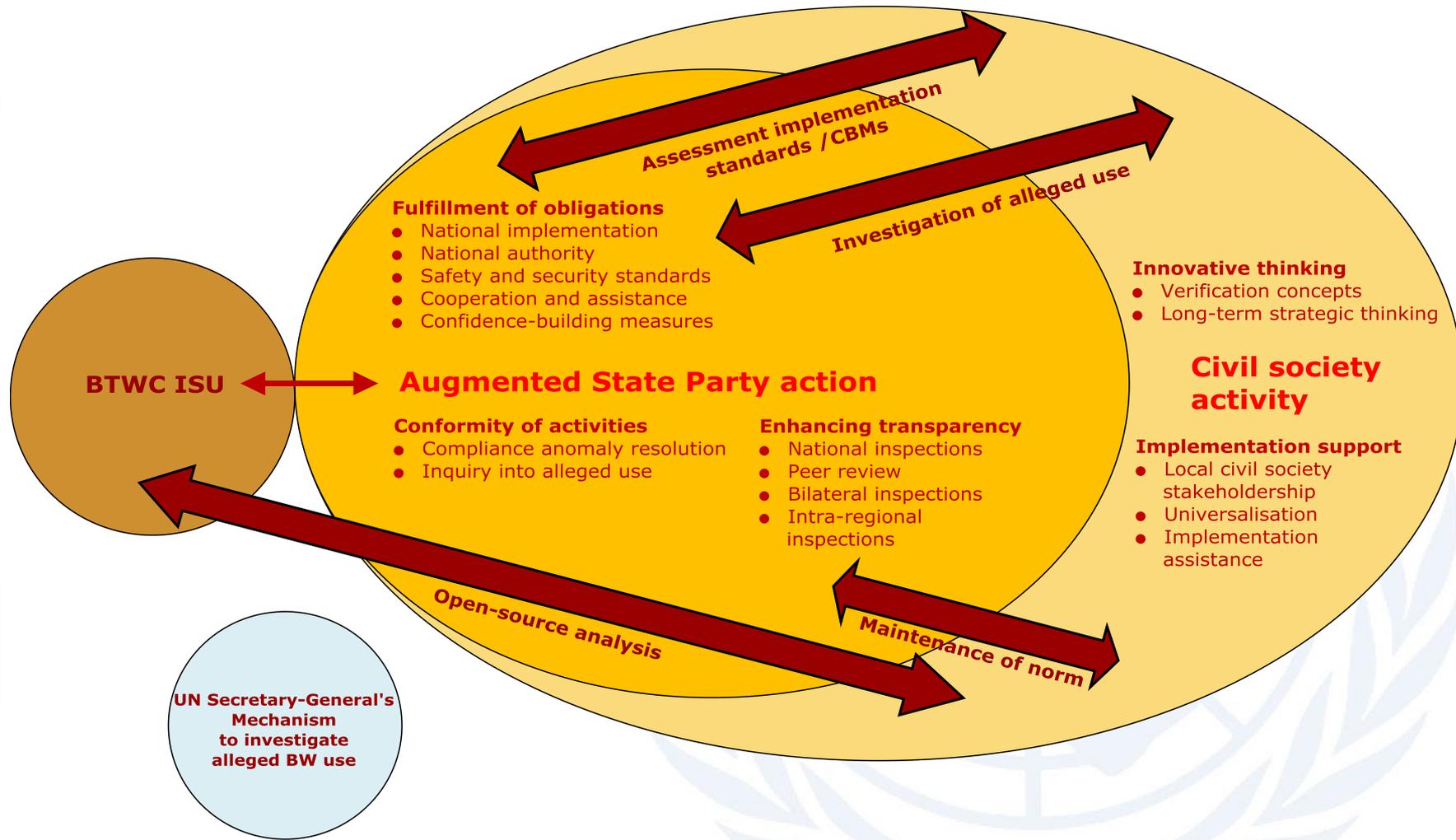


Formal verification

- **Centrality of international organisation**
 - Division of labour between IO and individual states parties
 - Verification of activities
 - Verification of treaty obligations (e.g., implementation legislation)
 - Investigation of alleged use of prohibited weapons in armed conflict
- **States can enhance the verification system**
 - On bilateral or regional basis
 - Supplementary verification activities
 - Assistance
 - Open sources and national intelligence
 - Options for bilateral consultations or action through IO
- **Civil society: supplementary roles**
 - Analysis and reporting on national compliance
 - Open source analysis and reporting
 - Raising concerns about the integrity of the norm (e.g., incapacitants & CWC)



Stakeholder roles in a BWC transparency regime



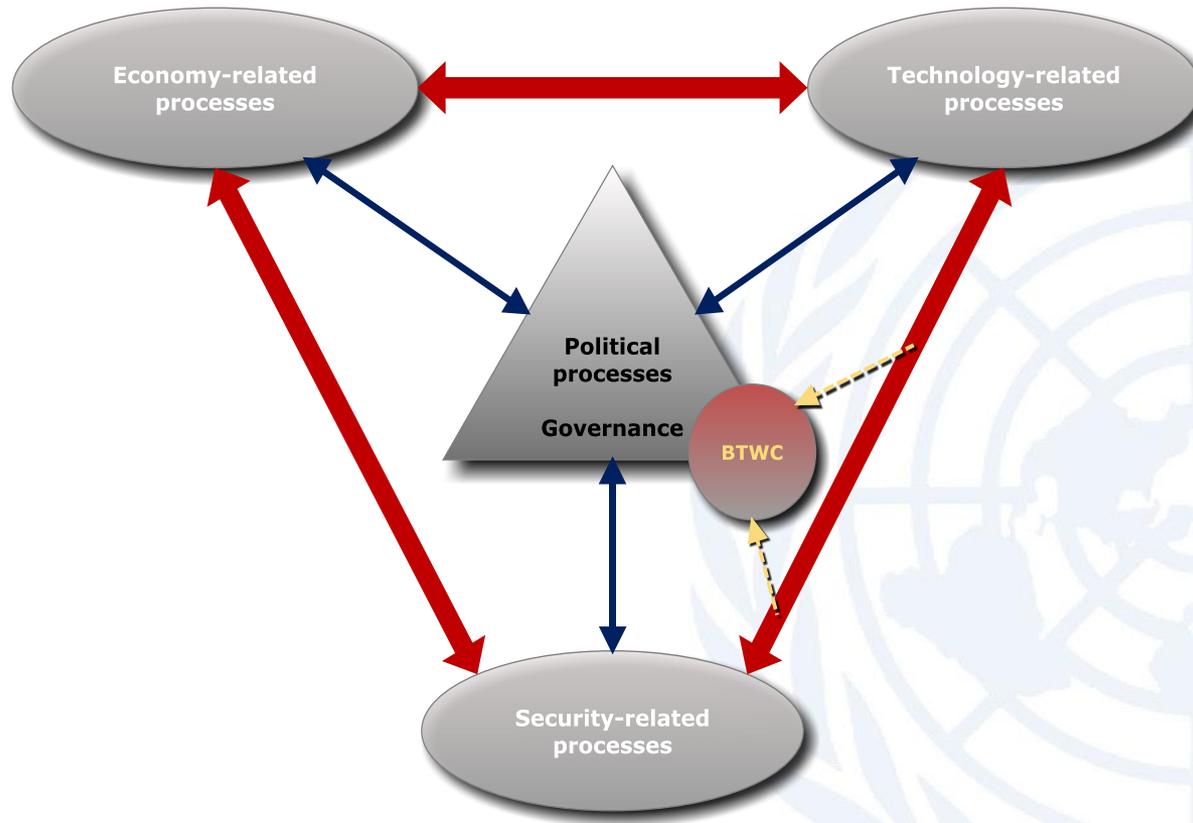


Verification in the BWC context

- **All transparency-related activities originate with the states parties**
 - No formal verification system
 - Confidence-building measures (CBMs)
 - Can be undertaken bilaterally (with reporting to state party meetings)
 - No sanction if a state party remains passive
 - Investigation of alleged use
 - UN Secretary-General retains full autonomy to initiate an investigation
 - States Parties have possibility to consult with each other in case of compliance concerns (Art. V), but retain right to take complaint to UN Security Council (Art. VI, 1)
- **No international organisation**
 - *Implementation Support Unit (ISU)* assists states parties with meetings, coordinates CBM collection and facilitates interactions between states parties in areas such as cooperation and assistance
 - ISU is part of UNODA, not an independent structure (even though ownership of the BWC is with States Parties)
- **Triple role for civil society possible**
 - Similar functions as with formal verification system
 - Active involvement in universalisation and implementation assistance, including building local civil society activity
 - Innovative thinking on future of the BWC, including options for a formal verification system



What future role for the BWC?

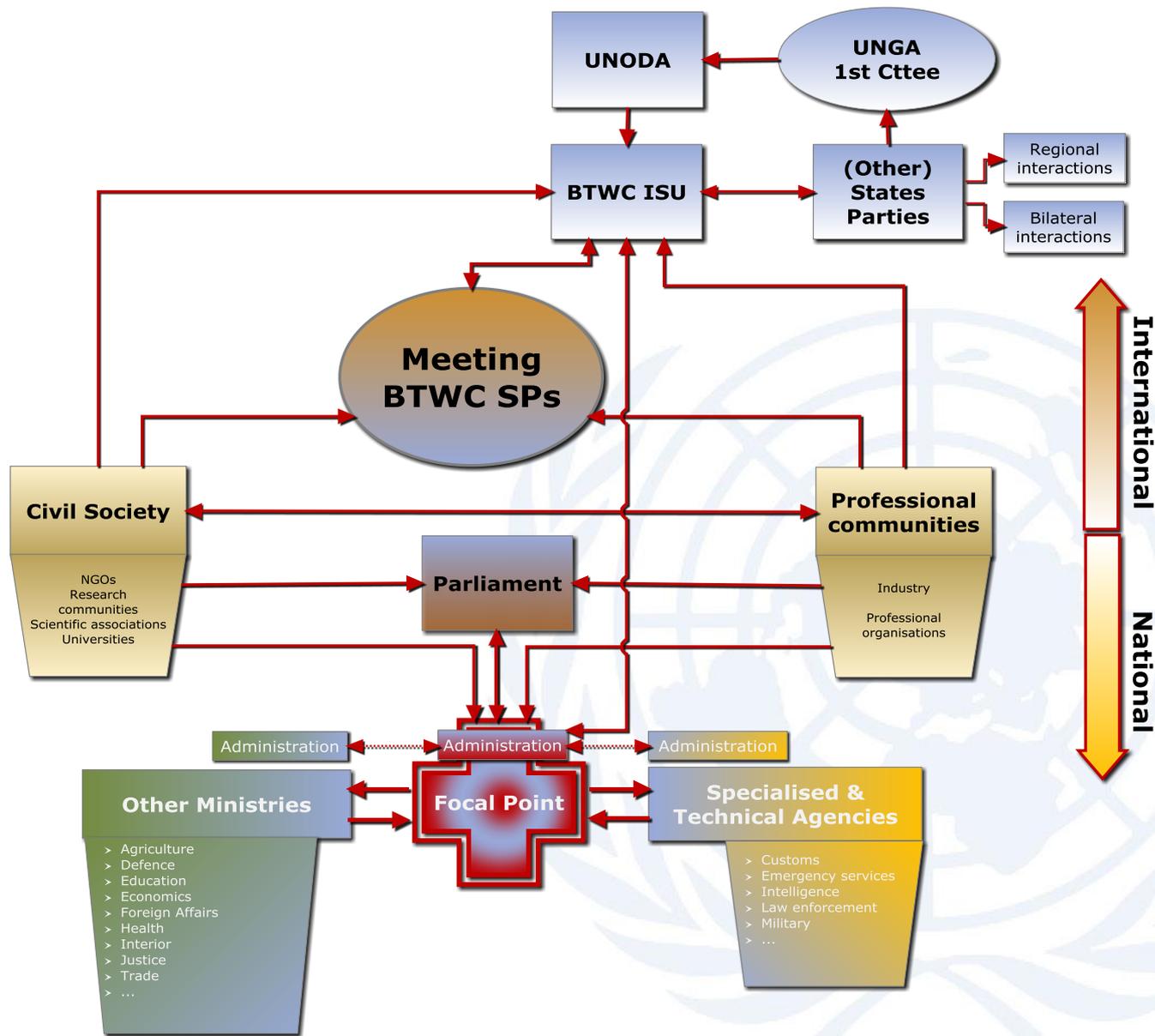


↔ Processes induced by / impeding by
↔ Decisions shaping / being shaped by processes

- No unified model for governance of weapon control anymore
- New stakeholders and security actors
- Increased role of non-state national & transnational actors
- 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
- ***Declining role of states in shaping developments, but many states reject formal governance responsibilities for non-state actors under BWC***



Treaty development in a multi-stakeholder context





Contact

Jean Pascal Zanders

Political Affairs Officer

UN Office for Disarmament Affairs (Geneva Branch)

Room C.1-1, Palais des Nations, CH-1211 Geneva 10

Tel: +41 (0)22 917 3463

Mob: +41 (0)76 691 0585

Fax: +41 (0) 22 917 04 83

jzanders@unog.ch

