

Institution: King's College London		
Unit of Assessment: 21 Sociology		
Title of case study: Advancing transparency and building trust in biodefence		
Period when the underpinning research was undertaken: Aug 2013 – Dec 2018		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Dr Filippa Lentzos	Senior Research Fellow	From 24/01/12
Period when the claimed impact occurred: Nov 2013 – Aug 2020		
Is this case study continued from a case study submitted in 2014? N		

1. Summary of the impact

183 states around the world are partners to the international treaty prohibiting biological weapons: the Biological and Toxin Weapons Convention (BWC). Yet, while the treaty signals the will and ambition of the international community, the BWC has always lacked the legal means to ensure states comply with their obligations. Sociologically-informed research into compliance assessment from King's College London's Department of Global Health and Social Medicine has raised awareness and expanded understanding of biosecurity governance and BWC compliance. The research has analysed, advocated and demonstrated new measures states can pursue to enhance transparency and build confidence in the intentions behind biological research and development activities with significant potential to be repurposed to cause harm. Shaping debate at the highest levels across governments and international organisations, the research has contributed to identify concrete ways BWC members can develop new practices to improve transparency, and to engage in confidence-building that strengthens global efforts to uphold the norm against biological weaponry.

2. Underpinning research

The 1972 Biological and Toxin Weapons Convention (BWC) unequivocally prohibits the development of biological agents - whether naturally occurring, genetically modified, or chemically synthesized - for the purpose of deliberately causing harm. Yet, the BWC permits almost any kind of activities for peaceful or defensive purposes. Article I of the BWC - through which states 'agree to never under any circumstances acquire or retain biological weapons' - is therefore vague in demarcating the borders of prohibited and legitimate activities. Article I merely refers to biological agents 'of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes'. An essential part in judging states' compliance with the BWC is therefore analysis of justifications provided for biological research and development (R&D) activities with significant potential to be repurposed to cause harm.

Unlike other post-Second World War weapons treaty regimes, the BWC does not have formal verification mechanisms to ensure compliance. Concerns about biological weapons have therefore endured and are now escalating. Accelerating advances in abilities to manipulate genes, biological systems and delivery systems mean it is now easier than ever to obtain disease-causing agents in the course of medical and biological research, but also easier to repurpose them for deliberate harm, and barriers to acquiring and using biological weapons have been significantly reduced in recent years. BWC compliance assessment has therefore taken on a new level of urgency.

A body of research undertaken by Dr Filippa Lentzos and colleagues at King's College London has focused on the complex relationship between transparency, evidence-based judgments and trust in biodefence programmes, where the potential for repurposing R&D is often considered greatest. Engaging with a complex chain of stakeholders, from individual research laboratories, the life sciences and biotech industries, national scientific academies, international organisations, state governments and multinational conventions, this theoretically-driven, empirically-informed research has drawn on a range of methods, including participant observation, interviews and documentary analysis. The research has won

support of competitive peer-review funding [7] and commissions from governmental agencies [8,9], and has yielded advances relating to:

Qualitative approaches to compliance assessment

ESRC-funded [7] research explored the evolving landscape of biological R&D in relation to compliance assessment, and found that quantitative, Cold War-era tools of compliance assessment were becoming increasingly outdated and irrelevant to understanding bioscience developments on the ground. To establish the intent of contemporary biological R&D—in academic, private, commercial and defence settings—the research showed that material accountancy-type verification methodologies were no longer enough. You could not simply count fermenters, measure the sizes of autoclaves, and limit amounts of growth media. Complicating matters was the increasing diffusion of relevant materials, equipment and technical know-how across multiple and varied scientific disciplines and sectors, as well as an increased concentration of R&D in private, rather than public, hands. The research found that compliance assessment in the biological field was becoming more complex, that there was a need for ‘multi-level stakeholdership’ in compliance assessment, and that traditional tools needed to be supplemented by a more qualitative approach to enable states to more effectively demonstrate transparency and build trust [1,2].

Sociologically-informed governance of biological R&D

The ESRC-funded research also drew attention to the social context of biological threats, emphasising how they are constructed in particular settings, by particular groups of individuals and institutions, using particular pieces of evidence [3,4]. In drawing attention to the sociology of biological threats and international efforts to counter them, the research demonstrated that an expanded ‘toolbox’ of measures are needed to manage the potential for certain biological R&D to be repurposed to cause harm.

The research promoted the concept of ‘trimodal regulation’ [5]. This innovative, sociologically-informed model of regulation builds on three modes of regulation: i) *coercive regulation*, based on the authority of states, and including penalties for non-compliance, statutory regulations and reporting requirements, mandatory licensing, certification and registration; ii) *normative regulation* based on mores and customs, and including codes of practice, guidelines and transparency measures; and iii) *mimetic regulation*, based on the emulation of successful examples and models of behaviour, national and international standards, education and awareness-raising. The research argued that the three modes must all be harnessed to effectively identify, influence and inhibit those who seek to misuse biological R&D.

These findings led to further research, commissioned by the former UK Foreign & Commonwealth Office (FCO), which sought to expand understandings of what builds confidence in compliance with the BWC. It found that confidence-building measures must be expanded beyond ‘hard law’ to also include ‘soft law’ and ‘informal measures’ as complimentary means of managing biosecurity risks. The approach emphasised interaction and flexibility, expert-level exchanges of best practices and a broad conception of ‘relevant’ laboratories and facilities [1].

Informal measures to manage biosecurity risks

Research funded by the Norwegian Ministry of Foreign Affairs further explored the role of soft law and informal regulatory measures, such as guidelines, codes of conduct, peer review, professional norms and regular interactions, as part of an incremental and inclusive approach to compliance assessment. The research showed that the knowledge, experience and expertise of civil society can contribute to enhancing transparency between BWC member states in several ways [6], including through assisting states to collect and collate information on confidence-building measures, monitoring states’ biodefence activities, collecting open source data, processing data provided by states to generate more accessible information, and bringing the information into the public sphere.

3. References to the research

- [1] Lentzos, F (2014), ‘The BWC: Compliance, transparency & confidence’, *Disarmament Times*, vol. 37, no. 1, pp. 6-8

Impact case study (REF3)

- [2] Lentzos F (2015), 3D BIO: Declare, Document and Demonstrate, European Union Non-Proliferation Consortium Paper No.45
- [3] Marris, C, Jefferson, C & Lentzos, F (2014), 'Negotiating the dynamics of uncomfortable knowledge: The case of dual use and synthetic biology', *BioSocieties*, vol.9, no.4, pp.401-428.
- [4] Lentzos, F (2016), *Biological Threats in the 21st Century: The Politics, People, Science and Historical Roots*. Imperial College Press, DOI: 10.1142/p1081
- [5] Lentzos, F (2013), *Hard to Prove: Compliance with the Biological Weapons Convention*. King's College London, London
- [6] Lentzos, F & Littlewood, J (2018), 'DARPA's Prepare program: Preparing for what?', *The Bulletin of Atomic Scientists*.

Relevant Funding

- [7] Economic and Social Research Council (RES-070-27-0003), *The politics of bioterrorism*, 2010-14, £207,000.
- [8] UK Foreign and Commonwealth Office, *Beyond hard law: Strengthening the BWC CBM regime*, 2014-15, £40,000.
- [9] Norwegian Ministry of Foreign Affairs, *BWC verification*, 2018, £20,000.

4. Details of the impact

The community involved in ensuring that the BWC is upheld is made up of stakeholders across governments, civil society, national and international scientific and medical associations, the private sector, and academia. All stakeholders are involved in BWC meetings. These include annual meetings of experts (MXs), which feed into annual meetings of states parties (MSPs), and five-yearly treaty review conferences—all held at the United Nations (UN) in Geneva.

Civil society has long played an important role in the BWC community, promoting new and innovative approaches, holding governments to account and acting as the 'collective memory' as governmental representatives come and go. Civil society members have also facilitated contacts between the state-driven BWC process and other stakeholders such as the scientific community and private industry. Without this important facilitative role, the BWC would not have the necessary level of engagement with such stakeholders at the international and national levels. As described by the UK's former Disarmament Ambassador in Geneva: "*as a long standing, expert member of civil society, of which Dr Lentzos is a prime example... [she is] well respected by both the expert and diplomatic communities, having an ability to 'translate' between the two*" [A].

Dr Lentzos' unique position and body of research has seen her be invited to provide a series of technical background reports commissioned by, among others, the World Health Organization (2020), the UN Institute for Disarmament Research (2019), the German Federal Foreign Office (2019), and the Nuffield Council on Bioethics (2015) [B]. Her research and expertise have also led to Dr Lentzos being invited to give several high-profile briefings, including: the WHO strategic & technical advisory group for infectious hazards (2019), the Australia Group on export controls (2019), the UN Conference of Disarmament (2018), the UN Office for Disarmament Affairs (2018), the European Commission (2018), the UN Secretary-General's Advisory Board on Disarmament Matters (2017), the UK Cabinet Office (2017), the UK Ministry of Defence (2017), and the Royal Society (2016).

By providing a robust evidence base for multilateral international policy discussions, Dr Lentzos' key position and trusted research has helped shape the agenda of high-level international discussions, ensuring that formal processes and practices around BWC compliance assessment focus on qualitative approaches, different modes of regulation and multi-level stakeholdership as ways to increase transparency and trust.

Shaping multilateral policy debates to strengthen the BWC

Dr Lentzos' sociologically-informed research has become integral to shaping many BWC conversations. For example, after introducing the concept of 'trimodal regulation' [5] at an

informal side event to the 2013 BWC meeting of experts, Germany said in a statement to the MX meeting that *“Monday’s side event organised by King’s College London...highlighted in particular the need to take into account the diverse group of stakeholders and to also take into consideration approaches other than the traditional top-down approaches”* [C1]. Another statement, from Switzerland, said *“King’s College’s policy brief on compliance contains very valuable ideas and recommendations that should be taken forward”* [C2]. Australia’s presentation to the meeting included a slide elaborating ‘trimodal’ regulation [C3]. Australia’s reference to King’s policy brief prompted a spontaneous and unprecedented invitation by the meeting chair to a non-government organisation (King’s College London) to elaborate further on the concept in the formal session of the meeting.

After further advocating multi-level stakeholdership, wherein BWC developments are shaped by multiple state and non-state actors, Dr Lentzos was nominated as the BWC’s NGO Coordinator in 2017. In this capacity, she initiated and delivered the first ever joint NGO statement to the 2017 meeting of states parties (with subsequent MX and MSP statements, and statements to the UN General Assembly First Committee in New York, in both 2018 and 2019). It is widely acknowledged that civil society activities have sustained an influential informal discussion on key issues when politics have blocked a more formal discussion of those matters. As described by the Head of the BWC Implementation Support Unit in the UN’s Office for Disarmament Affairs, Dr Lentzos’ research has been present *“at every MX and MSP in the last and the current intersessional process and [she] has coordinated and sometimes delivered statements on behalf of the civil society groups. These statements are closely read by States Parties and the ideas contained therein regularly find their way into the formal discourse at BWC meetings”* [D].

In 2014, commissioned by the former FCO, Dr Lentzos established a multi-stakeholder forum in collaboration with Defence Science Technology Lab (dstl) Porton Down and the UK Mission to the UN in Geneva to focus on BWC compliance and confidence-building measures. Enabling state representatives, international organisations and other experts to collectively and substantively engage in dialogue on key issues, the forum identified where points of contention and agreement were expected in advance of the BWC’s 2016 review conference.

Reflecting on her contributions to this process, the UK’s former Disarmament Ambassador described Dr Lentzos’ research on novel approaches to compliance assessment as making *“significant contribution to maintaining a rounded discussion on a polarising issue amongst a broad range of countries, helping ensure that there was a more nuanced discussion on how to strengthen the implementation of the BWC through the 2016 Review Conference”* which also *“undoubtedly helped ensure the issue was firmly on the agenda for the agreed forward programme of work”* [A]. In addition, Dr Lentzos’ research and engagement ensured that a range of stakeholders were well-informed on crucial issues, so that *“participating delegations, many with very limited domestic expertise, were better informed”* [A] and thereby better able to contribute to review conference negotiations.

The former FCO invited Dr Lentzos to author a policy paper [E] elaborating her assessment of the multi-stakeholder forum which was submitted by the UK to the 2014 BWC meeting of states parties. This directly informed the agenda of subsequent high-level meetings designed to formally review and strengthen the operation of the BWC, and ensured that the voices of important actors were present in the wider political process. It has traditionally been unusual to have non-governmental experts author BWC policy papers, but Dr Lentzos was further *“trusted”* [D] to author policy documents submitted by Germany to the 2016 review conference [F] and by Georgia to the 2018 meeting of states parties [G], both of which included verbal briefings to BWC delegations.

Informing activities to demonstrate transparency and build trust

In partnership with foreign government ministries, Dr Lentzos’ research on qualitative approaches to compliance assessment [1,2,3,4] has led to new activities to promote transparency and build trust. For example, in 2016, with the German Ministries of Foreign Affairs and Defence, Dr Lentzos helped develop and action a first-of-its-kind, two-day international on-site transparency visit for BWC states to the Bundeswehr Institute of Microbiology in Munich. Dr Lentzos acted as the sole civil society observer to the visit. The

visit's design reflected and implemented Dr Lentzos' research recommendations [1,2,5] relating to direct multi-stakeholder engagement to build trust, provide transparency and share best practices [F]. A follow-on transparency visit to the high-profile Luger Centre of the National Centre for Disease Control and Public Health in Tbilisi, Georgia in 2018, incorporated additional civil society observers, and Dr Lentzos was invited to act as an active independent, non-government expert. She represented the group to the media, being interviewed on both Georgian and Russian national television, and substantively contributed to the group's assessments and final report, as well as producing an independent report [G].

Raising awareness amongst a wider audience

Dr Lentzos' work on the sociology of biological weaponry and its governance identified that engaging with wider audiences, including the lay public, is crucial to raise fact-based awareness of biological weapons, and to establish broad levels of trust in the policies and practices governing biological R&D that could be repurposed to cause harm [4,5]. In addition, to sustain engagement with national and international media, Dr Lentzos provided conceptual, framing and background input into the 2016 BBC4 documentary 'Inside Porton Down: Britain's Secret Weapons Research Facility'. As reported by the BBC, the documentary had record viewing numbers: 1.2 million on first broadcast and an additional one million views on BBC iPlayer [H]. It has since been aired in several other countries, resulting in international newspaper and media coverage on the documentary and Dr Lentzos' wider research.

In cooperation with the former FCO, Dr Lentzos convened a screening and panel discussion of the documentary at the UN for BWC delegates. The event provided an innovative and more public way to demonstrate transparency of a national biodefence programme than the formal mechanisms usually employed within the BWC. The UK's Disarmament Ambassador at the time praised the screening as *"a very practical way of demonstrating how transparency could build confidence"* [A]. He also commented on an unintended benefit from the screening: *"when Russia attempted to blame the 2018 Skripal poisonings conducted by Porton Down, states knew that the British Government was transparent about the institute's work, making it easier to debunk the allegations"* [A]. This demonstrates the valuable impact of Dr Lentzos' work and activities: bringing *"technical and complex issues to a wider audience"* [D] and better informing a range of stakeholders about global efforts to uphold the norm against biological weaponry.

5. Sources to corroborate the impact

-
- [A] Testimonial from M Rowland, UK Disarmament Ambassador in Geneva, 2013-2018.
- [B] Series of commissioned technical background reports: F Lentzos (2020) 'DURC governance'. Internal report, World Health Organization Health Security Interface Technical Advisory Group; F Lentzos (2019) Compliance and enforcement in the biological weapons regime. UN Institute for Disarmament Research; K Brockman, S Bauer, V Boulanin & F Lentzos (2019) New Developments in Biotechnology in Capturing Technology, Rethinking Arms Control. German Federal Foreign Office; F Lentzos (2015) Dual use in biology and biomedicine Nuffield Council on Bioethics.
- [C] Report of research being used in the United Nations, Geneva [C1] Statement by Germany to the BWC meeting of experts under agenda item 7, 15 Aug 2013 [C2] Statement by Switzerland to the BWC Meeting of experts 16 August 2013 [C3] Presentation by Australia to the BWC meeting of experts under agenda item 7, 15 Aug 2013
- [D] Testimonial from D Feakes, Chief BWC ISU, UN Office for Disarmament Affairs.
- [E] United Nations BWC meeting of states parties 2014, Confidence and compliance with the Biological and Toxin Weapons Convention: Workshop report, BWC/MSP/2014/INF.3.
- [F] United Nations eighth BWC Review Conference, Peer review visit exercise at the Bundeswehr Institute of Microbiology in Munich, Germany: Civil society observer report, BWC/CONF.VIII/WP.29
- [G] United Nations BWC meeting of states parties 2018, Transparency visit to the Luger Center, Georgia: An independent report, BWC/MSP/2018/WP.11.
- [H] BBC viewing figures from film producer (2016)