

Impact case study (REF3b)

<p>Institution: University of Bradford</p>
<p>Unit of Assessment: C21</p>
<p>Title of case study: Improving the Effectiveness of the Biological Weapons Non-Proliferation Regime and the Biosecurity Practices of Life Scientists.</p>
<p>1. Summary of the impact</p> <p>Research at Bradford has focused on the Biological Non-Proliferation work of the Bradford Disarmament Research Centre (BDRC). The research-informed impact of this work is two-fold. Firstly BDRC has influenced, and continues to influence, decision- and policy-making involving 170 States on how to strengthen global governance through improvements to the Biological and Toxin Weapons Convention (BTWC). As a consequence of this influence BDRC has changed the practices of institutions and individual researchers and thus has, through novel training and curriculum development, helped foster a culture of biosecurity to reduce the risk of inadvertent or deliberate misuse of life and associated science research.</p>
<p>2. Underpinning research</p> <p>BDRC is a Policy Research Centre of Excellence within Peace Studies. Core staff include Malcolm Dando (Lecturer, 1978-2010, Emeritus Professor 2010-present), Graham Pearson (Honorary Professor, 1994-present), and Dr Simon Whitby (PDRA 1994-1999, Senior Research Fellow 2000-2011, Lecturer and Director of BDRC 2011-present), with Doctoral and Post-Doctoral Researchers Novossiolova and Minehata. From 1994 Dando led a research programme on preventing biological weapons proliferation. As well as working to strengthen the prohibition, this work focussed on the proliferation challenges presented by developments in bio-technology. From 1996, Dando, with Pearson and Whitby, supported by funding from the Joseph Rowntree Charitable Trust, further developed this research programme. During this phase of the work BDRC developed a strategic approach to maximise its impact consisting of a programme of critical but constructive engagement to facilitate work with States Parties to the BTWC. From 2000-2008, BDRC secured a series of four Carnegie Corporation of New York grants, amounting to approximately \$1 Million (US) in total, to continue this research.</p> <p>During this phase of the work BDRC staff and associates produced eight single authored books including references 1, 2, 3 and 4. Major insights from this body of research revealed: that during the Twentieth Century important States (the US, the UK, Japan and USSR) had developed large-scale offensive biological weapons programmes for the deployment of disease against humans, animals, and crops; that improvements in the prohibition regime (BTWC) were essential in preventing State programmes; that, there is a significant risk that the revolution in biology will be applied in weapons programmes (in making, for example, genetic weapons to target ethnic groups); and that poor biosecurity practices might lead to accidental misuse of life science research with potentially catastrophic consequences for industry, individual scientists and even for whole societies. Our research findings show that it is necessary for states to act both to formulate concrete measures to strengthen the Convention, but also so as to stop the misuse of science, and to champion the dissemination of best practice approaches to biosecurity amongst life- and associated science communities (5).</p> <p>Thus, supported by the above funders we began to produce a series of reports and briefing papers on a broad range of technical issues concerning how States might strengthen the treaty regime. In the current REF period we have produced 11 Bradford Review Conference Papers, six Bradford Briefing Papers on the 7th Review Conference and one Key Points for the Seventh Review Conference Book. BDRC was one of the first security research centres in the world to engage life- and associated-scientists in training programmes for understanding the ethical, social and legal implications of their work.</p> <p>In 2008 BDRC, in collaboration with the National Defence Medical College, Japan (with the Surgeon General of Japan's Air Force as PI) together with the Landau Network Centro Volta, Italy, obtained a</p>

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£35,000 grant from the British Council. The work allowed us to understand how best to incorporate dual-use biosecurity and bioethics into the training and professional practice of life and associated scientists (6). This understanding was developed in 2009 when we obtained a £350,000 Wellcome Trust grant. The latter work directly resulted in the development and delivery of curricula and international train-the-trainer courses to make life science communities aware of dual-use bioethics and thus change their everyday practice.

3. References to the research

1. Whitby S. (2001) *Biological Warfare Against Crops*. Basingstoke: Palgrave.
2. Dando MR. (2001) *The New Biological Weapons: Threat, Proliferation and Control*. Boulder, Co. Lynne Rienner.
3. Pearson GS. (2000) *The UNSCOM Saga*. Basingstoke: Palgrave.
4. Whitby S, Dando MR. (2010) Effective Implementation of the BTWC: The Key Role of Awareness Raising and Education. Strengthening the Biological Weapons Convention. *Review Conference Paper No 26*. University of Bradford. See paragraphs 41 and 42 (page 16)
5. Dando MR. (2002) *Preventing Biological Warfare: The Failure of American Leadership*. Basingstoke: Palgrave.
6. Whitby S, Dando M. (2010) Biosecurity awareness-raising and education for life sciences: what should be done now? In Rappert B. (ed.) *Education and Ethics in the Life Sciences: Strengthening the Prohibition of Biological Weapons*. Canberra: Australian National University E Press, 179-196. <http://epress.anu.edu.au/titles/centre-for-applied-philosophy-and-public-ethics-cappe/education-and-ethics-in-the-life-sciences/pdf-download>

The following grants are indicative of the quality of the research:

Joseph Rowntree Trust:

1997-1999, £41,508, *Biological weapons convention*, PI Dando

1998-2001, £98,850, *Biological weapons convention negotiations*, PI Dando

2003-2010, £101,396, *New weapons and new threats*, PI Dando

Carnegie Corporation:

2000-2003, £131,309, *Preventing the proliferation of biological weapons*, PI Dando

2002-2005, £162,858, *Preventing the proliferation of biological weapons*, PI Dando

2004-2007, £149,167, *Impact of scientific and technological development*, PI Dando

2006-2009. £114,354, *International meetings and dialogues on preventing the proliferation of biological weapons*, PI Dando

The British Council together with the National Defence Medical College, Japan (including the Surgeon General of Japan's Air Force) and the Landau Network Centro Volta, Italy), 2009, £35,000, *To develop a dual-use biosecurity curriculum for teaching life and associated science audiences in different cultural (Japan/UK), language (Japanese/English) and academic (Medical and Social and Political Science) settings*. PI Dando.

Wellcome Trust, 2009-2014, £350,000, *Building a Sustainable Capability in Dual-Use Bioethics*. PI Dando.

4. Details of the impact

Bradford's work on biosecurity issues has influenced state policy on biological weapons and has become internationally known and highly regarded by governments (a) (such as The Netherlands) and civil society groups (b) (such as Lord Rees, Royal Society) concerned with the maintenance and strengthening of the Biological and Toxin Weapons Convention (BTWC). BDRC works in a critical but

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constructive partnership with States Parties on strengthening the BTWC and its staff has been invited to participate in and give presentations at workshops, briefings and expert working groups at virtually every BTWC-associated international meeting of States Parties from 1996 to the present (2 per year in REF period). The impact of this engagement and the broader work of BDRC in influencing State policies on the BTWC is evidenced by the fact that its work is regularly cited by States parties in their own proposals and discussions on the BTWC. For example, just one Official Paper submitted in April 2011 by the governments of Australia, Japan and Switzerland to the Preparatory Conference of the States Parties to the Biological Weapons Convention, held at the UN in Geneva April 2011, includes more than 20 references to the work of BDRC (c).

One outcome of the Seventh Review Conference of the BTWC has been the addition of a standing agenda item that focuses on educating life scientists in the ethical aspects of their work and will be monitored by the future BTWC conferences. This was a key recommendation of the Bradford research and featured in the reports (a) presented (d) at BTWC (December 2011). Additionally, BDRC's Key Points paper published in 2012 included a foreword from the Head of the Review Conference involving 163 states who stated it would 'inform the States' Parties preparations for the Seventh Review Conference (a).

BDRC has brought together the knowledge generated by its research activity and its ongoing work with BTWC to create a series of innovative training resources for life scientists around the world. In 2009 as a result of research with the National Defence Medical College of Japan and the Landau Network Centro Volta of Italy, BDRC created an easily-accessible online Education Module Resource (EMR), intended to plug the gap in the ethical and social training provided to life scientists and others involved in bio-technologies (e,f). There are 20 lectures that explore the threat posed by dual-use technology in the life sciences and present best practice for the responsible conduct of scientific research. Each lecture with accompanying slides is available open source, free of charge to anyone that wants to use them. Initially produced in English and Japanese, they are now available in, Russian, French and Romanian/Moldovan, Spanish, Urdu, and Polish. One author (g) has produced a book chapter devoted entirely to the value of the EMR.

In 2010, building on the initial open source resource, BDRC and its partners launched a 12 week online Train-the-Trainer (TTP) programme to support educators in the provision of dual-use training for their own students and other practising scientists. This is the only University accredited module on bioethics and biosecurity in the world. The importance of this programme for preventing the misuse of life science research is evidenced by the fact that, following representations from BDRC, the Biosecurity Engagement Program (BEP) of the Office of Cooperative Threat Reduction in the US Department of State made a policy decision to provide a series of three grants amounting to £70,000 to fund 75 bursaries for practicing life scientists to participate in the TTP. To date, 75 life scientists from 14 different countries (e.g. Iraq, Afghanistan, Pakistan, Indonesia, Philippines, Kenya and Nigeria) have been trained. A unique capacity-building feature of BDRC's online train-the-trainer module is that it is a requirement that participants utilise the EMR to demonstrate how they will assimilate dual-use biosecurity considerations into the training of others. In accordance with the Testimonials (g) collected by BDRC, participants that have successfully completed the train-the-trainer course have thus incorporated dual-use biosecurity into teaching and practice. According to one Graduate (h): "*...I teach a course on Dual Use Education at Graduate level at Pakistan and this material has helped a lot*" (Shinwari.Z). Another student commented, "*I did speak to the Lagos State Chapter of the Association of Public Health Physicians of Nigeria (APHPN) on dual use issues. This was at a continuing professional development session held at the Lagos State University Teaching Hospital (Department of Community Health)... in Lagos. There I used my group assignment on the Thomas Butler case to introduce them to applied ethics, dual use and other biosecurity issues*" (Odubanjo.D) (h).

In 2011, the BRDC was funded by the UK MOD to develop another training programme, called the National Series, which tailors the existing EMR so that it reflects the particular issues relevant to scientists in 5 different countries (Pakistan and four Central European States). This eliminates the need for countries to produce their own materials and to find expert deliverers, thus increasing the opportunities for scientists in parts of the world where bio-security is particularly pertinent, to receive this

vital training. Following a successful trial in Iraq (with 30 participants) in 2012, BEP (US Department of State) are now commissioning BDRC staff to deliver further training in Iraq. Going forward, further BDRC capacity-building initiatives to change the practice of life and associated sciences through the creation of regional training hubs are being developed with the G8 Global Partnership (i) and under United Nations Interregional Crime and Justice Research Institute (UNICRI) Project 3 and Project 18 (i) both with the potential to build capacity in training for hundreds of scientists in different parts of the world.

5. Sources to corroborate the impact

- a. Strengthening of the Biological Weapons Convention: *Key Points for the Seventh Review Conference*: Foreword by the Head of the Review Conference Ambassador Paul Van den Ijssel, Permanent Representative of the Kingdom of the Netherlands on the Impact of the Publication. This notes the significance of this BDRC contribution to the 2012 negotiations. <http://www.brad.ac.uk/acad/sbtwc/key7rev/foreword.pdf>
- b. Martin Rees, President of the Royal Society and Master of Trinity College, Professor of Cosmology and Astrophysics, University of Cambridge, Astronomer Royal, Cross Bench Peer, House of Lords, noted that the EMR: "...deals authoritatively - but also accessibly - with a range of topics that are of growing pervasiveness and concern. One of the surest safeguards against misapplication of dual use technologies would be wide dissemination, to all potential users, of the knowledge and perspective that this well-produced material offers". (see Source f, p8)
- c. Working paper 20. Revised Possible approaches to education and awareness-raising among life scientist: Submitted by Australia, Canada, Japan, New Zealand, Republic of Korea and Switzerland (on behalf of the "JACKSNNZ"), and Kenya, Sweden, Ukraine, the United Kingdom of Great Britain and Northern Ireland and the United States of America. This contains numerous references to the impact of the work of BDRC. [http://www.unog.ch/80256EDD006B8954/%28httpAssets%29/2F1ECC909AAD5AB0C125795E004965BB/\\$file/Switzerland+%28et+al%29+education+and+awareness-raising+revised.pdf](http://www.unog.ch/80256EDD006B8954/%28httpAssets%29/2F1ECC909AAD5AB0C125795E004965BB/$file/Switzerland+%28et+al%29+education+and+awareness-raising+revised.pdf)
- d. Monday 5 December 2011. 13.00-15.00 University of Bradford - Key Points for the Review Conference (Room XXIV). NOTE: Deferred to Tuesday 13.00- 15.00 (Room XXIV). Available at: [http://www.unog.ch/80256ee600585943.nsf/\(httpPages\)/f1cd974a1fde4794c125731a0037d96d?OpenDocument&ExpandSection=3#_Section3](http://www.unog.ch/80256ee600585943.nsf/(httpPages)/f1cd974a1fde4794c125731a0037d96d?OpenDocument&ExpandSection=3#_Section3)
- e. [Educational Module Resource | Bioethics | SSIS | University of Bradford](#)
- f. Statement by the National Defence Medical College of Japan and University of Bradford at the December 2009, Meeting of States Parties, United Nations, Geneva. Available at: [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/70D3866F8B3F41E6C12576860049BEF3/\\$file/BWC_MSP_2009-NationalDefenceMedicalCollegeofJapan&UniversityofBradford-091207.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/70D3866F8B3F41E6C12576860049BEF3/$file/BWC_MSP_2009-NationalDefenceMedicalCollegeofJapan&UniversityofBradford-091207.pdf)
- g. A chapter focusing in its entirety on the Education Module Resource (EMR) created by the BDRC: Espona MJ. (2013). Biosecurity and Dual-Use Issues: The Education Module Resource. In: Gross ML, Carrick D. *Military Medical Ethics for the 21st Century*. Surrey: Ashgate. 155-167.
- h. See Testimonials from Course Graduates. These show Graduates are biosecurity competent, their work now addresses biosecurity concerns, and they use what they have learned in the training of others. See: <http://www.brad.ac.uk/bioethics/ref-impact-evidence/dual-usebiosecurityrefimpact/>
- i. G8 Global Partnership (see: <http://www.state.gov/t/isn/184759.htm>) and under United Nations Interregional Crime and Justice Research Institute (UNICRI) Project 3 & 18 (see: <http://www.unicri.it/topics/cbrn/coe/>)