

Lijun Shang, professor of biomedical science at London Metropolitan University's School of Human Sciences, tells Gwyn Winfield about their latest arms control report

Strengthening the ties that bind

Early February saw the opening salvo in an attempt to get CBRN arms control on the agenda. A group of academics including Lijun Shang, Tatyana Novosiolova, Michael Crowley (*CBRNe World*, 2015-6), Brett Edwards (*CBRNe World* 2019-2), Malcolm Dando (*CBRNe World* 2015-1) and Simon Whitby, co-authored a report titled: Biological and chemical security after Covid-19: options for strengthening the CBW disarmament and non-proliferation regimes.¹⁷

For those of you put off by academic

papers, this version is only 10 pages long and touches on many elements that are pertinent to all strata of chemical and biological response. It reviews the current arms control regulations in the Biological and Toxic Weapons Convention (BWC or BTWC) and the Chemical Weapons Convention (CWC) and re-examines them in the light of improvements in the life sciences and chemical incidents in Mesopotamia, Europe and Russia.

So far so normal for arms control... but then it also expands its reach. Riot

control agents (RCAs) are covered, especially those that impact the central nervous system (CNS), their wide area delivery systems (UAS and other devices), intelligence sharing and the need for these to be controlled by the Organisation for the Prohibition of Chemical Weapons (OPCW).

The BWC has been in place for 46 years and the CWC for 24 years. It is impossible to say how many incidents there might have been without these conventions, but a quick look through the Harvard-Sussex programme annals,



The UK is trying to put arms control back on the agenda, including things like drones, CNS affecting RCAs and bio safety/security ©DoD

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The military has strict rules in place for use of RCAs, the same is not the case for civilian forces ©DoD

or the University of Maryland POICN², would show that they have not been 100% successful. The BWC has long been seen as toothless, with no investigatory or enforcement body, though the UN secretary general's mechanism³ provides some cover. The CWC has failed gloriously in Syria. Its roller coaster ride first saw the country welcomed into the disarmament club and declaring its CW stocks... and then continuing to use chemical weapons against its civilians in flagrant breaches of its announcement.

That either convention exists is a miracle, which is the basis for a number of far larger written works (I'd recommend Jonathan Tucker's *War of Nerves*), but they are creatures of their times. Nixon unilaterally decided to stop US biological weapons programmes, even though the Soviets did not believe him, and the BWC eventually emerged. The collapse of the Soviet Union, and the cost of maintaining huge stocks of CW that were reaching their 'use by' dates helped birth the CWC, against howls of outrage from vested interests. Yet times have moved on, low cost gene editing, and gain of function, have allowed experiments to be far more wide reaching, and cheaper, than the BWC even imagined. As Ray Zilinskas has

shown (*CBRNe World* 2017-6), Russia has gone through a massive renaissance with its bio labs, and they remain as closely guarded as ever. The stigma around chemical weapons usage has been allowed to atrophy, and while this has been confined, so far, to northern Iraq and Syria, it is hard to imagine that autocratic states are not quietly building up limited capabilities.

Again, there is an explosion in drone capability, far more capable and cheaper than could have been dreamt in the '90s. RCAs were used more extensively by all stripes of government in 2020, and there seems to be little interest from them in trying to find less injurious ways of dispersing crowds beyond these 'less lethal' weapons. At the same time we are seeing novel, and half understood devices used on diplomats and government agents in places like Cuba, which suggests that anti-US forces are doing their research. While there is a clear need for arms control, it does seem like the new report is swimming against the tide, no matter how necessary it might be!

Professor Shang felt that I was too gloomy, and there was room for optimism. "It is very important to recognise that Biden's election has significantly and positively changed the

prospects for stronger chemical and biological security. Many US experts, such as Andy Weber, Obama's assistant secretary of defence for nuclear, chemical and biological defence programmes, acknowledge that we have a new US administration and Biden has a track record of working on international arms control/disarmament measures and promoting an international approach. We would hope to see Biden trying to renew arms control as a way forward.

"Secondly, it is important to recognise the huge advances that have been made so far. The CWC has achieved concrete results. With 193 states parties signed up, 98% of world is protected by the convention. By end December 2020 over 71,000 tonnes of declared stockpiles of chemical agents had been destroyed, and the remaining stockpiles will be destroyed in the near future. Where possible the OPCW operates on a consensus basis. Despite significant difficulties work goes on, and real advances continue to be made, such as the addition of Novichocks to the CWC schedules by consensus. Where consensus is not possible, the OPCW has collectively made difficult decisions by binding vote – notably on the establishment of an OPCW mechanism

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to identify perpetrators of chemical weapons attacks in Syria and elsewhere.

“Finally, BTWC progress is seen over its 46 years history. The BTWC virtual meetings in November and December 2020 indicated a good deal of agreement on what might come out of the 2021 review conference.”

Arguably Novichoks were already part of the CWC, the wording is quite clear if it is interpreted in a European way. Ironically it is also quite clear to the Russians in the diametrically opposite way – they feel the scheduled chemicals are a definitive list. Lawyers are happy to interpret things as they choose, and this might not always be to the liking of some state parties; such as the recent International Court of Justice ruling in favour of Iran⁴. One of the reasons so many arms control treaties were signed in the late ‘80s and early ‘90s was that the ‘enemy gets a vote,’ and in this case they voted for - to paraphrase James Mattis - the war to be over. Resurgent Russia of the 2020s is very different to 1990s Russia, keen to leave a shameful past behind, and it is unlikely to be the same partner it was previously.

Professor Shang thought there were still a lot of projects that the international community could agree on, such as legitimate use of RCAs, which the OPCW scientific advisory board (SAB) visited in 2017 and hopefully will again. Part of the purpose of the report is to encourage the UK in an arms control leadership position, which it has taken up in the aftermath of the Skripal investigation and the creation of the investigation and identification team. There is a difference between leading from the front, however, and being isolated and alone. Did Professor Shang believe that this was just the opening salvo, and further requests for increased arms control would come from other nations?

“This initiative is not lone voice and will never be one. There is a global network of civil society organisations, the CWC coalition, that supports the convention and presses for effective implementation from all states. The BTWC is also supported by a global civil society. This comprises academic

institutions, thinktanks, and professional associations which work to advance the full and effective implementation of the convention and engage life science stakeholders with the need for strengthening the international prohibition on biological and toxic weapons and develop a code of conduct.

“[For example], China and Pakistan are pushing hard for agreement on a code of conduct under the BTWC similar to The Hague Ethical Guidelines for chemists under the CWC. Japan is chairing the relevant MX2 BTWC meetings and is clearly interested in making progress in this area as well as a science and technology review mechanism [See pp.45 Ed.]. Regarding CW in Syria, states have worked for years to ensure destruction of the stockpiles and production capability, to end further chemical weapons attacks. Although there was no consensus on the Investigation and Identification Team (IIT) there was certainly a majority in favour. A growing number of states have confirmed that they have not developed, or possess, CNS acting weapons. In November 2020, 29 states signed a joint statement calling for clarification that these weapons cannot be legitimately used for law enforcement. The UK is not a lone voice on these issues and we are trying to keep at the front of the race.”

The code of conduct that Prof Shang mentioned is a big thing. Initiatives such as those run by the FBI’s Ed You (*CBRNe World* 2017-4) have been endeavouring to work with academic and private labs to try and increase understanding of dual use in the life sciences. It is a big ask, as academics generally only see the good in their research, and if potential malign elements are pointed out they can be left worrying that their research will be stopped. In addition, there is the gain of function work and CRISPR gene editing that can build on others’ research, or step where others fear to tread⁵. A mass education programme is needed, but it must be sustained and coherent, and many countries lack the resources or interest for that.

While it is difficult, Professor Shang

and his team are determined to push forward. “Recent incidents of gene editing, especially when they win the Nobel Prize⁶, push people to think harder about what can be done. A lot of scientists don’t have a clue about the negative outcome, so we’re trying to raise awareness. Malcolm Dando has already started trying to educate not just the life scientists and law makers, but also the general public. Engaging with parliament and the public is one of our projects. We are trying to show government that you need major investment in the fundamentals of biological security. This is to work in parallel with the World Health Organisation (WHO) who have already published a laboratory code of conduct, and this can be extended to bio security in the biological weapon convergence.”

An example of the BTWC’s optimism can be found in the confidence-building measures⁷ (CBM). These are designed to put all the states parties’ minds at ease, that there is nothing clandestine going on. Some of these are excellent⁸, but many are not. It has long been a complaint of the US that while they provide full disclosure, other nations are either classified or terrifyingly brief. Fundamentally there is little confidence in the CBMs, another step away, rather than towards, arms control. As mentioned previously Zilinskas’ book on *Biosecurity in Putin’s Russia*⁹ finds a great deal to be concerned about in Russian labs, yet the BWC turns a blind eye, since it has no investigative mandate and even other mechanisms like the Nunn Lugar Comprehensive Threat Reduction programme don’t have the insight into labs like Vector that they used to. Trying to encourage the BTWC to be more intrusive would seem to be a fool’s errand.

Professor Shang disagrees, and feels that while there are things that need to be improved it is worth the effort. “CBMs are only effective as part of a wider package of measures and work is being done to find ways of improving them. The peer review mechanisms that are also under consideration¹⁰ would be a useful addition. We need to push this confidence and it can be done in several different ways and levels. The political

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level is one and the other is a major input from civil society thanks to education. It might be a slow process, but the progress is worth making.”

RCAs are a problem long in the making. Like white phosphorous it seems easy at first, but once you lift the lid it's a far thornier issue. If law enforcement agencies don't have RCAs then they have to use other means, which are also sub-optimal. These can range from energy weapons (microwave devices) through to rubber bullets, both of which can be lethal. Persistent protestors can also build up resistance to CS gas, which leads some countries to continue research into RCAs, trying to find a formulation that can fit the same niche. These can be malodorants (like the Israeli Skunk), serotonin suppressants, psychotropic agents, injurians or even CNS agents (more information in *CBRN World 2014-3*).

Besides the agents themselves are the quantities they are used in. Many of the deaths from CS, for example, have happened because oxygen is displaced and hasn't been a reaction to the agent. Thanks to Michael Crowley's input a significant part of the report is devoted to RCAs, as Prof Shang explained. “We need to emphasise that it is very important to treat CNS-acting weapons and RCAs differently. They are not the same types of chemicals, have different effects and are intended for different purposes. In terms of CNS we are supporting attempts by a growing number of states to act on these. Firstly by clarifying that they do not possess and will not acquire or use such weapons, and secondly by calling for the OPCW to collectively address this issue.

“We support the joint statement presented by 29 states at the CSP in November 2020 - weapons using

aerosolised CNS-acting chemicals should never be developed or used for law enforcement, and their development and use is against the CWC. We encourage more states to publicly endorse this position. The UK needs to clarify its position and publicly support this statement. This issue has been difficult for the OPCW, however there may be a path forward following further technical work by its scientific advisory board and the establishment of an OPCW working group to develop proposals. Meanwhile, all states can act at the national level by introducing a moratorium to halt development and use of such weapons until the OPCW position is established.

“In terms of RCAs there is increasing medical and civil society awareness, concern, and growing anger over misuse of tear gas by law enforcement officials across the world, and increasing demands for regulation. This has been exacerbated by RCA misuse during the pandemic. Action in this area will take time, but steps have already been made. In 2014 the SAB issued advice on what chemicals should and should not be used as riot control agents. Now we need the OPCW to give guidance about what quantities of RCAs can be legitimately used and in what ways for ‘law enforcement’. The latter is an important emerging issue within the OPCW, needing urgent attention. Certain states have already acted – Turkey for example destroyed its stockpiles of RCA 120mm mortar bombs. At the 4th review conference, the SAB warned of the dangers from misuse of wide area and remote control RCA delivery mechanisms. The issue must be addressed now before RCA drones and other wide area and remote control RCA delivery mechanisms

proliferate and widespread misuse becomes unstoppable.

“Although it is very challenging there's much we can do to improve the things that are happening, especially in terms of the SAB. They are quite good at taking advice and suggestions about what to do. I recently spoke with the ex-president of SAB, Mr Cheng Tang and he stated that we need engagement from scientists and the SAB is crucial to advise and support the law making process.”

The team's recommendations are facing a lot of significant challenges, certainly more than a report and a related webinar can solve. So what is the next step in making these goals a reality? “We have sent our report to the relevant parliamentary committees and the government and opposition front benches to provide civil society input on these important issues. After the webinar we will carry out a feedback survey and follow up interviews to write a follow-on report, and build up our communication channels to further engage parliamentarians and the general public. The report is only a short version of our research, and we will continue to carry out wider projects on the CWC and BTWC engaging at national and international level. I have been awarded a project, funded by the Joseph Rowntree Foundation and starting this year, on working towards agreement on a biological security code of conduct, and mandatory education for life scientists. We try to build up multidisciplinary subject areas of expertise and we want this to be a wake up call for government and the general public. We hope to get additional funds and involve more people in doing this, so yes, there are lots of exciting projects on the way!”

¹ <https://www.londonmet.ac.uk/research/research-initiatives/biological-and-chemical-security-project/biological-and-chemical-security-after-covid-19/>

² <https://www.start.umd.edu/publication/pick-your-poison-introducing-profiles-incidents-involving-cbrn-and-non-state-actors-poison>

³ <https://www.un.org/disarmament/wp-content/uploads/2019/07/SGM-Fact-Sheet-July2019.pdf>

⁴ <https://www.timesofisrael.com/un-court-to-decide-if-it-can-hear-irans-lawsuit-against-us-sanctions/>

⁵ <https://www.nature.com/articles/d41586-020-00001-y>

⁶ <https://www.nobelprize.org/prizes/chemistry/2020/press-release/>

⁷ <https://www.un.org/disarmament/publications/more/cbm-guide/>

⁸ <https://bwc1972.org/publication/view/united-states-of-america-cbm-2016/>

⁹ https://www.rienner.com/title/Biosecurity_in_Putin_s_Russia

¹⁰ <https://www.unidir.org/files/publications/pdfs/a-peer-review-mechanism-for-the-biological-and-toxin-weapons-convention-en-310.pdf>

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