BioWeapons Prevention Project

COVID-19 impact report 2

Wednesday 17th June 2020

Distinguishing deliberate disease from natural events or accidental releases

The 1972 Biological and Toxin Weapons Convention (BWC/BTWC) – the international treaty to prohibit possession of biological weapons – contains no provisions for investigating alleged use of biological weapons. As any use of biological weapons would embody a fundamental breach of the Convention, methods for investigating alleged use have been discussed on many occasions during BWC meetings looking at how to strengthen the Convention. In all cases of investigation of alleged use of biological weapons there is a need to evaluate the possibility that the disease effects being observed have any other plausible cause such as being of natural origin.

The most detailed discussions within BWC meetings about investigations of alleged use took place within the negotiations in the Ad Hoc Group that was established after the 1994 Special Conference and which came to a halt in 2001. Further relevant discussions have been held within the inter-sessional work programmes that started in 2003 and which continue.

A recent highlighting of the challenge of identifying the origin of a disease was included in a 2018 working paper from Japan (with co-sponsors) which stated: 'In such a case as sudden spread of infectious disease, it is hard to determine at the initial stage whether the event has occurred naturally, accidentally or has been caused intentionally' .

Papers from the Friend of the Chair on Compliance Measures during the Ad Hoc Group included the text: 'All outbreaks of disease which are due to natural causes do not pose a compliance concern under the Convention and shall not be a reason for an investigation of a non-compliance concern' – reflecting a consensus that had been reached on this point. Several working papers were submitted to the Ad Hoc Group on investigation issues, the largest number of which were from South Africa. Three – WP.16, WP.54 and WP.440 – tackled the relationship between investigations of alleged use of biological weapons and investigations of unusual outbreaks of disease, including the differences needed between the types of investigations. The interplay between responses to natural disease outbreaks and to deliberate use of biological weapons will be explored further in this series of reports when BWC Article VII issues are discussed.

Investigation techniques

Key elements are relevant to investigations of all forms of infectious disease – the identity of the pathogen (the infectious agent) itself and understanding how the disease spreads.

When viruses circulate in nature they are constantly acquiring mutations. Modern techniques can track these mutations and show the geographical spread of the pathogen. One genetic concept that has been useful for examining outbreaks has been that of 'frozen evolution'. Reference strains of viruses used in laboratories do not gain mutations in the same way as they do in the wild. An early indication that the 2007 outbreak of Foot and Mouth Disease in the UK was from a nearby laboratory was similarity of the pathogen's genetic sequence to a 1967 reference strain used for vaccine production. As most potential biological weapons are derived from naturally-occurring pathogens, the stored strains will show reduced natural evolution from the time they were initially isolated.

The initial spread of a disease gives some indication of its source. Just as a clear indication of arson is that a fire starts at more than one place in a building at the same time, a disease outbreak that appears to start at more than one location simultaneously carries with it a suggestion of a deliberate cause. The further a disease has become widespread through human-to-human transmission, the harder it is to clearly distinguish its source through epidemiological methods.

Lessons from the discussion above relevant to the current pandemic

There is clear evidence that the SARS-CoV-2 coronavirus that causes COVID-19 is so closely related to viral species observed in bats that there is little doubt that a bat virus is the ultimate source of the new disease. Uncertainty remains as to how and when the virus crossed over into humans. These can be sensitive issues and questions about the origins need to be dealt with on a factual basis and not be drawn into unrelated geopolitical issues. However, such uncertainty creates a space which can be filled with politically motivated allegations. As with any control regime, unfounded allegations could, in the long run, undermine control efforts. It is therefore worth noting what are the levels of certainty in currently available information. An important point is that COVID-19 is still classed as an emerging infectious disease and there is more being learnt about the disease each week.

Published evidence counters suggestions that SARS-CoV-2 has an engineered origin. Detailed genetic analysis indicates it has not been subject to obvious artificial genetic modification techniques. In an article published in March, scientists concluded that SARS-CoV-2 'is not a laboratory construct or a purposefully manipulated virus'.

There have been two highly publicised theories about how the crossover into humans might have occurred. The first is that it happened in a so-called 'wet market' in Wuhan in which live animals of numerous species are held in close proximity before slaughter. The second that it was the result of an accidental release from one of two biological research laboratories in Wuhan. In neither case is the available information about the initial stages of the COVID-19 outbreak completely consistent with each possible explanation. On the other hand, there is no available information that would categorically rule out either possible explanation. Tracing the origin of a disease can be difficult. If there were ever a future allegation of use of a coronavirus as a biological weapon, understanding how new diseases become established in the human population will be key to distinguishing between a biological attack and other possible causes.

The World Health Assembly, the gathering of representatives of the member states of the World Health Organization, at its meeting on 19 May adopted resolution WHA73.1 that included language supporting investigations on the source of COVID-19 'to identify the zoonotic source of the virus and the route of introduction to the human population' and identify interventions 'to reduce the risk of similar events ... as well as to reduce further risks of emergence and transmission of zoonotic diseases'. It is not yet clear what form this investigation will take. As the investigation progresses, lessons may emerge that could be relevant for investigating future outbreaks of BWC concern.

Any infectious disease with a significant impact has some potential as a biological weapon. Three coronaviruses have evolved to cause fatal human diseases in the space of 20 years – SARS, MERS and COVID-19. Better understanding – whether through the WHO investigation or through other scientific research – of all routes by which further coronaviruses could crossover into humans will be valuable. Whatever steps might be identified that could reduce potential transmission via such routes would also reduce the possibility for future misuse of this family of viruses as well as help prevent future outbreaks of diseases similar to COVID-19.

This is the second in a series of reports looking at the impacts relating to the COVID-19 pandemic in relation to the BWC published by the BioWeapons Prevention Project (BWPP), a global network of civil society actors dedicated to the permanent elimination of biological weapons and of the possibility of their re-emergence. These reports follow the style of the daily reports that have been produced for all BWC meetings since the Sixth Review Conference in 2006 and are posted to <http://www.bwpp.org/covid.html> where links can be found to background materials that readers may find useful as well as to an email subscription link. The reports are prepared by Richard Guthrie, CBW Events, who is solely responsible for their contents. The author can be contacted via <richard@cbw-events.org.uk>. Financial support for these reports has been gratefully received from the Department of Foreign Affairs and Trade of Ireland.