

PLANNING FOR A BIOSECURE FUTURE

Relevant for: Developmental Issues | Topic: Health & Sanitation and related issues

COVID-19 has made it clear that our traditional imagination of national security is no longer credible. The preparedness of nation states and tenuous global security arrangements were insufficient in dealing with the crisis. The future of national security studies, therefore, will be forced to undergo a paradigm shift if it must retain any policy impact at all — it would need to rethink the sources of insecurity, to begin with. The growth of exponential technologies such as synthetic biology, artificial intelligence and nanotechnology is bound to change the theory and practice of national security. COVID-19 has quickened the inevitable.

Among the exponential technologies shaping the world today, the biological revolution is of exceptional importance. The rapid rise of synthetic biology in the last two decades and its still-to-be-understood implications haven't received sufficient attention from the security studies or policy communities. COVID-19 has further highlighted the biosecurity concerns of synthetic biology. The argument is not that [COVID-19 originated in a lab](#), but that dangerous bio-weapons can come from labs.

Hackers can trick scientists into creating deadly viruses

That new organisms, biological parts and devices can be created or that existing natural life forms can be redesigned should ideally be the subject matter for scientists to concern themselves with or for ethicists to debate. But today, there is a growing realisation that exponential technologies have hitherto unforeseen national and global security implications. In 2014, for instance, the U.S. Department of Defense categorised synthetic biology as one of the six 'disruptive basic research areas' even though linkage between national security and synthetic biology is yet to become an agenda item in mainstream national security debates.

[Synthetic biology](#) is a revolutionary technology which can help us manipulate biological organisms and processes for human betterment, especially in treating diseases, by re-engineering cells. But it is a double-edged sword. There are many risks associated with the technology which must be addressed before it becomes widely accessible. For one, there is the possibility of deliberate misuse. While the technology is still not easily accessible, the day is not far off when such technologies won't be difficult to access. There is a need to carefully review, especially in the wake of the pandemic, the biosecurity systems in place where such technologies are in use. Accidental leaks of experimental pathogens are another concern. Insufficiently trained staff, inadequately safeguarded facilities, and lack of proper protocols could all be behind such leaks. The reality is that there has been very little focus on threats emanating from biological sources. Contrast this with the focus on nuclear weapons, facilities and material. Not only are they tightly controlled but are also the subject of strong global regimes. This is despite the fact that a well-orchestrated biological attack could have serious implications even though it would be less 'spectacular' since its effects are less immediate. This was before synthetic biology came into play. A well-planned attack using highly infectious pathogens synthetically engineered in a lab could be disastrous.

What if such attacks are contemplated and carried out by state actors against adversaries? How easy would it be to pin responsibility on a specific actor if the incubation period is high and the pathogen can be modified to hide its origin? Unlike the nuclear domain, the fields of biology or synthetic biology are not regulated internationally despite growing military interest in synthetic biology applications and their potential misuse.

Viruses could be used as bioweapons: Vice Chief of Army Staff

The 'weapon of mass destruction' (WMD) capability of [bio-weapons](#) has been long recognised but very little has been done by the international community about it. Of the three types of WMD, nuclear weapons have received the maximum safety and security attention given the treaty and institutional arrangements associated with it. Chemical weapons come next. There is an international convention and an implementing body. However, when it comes to bio-weapons, all we have is the [Biological and Toxin Weapons Convention \(BTWC\) of 1972](#) with no implementing body. The BTWC does not have a verification clause, nor does it have clearly laid down rules and procedures to guide research in this field.

The dilemma is evident in Article 1 of the BTWC itself which bans "microbial or other biological agents, or toxins, whatever their origin or method of production" that "have no justification for prophylactic, protective or other peaceful purposes". In other words, while bio-weapons are banned, research for medical and bio-defence purposes are allowed. While this is understandable, the problem is that there is a thin line between bio-defence research and bio-weapons research. Since bio-defence research routinely uses pathogens and toxins for experimental purposes, processes, know-how and outcomes of bio-defence research could potentially be used to create bio-weapons, especially with the new advancements in synthetic biology. More so as the pharmaceutical industry has vehemently opposed any intrusive inspection regime.

An Ad Hoc Group set up in 1994 to negotiate a Protocol to enhance the transparency of treaty-relevant biological facilities and activities to help deter violations of the BTWC submitted a report at the [Fifth BTWC Review Conference](#) in 2001 but was not accepted by the member states. The initiative has since been shelved.

Pandemics have also highlighted that the traditional distinction at the international institutional level between biological weapons (a field governed by the BTWC) and diseases (a domain under the World Health Organization) may not be useful anymore. There needs to be more conversation between health specialists and bio-weapons/defence specialists.

The [November 2021 BTWC review conference](#) must take stock of the advances in the field, address the thinning line between biotechnology research and bio-weapons research, and consider international measures for monitoring and verification.

India is at a uniquely disadvantaged position compared to the more developed countries in this area given poor disease surveillance, insufficient coordination among various government departments dealing with biosecurity issues, and the pathetic state of the healthcare system.

WikiLeaks | [U.S. feared lax security at Indian bio labs](#)

India has multiple institutions dealing with biosafety and biosecurity threats but there is no coordination among them. For instance, implementation of biosafety guidelines is the responsibility of the Science and Technology Ministry and the Environment Ministry. However, labs dealing with biological research are set up under the Indian Council of Medical Research and the Indian Council of Agricultural Research, which are under the Ministries of Health and Agriculture, respectively.

This highlights two issues pertaining directly to biosecurity. One, the multiplicity of bodies and ministers makes coordination difficult, especially in the absence of an empowered coordinating body. Two, given the rising risk of diseases of zoonotic origin, the traditional ministry-wise separation might not be useful. Another important question is whether India, with its porous

borders and ill-trained border control institutions, is prepared for defending against pathogens or dangerous biological organisms or agents arriving from abroad. COVID-19 should serve as a wake-up call.

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To reassure Indian Muslims, the PM needs to state that the govt. will not conduct an exercise like NRC

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