

PANORAMA



New tools to confront
future biothreats

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Pandemics can now spread rapidly from one half of the globe to the other, and before a countermeasure can be developed, distributed, and dispensed.

This year marks the 100th anniversary of an influenza pandemic that killed as many as 50 million people [1]. Unfortunately, the world remains unprepared for the next, inevitable, high-consequence biological event. Emerging technologies, while vital for creating new treatments, now make it possible to create and modify high-consequence agents. Terrorists and states remain interested in developing and delivering weapons of mass destruction and disruption, including for use on the battlefield. Moreover, early warning for biological threats remains poor: there is no global biosurveillance system capable of detecting – let alone predicting – outbreaks in real time.

Nearly 75% of countries are unable to meet international biosecurity and biosafety targets. It is imperative to act now!

Despite the 2002 launch of the [Global Partnership Against the Spread of Weapons and Materials of Mass Destruction](#) in Kananaskis, Canada, when G-7 leaders recognised the importance of biological threats to global peace and security, most countries still lack the basic capability to stop outbreaks at the source, and nearly 75% are unable to meet international biosecurity and biosafety targets [2]. In addition, persistent challenges to the rapid development and distribution of countermeasures during biological crises remain unresolved, and no universal influenza vaccine exists. These are stunning statistics for 2018 – more than 16 years after the 2001 anthrax attacks, 15 years after severe acute respiratory syndrome (SARS), nine years after the 2009 influenza pandemic, and four years after the emergence of Ebola in West Africa. The risk is further compounded by a continued lack of consistent, independent and annual tracking, accountability, and evaluation of investments in threat reduction and health security.

What can be done to accelerate measurable change?

By 2020: Double the global biological threat reduction budget – and track outcomes. Foreign Affairs, Defence, and Development officials should prioritise biological threat reduction – including global biosecurity measures – by working in conjunction with health and agriculture leaders. In a recent analysis, [the Nuclear Threat Initiative \(NTI\)](#) found that only four donor countries are responsible for over 90% of reported biological threat reduction assistance, totalling a mere USD 370 million when compared with much larger budgets for traditional security and disease-specific assistance and disease-specific health and development aid [2, 3]. The G-7 should show leadership by endorsing a major increase in global biological threat reduction investments and creating a clear, independent mechanism for financing and accountability that tracks commitments made by countries, donors and the private sector.

In 2018: Endorse concrete stakeholder actions to reduce biological risks posed by advances in technology and incentivise biosecurity innovation. New technologies are vital for the development of vaccines, therapeutics and diagnostics. However, biotechnology is out-pacing risk-mitigation measures and governmental oversight. The rapidly changing nature of biotechnology makes it necessary for scientists and engineers to mitigate risk during the experimental design and technology development phase. In 2018, global leaders in synthetic biology and virology should adopt specific actions to mitigate risk and incentivise innovations that improve biosecurity.

By 2020: Publish and finance national action plans for reducing biological threats in at least 76 countries. In 2016, at Ise-Shima, Japan, G-7 leaders made an historic promise to assist 76 countries and regions to achieve basic health security capability. Many countries have now undergone external assessments and identified specific gaps. But the matching and tracking of funding streams to fill these gaps has lagged. Now is the time to prioritise the development and

publication of national action plans – and fund them. Stakeholders should drive creative incentives to leverage private-sector investment, such as a matching fund, as well as the publication of a regularly published Global Health Security Index. [4, 5]

In 2018: Chart a vision and create steps to drive global biosurveillance and pandemic forecasting by 2025. Stove-piped data streams have hampered creative solutions to gathering and analysing biosurveillance data. In addition, novel approaches are needed to accelerate surveillance and diagnostic methods that can detect newly emerging and engineered pathogens. Global leaders should publish a consensus vision for achieving real-time disease surveillance and data-sharing. The effort should also include specific steps towards pandemic forecasting and novel approaches to enhance surveillance for novel biological threats.

New and deadly biological risks can destabilise economies, change political landscapes and disproportionately affect vulnerable populations. It is imperative to act now.

<http://dx.doi.org/10.20506/bull.2018.1.2765>

PERSPECTIVES

▶ OPINIONS AND STRATEGIES

Threat reduction in an era of changing bio-risk

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