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This note summarizes key points discussed at a meeting held on 3 March 2005 on the recommendations of the Secretary-General's High-level Panel on Threats, Challenges and Change in relation to biological security and public health. The meeting was conducted in cooperation with the Center on International Cooperation at New York University. Participants included leading experts and a small number of member state representatives and UN staff. All discussion was off-the-record. This note represents one participant's summary of the meeting and does not necessarily reflect the views of other participants.

## GLOBAL PUBLIC HEALTH AND BIOLOGICAL SECURITY: COMPLEMENTARY APPROACHES

### SUMMARY:

- Biological security and public health represent one of the most compelling instances of the nexus between development and security.
- The threats—from malaria and tuberculosis, through HIV/AIDS, to catastrophic outbreaks—are among the most grave that the world's societies may collectively face in the coming years.
- Yet the severity of the problems is minimally appreciated and our response tends to be compartmentalized, treated as a technical or scientific problem, and under-resourced.
- This leaves the UN and broader international community with an acute challenge in raising awareness, designing workable solutions, and mobilizing political, financial, and other forms of critical support.
- One of the first steps needs to be briefing and informing political and institutional leaders about the magnitude and nature of the challenge.

## I. OVERVIEW OF THE HIGH-LEVEL PANEL'S POSITION

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The High-level Panel (HLP) identifies ‘biological security’<sup>1</sup> as a critical area in which consensus remains to be forged about the nature and magnitude of the problem, and about the urgency of improving capacities for response. Threats to biological security are myriad, they affect all states and regions, and our collective security depends especially on recognizing this mutual vulnerability. That disease can today so rapidly traverse state borders makes threats extremely difficult to isolate and therefore demands a well-coordinated collective response.

Challenges to biological security are frequently treated as three separate concerns, related to: (i) pandemic diseases, including malaria, tuberculosis (TB) and HIV/AIDS; (ii) outbreaks of new or resurgent diseases such as SARS and polio that re-emerge naturally; and (iii) accidental or deliberately perpetrated outbreaks, of which smallpox is perhaps the most widely discussed fear.

The High-level Panel examined these challenges, evaluated existing international responses to them and found them dramatically wanting. Malaria kills more than one million people every year, and the Millennium Project estimates that simply providing for wider distribution of subsidized mosquito bed-nets would drastically reduce this number. International response to the devastating toll of HIV/AIDS has been “shockingly late and shamefully ill-resourced,” especially in Africa. Moreover, policymakers have barely begun to project the long-term impact of the disease on states and societies. Meanwhile, contemporary patterns of trade and travel, along with the

sometimes long incubation periods of many diseases, give new infectious diseases such as SARS the “global reach” to threaten populations in the developing and developed world alike. At the same time, exponential advancement in the biotechnology sector, which has important benefits for agricultural production and health, brings with it the sobering risk that small groups or even individuals could accidentally or deliberately unleash overwhelming disease outbreaks with global ramifications.

The Panel urgently called for improved responses to all of these threats. It underscored the need for concerted action to reverse the spread of HIV/AIDS and major strengthening of global disease outbreak surveillance and response. In the case of the most extreme outbreaks, it argued that “there may be a need for cooperation between WHO [World Health Organization] and the Security Council.”<sup>2</sup>

At the center of the Panel’s proposals is its call for a “major new global initiative to rebuild local and national public health systems throughout the developing world.”<sup>3</sup> A much greater investment in healthcare infrastructure, it argued, had to be seen as the core of a solution to the entire range of biological threats.

## II. WHAT ARE THE BIOLOGICAL AND HEALTH THREATS?

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Threats to biological security from TB, malaria, and HIV/AIDS together constitute a world health crisis unparalleled since the black plague claimed more than 25 million lives in the 14th century. The prospect that a natural, accidental or intentional release of an acutely infectious and lethal pathogen

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<sup>1</sup> Broadly defined as the effective prevention and response to diseases that threaten people and agriculture.

<sup>2</sup> *A More Secure World: Our Shared Responsibility; Report of the High-level Panel on Threats, Challenges and Change* (United Nations Department of Public Information, December 2004), par. 70.

<sup>3</sup> *Ibid.*, par. 68.

could rapidly threaten hundreds of thousands, if not millions, of lives is today real. In this context, experts focused on five critical concerns:

**1. Armed conflict and extreme poverty pose grave threats to human health and biological security.**

Public health infrastructure has almost or completely collapsed in many countries, especially in zones of conflict. The average child born in 2002 in the Central African Republic, Lesotho, Mozambique, Sierra Leone, Zambia, or Zimbabwe can expect to live less than forty years.<sup>4</sup> Many diseases threaten communities on multiple fronts: HIV/AIDS, for example, not only compromises the physical health of individuals and communities but on such a scale that it also weakens states' capacities to provide security and basic public services—including healthcare.

**2. Well-known diseases thought to have been vanquished have resurged.**

Although there have been remarkable successes in eradicating diseases including smallpox, polio and leprosy, over the past few decades, many of these have been due to disease-specific initiatives—e.g., specific vaccination or drug provision—rather than building enduring public health capacity. Donors generally have preferred flagship initiatives to battle specific diseases over longer-term capacity building. The consequence has been an under-investment in public health systems, including basic, sanitary facilities, clean water and minimal human resources. The persistence of deadly childhood diarrheal disease and dismal provisions for basic child and maternal health are testament to this reality. As one participant tellingly put it, “If the cure for HIV/AIDS was a clean glass of water, we wouldn't be able to cure the disease.”

**3. The number of new or newly-recognized pathogens is on the increase.**

The human world has adapted poorly—and slowly—to rapid adaptation in the microbial world. More than 30 drug-resistant and emerging diseases have entered the human population in just the last 25 years.

**4. Changing patterns of human behavior have increased vulnerability to new or newly-recognized pathogens.**

Trade, travel and urban migration have long been key factors in the spread of—and ability to control—disease. Humans are now living in vast and growing “mega-cities” and are traveling with unprecedented frequency by air. Large-scale animal agriculture has exacerbated the risk of animal diseases being transmitted to humans. The average incubation period of diseases such as SARS, smallpox and Ebola ranges from two days to three weeks—far less than the duration of the longest international flight.

**5. New developments in biotechnology have increased the risk of biological attack or highly lethal accidents.**

The pace of change in the biotechnology field has been extraordinary, arguably even faster than the breakneck evolution of computer technology. While this has produced tremendous gains in agriculture and medicine, it has also lowered the threshold of access to potentially lethal technologies to an extremely worrying degree. Previously unimaginable destructive power is potentially within reach of small groups and individuals, raising the risk of both accidental and intentional release of agents that could be massively destructive. At least twelve

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<sup>4</sup> *Human Development Report 2004: Cultural Liberty in Today's Diverse World* (New York: Oxford University Press, 2004).

examples from open source literature indicate how easily these fears could be realized, particularly through the manipulation of existing pathogens or the re-introduction of diseases once thought to have been eradicated. For example, the polio virus has been created “from scratch” in labs, using supplies available on the open market; re-creating smallpox in this fashion, though more challenging, may only be a matter of time given rapid advances in technology; and a variety of mouse pox has been genetically engineered to undermine immunity, highlighting the potential to make already lethal diseases even more deadly.

Our options for offsetting threats due to biotechnological progress are particularly limited at present. Retarding research is not viable, given the immense benefits from biotechnology for food security, health and development. Effective “control” regimes for management of other deadly technologies are also hard to replicate in the biological field. Contrasting the Nuclear Nonproliferation Treaty (NPT) regime with the Biological Weapons Convention (BWC) is instructive. The NPT and its attendant safeguards remain credible instruments to prevent the acquisition of nuclear weapons by states and, to an extent, non-state actors. But the BWC as interpreted and implemented today provides far less assurance against the prospect of biological terrorism not only because there is no verification mechanism but also because, even were there one, a lower technological threshold for malfeasance means that potentially dangerous activity can easily occur outside state-run or declared programs. Nor does the BWC adequately address threats from accidental release.

This suggests that far more creativity is needed in developing instruments, policies and practices to protect against the myriad threats to biological security.

### III. WHAT ARE THE HIGHEST PRIORITIES FOR IMPROVING PREVENTION AND RESPONSE?

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The seriousness of and interlinkage among biological threats demand immediate, integrated and sustained responses at a number of levels. The meeting highlighted the following measures, in particular, to safeguard biological security:

#### 1. Raise public and governmental awareness.

A priority of the highest order is to raise awareness about the nature and full range of threats, as well as to galvanize serious debate about possible responses. At present, most attention to biological threats remains restricted to the scientific and public health communities. Governments need to be much better informed, and reform initiatives need to actively engage all relevant actors, including but going beyond the public health arena. Corporate actors, for example, should be encouraged to consider the impact of SARS on global travel and trade; and finance ministers should urgently consider issues related to the impact of HIV/AIDS on states’ economies and prospects for growth.

An obvious first step in the context of UN reform is to facilitate discussion between experts and UN member states, and there was some discussion about modalities for targeted briefings for key member states.

#### 2. Invest in national health systems as the core strategy for improving global public health capacity.

Experts present at this meeting spanned a full range of relevant fields, and all agreed that the essential,

first line of defense against the spectrum of biological threats lies in improving public health capacity globally. This is the “connective tissue” that can ensure effective response across all threat areas described above. Strengthening global public health, in turn, requires serious, concrete improvements in public health capacity at national and local levels.

The same basic capacity is required to reduce child mortality and respond to disease outbreaks; the same nurse who can observe suspicious symptom clusters in his community may be the one responsible for pediatric immunizations. Investing in local and national public health systems was considered imperative by all health task forces of the Millennium Project in order to meet the Millennium Development Goals (MDG). It is also essential to preparing for the next wave of health threats, including chronic and behavioral diseases. In addition, health systems are often the primary interface between citizens and their government. Ensuring that this interaction is effective, efficient, and equitable can serve to strengthen confidence in government beyond the health sector.

At present, inadequacies in health systems have encouraged donors to bypass rather than strengthen systems, typically opting for disease-specific “vertical” interventions. This form of response, while it can be narrowly successful, misses a crucial opportunity to address health threats in a more integrated way. Some initiatives have demonstrated greater understanding of the limitations of this approach. For example, the United Kingdom government is moving away from strictly vertical interventions, and the Global Fund to fight HIV/AIDS, TB and malaria will now have major health system and human resources components. The Global Alliance for Vaccines and

Immunization (GAVI) now plans to spend approximately 50% of its funds for health systems development, recognizing that vaccines cannot be effectively administered without such infrastructure.

However, donors and initiatives have been too slow to appreciate the importance of “horizontal” strategies or the need to integrate these with vertical interventions. Over half of health expenditure in the poorest countries comes from foreign aid, and most of this aid remains focused on disease-specific programs. This problem is more than a health issue. It will require finance, foreign, and development ministries to ensure that development strategies incorporate attention to health systems at local and national levels.

For example, one of the primary weaknesses in many health systems in the South is the lack of human resources. Health worker density is highly correlated with positive health outcomes, and approximately 2.5 workers per 1,000 people is considered necessary for an adequate system. Yet while Europe has about 10 workers per 1,000 (that is, four times the adequate level), Africa has less than 1 per 1,000 (that is, between one-third and one-half the adequate level). Africa must therefore at least double and probably even triple its human resources in the health sector. Out of 31 MDG “challenge” countries<sup>5</sup>, 29 suffer from human resource crises. Meanwhile, the aging population in developed countries is draining acutely needed health workers from many parts of the developing world. Recent proposals to address this problem through the mechanism of an International Finance Facility (IFF) signal growing appreciation of the problem, but the shortage of health workers in the developing world remains inadequately recognized.

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<sup>5</sup> As identified by *Human Development Report 2003: Millennium Development Goals: A compact among nations to end human poverty* (New York: Oxford University Press, 2003).

### **3. Strengthen surveillance and response mechanisms.**

Effective health systems must also include mechanisms for surveillance and response. At present, there is no single institution with sufficient capacity to cope with truly global outbreaks. WHO performs some of this function, but only by relying on national governments, making resilient local and national capacities imperative.

In this connection, WHO has strengthened its Global Outbreak Alert and Response Network (GOARN). GOARN marshals the resources of 125 public and private institutions to identify and respond to outbreaks. Over 60% of verification requests issued by GOARN in the last three years subsequently have been confirmed as “verified events” (849 out of 1300). To date, 400 experts have deployed to 40 countries in 48 outbreak responses. This is as relevant for developed as for developing countries. Witness the SARS outbreak, which revealed that even sophisticated health systems have vulnerabilities (as one participant put it, “complicated systems simply collapse in complicated ways.”)

GOARN’s utility would be greatly enhanced by improved national and local surveillance capacity. At present, most reporting to them originates from media and other “informal” sources. Alerts and confirmation are often late, and risk assessment is not transparent. Timely response is also hampered by a lack of human resources. GOARN’s experience suggests that a more effective global alert and response system would be able to rely on more dynamic links between international mechanisms (like GOARN) and more resilient national systems which, in turn, need to better mobilize both public and private resources and strengthen cooperation with local health systems. Counting on “leviathan government health systems” to serve these purposes is unlikely to succeed.

Communication and information are essential, and

governments need to have reliable mechanisms to communicate quickly and accurately to the public during a crisis, which places a special responsibility on the media. Nevertheless, the realities of migration, trade, and travel mean that countries cannot rely on national strategies alone. Any serious strategy needs to include a mechanism for rapid exchange of accurate information, expertise, and resources, which can be coordinated at regional and global levels.

In May 2005, ongoing negotiations to revise the existing International Health Regulations may clarify states’ responsibilities for reporting and cooperating with WHO in the event of disease outbreaks of specified severity. Among the outstanding issues is the question of procedures in the event of deliberate outbreaks, including whether WHO should play a more prominent role in these cases. Debate centers around a perceived trade-off between confidentiality and transparency in communication between WHO and member states.

### **4. Involve the animal science community in disease control initiatives.**

Human vulnerability to animal disease has long been the Achilles heel of public health, and the recent emergence of avian influenza underscores this imperative. This makes the involvement of the animal science community in preventing and countering the spread of disease essential. Livestock (especially poultry) markets have expanded rapidly and dramatically, and there is an acute and growing need for effective outbreak surveillance and response for animal agriculture. The Food and Agriculture Organization (FAO) and World Organization for Animal Health are vital actors here, together with the private sector and non-governmental organizations (NGOs). Yet within most governments, agricultural authorities are marginal to core policy making, especially in comparison with human health and defense sectors.

## **5. Reduce risks from scientific and medical research.**

More attention to the responsibilities of individuals and institutions across scientific and medical fields—in both the public and private sectors—would help to reduce the risk of accidental or deliberate outbreaks.

Better basic training of laboratory workers could help to prevent accidental outbreaks. Deliberate outbreaks perpetrated by individuals or small groups with access to potentially lethal agents present a greater challenge. Efforts are underway to establish international standards and codes of conduct to help prevent both accidental and deliberate release, though standards of behavior must to some degree emerge organically from the research community. Even then, some level of abuse seems inevitable, including within the bio-defense sector.

## **6. Strengthen compliance and verification of the Biological Weapons Convention.**

Strengthening compliance and verification of the Biological Weapons Convention would exert both a preventive and deterrent effect to help reduce the risks of bioterrorism, especially in relation to large-scale programs which have real vulnerabilities to both accidental and deliberate outbreaks. The High-level Panel report also recommended the conclusion of a bio-security protocol to the BWC to classify and establish regulations for the most dangerous biological agents. Despite the inherent limits of any BWC verification regime, there is undeniable value in greater transparency for bio-defense programs, particularly in reducing the likelihood of a costly and dangerous biological “arms race.”

The pace of change in biotechnology has escalated so rapidly that it challenges us to develop new approaches to manage risks and threats beyond traditional multilateral arms control measures. In

the longer term, what could be called a “modular” approach may be more successful in keeping pace with the evolution of threats from mass casualty weapons, and biological ones in particular. As just one element of such an approach, the BWC could establish a small secretariat to provide technical assistance to states parties in implementing their commitments and adapting to rapidly evolving challenges to the regime. Greater scientific and technological expertise within the United Nations is also required, especially in the event of a crisis.

## **7. Prepare for attack or accident.**

The scope of the BWC in preventing biological attacks is inevitably constrained by the nature of the threat from biological terrorism, even with improved harmonization of legal systems and other measures. Preparedness in the event of attack is the most important element in a strategy to address this threat, and also happens to be essential to coping with natural or accidental outbreaks. Preparedness for either threat demands the same continuum of response identified above, including robust health systems; improved surveillance and response; and more effective linkage among local, national, regional and global capacities, and across government sectors.

Vaccines are a key component of preparedness, and their regulation and use by national and international authorities merits more attention. The WHO maintains some vaccine stocks, and agreements to maintain another “virtual” WHO stockpile are near conclusion. Yet there is room to develop a broader international framework in this area. Stockpiling and use of vaccines often create conflicting priorities for governments, which need to ensure sufficient vaccines for domestic use while also deploying vaccines abroad to prevent cross-border spread of disease. Strategies to help resolve this dilemma have yet to be adequately elaborated at either national or global levels.

Systems for rapid development of new drugs and vaccines should also be introduced. This will require close and creative partnership between public and private sectors, but is essential, given rapidly evolving natural pathogens and the potential for deliberate manipulation of pathogens to resist immunity.

#### IV. CONCLUSION

Biological vulnerability incorporates a wide range of threats, from chronic and pandemic diseases that are naturally occurring, to accidental and deliberate outbreaks. It is not always possible to distinguish between natural and human-manipulated diseases, or between accidental versus deliberate release of harmful agents. Moreover, the response to a deliberately released biological agent relies on very similar mechanisms as the response to a natural deadly disease. For any response to be effective, basic health infrastructure is essential.

Preparedness to respond is also crucial. The pace of natural pathogen evolution and technological development, the widespread availability of biotechnology, and the rapidity of disease spread argue strongly that, as critical as is prevention, we cannot rely on preventive measures alone.

Our approach to the full range of biological threats must be multi-disciplinary, involving governments, the private sector, the research and science community, NGOs and multilateral institutions like WHO and other parts of the UN system. It must also be multi-layered. Countering the biological threat requires strong national capacity, which must be reinforced through regional and global cooperation. At every level, it will be critical to emphasize transparency, information sharing, and rapid response. No government or agency can alone develop the expertise for dealing with this rapidly evolving range of threats. Interdependence is a source of the world's weakness against the biological threat, but it is also the basis for what must ultimately be a strong, collective response.

##### **About this Meeting**

This meeting is one of a series of activities designed to support follow-up to the UN Secretary-General's High-level Panel on Threats, Challenges and Change. The program aims to help move the reform agenda forward in practical terms by: providing a forum for informal policy dialogue among member states around core recommendations, contributing specific analytical inputs to support negotiations, and putting in place a substantive program to support longer-term implementation of critical reforms.

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