EU – Russian partnership to reduce bio-threats and fight disease outbreaks

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Veterinary workers attempt to curb the spread of avian influenza by giving lethal injections to ducks on a farm in Siberia. (Photo credit: AP/Wide World Photos)

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Sammanfattning

Studien beskriver hur ett förbättrat samarbete kan uppnås mellan EU och Ryssland liksom stater i Östeuropa och Centralasien. Sedan lång tid har samarbete förekommit inom flera områden samt när det gäller icke-spridning från det forna sovjetiska biologiska vapenprogrammet. En genomgång görs av s.k. hotreducerande program inom det biologiska området. Dessa behöver breddas och tänkbara åtgärder för att uppnå det från EUs sida diskuteras. Genom ett aktivare samarbete med internationella partners kan en ökad effektivitet och integration uppnås i systemen för de globala nätverken för övervakning av infektionssjukdomar och för den biologiska beredskapen för alla berörda. Förslagsvis kan ”centres of excellence” för samverkan inom krishantering, biologisk beredskap, utveckling av diagnostik, medicinskt skydd och utbildning inom biologiskt skydd och säkerhet samt till stöd för epidemiologisk övervakning skapas. Ett angeläget område med potential för givande samarbete kan vara studier av hur de förväntade klimatförändringarna på 5-30 års sikt kan komma att inverka på mönstret av infektionssjukdomar i de europeiska delarna av Ryssland, Ukraina och Vitryssland liksom i grannländer inom EU samt de risker som det kan innebära. Uppmuntra införandet av internationellt accepterade riktlinjer för biologiskt skydd och säkerhet inom Ryssland och de Östeuropeiska och Centralasiatiska länder då de är nödvändiga för utländska investeringar och för främjandet av en skydds- och säkerhetskultur. Ett annat område kan vara gemensamma program när det gäller skydd och beredskap mot bioterrorism. Gemensamma satsningar inom bioteknik under förutsättning att Ryssland kan skapa en företagsvänlig miljö för sådana. Ryssland har mycket att bidra med i samarbeten men då krävs att Ryssland arbetar som en aktiv partner. Denna rapport utgör också en uppdatering av tidigare arbete inom området och kan utgöra ett bakgrundsmaterial inför det svenska ordförandeskapet inom EU 2009.

Nyckelord: biologiska vapen, bioterrorism, biologisk säkerhet, hotreducerande program, EU, G 8 partnerskapet, hälsosäkerhet, icke-spridning, Ryssland.

Summary

The aim of this study was to discuss improved partnerships between the EU and Russia as well as with other Eastern European and Central Asian (EECA) countries. For a long time cooperation has been ongoing in several areas as well as to prevent the proliferation from the former Soviet biological weapons programme. The threat reduction activities in the biological area need to be widened in scope and measures that could be promoted by the European Union are discussed. Through a more active cooperation with international partners the efficiency and better integration with global networks on disease surveillance and biological preparedness response can be achieved for all involved. Potential centres of excellence for collaboration on crisis management, bio-preparedness, for development of diagnostics, medical countermeasures and biosecurity/ biosafety training as well as supporting epidemiological surveillance training could be created. One area of mutual concern with potential for mutual beneficial partnership could be to study how the climate changes anticipated in 5-30 years will influence the infectious disease patterns in the European part of Russia, Ukraine and Belarus as well as in bordering countries of the EU and the risks involved for partners. Encouraging internationally accepted biosafety and biosecurity practices at Russian and other EECA institutes will be essential in promoting Western investments and creating a safety culture that will have multiple benefits. Another area could be joint programs to develop protection and preparedness against bioterrorism. Commercial endeavours in biotechnology could be promoted depending on Russia being able to create a more business friendly environment. Russia has much to offer for cooperation but this will not happen without active Russian partnership. The report can also be seen as an updating of previous work in this area and can also serve as a background paper on these issues in preparation for the Swedish Presidency of the EU in 2009.

Keywords: biological weapons, bioterrorism, biosecurity, Cooperative Threat Reduction, EU, G8 Global Partnership, health security, non-proliferation, Russia.

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1 Introduction

The aim of this study is to review and propose possible new and improved partnerships between the EU and Russia as well as with other Eastern European and Central Asian (EECA)[1] countries. The report concludes by recommending some specific areas for cooperation that could also at the same time promote EU's non-proliferation aims:

- The EU should based on the new Instrument for Stability develop an action plan to enhance EU cooperation with Russia and other EECA countries in the biological area.
- Enhance and improve coordination of epidemiological surveillance networks for human, animal and plant diseases and integrate them better in EU networks through collaborative projects.
- Create one or several centres of excellence for collaboration on bio-preparedness and biosecurity/biosafety as well as supporting epidemiological surveillance training affiliated to for example the ECDC (European Centre for Disease Control). The activities could include cooperation on setting up specific rapid response teams that can be used for support in bio-preparedness planning and training in EECA countries.
- Promote common studies of the predicted future climate changes on the pattern of infectious diseases in the EU, Russia, Ukraine and Belarus and its consequences.
- The EU could initiate new public-private partnerships in biotechnology R&D and commercialisation of mutual benefit.
- Cooperate on prevention of bioterrorism and enhancing biosafety/biosecurity R&D programmes to develop improved protection for civilian populations of mutual benefit.

[1] EECA, Eastern European and Central Asian countries formerly called the New Independent States: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan

This report is based mostly on Western sources as much of the discussion deals with so called threat reduction programs initiated by Western governments during the 1990s. There is plenty of Russian material dealing with threat reduction in the chemical and nuclear areas, priority areas for Russia, but it is almost non-existing for the biological area. The reason for this is explained in the report but this should be remembered when reading it. The report also discusses why the EU could be in a better position now to achieve progress in the biological area than the US was in the beginning of the 1990s. There is a perceived enhanced bioterrorism threat acknowledged by both the EU and Russia as well as by the U.S., but no attempt is made in this report to discuss the differences that exist or evaluate the threat as such. The threat perception has led to a need to develop strategies to enhance biological safety and security. This report is one in a series of reports that will cover the R&D developments in Russian biotechnology including defence aspects why these issues are only briefly described here which is also the case concerning the history and previous activities in the former Soviet biological weapons program.

There are several terms that frequently are used in connection with discussions on biological threat reduction or bioterrorism. It should be mentioned that the international community has still to agree on a common term for terrorism, but bioterrorism would include using biological agents, disease causing microorganisms or toxins derived from microorganisms as a means of terrorism. In cases where biological agents are used in other criminal circumstances to harm individuals this is refered to as biocrimes.[2] The term biosafety is internationally well defined by the WHO and commonly used. During recent years the term biosecurity has become common and is much used but there is no internationally agreed definition of this term. This should also be taken into account when reading the report and the activities being discussed in various cooperative programs. There is also a language problem as both in French and Russian the same word is used for biosafety and biosecurity. The WHO (World Health Organisation) has with other international organisations developed a definition of laboratory biosecurity and biorisk management:[3]

Biorisk assessment is the process to identify acceptable and unacceptable risks (embracing biosafety risks (risks of accidental infection) and laboratory biosecurity risks (risks of unauthorized access, loss, theft, misuse, diversion or intentional release)) and their potential consequences.

[2] Kellman B., *Bioviolence: Preventing Biological Terror and Crime*, Cambridge University Press, August, 2007.

[3] *WHO Biorisk Management, Laboratory biosecurity guidance*, Department of communicable disease surveillance and response, WHO/CDS/EPR/2006.6, September 2006.

Laboratory biosecurity describes the protection, control and accountability for valuable biological materials within laboratories, in order to prevent their unauthorized access, loss, theft, misuse, diversion or intentional release.

Laboratory biosafety describes the containment principles, technologies and practices that are implemented to prevent the unintentional exposure to pathogens and toxins, or their accidental release

Laboratory biosecurity practices are a logical extension of good laboratory biosafety procedures and both are essential to good laboratory practice.[4] Biosecurity is sometimes inappropriately used to refer to a broader range of measures to prevent and respond to possible biological attacks (e.g., bio-defence, public health and law enforcement). Some bio-security measures overlap with policies on bio-safety, food safety, agricultural security, biodiversity and counter-terrorism measures. In the United States, for example, the term biosecurity is used to motivate increased funding for biodefence research. The term biosecurity is also used in different ways for political reasons with the U.S. preferring a wide interpretation in contrast to the European side where it is often seen in a more limited context as part of biosafety.

For a number of years cooperation has been ongoing in many areas in the biological area such as, public health, R&D in the life sciences as well as to prevent proliferation of biological agents, technologies and know-how from the former biological weapons program. One part of this report is a review of the threat reduction activities in the biological area with a focus on Russia and relating these to other international developments with relevance including the changed political security situation. There is a need to widen the scope of traditional threat reduction activities. The kind of measures that could be envisioned and could be promoted will be considered. This involves analysing governments and international organisations ongoing threat reduction initiatives or non-proliferation prevention measures in the biological area. Based on this analysis conclusions and recommendations are presented for ways of cooperating and potential new initiatives, for example, by the European Union. The report can also be seen as an updating of previous work in this area and with the hope to further the discussion on these issues.[5][6][7][8][9][10][11] The report can also serve as a

[4] World Health Organization, *Laboratory Biosafety Manual*, 3rd ed. (WHO: Geneva, 2004), at http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/.

[5] Roffey, R, W. Unge, J. Clevström and K. S. Westerdahl, *Support to Threat Reduction of the Russian Biological Weapons Legacy – Conversion, Biodefence and the Role of Biopreparat*, FOI Report 0841, 2003.

[6] Roffey, R. and K. S. Westerdahl, *Conversion of former biological weapons facilities in Kazakhstan – A visit to Stepnogorsk*, July 2000, FOI R 0082-SE, May 2001.

background and resource paper on these issues in preparation for the Swedish Presidency of the European Union in 2009. The report is produced on behalf of the Swedish Ministry of Defence.

The emerging and re-emerging infectious diseases are a worldwide problems and a global strategy is needed to manage these. The rapid social and economic changes now taking place as well as the increased travel is affecting this in ways that are difficult to predict. The climate changes due to projected global warming will also impact on this and is not yet well understood. There are major challenges in this area for the EU as well as Russia and most former Soviet republics. The disease-related developments in Russia and other Eastern European and Central Asian countries (EECA),[12] also called NIS (Newly Independent States) will have a significant impact also for neighbouring countries but also on a global scale. The infectious disease situation, the epidemiological disease surveillance systems discrepancies, weaknesses in diagnostic capabilities, preparedness and response capacities are of immediate concern. This is also the case concerning deficiencies in the level of biosecurity and biosafety at facilities where work is carried out on dangerous pathogens. In order to support efforts to improve the situation concerning these and similar

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[7] Lilja, P., R. Roffey and K. S. Westerdahl, *Retention or disarmament, is the Soviet offensive BW-programme continuing in Russia*, FOA Report R-99-01366-865, December, 1999.

[8] Roffey, R., *From Bio Threat to EU Biological Proliferation Prevention Cooperation, Background paper 4*, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html 2007-03-10.

[9] Roffey, R., "Need for enhanced support for reduction in the biological area for redirecting production facilities", In *Next Generation Threat Reduction: Bioterrorism's challenges and solutions*, New Defence Agenda's Bioterrorism Reporting Group, Biblioteque Solvay Brussels, 25 January 2005.

[10] Knoph, J. T., and K. S. Westerdahl, "Re-Evaluating Russia's Biological Weapons Policy, as Reflected in Criminal Code and Official Admissions: Insubordination Leading to a President's Subordination", *Critical Reviews in Microbiology*, vol. 32, 2006, pp. 1-13.

[11] Westerdahl, K. S. and Roffey R., "Vaccine production in Russia: An update", *Nature Medicine Vaccine Supplement*, Vol. 4, No 5, 1998, p. 506.

[12] EECA, Eastern European and Central Asian countries formerly called the New Independent States: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

topics international cooperation has been carried out but is still insufficient and enhanced efforts are needed not least from the European Union.

The continuing appearance of highly virulent emerging and re-emerging communicable diseases highlights the need for coordinated preparedness in support of global public health.[13] A disease outbreak in one country can be spread internationally in a matter of hours or days. New and re-emerging infectious diseases will continue to pose a rising global threat and only malaria; tuberculosis and HIV/AIDS still kill around 5 million people every year. At least 30 previously unknown diseases have appeared since 1973, including HIV/AIDS, Ebola, hepatitis C, SARS (Severe Acute Respiratory Syndrome) and Nipah, for which no cures are available yet. In addition other diseases like measles, influenza and the threat of pandemic flu are serious health problems on a global scale.[14] [15] [16] [17] [18] [19] For Russia and Eastern European and Central Asian countries (EECA) it is well known the problems they face concerning HIV/AIDS, tuberculosis and hepatitis C. The predicted climate changes and their effects in the short and long-term are the focus of global attention and also its effects on health and spread of infectious diseases.[20] [21] [22] The effects of climate changes envisioned on the incidence of infectious diseases on the health of the

[13] WHO, *A Safer Future, The World Health Report 2007, Global public Health Security in the 21st Century*, Geneva, 2007.
[14] Jones, K. E., *et. al.*, "Global trends in emerging infectious diseases", *Nature*, Vol. 451, 21 February, 2008, pp. 990-993.
[15] United Nations, *Report from the High level Panel on Threats, Challenges and Change*, Doc. A/59/565, December, 2004.
[16] Gannon, J. C., Chairman, National Intelligence Council, *The Global Infectious Disease Threat and Its Implications for the United States*, NIE 99-17D, January, 2000.
[17] Leitenberg, M., "Assessing the biological weapons and bioterrorism threat", Presented at Meeting the challenges of bioterrorism: Assessing the threat and designing biodefence strategies, Furingen, Switzerland, 22-23 April, 2005.
[18] Enserink, M., "Looking the pandemic in the eye", *Science*, Vol. 306, pp 392-394, 15 October 2004.
[19] "WHO warns of bird flu pandemic, World health officials have issued their strongest warning yet about the global threat posed by bird flu", *BBC Monitoring*,23 February, 2005, at http://news.bbc.co.uk/go/fr/-/1/hi/world/asia-pacific/4289637.stm
[20] *Climate Change and Human Health, Risks and Responses*, World health Organisation, Geneva, 2003.
[21] *Using Climate to Predict Infectious Disease Outbreaks: A Review*, WHO/SDE/OEH/04.01, World Health Organisation, Geneva, 2004.
[22] *Health and Climate Change: the "now and how", A policy action guide*, WHO Regional Office for Europe and DG Research European Commission, World Health Organisation, Copenhagen, 2005.

population in the EU and the EECA[23] countries are not well understood and this could be one area for a fruitful cooperation and partnership.

It is well known that it is extremely difficult to prevent the spread of biological warfare capabilities due to the dual-use nature of the biotechnology area. Today the proliferation of weapons of mass destruction (WMD) know-how, technology and materials to states or non-state actors is still a major threat that only international cooperation can prevent. If more states acquire the required know-how and materials it becomes potentially easier also for non-state actors to obtain these. This can be seen as partly a result of the general globalisation trend concerning R&D and industrial production including increased trade in dual use items. There is an increasing focus on questions related to security also in the biotechnology area such as the security of dangerous pathogens and the potential misuse of the rapidly developing technology.

The terrorist attacks in the U.S. on 11 September 2001 and further terrorist incidents since then showed that terrorism has become a major threat to international peace and security.[24] The risk of mass casualty terrorism and bioterrorism is not and cannot be disregarded by the EU, Russia or other EECA countries. There have been several recent cases where law enforcement authorities in several EU member states have stopped what they believed were plans to use biological or chemical agents in attacks.[25] [26] [27] [28] Cooperation in this area could also have mutual benefits.

The international community has tried to prevent the proliferation of biological weapons, related materials and know-how but with so far somewhat limited progress to which can be added the set back due to the collapse 2001 of the multilateral negotiations to strengthen the 1972 BTWC (Biological and Toxin Weapons Convention) with a compliance regime. Arms control and disarmament actions in the biological area have been found to be more difficult than for other WMD categories not least due to political but also for practical reasons. One factor being the ease of acquiring dual use materials and technologies as well as know-how for small scale production. In addition the extreme secrecy that has

[23] EECA, formerly called the New Independent States: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.
[24] *EU Terrorism Situation and Trend Report 2007*, TE-SAT, Europol, March, 2007.
[25] "Group warns Europe of more terror attacks", *The Associated Press*, 2 July, 2004.
[26] "Terrorist chemical threat 'worse than suspected", *The Financial Times*, 11 April, 2004.
[27] Croddy, E., M. Osborne and K. McCloud, *Chemical Terrorist Plot in Rome? Research Story of the Week*, Center for Nonproliferation Studies, Monterey Institute of International Studies, at http://cns.miis.edu/pubs/week/020311.htm, 2003-03-19.
[28] *EU Terrorism Situation and Trend Report 2007*, TE-SAT, Europol, March, 2007.

always surrounded work in the BW-area and the well known difficulties in identifying prohibited activities especially for non-state actors.[29]

One way used for reducing the risks, due to biological weapons/bioterrorism and preventing proliferation from areas with previous biological weapons programs have been so called threat reduction activities. These have involved elimination of BW relevant equipment and infrastructure as well as redirecting former weapons scientists to peaceful purposes and securing dangerous pathogens. The problems connected with the risks of proliferation of biological weapons and with bioterrorism came to the forefront of attention during the 1990s. The reasons for this included, the revealed Iraq's BW-programme and the large scale Soviet Union offensive biological weapons program[30] [31] and in addition the perceived increased threat of bioterrorism.[32] To this can be added the terrorist attacks causing mass casualties in USA 2001 and Spain 2004, focusing international attention on the fight against terrorism. In addition it can be said that the rapid progress in biotechnology, its dual use nature and potential for misuse to create more efficient biological weapons, that could be a driving force for promoting such developments and promote future misuse. The future challenges posed by biological nonproliferation are significant but can be handled if a global approach can be achieved with a mix of effective measures specific for the biological area.

The term cooperative threat reduction (CTR) for the U.S. DOD activities have become generally used for threat reduction activities and also used for the first time by the EU in its WMD Strategy. It has been suggested that this term now does not reflect the type of activities being covered by it or the way these are carried out today in partnership. The span of activities has broadened from the traditional threat reduction activities to more biosafety/biosecurity, public health related issues and R&D cooperation in selected areas. Many of the projects today have multi-functions why sometimes financing them can become difficult due to

[29] Roffey, R., "Biological weapons and potential indicators of offensive biological activities", Chapter 13, In *SIPRI Yearbook 2004, Armaments, disarmament and International Security*, Stockholm International Peace Research Institute, SIPRI, Oxford University Press, 2004, pp 557-571.

[30] Alibek, K. with S. Handelman, *Biohazard, The chilling true story of the largest covert biological weapons program in the world – Told by the man who ran it*, Random House, New York, 1999.

[31] Pikaev, A. A., "International commitments on the prohibition of biological weapons", Lecture at Moscow Institute of Physics and Technology, 13 April, 2005, Center for the Study of Disarmament, Energy and the Environment at MFTI, 2006, at http://www.armscontrol.ru/course/lectures06a/aap060413.htm 2007-09-20.

[32] National Intelligence Council, *Mapping the Global Future, Report of the National Intelligence Council's 2020 Project*, NIC-2004-13, December 2004, p. 95.

bureaucratic problems and difficulties to cooperate between agencies and ministries in donor countries.

International cooperation is essential and the leaders of the G8 countries[33] took an important step in the right direction at Kananaskis in Canada in June 2002 by adopting the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction.[34] In the forward of the High Level Report the Secretary-General points out biosecurity concerns, the deterioration of our global health system and it highlights both the promise and the peril of advances in biotechnology. Every threat to international security today enlarges the risk of other threats.[35] [36] Biosecurity as a phenomenon in a wide sense has become a key security issues in this century.[37] [38] International groups like the G7+ Global Health Security Action Group (GHSAG), the G8 Global Partnership, the BTWC meetings, the OECD, and the EU have all taken initiatives in this area.

[33] The G8 consists of Canada, France, Germany, Italy, Japan, Russia, the United Kingdom and the United States.

[34] "The G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction, Kananaskis", 2002, at http://www.g8.fr/evian/english/navigation/g8_documents/archives_from_previous_summits/kananaskis_summit_2002/the_g8_global_partnership_against_the_spread_of_weapons_and_materials_of_mass_destruction.html 2007-12-11.

[35] "United Nations Secretary-Generals forward" in: *A more secure world: Our shared responsibility, Report of the Secretary-General's High-level Panel on Threats, Challenges and Change*, 2004.

[36] United Nations, *Report from the High-level Panel on Threats, Challenges and Change*, Doc. A/59/565, December 2004.

[37] Roffey, R. and F. Kuhlau, "Enhancing biosecurity: the need for a global strategy", Appendix 14A, pp 732-748, in SIPRI *Yearbook 2006, Armaments, Disarmament and International Security*, Stockholm International Peace Research Institute, Oxford University Press, 2006.

[38] Koblentz, G., "Pathogens as weapons, the international security implications of biological warfare", *International Security*, Vol 28, No. 3, pp 84-122, Winter 2003/2004.

2 Russian approaches

2.1 Threat reduction in the biological area and biosecurity priorities in Russia.

The Russian view in general terms on non-proliferation of weapons of mass destruction has been presented in a white paper 2006 just before the G8 summit in St. Petersburg.[39] [40] The basic documents are The National Security Concept, Foreign Policy Concept and Russian Military Doctrine on which the white paper is based. During 2005 The principles of Russian Federation State Policy in the Sphere of the Non-proliferation of Weapons of Mass Destruction and Means of Their Delivery, The Comprehensive Program on the Non-proliferation of Weapons of Mass Destruction and Means of Their Delivery for the Period Until 2010 and a series of legal documents concerning issues of non-proliferation and export control were adopted. The Russian state policy on non-proliferation of chemical and biological weapons is defined in the Principles of State Policy in the Area of Ensuring the Chemical and Biological Safety of the Russian Federation for the Period up to 2010. Not much is mentioned in the white paper about the BW/bioterrirsm area in the document. Russia has consistently advocated the strengthening of the BTWC by renewing the work on a verification arrangement. As there is no reliable information demonstrating the complete cessation of work on BW, a number of states are not parties to the BTWC it is clear that the threat of BW use in inter-state conflicts is real. The rapid developments in biotechnology have created the prerequisites for the development of new types of BW. One motivation mentioned for interest in BW is the possibility of covert military programs given the lack of a clear distinction between offensive and defensive activities. It is pointed out that the greatest threat faced by Russia and other states in this area will come from the possible use by terrorist of some type of WMD. One problem mentioned is that a number of countries lack effective systems of physical protection and export controls. Further the Russian Federation also has approved a program of long-term

[39] *The Russian Federation and Nonproliferation of Weapons of Mass Destruction and Delivery systems: Threats, Assessments, Problems and Solutions*, CNS translation of a Russian government white paper on non-proliferation policy, James Martin Center for Nonproliferation Studies, at http://cns.miis.edu/pubs/other/rusfed.htm 2007-10-15.

[40] Sokov, N., "CNS Analysis of the Russian Government's White Paper on WMD Nonproliferation", James Martin Center for Nonproliferation Studies, at http://cns.miis.edu/pubs/week/060726.htm 2007-10-15.

cooperation with the CIS (Commonwealth of Independent States) in WMD non-proliferation.

This Russian policy can also be seen for example in the statements from the G8 summits but it is difficult to find statements referring to threat reduction issues connected to the biological area. In these statements it is said that the G8 are committed to strengthening and the universalisation of WMD treaties including the BTWC. The G8 will work towards rendering the implementation of the CWC (Chemical Weapons Convention) and the BTWC more effective. To help states in effectively implementing their obligations at national levels, *inter alia*, by accounting for, securing and physically protecting sensitive materials. Russia has legislation covering the BTWC and to prevent bioterrorism[41] [42] and for a detailed discussion on the Russian legislation on this see Knoph and Westerdahl.[43] The G8 statement 2007 further states that the G8 states are determined to exclude completely the possibility of biological agents and toxins being used as weapons.[44] The Russian government has also confirmed that it sees threat reduction and disarmament support as important elements in its security policy. In the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction Russia has though not since the first summit in Kananaskis 2002 been supportive of threat reduction activities in the biological area although other partners have tried to include this issue on the agendas. In addition Russia's official present position is that Russia has not even inherited any BW capacity from the Soviet Union. Russia maintains that it does not possess facilities for the production of biological and toxin weapons and strictly observes its international obligations.[45] [46] [47] In contrast, former Soviet biological weapon scientists who

[41] United Nations Security Council, "Annex to the note verbale dated 26 October 2004 from the Permanent Mission of the Russian Federation to the United Nations addressed to the Chairman of the Committee", *Report of the Russian Federation on the implementation of Security Council resolution 1540 (2004)*, S/AC.44/2004/(02)/14, 2 November 2004.

[42] United Nations, Working paper submitted by the Russian Federation, "Answers to the questionnaire on national legislation ensuring compliance with the Convention on the Prohibition of Biological and Toxin Weapons", BWC/MSP.2003/WP.6, 11 November, 2003.

[43] Knoph, J. T., and K. S. Westerdahl, "Re-Evaluating Russia's Biological Weapons Policy, as Reflected in Criminal Code and Official Admissions: Insubordination Leading to a President's Subordination", *Critical Reviews in Microbiology*, vol. 32, 2006, pp. 1-13.

[44] G8 Summit 2007, Heiligendamm, "Statement on non-proliferation", at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-nonprolif.pdf 2007-09-03.

[45] Kalinina, N. I., "The Convention on the Prohibition of Biological Weapons, Russian Context", Lecture at Moscow Institute of Physics and Technology, 31 March, 2005, Center for the Study of Disarmament, Energy and the Environment at MFTI, 2005, at http://www.armscontrol.ru/course/lectures05a/nik050331a.htm 2007-09-20.

[46] Yevstigneyev, V., "On issues, relating to Russian biological Weapons", *Yadernyi Kontrol Digest*, No. 11, Summer 1999, at http://www.pircenter.org/board/article.php3?artid=77 2007-09-21.

indicated that they were this, who submitted project proposals that were first screened by the Russian government, could be financed through international threat reduction programmes administrated by the ISTC.[48] It is also well-known fact that the situation concerning infectious diseases in Russia and NIS countries constitutes a serious problem in many aspects. During the St. Petersburg G8 Summit in 2006 Russia promoted the fight against infectious diseases in general.[49] Russia also has much to offer in the area of vaccine development. One step for cooperation could be to establish common standards for biosafety and biosecurity.[50]

President Putin has stated that terrorists will try to acquire WMD and that bioterrorism is a reality requiring national defence policies to be adjusted.[51] Measures are taken to evaluate security measures in the defence industry.[52] Russia has initiated several measures to counter bioterrorism including that two centres to prevent bioterrorism were created in Volgograd and one for diagnosis and treatment of dangerous and exotic diseases under the Ministry of Defence at Sergiev Posad.[53] There was also a major program often refered to as "Zashchita" (protection) 1999-2005 aimed at developing protection against natural and deliberate outbreaks of disease that covered activities for example in the area of Ministry of Defence and Ministry of Health and Social Development.[54] It has also been stated that the cooperation between Russia and USA in the fight

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[47] Knoph, J. T., and K. S. Westerdahl, "Re-Evaluating Russia's Biological Weapons Policy, as Reflected in Criminal Code and Official Admissions: Insubordination Leading to a President's Subordination", *Critical Reviews in Microbiology*, vol. 32, 2006, pp. 1-13.

[48] Roffey, R, W. Unge, J. Clevström and K. S. Westerdahl, *Support to Threat Reduction of the Russian Biological Weapons Legacy – Conversion, Biodefence and the Role of Biopreparat*, Swedish Defence research Agency, FOI Report 0841, 2003.

[49] "G7/G8 St, Petersburg Summit Document, Fight against Infectious Diseases", 16 July, 2006, at http://www.g7.utoronto.ca/summit/2006stpetersburg/infdis.html 2007-09-03.

[50] Kobyakov, D. and V. A. Orlov, *Global partnership: What's next? Report prepared for the Geneva Centre of Security Policy*, 2005, at http://www.sgpproject.org/publications/KobyakovOrlovApril2005GPWhatisnext.pdf 2007-11-07.

[51] "Putin felt the threat of bioterrorism, (in Russian)", 2001, at http://www.nns.ru/archive/chronicle/2001/11/12.html

[52] "FSB says terrorists are trying to secure WMD", *Moscow Times*, 22 August, 2005.

[53] Westerdahl, K. S. and L. Norlander, *The role of the new Russian anti-bioterrorism centres*, Swedish Defence Research Agency, FOI Report 1971, 2006.

[54] "The creation of methods and means of defending the population and environment against dangerous and extremely dangerous pathogens in natural and man-made emergency situations from 1999 to 200", Government of the Russian Federation, Resolution No. 737, 2 July, 1999.

against terrorism including bioterrorism plays an important role in achieving the long-term non-proliferation goals. The importance of bioterrorism and working together to prevent this was already pointed out in the Joint Statement by Presidents Bush and Putin 2001. The security of materials, facilities, expertise, and technologies that can be exploited by bioterrorists should be enhanced and they confirmed a strong commitment to the BTWC.[55] However the practical level of cooperation between the two countries has remained low over the years.[56] [57] Similar to other countries in Europe a substantial part of Russia's measures to counter bioterrorism are carried out in conjunction with existing systems for fighting infectious diseases.[58] It has been estimated that around 40 million cases of infectious diseases occur in Russia annually resulting in economic loses of R18 billion.[59] Goals have been set for healthcare agencies and institutes in Russia such as: increasing the effectiveness of the epidemiological surveillance system, developing relevant regulations, improve vaccine based preventive system, upgrading laboratories, increase research on prevention, diagnostics, treatment, epidemiology and vaccines.[60]

According to the head of the Institute in Sergiev Posad biosecurity measures are good and the system of monitoring biological substances in scientific institutions of the Russian Defence Ministry rules out the potential threat of biological weapons being acquired by terrorist organizations. There are sufficient forces and means to prevent individuals from entering (laboratories) without permission and stealing biological materials from institutions.[61] [62] Instead, the risks of

[55] "Joint Statement by President George W. Bush and President Vladimir V. Putin on Cooperation Against Bioterrorism", The White House, Washington, November 13, 2001, in "Bush-Putin Summit", *Disarmament Diplomacy*, Issue No. 61, October-November, 2001, at http://www.acronym.org.uk/dd/dd61/61doc03.htm 2007-10-12.

[56] Warrick, J., "Russia Denies U.S. Access on Bioweapons", *The Washington Post*, September 8, 2002.

[57] "Russia stops funding of bioterrorism countermeasures, says expert", (Interfax-AVN 1 February), *Mental Health Law Weekly*, 5 February, 2005.

[58] Onishchenko, G. G., L. S. Sandakhchiev, S. V. Netesov and R.A. Martynsk, "Bioterrorism: A National and Global Threat", *Vesnik Akademii Nauk*, Vol. 73, No. 3, March 2003, pp. 195-204, Translated in "Appendix G", p. 106, in *Biological Science and Biotechnology in Russia, Controlling Diseases and Enhancing Security*, National Research Council of the National Academies, Washington D.C., NAS Press, 2006.

[59] "Russia approves chemical and biological security programme concept", *RIA-Novosti*, 1 February, 2008 (Translated by NTIS U.S. Dept. of Commerce).

[60] Onishchenko, G. G., "Main Goals and Objectives in Combating Infectious Diseases in the Russian Federation", Moscow, March 26-28, 2002, Translated in "Appendix D", p. 93-95, in *Biological Science and Biotechnology in Russia, Controlling Diseases and Enhancing Security*, National Research Council of the National Academies, Washington D.C., NAS Press, 2006.

[61] "Russian military warn of bioweapons attacks", (from *ITAR-TASS news agency*, Moscow, in Russian 1103 gmt 29 April, 2004), *BBC Monitoring International*, 29 April, 2004.

proliferation of know-how comes from inside, especially for these high security facilities, as scientists are approached for information, technology or strains.[63] In the mid-1990s fears were also raised that improved means of modern telecommunications could offer a possibility to communicate sensitive know-how with the outside world without physically leaving Russia, e.g. via e-mail.[64]

The fall of the Soviet Union brought about a rapid decline in federal funding to institutes and many scientists had to look for alternative sources for income.[65] [66] As a result many scientists left the country in a first wave in 1980-1990 where a number of internationally well known scientists left mainly (80%) for Germany and Israel. During a second phase 1992-1993 where 30 percent of the scientists were biologists and left for Germany, Israel and United States. A third wave 1994-1998 was led by biologists. Around 2000, 1400 scientists were leaving per year.[67] Anecdotal reports persist of former Soviet scientists, especially those in Central Asia and the Caucasus, being approached by officials from states of concern. Further, a 2003 survey of Russian scientists with weapons expertise found that 20 percent of respondents would consider working in North Korea, Syria, Iran, or Iraq for a year or more. Comparable WMD proliferation concerns are emerging in other parts of the world where there are scientists and technicians with WMD-relevant know-how.[68]

Biosecurity in Russia is referred to as the deficiencies in the protection against bioterrorism. The term biological security in Russia can mean biosecurity and

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[62] "Terrorists will not have access to biological, nuclear, chemical weapons – FSB director", *Novosti*, 18 May, 2005.
[63] Hoffman, D., "Where have Russian arms scientists gone?" *Salt Lake Tribune*, 24 January 1999.
[64] Cooperman, A. and K. Belianinov, "Moonlighting by modem in Russia", *US World & News Report*, 17 April, 1995.
[65] Center for Science Research and Statistics (CSRS), Nauku v SSSR: Analiz i statistika (CSRS: Moscow, February 1972), p. 256, as cited by Dezhina I. and L. Graham, "Russian basic science: Changes since the collapse of the Soviet Union and the impact of the international support", Paper presented at the Royal Society, London, 22 October, 2001.
[66] *Russian basic science after ten years of transition and foreign support, Carnegie Endowment for International Peace*, Carnegie Paper No. 24, February, 2002.
[67] Boureston, J. and M. B. Nikitin, "Improving the ISTC/STCU science centres' programmes to support worldwide non-proliferation objectives", Background paper 8, p. 10, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html
[68] U.S. Department of State, *Annual Report to Congress*, December, 2004.

biosafety, which might confuse but also assist with agreeing and implementing joint programmes. Supporting chemical and biological security is one of the most important ways of strengthening the Russian Federation's national security and the president shall supervise its principles of implementation.[69] [70] [71] One of several reasons stated why a state policy was needed was for example: the increasing number of dangerous facilities, presence of toxic industrial wastes, absence in many regions of special enterprises for recovery of dangerous chemical and biological materials, loosening of procedures of physical protection, decrease in general proficiency level of technical and maintenance personnel and intensification of terrorist activities aimed at dangerous facilities.. The Ministry of Health and Social Development prepared a Federal program on biosecurity and indicated that Russia needed to create an effective biosecurity system.[72] A commission on biological and chemical security was set up under the Minister for Health and Social Development, including representation from all the security ministries as well as the ministries of science and education and agriculture at no less than deputy ministerial level.[73] [74] [75] An annual report will be produced on the progress to improve biological and chemical security. In February 2008 “the concept of the federal targeted development programme the national system of chemical and biological security of the Russian Federation 2009-2013” was approved. The coordinator for the program will be the Ministry of Health and Social Development, and it will involve the Ministry of Defence, the Ministry of Agriculture, the Federal Service for Consumer Rights Protection, the Russian Federal Veterinary and the Phytosanitary Inspection Service and the Russian Federal Industry Agency with a funding of R28.7 billion. The programme will reduce the danger and threats to public health due to hazardous

[69] Unattributed article: “Fundamental Principles of State Policy on Chemical and Biological Security of the Russian Federation in the Period to 2010 and the Long Term”, (FBIS Translated Text, FBIS-SOV-2004-0408), Moscow *Rossiyskaya Gazeta* in Russian 7 April 2004.

[70] The foundations of the state policy for ensuring chemical and biological safety of the Russian Federation for the period up to 2010 and longer terms, approved by President of Russian Federation V.V. Putin on December 4, 2003. no Pr-2194, in Analysis of the existing chemicals management system in the Russian Federation, Unofficial translation, J Ruut & J. Simanovska, Baltic Environmental Forum, Nordic Council, October 2004- December 2005, at http://www.norden.org/pub/miljo/miljo/uk/US2006416.pdf 2008-02-29.

[71] Onishchenko, Ministry of Health, 2003, at http://www.informeco.ru/stat.php?stat=231

[72] Russian Government Resolution No. 303: “On the division of authority among Federal Agencies in the sphere of biological and chemical security of the Russian Federation”, 16 May, 2005.

[73] “Public Health Chief Onishchenko says Russian biosecurity ‘cause of concern’”, Moscow *Nezavisimaya Gazeta* in Russian 15 October 2004, FBIS-SOV-2004-1015, 20 October, 2004.

[74] “Russia sets up Commission to fight biological threat”, *Monnews*, 14 February, 2005, at http://www.mosnews.com/news/2005/02/14/biodefence.shtml

[75] “Russian government tightens grip on country’s biological, chemical security”, *BBC/Itar Tass*, 19 May, 2005, at http://www.sgpproject.org/Personal%20Use%20Only/RUCWBWSecurity.html

chemical and biological facilities through their modernisation and re-equipment and development of scientific and technical means of protection. The programme will also involve informing the general public and training of personnel.[76] As a consequence of a report from the FSB indicating that the West were developing genetically engineered biological weapons and due to the threat of bioterrorism Russia has banned all exports of biological material or medical specimens such as for research which will hinder international collaborative work. There was no indication of how long this ban would be.[77] The ban was initiated by the Ministry of Health and Social Development on the 28th of May 2007 and is carried out by the Federal Customs Service.[78]

The standard of the facilities and equipment vary and during the last decade improvements have been initiated both at individual facilities and for the industry as a whole. Improvements are though still needed on the system of training, retraining and certification of highly qualified personnel working with dangerous pathogens. Criteria will be developed for categorization of facilities according to risk level and an inventory of facilities will be carried out, including a list of critically important facilities.[79] Codes of Practice that complement legislation and regulations may be produced by national authorities to set out how these should be implemented. There are a number of these common international practices that should be promoted like Good Manufacturing Practice (GMP),[80] [81] [82] Good Laboratory Practice (GLP)[83] and Good Microbiological Technique (GMT) and

[76] "Russia approves chemical and biological security programme concept", *RIA-Novosti*, 1 February, 2008 (Translated by NTIS U.S. Dept. of Commerce).
[77] "Russia warily eyes human samples, in the name of fighting bioterrorism, export of biological materials prohibited", *Komersant*, 30 May, 2007.
[78] "Russia bans human tissue export in bioweapon alert", *New Scientist*, 30 May, 2007.
[79] Kobyakov, D. and V. A. Orlov, *Global partnership: What's next?* Report prepared for the Geneva Centre of Security Policy, 2005, at http://www.sgpproject.org/publications/KobyakovOrlovApril2005GPWhatisnext.pdf 2006-04-15.
[80] European Commission, *The rules governing medicinal products in the European Union, Volume 4, Good Manufacturing Practices, Medicinal products for human and veterinary use*, 1998 Edition, Update of legal references in August 2004, at http://pharmacos.eudra.org/F2/eudralex/vol-4/pdfs-en/intr4en.pdf
[81] WHO, *Quality assurances of pharmaceuticals: A compendium of guidelines and related materials*, Volume 2, Good Manufacturing Practices and inspections, at http://www.who.int/medicines/organization/qsm/activities/qualityassurance/gmp/gmpintro.html
[82] U.S. Department of Health and Human Services, Food and Drug Administration, 21 CFR Parts 808, 812 and 820 Medical Devices; *Current Good Manufacturing Practice (CGMP); Final Rule*, Federal register No 52601, 7 October, 1996.
[83] OECD, *Series on principles of Good Laboratory Practice and compliance monitoring*, Number 1, ENV/MC/CHEM(98)17, 26 January, 1998, at http://www.oecd.org/document/63/0,2340,en_2649_34381_2346175_1_1_1_1,00.html

for biosafety/biosecurity.[84] There is a need to enhance the level and intensify training and education concerning GMP, biosafety and biosecurity as well as promoting other codes of practice and code of conduct for scientists in Russia and other EECA countries. The bottom-up approach directly involving the scientists is essential.[85] In many states the national regulations for pathogenic microorganisms and toxins require those engaged in working with such materials to be appropriately qualified and trained.

In line with the policy that the fight against infectious diseases is a priority Russia and the World Bank agreed to collaborate in developing debt-for-development swap for channelling $250 million freed-up from debt service to high priority development actions in Sub-Saharan Africa. Russia will join forces with the World Bank in the fight against malaria in Sub-Saharan Africa, and will support the World Bank-led malaria booster program that aims to achieve tangible results by 2010. Besides that Russia and the World Bank agreed to expand their cooperation in Central Asia to meet the challenge of infectious diseases. In 2005, Russia has doubled up to $40 million its pledge to the Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria. For information on progress in the fight against these diseases see WHO reports.[86] [87] [88] Russia also intends to reimburse to the Global Fund till 2010 near $270 million, which were distributed to fund projects in the Russian Federation. Russia has committed to contribute $18 million to the Global Polio Eradication Initiative. In addition Russia has pledged near $45 million for efforts to prepare for, detect, and rapidly respond to outbreaks of highly pathogenic avian influenza.[89]

[84] World Health Organization, *Laboratory Biosafety Manual*, Third Edition, 2004, at http://www.who.int/csr/resources/publications/biosafety/en/Biosafety7.pdf

[85] Averre, D., K. N. Luongo and M. Martellini, *Advancing bio threat reduction, findings from an international conference*, Landau Network Centro-Volta and Russian American Nuclear security Advisory Council, 2004.

[86] *Plan to Stop TB in 18 High-priority Countries in the WHO European Region, 2007-2015*, WHO European Regional Office for Europe, Copenhagen, 2007.

[87] *WHO meeting on progress achieved with malaria elimination in the WHO European Region, Ashgabat, Turkmenistan*, 2007, WHO European Regional Office for Europe, Copenhagen, 2008.

[88] *Update on HIV/AIDS in the European Region, Ensuring universal access to prevention, treatment, care and support services, Technical briefing document 01A/06*, WHO European Regional Office for Europe, Copenhagen, 12 September 2006.

[89] G8 Summit, St. Petersburg 2006, *Fight against infectious diseases*, 16 July, 2006, at http://en.g8russia.ru/docs/10.html 2007-12-06.

Facility used for biotechnology production (Photo K. S. Westerdahl FOI)

2.2 The legacy of the former BW program of the Soviet Union

Since the First World War a number of states initiated BW programmes and the United States and the Soviet Union put major resources into it after the Second World War to further develop large scale military capabilities. These programmes together with other WMD programmes were part of the Cold War arms race. The U.S. unilaterally decided to destroy their BW stockpile in 1969 in order to promote the negotiations on a ban on biological weapons, the BTWC, but also for other reasons.[90] There was no similar action from the Soviet Union and from that time mistrust has been great in this area between the two states. It was later found out that the Soviet Union did not believe the U.S. was abandoning BW (in line with deliberate U.S. disinformation[91]) and to counter this they instead greatly increased activity in the area of developing improved BW using recent scientific breakthroughs in biotechnology.

[90] The Nixon Administration's Decision to end U.S. Biological Warfare Programs, The National Security Archive Electronic Briefing Book No. 58, Volume III: Biowar, Ed. R. A. Wampler, 7 December, 2001, at http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB58/ 2008-01-10.

[91] Garthoff, R. L., "Polyakov's Run", *The Bulletin of the Atomic Scientists*, Vol. 56, No. 5, September/October, 2000, pp. 37-40.

The BW-program grew quickly, had the highest Soviet leadership support but has with one or two exceptions never been officially acknowledged. A new phase came in the 1970s, when the Soviet Union had ratified the BTWC, when scientists and politicians began to realize the potential of genetic engineering. The core of the new civilian secret research and production was the organization Biopreparat with many facilities focusing on fundamentals in molecular biology and genetics, and advanced technology for the military.[92] [93] The number of facilities in the program is still not clear due to the lack of openness and transparency from the Russian authorities. The programme included facilities within a number of ministries: Ministry of Defence, Main Directorate Biopreparat, Ministry of Agriculture, Ministry of Chemical Industry, Ministry of Health, USSR Academy of Sciences, Committee of State Security (KGB), Ministry of Internal Affairs.[94] A total of 20-50 facilities and around 65,000 personnel, with 40,000 in Biopreparat, 15,000 in the Ministry of Defence and an additional 10,000 in the Ministry of Agriculture's facilities.[95] [96] [97] [98] [99] Experts from the U.S. estimated that 9,000 of those people had substantial biological weapons expertise. Institutes of the Ministry of Health were also involved with the system of six anti-plague institutes with numerous epidemiological stations.[100] About 37 different human and animal pathogens, from plague, anthrax, brucella and tularaemia bacteria to smallpox, Marburg and Ebola viruses were being studied. Some strains were genetically altered to increase potency or resist antibiotics and vaccines. The Soviet BW-programme reached the stage where weapons were produced. The Ministry of Defence, directed the BW-programme with several of its own facilities for example The Institute of Microbiology in Kirov, Sverdlovsk (now Yekaterinburg), Zagorsk (now Sergiev

[92] Rimmington, A. “Invisible Weapons of Mass Destruction: The Soviet Union’s BW Programme and its Implications for Contemporary Arms Control”, *Journal of Slavic Military Studies*, Vol. 13, No. 3, pp. 1-46, September 2000.

[93] Shohan, D. and Z. Wolfson, “The Russian Biological Weapons Program: Vanished or Dissappeared?”, *Critical Reviews in Microbiology*, Vol. 30, pp. 241-261, 2004.

[94] Alibek, K. with S. Handelman, Appendix 2, in *Biohazard*, Hutchinson, London, 1999.

[95] Alibek, K. with S. Handelman, *Biohazard*, Hutchinson, London, 1999.

[96] Adams, J., Chapter 20: “The weapons of special designation”. *The New Spies - Exploring the Frontiers of Espionage*, pp. 270-283; Hutchinson, London, 1994.

[97] Smithson, A. E., *Toxic Archipelago: Preventing Proliferation from the Former Soviet chemical and Biological Weapons Complexes*, Report No. 32, p. 9, The Henry L. Stimson Center, December 1999.

[98] Domaradskij, I. V. and W. Orent, *Biowarrior: Inside the Soviet/Russian Biological War Machine*, Amherst, New York, Prometheus Press, 2003.

[99] Hart, J., “The Soviet Biological Weapons Program”, Chapter 6, in (Eds. Wheelis M., L. Rozsa and M. Dando), *Deadly Cultures*, Harvard University Press, London, 2006, pp. 132-156.

[100] Zilinskas, R. A., “The Anti-Plague System and the Soviet Biological Warfare Program”, *Critical Reviews in Microbiology*, Vol. 32, 2006, pp. 47-64.

Posad), The Institute of Military Medicine in Leningrad (now St Petersburg) and a facility at Strizhi and test ground on Vozrozhdenie island. The Strizhi facility has been demilitarized since several years and was supposed to be open for foreign investments. The Biopreparat organisation possessed mobilisation facilities located on Russian territory at Berdsk, Kurgan, Omutninsk and Penza, and on Kazak territory at Stepnogorsk. In addition however, mobilisation capacity was also retained at the Ministry of Agriculture's Pokrov Factory of Biopreparations in Vladimir oblast. These production plants incorporated capacity for the wartime production of hundreds of tonnes of a range of biological agents.[101] In 1992, President Yeltsin acknowledged in a decree that biological programmes violating the BTWC would not be allowed on the territory of the Russian Federation.[102] It was also stated that the number of personnel working in this area would be decreased by half and the funding by 30%.[103] This was formulated in the joint statement by UK, USA and Russia from 1992.[104] The only official information on the past offensive program is what was reported by Russia in the framework of the confidence-building measures (CBMs) of the BTWC in 1992 which was not very detailed or clear.[105]

Although the past CTR projects have provided more information on the previous Soviet BW programme they have not been more successful than other processes in resolving remaining concerns. The U.S. is still concerned and continues to receive unconfirmed reports of some ongoing offensive biological warfare activities. The assessment is that Russia has the capability to mobilise BW production. The U.S. is also concerned about Russia's commitment to comply with the BTWC. The contacts between the U.S. and Russia on BTWC related issues are strained.[106]

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[101] Rimmington, A. "Invisible Weapons of Mass Destruction: The Soviet Union's BW Programme and its Implications for Contemporary Arms Control". *Journal of Slavic Military Studies*, Vol. 13, No. 3, pp. 1-46, September 2000.

[102] "Decree of the President of the Russian Federation", Edict no 390, B Yeltsin, Moscow, 11 April, 1992.

[103] Leitenberg, M., "The possibilities and limitations of biological weapons conversion", pp. 119-133, In Conversion of former BTW facilities, Ed Geissler E, L Gazso and E. Buder, NATO Science Series, *1 Disarmament Technologies*, Vol. 21, Kluwer Academic Publishers, the Netherlands, 1998.

[104] Roffey, R, W Unge, J. Clevström and K. S. Westerdahl, *Support to Threat Reduction of the Russian Biological Weapons Legacy – Conversion, Biodefence and the Role of Biopreparat*, FOI Report, ISSN 1650- 1942, 2003.

[105] Nicholas Isla, "Transparency in past Offensive Biological Weapons Programmes: An analysis of Confidence Building Measures Form F, 1992-2003", *Occasional Paper No. 1*, Hamburg Centre for Biological Arms Control, June 2006.

[106] *Adherence to and Compliance with Arms Control, Nonproliferation and Disarmament Agreements and Commitments*, U.S. Department of State, August, 2005.

3 European Union approaches, on biosecurity and biological threat reduction

The EC Treaty identifies most public health issues as competencies of the member states. The importance of joint action in the EU to complement national measures led to the need for health security coordination in the EU through the establishment of a high level Health Security Committee (HSC) in 2001. This to serve as an instrument for cooperation and planning, for countering deliberate releases of biological and chemical agents within the EU and is assisted by a Task Force. The programme of co-operation in the EU on preparedness and response to biological and chemical agent attacks (health security) drawn up in 2001, named BICHAT, comprised 25 actions.[107] [108] An advisory group on biosecurity has carried out an inventory of research in Member States although not all seemed to be willing to share information.[109]

The Commission promotes through funding an action program in the field of public health (2003-2008) that aims to develop mechanisms and build up the necessary capacity in Member States and candidate countries with which to respond to major health threats, including a rapid reaction capability. It will for example focus on communicable diseases development of an improved control and prevention system at European level. Priorities are rapid diagnostics, detection tools, diseases and risk assessment models, new vaccines and novel therapeutics, surveillance methods and periodic appraisal of vulnerabilities.[110]

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[107] Commission of the European Communities, Programme of cooperation on preparedness and response to biological and chemical agent attacks (Health Security), Luxembourg, 17 December 2001, Doc. GFS D(200) GG, at http://europe.eu.int/comm/health/ph_threats/Bioterrorisme/bioterrorisme_en.htm 2007-12-12.

[108] Health ministers wish to strengthen the network approach in response to bioterrorism threat, Eurosurveillance Weekly, 5:011129, 2001.

[109] Flåoyen, A., "Presentation at Next Generation Threat Reduction, Bioterrorism's challenges and solutions", New Defence Agenda, Biblioteque Solvay Brussels, 25 January, 2005.

[110] European Commission, Directorate-General for Research, Scientific support to policies, Policy orientated research at ftp://ftp.cordis.lu/pub/fp6/docs/wp/sp1/h_wp_200201_en.pdf
Gouvras, G., "Policies in place throughout the world: action by the European Union", *International Journal of Infectious Diseases, Smallpox Biosecurity: Threat , Policy, Science*, Vol. 8, Supplement 2, 852, pp 521-530, 2004, at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B7CPT-4DHX5X0-4&_user=641931&_coverDate=10%2F01%2F2004&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000034518&_version=1&_urlVersion=0&_userid=641931&md5=b46ff6711155eb8f96f0e95ee51c40d7

The Commission has adopted further decisions[111] [112] so as to place under specific surveillance in the EU with appropriate case definitions certain pathogens that might be used in bioterrorist attacks and development of surveillance schemes and networks for epidemiological surveillance. The Commission facilitates information sharing and mutual consultation of Member States on counter-measures using the Early Warning and Response System (EWRS) of the EU. This health security initiative is now being embedded in a wider effort of emergency preparedness and response.[113] The EWRS is linked to other alert systems for human, animal, and plant diseases and to the RAS-BICHAT alert system for biological and chemical emergencies as well as to the civilian protection mechanism. It exchanges information on health-related threats, coordinates health preparedness and emergency response plans and crisis management strategies, raises the alert and communicates rapidly in case of health-related incidents of EU concern, advises on the management of risk, facilitates and supports training and dissemination of good practice and experience. There is also EU support to the WHO disease surveillance system and a process for collaboration on risk assessment.

A European Centre for Disease Prevention and Control (ECDC) was established in Stockholm in 2005.[114] [115] There is now a European Surveillance System for communicable diseases operated by the ECDC and the surveillance should cover 46 diseases. The Health sector has been particularly active in international cooperation. The ECDC is making extensive efforts to establish good working relationship with Russia and Western NIS on all aspects of surveillance including through the EpiNorth network.[116] The Commission is a founding and full partner

[111] European Commission Decision 2003/534/EC of 17 July 2003.
[112] Commission of the European Communities, Communication from the Commission to the Council and the European Parliament on Cooperation in the European Union on Preparedness and Response to Biological and Chemical Agent Attacks (Health Security), Brussels, Doc. COM(2003) 320 final, 2 June, 2003.
[113] Gouvras, G., "Policies in place throughout the world: action by the European Union", *International Journal of Infectious Diseases, Smallpox Biosecurity: Threat, Policy, Science*, Vol. 8, Supplement 2, 852, 2004, pp 521-530, at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B7CPT-4DHX5X0-4&_user=641931&_coverDate=10%2F01%2F2004&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000034518&_version=1&_urlVersion=0&_userid=641931&md5=b46ff6711155eb8f96f0e95ee51c40d7 2007-11-20.
[114] Regulation (EC) No 851/2004 of the European Parliament and of the Council of 21 April 2004 establishing a European Centre for Disease Prevention and Control.
[115] Council of the European Union, *Implementation of the WMD Strategy, 6 monthly progress report, list of priorities for coherent implementation*, Doc. 15246/04, Brussels, 3 December 2004.
[116] ECDC, Framework for a strategy for infectious disease surveillance in Europe (2006-2008), Document for the Management Board 27th-28th October 2005, 29 August, 2006.

in the Global Health Security Initiative initiated by the G7 and Mexico.[117] The EU has recognised the need to develop cooperation with the WHO-Europe, the OECD (Organisation of Economic Cooperation and Development), the World Bank, and WTO (World Trade Organisation) in the health sector with neighbouring countries in the framework of the EU/ENP. With WHO-Europe work is carried out on health security and preparedness planning.[118] [119]

In the European Commission the Health Threat Unit is responsible for CBR-terrorism surveillance and warning, including work on preparedness and response planning, incident investigation and sampling and co-operation between laboratories.[120] [121] Communicable disease and diseases caused by potential bioterrorism acts are monitored by the EU Rapid Alert System (RAS) through a complex network of rapid alert systems, including national surveillance systems and WHO systems. The Health Emergency Operations Facility coordinates and evaluates data and conducts follow-ups. Then information and warnings are sent to member states via (BICHAT) which also conducts follow-ups, coordinates information and deploys emergency teams if appropriate. In the EU standards for biosafety exists and the WHO has developed international guidelines in their manual. In contrast concerning biosecurity there are not yet any common agreed standards in the EU and no real agreement on how the term is defined. The Commission has prepared a Green Paper for consultations on bio-preparedness including biosecurity issues.[122] In addition the Justice, Freedom and Security Directorate-General of the Commission supports the European Committee for Standardisation (CEN) work on a standard on biosecurity.[123] [124] The OECD has also recently prepared guidelines on biosecurity in connection with BRCs

[117] Communiqué Eight Ministerial Meeting of the Global Health Security Initiative, Washington D.C., USA, 2 November, 2007, at http://circa.europa.eu/Public/irc/sanco/bichahsbio/library?l=/bichat_documents/bulletin_november/communique_ghsipdf/_EN_1.0_&a=d 2007-11-20.

[118] Madelin, R., "Strengthening Health in the European Neighbourhood", Seminar on health in all policies and ENP countries, Brussels, 26, June, 2007.

[119] DG SANCO – WHO/EUROPE cooperation, overview 2006 contracts, at http://ec.europa.eu/health/ph_international/int_organisations/backgrounder2006.pdf 2007-11-20.

[120] Thinus, G., "Health Security Cooperation in the European Union", Presented at International Conference on Biosafety and Biorisks, Lyon, 2-3 March, 2005, at http://www.upmc-biosecurity.org/pages/events/biosafety/speakers/thinus/thinus.html

[121] See also http://europa.eu.int/comm/health/ph_threats/threats_en.htm

[122] European Commission, Green Paper on Bio-preparedness, Brussels, Doc. COM(2007) 399, 11 July, 2007.

[123] Laboratory Biorisk Management Standard, CWA Biorisk Management, Public Consultation, International Biorisk Management Standard, 2007-07-25, at http://www.biorisk.eu/ 2007-09-10.

[124] CEN Laboratory Biorisk Management, CEN European Committee for Standardisation at http://www.biorisk.eu/documents/draft_document.PDF 2007-09-10.

(Biological Resource Centre).[125] It has also been proposed by others to develop international biosecurity standards that could include legal recommendations, set of universal standards, and an oversight mechanism.[126] [127]

Health security is not new but has been given increased political focus due to the emergence of new and emerging diseases and recent outbreaks like SARS (Severe Acute Respiratory Syndrome) and risk of influenza pandemic. Public health security according to WHO is defined as the activities required, both proactive and reactive, to minimize vulnerability to acute public health events that endanger the collective health of national populations.[128] A sign of this is also the revision of the International Health Regulation with a focus on global health security. The major threats to health security in WHO European Region have been mapped.[129] The EU has taken initiatives in cooperation with neighbourhood countries on for example tuberculosis and HIV/AIDS and in the longer term cooperation will be enhanced through the ECDC (European Centre for Disease Prevention and Control). The European Commission has a long history of integrating health into other policy areas such as environment, socio-economic development and poverty reduction. It has so far though been difficult to integrate it into policies on non-proliferation which is needed and also recognised.

The Northern Dimension Partnership in Public Health and Social Well-being (NDPHS) is a cooperative effort of thirteen governments and nine intergovernmental organizations. It constitutes a voluntary and targeted form of coordination and cooperation aimed at achieving the NDPHS mission and objectives. The mission of the NDPHS is to promote the sustainable development of the Northern Dimension area by improving peoples' health and social well-being. The Partnership has two main priority fields of which one is to reduce the spread of major communicable diseases and prevent life-style related non-communicable diseases. These diseases include HIV/AIDS, tuberculosis, sexually transmitted infections, cardiovascular diseases, resistance to antibiotics,

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[125] OECD Best practice guidelines on biosecurity for BRCs, 2007, at http://www.oecd.org/dataoecd/6/27/38778261.pdf 2007-09-10.

[126] Tucker, J., "A strategy for international harmonization of biosecurity standards under SCR 1540", Presented at Workshop on U.N. Security Council Resolution 1540 as it pertains to biological weapons, Palais des Nations, Geneva, 3 December, 2004.

[127] Atlas, R. M. and J. Reppy, "Globalizing biosecurity", *Biosecurity and bioterrorism: Biodefense strategy, practice, and science*, Vol. 3, No. 3, 2005, pp 51-60.

[128] WHO, *A Safer Future, The World Health Report 2007, Global public Health Security in the 21st Century*, Geneva, 2007.

[129] *Towards health security*, (Rockenschaub G., J. Pukkia and M. C. Profil Eds.), A discussion paper on recent health crisis in the WHO European Region, Who Regional Office for Europe, Copenhagen, 2007, at http://www.euro.who.int/eprise/main/who/progs/whd07/home 2007-10-15.

as well as other major public health problems that arise from the use of illicit drugs and social distress.[130] In the framework of the Barents Euroarctic Council and Northern Dimension Partnership there is a Task Force on Communicable Disease Control in the Baltic Sea Region that deals with epidemiological surveillance, HIV, tuberculosis and preventing antibiotic resistance questions.[131] [132] [133] [134]

Since the Creation of the Global Fund to fight HIV/AIDS, Tuberculosis and Malaria in 2001 the European Commission (EC) had contributed €522 million by the end of 2006, with €90 million allocated in 2006 alone. In 2002-2006, the EC will have spent €420 million on research targeted at the three main communicable diseases - HIV/AIDS, malaria and tuberculosis a four-fold increase in comparison to the previous four-year period. The European Commission pledged €100 million at the Beijing Conference in January 2006 to confront avian influenza and prepare for a possible human pandemic, with additional €111 million pledged by the EU member states. €20 million of European Commission's pledge is targeted to support of scientific research projects, with a further €80 million devoted to assistance projects. As regards polio eradication, the European Commission has provided €61 million to finance supplementary immunization activities in countries with endemic transmission - Nigeria, Niger and Somalia. In Nigeria this support was provided on top of already existing support of €118 million for immunization and polio eradication. Additional funding of €15 million to support eradication activities needed in Ethiopia.[135] The European Commission granted UNICEF €4.8 million for anti-malaria work in four African countries.[136]

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[130] http://www.ndphs.org/?partners

[131] Declaration, Concerning the Establishment of a Northern Dimension Partnership in Public Health and Social Wellbeing, Ministerial Meeting in Oslo, 27 October, 2003, at http://www.norden.org/moten/tema2004/bakgrundsdokument/session3/sk/final-declaration.pdf 2007-11-07.

[132] Barents Euro-Arctic Region Cooperation in Health and Social Affairs, Partnership Annual Conference 14 December in Tallinn, Doc. BEAC.CSO.2004.39, 1 December, 2004, at http://web3.custompublish.com/getfile.php/135427.771/Tallinn.PAC+Barents+Health+Report.doc?return=northerndimension.custompublish.com 2007-11-07.

[133] Northern Dimension Policy Framework Document, 1 January, 2007, at http://www.beac.st/_upl/doc/11865_doc_download1.pdf 2007-11-07.

[134] Northern Dimension Partnership in Public Health and Social welfare, at http://www.ndphs.org/ 2007-11-07.

[135] G8 Summit, St. Petersburg 2006, Fight against infectious diseases, 16 July, 2006, at http://en.g8russia.ru/docs/10.html 2007-12-06.

[136] The European Commission grants UNICEF €4.8 million to boost anti-malaria efforts in four African countries, at http://ec.europa.eu/europeaid/multimedia/press-releases/documents/web-release-unicef_en.pdf 2007-12-10.

Since 2001 the EUs' views on the threat from CBRN and risks of non-proliferation have developed much.[137] The European Security Strategy entitled, 'A secure Europe in a better world' was adopted by the European Council in December 2003 which identifies the proliferation of weapons of mass destruction as a key and potentially the greatest threat for EU security.[138] The European Council Heads of State had in June 2003, adopted a declaration on non-proliferation of WMD[139] and then later an EU strategy against proliferation of WMD.[140] [141] The strategy is aimed at preventing third countries and terrorists from acquiring CBRN-materials and their means of delivery by seeking an effective multilateral response to this threat (including the multilateral non-proliferation treaties). This will be done by making use of all available EU-instruments to prevent, deter, halt and if possible prevent proliferation, including implementing export control policies, adding non-proliferation clauses in agreements with third countries, and enhancing the security of proliferation-sensitive materials, equipment and expertise. Cooperation between the public health, occupational health and safety and the non proliferation structures should be reinforced in the EU. Further the EU should reinforce its cooperative threat reduction programmes with other countries, targeted at support for disarmament, control/security of sensitive materials, facilities and expertise. EU's cooperative threat reduction funding should be increased. These efforts should include setting up programmes of assistance and measures aimed at reinforcing the control of the non-proliferation of WMD related expertise, science and technology. In 2002 the EU committed €1 billion over ten years to G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. The EU should aim at measures ensuring that any possible misuse of civilian programmes for military purposes will be effectively excluded. The European Commission should promote strengthening national legislation and control over pathogenic micro-organisms and toxins (both in member states and in acceding countries) where

[137] Cornish, P. and I. Anthony, "Assessing nuclear, biological, chemical and radiological threat to the European Union", 2005-13, Background paper 1, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html

[138] *European Security Strategy, A secure Europe in a better world*, Brussels, 12 December 2003, at http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/reports/78367.pdf

[139] Council of the European Union, Proliferation of Weapons of Mass Destruction – report on the follow up to the Thesaloniki European Council and on the state of execution of the Action Plan for the implementation of the Basic Principles for an EU Strategy against Proliferation of Weapons of Mass Destruction, Brussels, 12 September 2003.

[140] Council of the European Union, EU strategy against proliferation of weapons of mass destruction, Doc. 15708/03, Brussels, 10 December 2003.

[141] Council of the European Union, Implementation of the WMD Strategy, 6 monthly progress report, list of priorities for coherent implementation, Doc. 15246/04, Brussels, 3 December 2004.

necessary. The EU should promote biosecurity and bio-safety standards inside the EU, but also outside the EU. A dialogue should be initiated with industry to reinforce awareness firstly with EU industry raising the level of awareness of problems related to the WMD. A WMD Monitoring Centre has been established and an exchange of views on proposals received from WHO for joint projects in the area of biosafety/biosecurity has taken place.[142] [143]

The EU supports the BTWC and the need for an international verification capability regarding biological weapons has been identified in the WMD strategy as an EU objective.[144] The examination of information provided by member states on their bilateral assistance programmes, lead to the conclusion that there is scope for EU initiatives in the field of biological weapons issues. This can include setting up of programmes of assistance to states in need of technical knowledge in order to ensure the security and control of sensitive material, facilities and expertise.

In October 2003, a Personal Representative for the non-proliferation of WMD was appointed in order to coordinate, help implement and further develop the EU WMD Strategy. WMD non-proliferation concerns will be integrated into the EU's political, diplomatic and economic activities and programmes, aiming at the greatest effectiveness. In the seventh WMD Strategy progress report in June 2007 it is stated that, after more than 10 years of operation, the European Commission has decided to reassess the level of the present threat and the non-proliferation impact of such programs. A reassessment and evaluation was carried out 2007 of the non proliferation activities in both science centres (ISTC and STCU).

The EU is developing a more coordinated and cross-pillar approach to the fight against terrorism. It will also ensure full implementation of the EU Health Security Strategy and CBRN-programme.[145] In 2002 a joint Commission and Council programme was adopted to improve preparedness against CBR-terrorism

[142] Council of the European Union, Six-monthly Progress Report on the Implementation of the EU Strategy against the Proliferation of Weapons of Mass Destruction, Brussels, No. 11024/07, 19 June, 2007, at http://register.consilium.europa.eu/pdf/en/07/st11/st11024.en07.pdf 2007-08-30.
[143] Council of the European Union, EU Strategy against the proliferation of WMD: Monitoring and enhancing consistent implementation, Brussels, No. 16694/06, 12 December, 2006.
[144] Council of the European Union, A Common Position on the universalisation and reinforcement of multilateral agreements in the field of non proliferation of WMD and their means of delivery, Doc. 2003/805/CFSP, Brussels, 17 November 2004.
[145] Council of the European Union, EU Plan of Action on Combating Terrorism, Doc 10586/04, Brussels, 15 June 2004.

with initiatives in the areas of research, public health, agriculture, energy, nuclear, transport and environment.[146] [147]

Russia has been identified in the WMD Strategy as a key partner for cooperation. If possible, political solutions should be found to the problems, which lead countries to seek WMD. At the same time, the EU will continue to address the root causes of instability including through pursuing and enhancing its efforts in the areas of political conflicts, development assistance, reducing poverty and promoting human rights. Already in 1999, the European Council agreed on a common strategy on Russia which was followed by a Joint Action on the 17th of December 1999 to support the establishment of an EU Cooperation Programme for Non-proliferation and Disarmament (initially only dealing with chemical and nuclear weapons issues).[148] This document though indicates the strong commitment of EU that efforts are grounded on a positive collaborative spirit. The EU has stepped up its dialogue with Russia on the basis of the External Security Common Space adopted 2005 EU-Russia Summit.

The EU has reached a science and technology agreement in 2001 with Russia to improve the access of Russian Scientists to European programmes and ensure EU scientists a reciprocal access to Russian research programs. Technical assistance will support the commercialization of Russian research results and the development of related small and medium sized businesses. Life sciences will be central in the EU's Seventh Framework Program of security research. Biological research is one key elements of the whole strategy. The actions for international cooperation in the Capacities Programme will be carried out by consortia with participants from different countries and will aim at developing, adapting and using new knowledge supporting European research policy as well as trade and industry-related policies and reinforcing the Union's relations with third countries like the Eastern European and Central Asian countries (EECA) through the European neighbourhood and partnership instrument (ENPI).

From 2008, scientific research cooperation between Russia and the EU will be supported by the Federal Agency for Science and Innovation through two large Russian programmes. The first will support research and development activities

[146] Council of the European Union, Adoption of the programme to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological or nuclear terrorist threats, DG I, 14627/02, Brussels, 21 Nov. 2002.

[147] Council of the European Union, EU solidarity programme on the consequences of terrorist threats and attacks (revised/widened CBRN Programme) - Adoption, Doc. 15480/04, Brussels, 1 December 2004.

[148] European Council Joint Action on the 17th of December 1999 to support the establishing a EU Cooperation Programme for Non-proliferation and Disarmament in the Russian Federation, (OJ L331/11 of 23.12.99), 17 December 1999.

in five priority areas. Around 40% of the funds have been allocated to the field of new materials and nanotechnologies, while 25% will go to the life sciences and biotechnology. One area that is promising is the field of agro-bio-food research. The remaining funds are set to be split between the thematic areas of energy and energy efficiency, rational nature use and information and communication technologies. The second programme is dedicated to the industrial development of nanotechnologies and new materials. These priorities reflect the areas where the Russian scientific community has great potential in terms of both infrastructure and well-qualified people.[149]

Previously until 2006 INTAS (the International Association) promoted scientific cooperation between researchers in the former Soviet Union republics and those in the EU member states and more than 300 life science projects including in biotechnology were funded.[150] The Technical Assistance to the Commonwealth of Independent States (TACIS) launched 1991 was terminated in 2006 and it was the EU's assistance programme for the Newly Independent States of the Former Soviet Union on both a national and regional basis. The total budget was €3.138 billion for 2000-06.[151] TACIS tasks are taken over by the European Neighbourhood Partnership Instrument (ENPI[152]) from 2007 and Russia was offered a Partnership Accord.[153] The ENPI will be the main financial instrument for supporting the implementation of the strategic partnership with Russia.[154] For 2007-2010 the available funding according to ENPI will be for Russia €120 million, for Ukraine €494 million and for Belarus €20 million.[155]

[149] EU and Russia strengthen research ties, European Commission, CORDIS News, 13 November, 2007.
[150] INTAS International Association for the promotion of co-operation with scientists from the New Independent States of the former Soviet Union in liquidation from 1 January 2007, at http://www.intas.be/ 2007-11-13.
[151] The G8 Global Partnership: Progress during 2004 on the UK's programmes to address nuclear, chemical and biological legacies in the Former Soviet Union, Section 6, TACIS p 73, UK Foreign& Commonwealth Office, Department of Trade and Industry and Ministry of Defence, December, 2004, at URL http://www.dti.gov.uk
[152] ENPI will replace CARDS, INTEREG, MEDA, PHARE and TACIS.
[153] Anthony, I., V. Fedchenko and A. Wetter, *The delivery of EU non-proliferation and disarmament assistance in Russia*, Background Paper 9, Presented at Conference on Strengthening European Action on WMD Non-proliferation and Disarmament: How Can Community Instruments Contribute?, Brussels, 7-8 December, 2005.
[154] EU Country Strategy Paper 2007-2013, Russian Federation, at http://ec.europa.eu/external_relations/russia/csp/2007-2013_en.pdf 2007-10-15.
[155] European Commission, European Neighbourhood and Partnership Instrument (ENPI), Funding 2007-2013, at http://ec.europa.eu/world/enp/pdf/country/0703_enpi_figures_en.pdf 2007-10-15.

The new EU Instrument for Stability's[156] scope is designed to prevent conflict, support post-conflict political stabilisation and to ensure recovery after natural disaster. This includes timely response to political crisis or natural disasters. It also includes addressing certain long-term, trans-regional threats to stability like non-proliferation and organised crime, protection of critical infrastructure and major public health threats. Financial implications for the programmes is for crisis response 2007 €100 million, 2013 €371 million, non-proliferation 2007 €26 million, 2013 €50 million and for global threats for 2007 €9 million, 2013 €30 million. According to the Instrument for Stability the EU should provide technical and financial assistance to ensure adequate response to sudden major threats to public health, such as epidemics with a trans-national impact. Particular emphasis shall be placed on emergency planning, management of vaccine and pharmaceutical stockpiles, international cooperation, early warning and alert systems. Assistance shall also cover risk mitigation and preparedness relating to chemical, biological, radiological and nuclear materials or agents. This covers:

- promotion of civilian research activities as an alternative to defence-related research, and support for retraining and alternative employment of scientists and engineers formerly employed in weapons-related areas;
- support for measures to enhance safety practices related to civilian facilities where sensitive chemical, biological, radiological and nuclear materials or agents are stored, or are handled in the context of civilian research programmes;
- support within the framework of Community cooperation policies and their objectives, for the establishment of civil infrastructure and relevant civilian studies necessary for the dismantlement, remediation or

[156] The European Commission has decided to replace the existing range of financial instruments for the delivery of external assistance with a simpler, more efficient framework of four new instruments: an instrument for Pre-Accession Assistance, a European Neighbourhood and Partnership instrument, a Development Cooperation and Economic Cooperation instrument, and an Instrument for Stability. Two existing instruments, for Humanitarian Aid, and for Macro Financial Assistance are not in need of modification, and will be maintained. At present Community assistance and cooperation is delivered through a range of regional instruments, for example CARDS, TACIS, MEDA, and a substantial number of thematic instruments. The Pre Accession Instrument will cover the candidate countries (Turkey and Croatia) and the potential candidate countries (the Western Balkans). It replaces existing instruments PHARE, ISPA, SAPARD, CARDS as well as a number of other regulations. The European Neighbourhood and Partnership Instrument will cover third countries participating in the European Neighbourhood Policy i.e. the countries of the south and eastern Mediterranean, Ukraine, Moldova and Belarus, and the countries of the southern Caucasus, thus replacing MEDA and part of TACIS. This instrument will also support the EU's strategic partnership with Russia.

conversion of weapons-related facilities and sites where these are declared as no longer belonging to a defence programme;

- strengthening the capacity of the competent civilian authorities involved in the development and enforcement of effective control of illicit trafficking in chemical, biological, radiological and nuclear materials or agents (including the equipment for their production or delivery);
- the development of the legal framework and institutions capacities for the establishment and enforcement of effective export controls on dual-use goods, including regional cooperation measures; and
- the development of effective civilian disaster-preparedness, emergency-planning, crisis response, and capabilities for clean-up measures in relation to major environmental incidents in the field. [157]

The total funding for the Instrument for Stability for 2007-2013 is €2 062 million and a maximum of 15 % may be used to address non-proliferation (€266 million).

Project area	€ million	%
Crisis response/preparedness	1587	77
Non-proliferation of WMD	266	13
Trans-regional threats to security	118	6
Administrative expenditure	91	4
Total	2062	100

In the indicative programme for the Instrument for Stability the funding for non-proliferation is priority one with a funding of €53 million 2007-2008 for ISTC/STCU and an "expert support facility". The priorities listed are:

1) Non-proliferation of WMD;
2) Counteracting global and trans-regional threats; and
3) Building capacity for effective response.

[157] Regulation (EC) No. 1717/2006 of the European Parliament and the Council of 15 November 2006 establishing an instrument for stability, Official Journal of the European Union, L 327/1, 24 November, 2006, at http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_327/l_32720061124en00010011.pdf 2007-10-15.

The EU contribution for ISTC/STCU will be €15 million for 2008 but only €8 million for 2009 due to re-examination of the science centres. One project deals with a Knowledge Management System on CBRN trafficking (€1 million).[158] In project area 4 the focus is on strengthening capabilities against biological threats and addresses safety practices of key biological laboratories. It also includes a risk reduction in the biomedical research sector.[159] The European Community; especially through activities relating to the EU Seventh Framework Programmes for Research and Technological Development International Cooperation activities will help to open the European Research Area (ERA) to third countries and the EECA countries by supporting scientific cooperation.

The EU has taken steps to enhance cooperation in the area of threat reduction with Russia and the Common Strategy on Russia was extended for one year.[160] [161] As a result of positive developments in EU-Russian relationship it has not been considered necessary to renew its extension since then. There are now four Common Spaces that were agreed with Russia in St Petersburg in May 2003. The immediate priority is to develop these areas.[162] Part of the intention is to boost cooperation on non-proliferation and crisis management.[163] The bilateral basis for EU relations with Russia is the Partnership and Cooperation Agreement (PCA) which came into force in 1997. Non-proliferation of WMD is not specifically mentioned in the PCA.[164] Increasing EU cooperative threat reduction funding and also creating a specific Community budget for non-proliferation and

[158] Illicit trafficking in CBRN, Security – WMD, activities, UNICRI, at http://www.unicri.it/wwd/security/wmd_cbrn/activities.php 2007-11-27.
[159] EU Instrument for Stability, The first indicative programme, covering the two year period 2007-2008, at http://ec.europa.eu/europeaid/where/worldwide/stability-instrument/documents/ifs_indicative_programme_2007-2008_en.pdf 2007-10-16.
[160] Council of the European Union, Report of the implementation of the Council Joint Action 1999/878/CFSP of 17 December 1999 establishing a European Union Cooperation Programme for Nonproliferation and Disarmament in the Russian Federation, Doc. 13154/01, Brussels, 23 October 2001.
[161] Council of the European Union, Decision 2003/874/CFSP of 8 December 2003 implementing Joint Action 2003/472/CFSP with a view to contributing to the European Union cooperation programme for non-proliferation and disarmament in the Russian Federation, OJ L 326, 13 December 2003.
[162] Council of the European Union, Relations with Russia – Council report on the implementation of the Common Strategy of the European Union on Russia, Brussels, Doc. 10293/04, 8 June, 2004.
[163] Anthony, I., V. Fedchenko and A. Wetter, *The delivery of EU non-proliferation and disarmament assistance in Russia*, Background Paper 9, Presented at Conference on Strengthening European Action on WMD Non-proliferation and Disarmament: How Can Community Instruments Contribute?, Brussels, 7-8 December, 2005.
[164] Anthony, I., V. Fedchenko and A. Wetter, *The delivery of EU non-proliferation and disarmament assistance in Russia*, Background Paper 9, Presented at Conference on Strengthening European Action on WMD Non-proliferation and Disarmament: How Can Community Instruments Contribute?, Brussels, 7-8 December, 2005.

disarmament of WMD has been important. As noted by the 12th EU-Russia summit held in Rome on 6 November 2003, cooperation will continue to combat terrorism in all its forms and to prevent the proliferation of WMD. It is well known that the main EU assistance to Russia in WMD related areas concerns nuclear safety and chemical weapons destruction.[165] The examination of information provided by member states on bilateral assistance programs, to Russia and Newly Independent States, leads to the conclusion that EU Member States are not very active in the biological area. Consideration should be given to develop new EU initiatives. The EU is though in other areas a long-standing provider of assistance directly or indirectly related to cooperative threat reduction. In particular the European Community contribution made in 2002 to the G8 Global Partnership of €1 Billion has been committed over a period of 10 years. Projects are ongoing to enhance nuclear safety and security, chemical weapons destruction, the re-employment of former scientists, export control and border security. It has been pointed out that the EU might be in a better position to acquire Russian trust and cooperation in the biological area than the U.S.[166]

The EU and member states funding for threat reduction activities are increasing as a result of the G8 Global Partnership initiative but still the EU and its member states funding is not of the same magnitude as the U.S. In the biotechnology area funding has been limited and channelled through the ISTC (International Science and Technology Centre) in areas like public health. Member states are showing interest to enhance their efforts in the biological area but still seem to be unwilling to directly fund large projects in this area.[167] The UK plans for further biological redirection projects but the budget so far is modest.[168] France has during 2004 committed €5 million for biosecurity and biosafety in Russian biological facilities.[169] Sweden has for a number of years had an interest in the

[165] Finaud, M. and I. Anthony, *The Role of the European Union in International Non-proliferation and Disarmament Assistance*, Geneva Centre for Security Policy, Occasional Paper Series, No. 50, April, 2006, pp. 17-18, at http://www.isn.ethz.ch/pubs/ph/details.cfm?lng=en&id=16964 2007-09-04.

[166] Höhl, K., H. Muller and A. Schaper, *EU cooperative threat reduction activities in Russia, EU Institute for Security Studies*, Chaillot Paper, No. 61, June, 2003.

[167] Roffey, R, W Unge, J. Clevström and K. S. Westerdahl, *Support to Threat Reduction of the Russian Biological Weapons Legacy – Conversion, Biodefence and the Role of Biopreparat*, FOI Report, ISSN 1650- 1942, 2003.

[168] The G8 Global Partnership: Progress during 2004 on the UK's programmes to address nuclear, chemical and biological legacies in the Former Soviet Union, UK Foreign & Commonwealth Office, Department of Trade and Industry and Ministry of Defence, December, 2004, at http://www.dti.gov.uk

[169] The G8 Global Partnership: Progress during 2004 on the UK's programmes to address nuclear, chemical and biological legacies in the Former Soviet Union, Section 5, France p 63, UK Foreign& Commonwealth Office, Department of Trade and Industry and Ministry of Defence, December, 2004, at http://www.dti.gov.uk

biological and funded some small projects.[170] For a number of years a Finnish-Russian Joint Biotechnology Laboratory has been operating in Turku, Finland. The activities have been very limited due to lack of funding and consisted mainly of advice to and small projects with Russian biotech businesses. There is though a proposal to establish a centre of excellence on biosecurity and diagnostics in Turku to promote cooperation between EU and Russia and other EECA countries. The European Commission has a project involving several member states with the Vector institute to develop Diagnostic methods for orthopoxvirus. This project has been initiated through the EC Directorate for Public Health and Risk Assessment.[171]

One way forward could be that the EU will enhance its activities that can be seen as complementary to the U.S. CTR programs and focus on public health, essential R&D on dangerous pathogens and bio-preparedness but keeping a clear non-proliferation aim at the same time. The challenge here is perhaps not so much in Russia or other EECA countries but internally in the EU to find a mechanism for this and being able to develop a road map for this type of cooperative partnership as it will involve several of EUs pillars and involve many different stakeholders. For Russia on the other hand the EU is seen as difficult to deal with as the impression it gives in this area is that it is weak and indecisive due to the before mentioned reasons. Russia instead prefers to deal with single EU states on a bilateral basis.

[170] The G8 Global Partnership: Progress during 2004 on the UK's programmes to address nuclear, chemical and biological legacies in the Former Soviet Union, Section 5, Sweden p 65, UK Foreign & Commonwealth Office, Department of Trade and Industry and Ministry of Defence, December, 2004, at http://www.dti.gov.uk

[171] Gouvras, G., Personal communication, European Commission, Directorate Public Health and Risk Assessment, Health and Consumer Protection Directorate-General 23 May, 2005.

4 U.S. threat reduction programs in the biological area

The U.S. Cooperative Threat Reduction (CTR) Program supports U.S. Presidential Directives by pursuing four objectives and for fiscal year 2006 $492 million was obligated and for fiscal year 2008 $348 million was requested.[172] This was increased by the Congress to $480 million.[173] The four objectives are:

- Dismantle former Soviet Union WMD and associated infrastructures;
- Consolidate and secure former Soviet Union WMD and related technology and materials;
- Increase transparency and encourage higher standards of conduct; and
- Support defence and military cooperation with the objective of preventing proliferation.

The U.S. has been the principal donor and has devoted approximately $100 million per year for the past several years and the funding is increasing for biological threat reduction in the former Soviet Union.[174] In the mid-1990s the U.S. began engaging biological research and production centres throughout the former Soviet Union in cooperative projects aimed at preventing spread of BW capabilities.[175]

Due to the legacy of the large former Soviet BW-program and the lack of transparency of its dismantlement the U.S. regularly voices its concerns over Russian compliance with the BTWC.[176] Still the major concern is focused on the three Ministry of Defence facilities in Kirov, Sergiev Posad and Yekaterinburg due to the total lack of transparency and that they or the Russian Ministry of Defence do not engage in any contacts with U.S. or other Western governments or scientists. In addition the state of around 40 Russian institutes that were part of the former BW-programme are mentioned as of concern and they often contain

[172] U.S. Department of Defense, *Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 1.
[173] "Congress boosts U.S. non-proliferation funding", *Arms Control Today*, 22 January, 2008.
[174] Powers, M., pp 65-70, *Next Generation Threat Reduction, Bioterrorism's challenges and solutions*, New Defence Agenda, Biblioteque Solvay Brussels, 25 January, 2005.
[175] Coo M. S. and A. F. Woolf, *Preventing proliferation of biological weapons US assistance to former Soviet states*, CRS Report to Congress, Congressional Research Service, The Library of Congress, Code RL31368, 10 April 2002.
[176] *Adherence to and Compliance with Arms Control, Nonproliferation and Disarmament Agreements and Commitments*, U.S. Department of State, August, 2005, at http://www.state.gov/documents/organization/52113.pdf 2007-10-25.

extensive collections of dangerous pathogens. These could face threats from within, under-employed experts, and from without, poorly secured facilities and weak inventory controls. These threats are addressed by balancing carefully the risks of proliferation against Russia's compliance with international commitments.[177] [178] Russia does not agree with the above description and believes that such views are only hampering the CTR process.[179] [180] [181] In the U.S. Department of Defense (DOD) there is still mistrust that the funding supplied could be misused by the former weapons scientists.[182] During 2002 the U.S. Congress put restrictions on the funding and the result was that threat reduction projects could not take place at a facility until the U.S. Secretary of Defense determined that no prohibited research occurred at the facility and until the facility plans to implement appropriate security measures.[183] The U.S. Congress set up six broad conditions for funding such as that Russia is adhering to all international arms control agreements like the BTWC and human rights agreements. The Congress has also annually issued a waiver authority to the President.[184] There is though still no official Russian information on details of activities or facilities involved in the former Soviet BW-programme.

In addition to the above reasons the U.S. government is also concerned with some facilities in the former Soviet Union republics (the countries referred to by the EU as Eastern European and Central Asian countries (EECA)). The program involves enhancing facility security, redirecting former weapons scientists, dismantlement of infrastructures from the former BW-program and improving

[177] Bronson, L., "Testimony of Deputy Under Secretary of Defense for Technology Security Policy and Counterproliferation before the Senate Committee on Armed Services Subcommittee on Emerging Threats and Capabilities, Cooperative threat reduction programme", March 10, 2004

[178] "U.S. Department of Defense warned Russian institutes working with biologically hazardous substances are unsafe", *Nezavisimaya Gazeta*, No 49, p.6, Russica Izvestia Information Inc. 12 March, 2004.

[179] "Russian centers working with pathogens unrelated to bio-arms", *Interfax News Agency*, 11 March, 2004.

[180] "Moscow daily notes US leadership 'alarmed' at Russian bioweapons facilities", *BBC Monitoring International*, 13 March, 2004.

[181] Kobyakov, D. and V. A. Orlov, *Global partnership: What's next?* Report prepared for the Geneva Centre of Security Policy, April, 2005, at http://www.sgpproject.org/publications/KobyakovOrlovApril2005GPWhatisnext.pdf

[182] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 57, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.

[183] Woolf, A. F., *Nonproliferation and Threat Reduction Assistance: U.S. Programs in the Former Soviet Union*, CRS Report for Congress, No. RL31957, 6 April, 2006, p. 21.

[184] Walker, P. F., "Nunn-Lugar at 15: No time to Relax Global Threat Reduction Efforts", *Arms Control Today*, May, 2006.

disease surveillance capabilities. Here agreements have been reached between the U.S. and each EECA government (except Russia). The U.S. has stated that it will encourage friends and allies to increase their contributions to these CTR-programmes, particularly through the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction.[185]

U.S. Department of Defense CTR BTRP, the Biological Threat Reduction Program

The BTRP's (the Biological Threat Reduction Program) objectives are to prevent bioterrorism and the proliferation of biological weapons related technologies, materials, and expertise at their sources in FSU (Former Soviet Union) states. This is done through cooperation with these states promoting sustained transparency of activities, preventing bioterrorism and dismantlement of former BW-facilities. The approach is capacity building to enhance public health while consolidating and accessing dangerous pathogens and improving safety and security of biological facilities. The CTR program in the biological area was initiated in the late 1990s even though Russia had not provided a complete inventory of the sites or scientists involved in biological weapons work.[186] [187] [188] [189] The program is divided into four parts[190]:

- Cooperative Biological Research (CBR) covers 14.5% of the program;
- Biosecurity and Biosafety/Biological Weapons Threat Agent Detection and Response (BS&S/TADR) covers 63% of the program;
- Biological Weapons Infrastructure Elimination (BWIE) covers 3.5% of the program; and
- Program administration including a Threat Reduction Support Center, 19% of the program.

[185] *President Bush National Strategy to Combat Weapons of Mass Destruction of the United States*, 17 September, 2002.
[186] U.S. Department of Defense, *Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 16.
[187] Woolf, A. F., *Nonproliferation and Threat Reduction Assistance: U.S. Programs in the Former Soviet Union*, CRS Report for Congress, No. RL31957, 6 April, 2006.
[188] Bronson, L., "Testimony of Deputy Under Secretary of Defense for Technology Security Policy and Counterproliferation before the Senate Committee on Armed Services Subcommittee on Emerging Threats and Capabilities, Cooperative threat reduction programme", March 10, 2004
[189] Lackie, J., "Reported accomplishments of selected threat reduction and non-proliferation programs, by agency, for Fiscal Year 2006", *Policy Update Partnership for Global Secu*rity, July, 2007.
[190] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 1.

The Cooperative Threat Reduction BW proliferation prevention program referred to as the Biological Threat Reduction Program (BTRP) has devoted $430 million from FY 1998 through FY 2007 increasing each year, and the requested $148 million was increased by Congress to $158 million for FY 2008.[191] This means that the biological threat reduction part of the CTR program is a large part of the total funding.[192] From 1998 to 2007 the funding has been divided between Kazakhstan 28%, Georgia 25%, Russia 21%, Uzbekistan 21%, Azerbaijan 3% and Ukraine 2%. The funding for the next five years has been estimated to $200 million per year and with a focus on FSU states except Belarus and Russia. For a list of projects carried out from 1999 to 2007 see National Academies report Appendix F.[193] Current work deals mainly (90%) with biosafety, biosecurity and enhancing the epidemiological surveillance networks (TADR). There will be no further work in the area of infrastructure elimination after 2007.[194] The program has been carried out under guidance of the U.S. National Security Council and through an interagency coordination with the biological programs of the Department of State, Health and Human Services, Agriculture, Energy and the Environmental Protection Agency. Examples of how the BTRP impacts:[195]

- Reducing risk of unauthorised access to facilities and expertise;
- Improve capabilities to detect and respond to natural or deliberate disease outbreaks;
- Confidence building in this area between states;
- Enhancing security of American personnel and assets abroad;
- Containing spread of infectious diseases; and
- Contributing to global R&D.

[191] "Congress boosts U.S. non-proliferation funding", *Arms Control Today*, 22 January, 2008.
[192] Williams, I., "Analysis of the U.S. Department of Defense's Fiscal Year 2008 Cooperative Threat Reduction Budget Request", *Partnership for Global Security, PGS Updates*, 19 March, 2007, pp. 1-4.
[193] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, Research Projects Supported under the Cooperative Biological Research Program (1999-present), Appendix F, p. 99.
[194] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 67.
[195] The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships, National Research Council of the National Academies, Washington D.C., NAS, 2007.

DOD is an ISTC partner and manages its Russian BTRP projects through the ISTC Funding Memorandum of Agreement, as there is no CTR biological threat reduction implementing agreement with Russia.[196] There are U.S. agreements with Kazakhstan, Uzbekistan, Georgia, Azerbaijan and Ukraine. Due to the lack of an implementing agreement, all BTRP projects in Russia are governed by the ISTC Agreement and the ISTC Funding Memorandum.[197] Problems remain but might be changing with the Russian ratification of the CTR umbrella agreement.[198] [199] The unresolved DOD concerns has limited and will limit further the types of projects it is willing to initiate in Russia until it is possible to conclude a Biological Threat Reduction Implementing Agreement. The progress in the biological area in Russia has been very slow due to Russian lack of transparency and site access especially to Ministry of Defence facilities. DOD decided to pull out of Russia, observers say, because of the problems it has encountered trying to implement the various projects. In 2006, for example, DOD auditors visiting the State Research Centre for Applied Microbiology at Obolensk were denied full access and one project at Obolensk was halted.[200] The DOD has been concerned that Russia might misuse funding for this research program and due to this lack of confidence delays in the program have occurred. A decision has been taken to sharply reduce U.S. DOD activities in Russia and limit them to only research related to smallpox. On the Russian side the DOD's motivation for the whole BTRP is questioned.[201] This has then led to that the CTR program increasingly is focusing on former Soviet Republics instead of Russia. DOD has adopted the use of "non-proliferation pledges." Although 739 scientists from 27 biological facilities in Russia, Uzbekistan, Georgia, and Kazakhstan have signed the pledges, they have not been a success and caused concern among Russia's security officials and staff at Russian institutions.[202]

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[196] Walker, P. F., "Nunn-Lugar at 15: No time to Relax Global Threat Reduction Efforts", *Arms Control Today*, May, 2006.

[197] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 1.

[198] Eisler P., "U.S. Russia reach deal on securing Soviet WMD", *USA Today*, 15 June, 2006, at http://www.partnershipfor globalsecurity.org 2007-08-29.

[199] Digges, C., "Putin moves Duma a step closer to ratifying CTR umbrella agreement", Partnership for Global Security, 2 March, 2007, at http://www.partnershipfor globalsecurity.org

[200] "Biosecurity, Rising Asian Threat Leaves Russia in the Lurch", *Science Magazine*, 3 August, 2007, at http://www.sciencemag.org/cgi/content/full/317/5838/581 2007-09-17.

[201] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 39, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.

[202] Lugar, R. G., "Nunn-Lugar in an Election Year". August 11, 2004. Available at http://lugar.senate.gov 2005-10-15

The BTRP has helped to contain dangerous pathogens and equipment as well as increased transparency of production and research facilities. It has resulted in dismantlement and/or conversion of facilities. It has helped to increase the number of publication and increase international cooperation. The programs have improved epidemiological surveillance capabilities, enhanced the levels of biosafety and biosecurity and helped with national regulations.[203]

The Cooperative Biological Research (CBR) project requested funding has increased from $1.350 million 2006 to $19.782 million 2007.[204] In the FY 2005 budget request the Pentagon proposed cutting cooperative research funding and doubling funds for biosecurity and biosafety.[205] The funding from 1998 to 2007 was divided between Russia 46%, Kazakhstan 19%, Uzbekistan 18%, Georgia 9%, Ukraine 5% and Azerbaijan 3%. It can also be noted that around 75% of the funding is provided to U.S. organisations over this period.[206] The aim of the program is to:[207]

- Encourage peaceful scientific pursuits;
- Strengthen recipient state research capabilities by funding biological research of mutual benefit to the recipient state and the U.S. Department of Defense;
- Promote open communication of recipient state scientific data and the international community; and
- Enhance the likelihood of continued future success by connecting recipient state scientists with other funding sources.

The program engages former BW scientists in peaceful pursuits in order to prevent the proliferation of BW expertise to terrorist groups and rogue states, increases transparency and encourages higher standards of openness, ethics, and conduct. They provide opportunities for transfer of BW pathogens for additional

[203] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007.
[204] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, Appendix D, p. 41.
[205] Luongo, K. N., D. Averre, R. Della Ratta and M. Martellini, "Building a forward line of defense security former Soviet biological weapons", *Arms Control Today*, July/Aug. 2004, at http://www.armscontrol.org/act/2004_07-08/Luongo.asp 2007-11-08.
[206] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 37, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.
[207] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008, 31 December, 2*006, Appendix D, p. 41.

study in the U.S. to improve public health and for forensics reference. The program refocuses projects at former BW institutes on peaceful purposes.[208] There has been work at 49 biological sites, including many former BW facilities.[209] [210] The CBR projects have during 2006 engaged 289 scientists (252 scientists from non-Russian states) at 17 institutes (16 institutes in non-Russian states).[211] There are around ten CBR projects in Kazakhstan, Uzbekistan, Georgia and Azerbaijan dealing with Anthrax, Plague, Brucella, Tularaemia, Avian influenza, Congo-Crimean Hemorrhagic fever virus and Hemorrhagic Fever Virus with Renal Syndrome.[212] At Vector there are three projects on protection against smallpox: 1. Conservation of genetic material and study of genomic structures of different Variola virus strains; 2. Search for antivirals for treating and preventing of Orthopoxviruses; and 3. Combinatorial antibodies libraries of Orthopoxviruses.[213]

The Biosecurity and Biosafety/Threat Agent Detection and Response (BS&S/TADR) project requested funding decreased from $66.3 million 2006 to $47 million 2007.[214] Funding from 1998 to 2007 has been divided between Georgia 31%, Uzbekistan 23%, Kazakhstan 21%, Russia 18%, Azerbaijan 4% and Ukraine 3%.[215] The program aims to:[216]

- Help to establish an integrated secure and sustainable disease surveillance network for especially dangerous human or animal pathogens;

[208] *US Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2006*, 31 December, 2004.
[209] GAO, *Weapons of mass destruction: Additional cooperation needed to facilitate US efforts to improve security at Russian sites*, GAO Report 03-482, March, 2003.
[210] "Global Partnership Scorecard", *Strengthening the Global Partnership*, May/June, 2004, at http://www.sgpproject.org
[211] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 16.
[212] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 24.
[213] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, Appendix D, p. 24.
[214] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, Appendix D, p. 41.
[215] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 33, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.
[216] U.S. Department of Defense, presentation, "Overview of CTR Biological Threat Reduction Program Area (BTRP)", 19 January, 2007.

- Enhance capabilities to detect, diagnose and respond to disease outbreaks;
- Consolidate and secure especially dangerous pathogens and related technologies and materials; and
- Establish Central Reference Laboratories and Epidemiological Monitoring Modules that meet U.S. biosafety and DOD biosecurity guidelines.

The program aims to promote and maintain biosecurity and biosafety at biological facilities to prevent theft, sale, diversion or accidental release of pathogens. It includes strengthening dangerous pathogen detection and response networks. The DOD is developing a network of disease surveillance and diagnostic laboratories from the national to local level the TADR, (Threat Agent Detection and Response) network linked to an electronic integrated disease surveillance system. It also involves removing pathogen collections from existing epidemiological field stations and transferring them to central labs for consolidation. Promote biosecurity/biosafety awareness and education to enhance personnel security, maintenance, safety-monitoring and pathogen control.[217] Biosafety and biosecurity upgrades have been carried out at facilities in Golitsino, Pokrov, Vladimir, Koltsovo (Vector), Obolensk and Kazan.[218] One example of good cooperation between US and Russia in the area of biosafety/biosecurity are the projects carried out at Vector that have substantially improved the level of biosafety and physical security at Vector.[219] The focus of monitoring and consolidation efforts will be on dangerous pathogens posing particular risks for theft, diversion, accidental release, or use by terrorists. A special Pathogen Asset Control System is being installed at several institutes to store and to control access to select agents. The program also develops highly qualified and well-equipped response teams to prevent, deter, detect and contain a bioterrorism attack.[220] A prototype electronic disease reporting system has been fielded and the first of 32 Epidemiological Monitoring Stations, and completing

[217] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 16.
[218] *U.S. Department of Defense, Cooperative Threat Reduction* Annual Report to Congress Fiscal Year 2008, 31 December, 2006, p. 16.
[219] Sandakhchiev, L. S. and S. V. Netesov, "The contribution of international collaboration to strengthening biosafety and physical security at Russian State Research Center of Virology and Biotechnology Vector and its perspectives in biotechnology", Presented at International Workshop Building Global Partnership for bioproliferation prevention: Current status and future of Russian biotechnology, Como, Italy, 17-18 November, 2003.
[220] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 16.

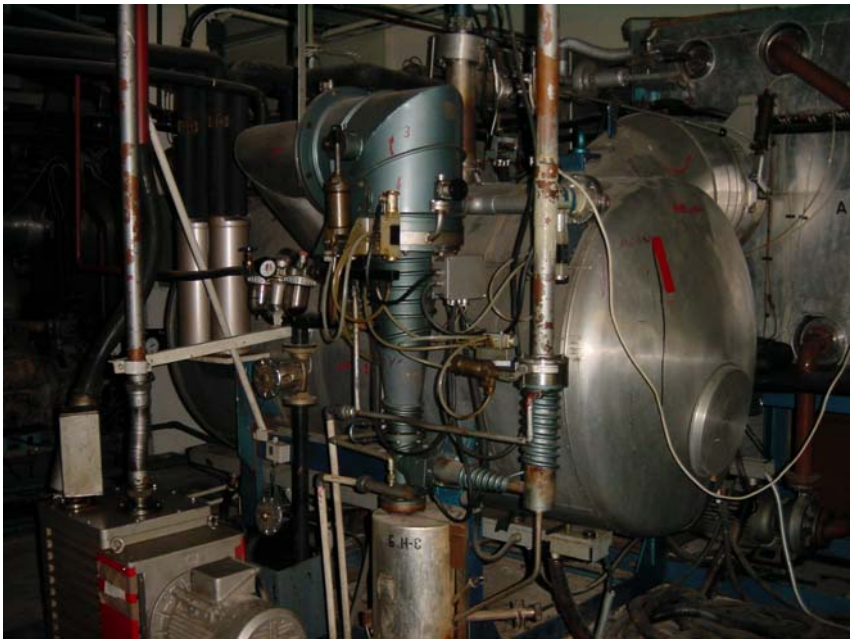
conceptual designs for Central Reference Laboratories in each country with mobile Outbreak Response Units with diagnostics and epidemiological teams. These centres networks for epidemiological monitoring will link with regional partners to enhance disease monitoring, reporting and ensure early warning of disease outbreaks. This system is not being established in Russia but other FSU states. The program also meets priority G8 Global Partnership objective to improve global disease surveillance.[221] In the U.S. National Research Council's 2007 review of the BTRP there are a number of recommendations for improvements of this part of the program.[222] [223]

Work has and will be carried out on the construction/renovating of epidemiological monitoring stations or CRL (Central Reference Laboratory) in Ukraine, Georgia, Azerbaijan, Uzbekistan and Kazakhstan.[224] [225] In Georgia, interim biosafety and biosecurity upgrades at the National Center for Disease Control, the site of the temporary Central Reference Laboratory (CRL) and national pathogen repository have been completed. Construction continues at the Veterinary Epidemiological Monitoring Station in Kutaisi. In Uzbekistan five Epidemiological Monitoring Stations have been completed. In Kazakhstan construction of the Epidemiological Monitoring Station at the National Veterinary Center in Astana has been completed.[226]

In Kazakhstan the US upgraded the country's sanitary-epidemiological and veterinary services and has improved the scientific research capacity. Several ministries are involved in a biosecurity programme initiated by US and now to be led by the Kazakh centre for quarantine and zoonosis infections. Similar work is continuing at the anti-plague and sanitary-epidemiological and veterinary stations in the regions. This also involves a new central reference-laboratory, improving epidemiological surveillance systems, establishing a communication system and

[221] "DOD, Biological Weapons Proliferation Prevention Program", Briefing given by A Weber, 7 April, 2005.
[222] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 36, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.
[223] *Letter Report to Review Research Proposals from Former Soviet Biological Weapons Institutes*, National Research Council of the National Academies, 24 August, 2006.
[224] *U.S. Department of Defense, Cooperative Threat Reduction* Annual Report to Congress Fiscal Year 2008, 31 December, 2006, p. 16.
[225] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 68, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.
[226] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 16.

connecting them to the international networks. Scientists and laboratory specialists will be trained in the USA. There is a plan to set up a regional centre at the Kazakh scientific centre to train specialists, including on the international standards for biosafety/biosecurity, from Central Asia and the Caucasus. The cooperation with the US will involve improving diagnostic methods and medical treatment including setting up a rapid response team. The program was initiated in 2003 and new bilateral agreements have been signed.



Equipment at former BW facility being used in biotechnology projects

(Photo K. S. Westerdahl FOI)

The Biological Weapons Infrastructure Elimination (BWIE) project's funding request decreased from $2.2 million 2006 to $1.6 million 2007.[227] Funding has for 1998 to 2007 been divided between Georgia 43%, Uzbekistan 29% and Kazakhstan 28%.[228] The project area seeks to eliminate former BW facilities,

[227] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, Appendix D, p. 41.

[228] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies,

equipment or infrastructure in FSU states either through the removal of dual use equipment or through the destruction of the facility. DOD continues to assess former BW facilities and biological research institutes where DOD is granted access, and there is an ongoing effort to identify BW facilities and institutes not yet known to the U.S. These assessments provide vulnerability analyses for each facility and support recommendations for elimination or engagement. The dismantlement at the open air biological weapons testing facility at Vozrozhdeniye Island part Kazakh and part Uzbek, in the Aral Sea and at the Stepnogorsk anthrax production facility (building 221 and 600), Kazakhstan has been completed.[229] [230] [231] [232] Still there is a lack of transparency on the Russian side as there is no official information on what pathogens were tested in weapons on Vozrozhdeniye Island. This information would assist Kazakh and Uzbek scientists better determine the level of danger from any remaining agents in the environment.[233] In Georgia dual use equipment has been removed and buildings at Biokombinat have been demolished. DOD has not carried out dismantlement work in Russia but the Russian government has converted facilities at Omutnisk, Berdsk and Pokrov.[234]

Department of State, DOS, Non-proliferation of WMD Expertise

The NADR (Non-proliferation, Anti-terrorism, Demining, and Related Programs) supports the engagement and permanent redirection of former weapon scientists worldwide. It covers critical and security-related programs that aim to

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Washington D.C., NAS, 2007, p. 32, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.

[229] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2008*, 31 December, 2006, p. 1.

[230] *U.S. Department of Defense, Cooperative Threat Reduction Annual Report to Congress Fiscal Year 2006*, 31 December, 2004.

[231] "Kazakh paper mulls over joint biological security programme with USA", (from *Kazakhstanskaya Pravda web site*, Astana, in Russian 17 February 2005) *BBC Worldwide Monitoring, Monitoring* Central Asia Unit, 1 March, 2005.

[232] Roffey, R. and K. S. Westerdahl, *Conversion of former biological weapons facilities in Kazakhstan – A visit to Stepnogorsk*, July 2000, FOI R 0082-SE, May 2001.

[233] "Kazakhstan experts discuss ways of preventing bioterrorism", From *Kazakhstanskaya Pravda*, Almaty, (in Russian 22 Sep 04 p 6), *BBC Monitoring International* Reports, 24 September, 2004.

[234] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 32, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.

reduce regional and trans-national threats. There are three programs that deal with non-proliferation and global security of WMD material and expertise, Non-proliferation and Disarmament Fund, Export Control and Related Border Security and Global Threat Reduction Program. Of these the funding for the Global Threat Reduction Program was for Fiscal Year 2006 $52 million and 2007 $56.2 million, and requested for FY 2008 $53.5 million. This program consists of six parts, the Science Centers program, the Bio-Chem Redirection program, the Bio Industry Initiative, the Biosecurity Engagement Program (BEP) and the Iraq International Center for Science and Industry (IISCSI) and program for Libya.[235] [236] The State Department also funds work through the Civilian Research and Development Foundation (CRDF)[237] in an area between basic research and industrial applications. There is also a coalition of U.S. companies and universities that facilitates technology commercialisation for the CTR scientist redirect programs.[238]

The Science Centers program (with a funding of $21.6 million (5 % decrease) for FY 2008 and $22.7 million for FY 2007[239] [240] and is decreasing since 2000[241]) operates through two multilateral organizations, the International Science and Technology Center (ISTC) in Moscow and the Science and Technology Centre in Ukraine (STCU) in Kiev. The United States, the European Union, Canada, Japan, Norway and South Korea, other U.S. agencies, and private industry finance them. DOS oversees all science centres activities, including those supported through DOD partner relationships. The U.S.-led program aims at reforms at the ISTC in Moscow and STCU in Kiev. These reforms expanded and improved the two centres' capabilities to move scientists and institutes more quickly along a path of "graduation" from Science Centres funding. This approach serves the U.S. objective of transforming Science Centres participation

[235] Lackie, J., "Reported accomplishments of selected threat reduction and non-proliferation programs, by agency, for Fiscal Year 2006", *Policy Update Partnership for Global Security*, July, 2007.
[236] *U.S. State Department, Fiscal Year 2008 Budget Request*, Summary and Highlights, International Affairs Function 150, 2007, at http://www.fas.org/asmp/resources/110th/Function150.pdf 2007-09-18.
[237] CRDF at http://www.crdf.org/usr_doc/annual_web06.pdf 2007-08-29.
[238] Finlay, B., "Venture capitalist.gov: Courting the Ultimate Angel Investor", *American Venturemagazine.com*, January, 2006, http:americanventuremagazine.com/articles/243?pag=0 2007-09-11.
[239] Williams, I., "Preliminary Analysis of the U.S. State Department's Fiscal Year 2008 Budget Request for Global WMD Threat Reduction Programs", *Partnership for Global Security, Policy Update*, 1 April 2007.
[240] Woolf, A. F., *Nonproliferation and Threat Reduction Assistance: U.S. Programs in the Former Soviet Union*, CRS Report for Congress, No. RL31957, 6 April, 2006, p. 25.
[241] Hoehn, W., "Preliminary analysis of the U.S. State Department's Fiscal Year 2007 budget request for global WMD Threat Reduction Program", *Policy Update RANSAC*, May, 2006.

from an aid relationship to one of partnership. The science centres are used as clearing house for matching Russian and other EECA countries technical capabilities with Western partners. U.S. companies can submit a list of technology areas of interest and ask the centres to identify research teams and institutes. The redirection efforts have matured from identification, initial engagement and providing access to guiding former WMD scientists into sustainable and transparent civilian work. The funding through ISTC and STCU is now directed towards activities aimed at helping scientists become marketable and integrate into peaceful international scientific community. In order to increase the likelihood that engaged institutes attain financial self-sustainability, the U.S. has invested significant resources. During 2006 the State Department "graduated" four institutes (three were former BW/CW institutes) from Science Centre funding.[242] There is a trend to increasingly rely on so called partner programs for funding and to focus on long-term redirection of former weapons scientists.[243]

The Bio-Chem Redirection (BCR) program (funding of $16.1 million for FY 2006 to $17 million for 2007[244]), addresses the proliferation threat posed by former Soviet biological weapons scientists and engages them in activities leading toward self-sustainability and promotes access and transparency at formerly closed facilities once associated with the Soviet biological weapons program. This is done by focusing on joint research projects in critical public health, agricultural and environmental research areas of concern. The State Department is increasingly aiming at "graduating scientists" from assistance to projects of more commercial viability.

The program funds the Department of Health and Human Services (DHHS), Department of Agriculture (USDA), and the Environmental Protection Agency (EPA) requiring their specialized expertise. Some research projects directly support efforts to combat biological and chemical terrorism. The DHHS's Biotechnology Engagement Program (BTEP) goals are integrating N. Eurasia scientists into the international community; reducing the risk of proliferation of weapons of mass destruction expertise; increasing transparency at former Soviet biological weapons (BW) research sites; and redirecting bio-technology expertise to peaceful research in areas of urgent public health needs (including HIV/AIDS

[242] Lackie, J., "Reported accomplishments of selected threat reduction and non-proliferation programs, by agency, for Fiscal Year 2006", *Policy Update Partnership for Global Security*, July, 2007.
[243] Woolf, A. F., *Nonproliferation and Threat Reduction Assistance: U.S. Programs in the Former Soviet Union*, CRS Report for Congress, No. RL31957, 6 April, 2006.
[244] Hoehn W., "Preliminary analysis of the U.S. State Department's Fiscal Year 2007 budget request for global WMD Threat Reduction Program", *Policy Update RANSAC*, May, 2006.

and drug resistant tuberculosis) in Russia and N. Eurasia (Armenia, Kazakhstan, and Georgia).[245] In February 2007 there were 33 ongoing projects in Russia, Georgia, Kazakhstan and Armenia. 29 projects have been completed.[246] Other areas concern blood-borne pathogens, West Nile virus, water borne diseases and tick-borne diseases. It also includes work on animal health and production, natural resources, and crop health and production. Further it involves work to combat agro-terrorism via plant and animal disease detection, characterization, monitoring and prevention, with former CBW institutes in Russia, Kazakhstan, Uzbekistan, and Tajikistan. The BCR-program is engaging the former weapons scientist community in Stepnogorsk (around 70) through the Environmental Monitoring Laboratory (EPA funded) and DHHS and USDA funded projects. In addition to the established cooperative projects the U.S. will now also get engaged in Ukraine at leading public health institutes in Kiev, Odessa, and Lviv and veterinary institutes in Kiev and Kharkiv. One area of focus will be on improving systems for human and animal disease surveillance. The future plans for CBR include: engage more than hundred former BW-scientists in Stepnogorsk, Kazakhstan, engage former BW-scientists at Kirov 200 in Russia, initiate projects in Tajikistan and continue to 'graduate' the Vector institute in Russia. From 1998 the U.S. has provided around $70 million to ISTC to support the Biological Weapons Redirection Program.[247] The U.S. has graduated 46 institutes from U.S. assistance through the Science Centres.[248]

The Bio Industry Initiative (BII) (increased from $6 million to $13 million for 2007[249]) and is the only program focusing on reconfiguring large-scale former BW-related production facilities and it also engages former BW/CW scientists in accelerated vaccine and drug development research.[250] [251] Of an estimated 15-20

[245] DHHS Office of Global Health Affairs, DHHS Biotechnology Engagement Program (BTEP), 2005, at http://www.globalhealth.gov/europeaffairsdhhs.shtml

[246] *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships*, National Research Council of the National Academies, Washington D.C., NAS, 2007, p. 48, at http://books.nap.edu/openbook.php?record_id=12005&page=R1 2007-09-19.

[247] Woolf, A. F., *Nonproliferation and Threat Reduction Assistance: U.S. Programs in the Former Soviet Union*, CRS Report for Congress, No. RL31957, 6 April, 2006, p. 24.

[248] G8 Summit Heiligendamm 2007, GPWG Annual Report 2007, Consolidated Report Data, Annex A, at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-gp-report-anx.pdf 2007-09-03.

[249] Hoehn, W., "Preliminary analysis of the U.S. State Department's Fiscal Year 2007 budget request for global WMD Threat Reduction Program", *Policy Update RANSAC*, May, 2006.

[250] Scharl, E, "Engagement Strategies for the Biological Production Facilities in the Former Soviet Union: Progress and Perspectives", Session C, NDCI Conference, Brussels 16-17 December 2002.

[251] Lackie, J., "Reported accomplishments of selected threat reduction and non-proliferation programs, by agency, for Fiscal Year 2006", *Policy Update Partnership for Global Security*, July, 2007.

large-scale production plants in the former Soviet Union, BII has engaged twelve including first-ever access to ten former BW production facilities. Two facilities with very huge fermentation capacities at Berdsk and Omunitnisk have been engaged. U.S. industry plays a key role in the program. BII is providing patenting, commercialization, training (quality control, GMP or GLP), focusing on IPR (Intellectual Proprietary Rights), business and market development for both institutes and large-scale production facilitates in the former Soviet Union.[252] BII has also a partnership with Russian TEMPO and US RAPS (U.S. Regulatory Affairs Professional Society) in the sphere of biosafety, biosecurity and for international training. The focus will be on economic viability and greater self-sustainability. The implementation network for this program includes The Center for Innovative Medicine and Integrated Technology (CIMIT), The Civilian Research and Development Foundation (CRDF) and The International Science and Technology Center (ISTC). BII supports R&D on HIV/AIDS, tuberculosis, flu and also cancer research. Future plans include: access to remaining Institutes, identify new opportunities, conversion of Biokombinat in Tiblisi, Georgia and engage Kirov 200. BII is used as a 'carrot' to gain access for example to Kirov 200. In 2006 four new institutes were engaged in Azerbaijan, Ukraine and Armenia and five new projects were funded.[253] There is also the Russian – American BioIndustry Initiative Integrated Toxicology Testing program (RABIIT) to attract international clients for contract research and testing services. In 2007 a new lending program will be launched so as to move away from R&D grants to loans to help commercialisation.[254]

The Biosecurity Engagement Program (BEP) with a funding of $3.9 million for Fiscal Year 2006 with an increase to 8 million in FY 2007, was initiated in 2006, is implemented with support of Sandia National Laboratories, and CRDF and aims to improve facility and pathogen biosecurity, biosafety training, assist in risk assessments and engage scientists in South Asia, Southeast Asia and the Middle East. This includes training in infectious disease surveillance and molecular diagnostics, and laboratory capacity building activities.[255] [256] In 2006

[252] BioIndustry Initiative, Fact Sheet, Bureau of Nonproliferation. Washington, DC, September 16, 2003, at http://www.state.gov/t/np/rls/fs/24242.htm

[253] Lackie, J., "Reported accomplishments of selected threat reduction and non-proliferation programs, by agency, for Fiscal Year 2006", *Policy Update Partnership for Global Security*, July, 2007.

[254] Douglas, M., Session 9, in (eds. K. N. Luongo, J. R. Della Ratta, D. Averre, and M. Martellini), *Cooperation on Bio-Initiatives in Russia and the NIS: Towards a True Partnership, Analysis and Report from the September 28-29, 2006 Conference*, Partnership for Global Security and Landau Network-Centro Volta, Fall, 2007, p. 26.

[255] Sandia, at http://www.biosecurity.sandia.gov/subpages/pastConf/20062007/cairo/BEPPresentation-2.pdf

projects were carried out in the Philippines and in Indonesia. In 2007 Pakistan, Yemen and Egypt will be included in the program.[257] [258]

The Department of Energy's Initiatives for Proliferation Prevention (IPP) has redirected 7900 WMD scientists, engineers and technicians to sustainable commercial work since June 2002.[259] In addition, DOE spent approximately $7-8 million annually and has provided more than $30 million for programs to re-employ biological experts in commercially oriented projects up to 2004.[260] The IPP will only fund projects which deal with technology that is sufficiently mature that it would attract a commercial partner who is willing to collaborate on the development of a new business venture.[261] The DOE projects are usually large around $1-1.5 million and agreements are signed directly between partners. The DOE's programs depend on the active participation of DOE around ten national laboratories.[262] [263] [264]

In addition to the above the United States will provide $15 billion over 5 years to support international HIV/AIDS programs; will contribute $90 million in fiscal

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[256] Williams, I., "Preliminary Analysis of the U.S. State Department's Fiscal Year 2008 Budget Request for Global WMD Threat Reduction Programs", *Partnership for Global Security, Policy Update*, 1 April 2007.

[257] Lackie J., "Reported accomplishments of selected threat reduction and non-proliferation programs, by agency, for Fiscal Year 2006", *Policy Update Partnership for Global Security*, July, 2007.

[258] U.S. Department of State Biosecurity Engagement Progam, Information, at http://bepstate.net/about.html 2007-09-17.

[259] The G8 Global Partnership: Progress during 2004 on the UK's programmes to address nuclear, chemical and biological legacies in the Former Soviet Union, Section 5, USA p 66, UK Foreign& Commonwealth Office, Department of Trade and Industry and Ministry of Defence, December, 2004, at http://www.dti.gov.uk

[260] Luongo, K., D. Averre, R. Della Ratta and M. Martellini, "Building a Forward Line of Defense Securing Former Soviet Biological Weapons," *Arms Control Today* (July/August 2004), The Arms Control Association, at http://www.armscontrol.org/act/2004_07-08/Luongo.asp

[261] Williams, I. and K. Luongo, "Analysis of the U.S. Department of Energy's Fiscal Year 2008 International Nonproliferation budget request", *Policy Update Partnership for Global Security*, 26 February, 2007.

[262] Initiative for proliferation prevention (IPP) program, at http://www.ne.anl.gov/activ/programs/IPP/ 2007-08-28.

[263] DOE, Initiative for Proliferation Prevention (IPP) Program, URL http://www.ne.anl.gov/activ/programs/IPP/

[264] Kellett, F. P., *USIC and the Initiatives for Proliferation Prevention: A survey of companies doing business in the former Soviet Union*, The Henry L. Stimson Center, Report No. 60, March, 2007.

year 2006 to the bilateral tuberculosis programs in over 35 countries; will increase funding for malaria prevention and treatment by more than $1.2 billion over 5 years; has provided nearly 25 percent of the Global Polio Eradication Initiative (GPEI) funding; has pledged $362 million for countries to prepare for, detect, and rapidly respond to outbreaks of highly pathogenic avian influenza; has contributed over $1.5 billion over the past 5 years to save the lives of children under the age 5 for support for childhood vaccinations and treatment for pneumonia and diarrhoea; has awarded nearly $1 billion in grants to U.S.-based research institutions that collaborate directly with counterparts in developing countries to investigate, develop, and test novel approaches to prevention, control, and treatment of infectious diseases; and takes note of the technical work by the World Bank and GAVI (Global Alliance for Vaccines and Immunization) on AMC (Advanced Market Commitments) for vaccines, and supports additional work towards a successful launch of an AMC pilot project by the end of the year.[265]

[265] G8 Summit, St. Petersburg 2006, Fight against infectious diseases, 16 July, 2006, at http://en.g8russia.ru/docs/10.html 2007-12-06.

5 Other international approaches

5.1 The Science Centres, ISTC in Moscow and STCU in Kiev.

The main aim of the science centres are to provide former weapons scientists who possess sensitive knowledge in the area of weapons of mass destruction opportunities to redirect their talents to peaceful R&D and their missions were to engage military scientists and engineers.[266] The ISTC (International Science and Technology Centre, Moscow) was founded in 1992 has emerged as the main multilateral source of funding specially for the biological area. The ISTC has been operating under a presidential decree which states that the framework agreement will operate provisionally until ratified by the Russian Duma which is not very supportive of the ISTC activities. It is surprising that the ISTC does not yet have a full support from the higher levels in the Russian administration. The STCU (Science and Technology Centre, Kiev) was founded in 1993. The ISTC[267] and STCU[268] focus on all categories of former Soviet WMD scientists and over 60000 scientists (more than $600 million in funding) have been supported by ISTC and over 12000 scientists (more than $117 million in funding) have been supported by STCU over a ten year period so they have had a significant impact.[269] In a study it was found that scientists receiving funding from ISTC or similar were less likely to consider working for "rogue states" compared to those not receiving such funding pointing to one of several clear positive effects of their activities.[270]

Projects are divided into regular projects and partner projects financed directly by a partner government, agency or company. Each project proposal must be

[266] Gambier, D., Session 3, p. 8, in (eds. D. Averre, K. N. Luongo and M. Martellini), *Advancing bio threat reduction, findings from an international conference*, Landau Network Centro-Volta and Russian American Nuclear security Advisory Council, 2004.
[267] ISTC, Annual Report for 2006, at http://www.istc.ru/
[268] STCU, Annual Report 2006, at http://www.stcu.int/documents/stcu_inf/reports/annual/2006/2006_Annual_Report_(EN).pdf 2007-08-29.
[269] Boureston, J. and M. B. Nikitin, *Improving the ISTC/STCU science centres' programmes to support worldwide non-proliferation objectives*, Background paper 8, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html.
[270] Ball, D. Y. and T. P. Gerber, "Russian Scientists and Rogue States, Does Western Assistance Reduce the Proliferation Threat?" *International Security*, Vol. 29, No. 4, pp. 50-77.

agreed by the host government and for Russia there have been two organisations that provide this the Russian Academy of Sciences and the Federal Agency for Atomic Energy. If scientists are BW-scientists this is assessed through the inter-agency process in which projects and participants are reviewed. The science centres provides Russian and NIS weapons scientists and engineers with opportunities to re-direct their talent to peaceful activities and integrate into the world scientific community, support fundamental and applied research and also support transition to the market economy. To seek commercial opportunities has not been a primary aim for the science centres. There are different stages with the first being engagement of key weapons scientists, followed by transformation of former weapons scientists through public/private partnership which leads to a balanced partnership and then self-sustainable research institutes and diffusion of 'best practices'. Originally the mission was to fund research grants that met specific criteria but each funding partner has its own criteria. Then later during the 1990s the Partner Programs were created to attract private entities and government agencies to engage former weapons scientist in research in areas of interest to them and funnel funds by using the ISTC system. The U.S. has been much more active in using partner projects than the EU over the years which is unfortunate.

The science centres have been putting more efforts into facilitating commercialisation of project results and other means promoting long term sustainability. In an assessment of the science centres it was concluded that that the goal of the centres are to keep scientists with the most sensitive expertise in the country and not be part of proliferation attempts and any commercialisation of research is a plus but not a primary aim. The centres were not designed for promoting commercialisation even if they now help with designing business plans and training.[271] The centres have been criticised for not being very effective in their attempts at commercialisation and that their organisations would need major changes to achieve this. It has also a number of times been pointed out that one problem with the Russian innovation system is still that the Intellectual Property Rights (IPR) are not clear in Russia why large biotechnology companies will not take the risk of getting involved.[272] The EU

[271] Boureston, J. and M. B. Nikitin, *Improving the ISTC/STCU science centres' programmes to support worldwide non-proliferation objectives*, Background paper 8, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html

[272] Discussion, Session 3, in (eds. K. N. Luongo, J. R. Della Ratta, D. Averre, and M. Martellini), *Cooperation on Bio-Initiatives in Russia and the NIS: Towards a True Partnership, Analysis and Report from the September 28-29, 2006 Conference*, Partnership for Global Security and Landau Network-Centro Volta, Fall, 2007, p. 16.

though still see the science centres as important organisations for R&D cooperation but the views in the EU are changing and it is pointed out that Russia's "transition period is over" due to the improved economic situation. Russia can no longer just be a beneficiary of support but has to actively participate as partner.[273]

ISTC covers: Armenia, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Russian Federation and Tajikistan. Donor parties are Canada, EU, Japan, U.S., Russia, Norway and South Korea. There was a large increase in funding in the bio area from 1998 and for 2006, 48 projects, (at a cost of $17 million) out of a total of 182 new projects, were in the area of biotechnology and life sciences. During the period 1996 to 2006 a total of 548 projects in the area of biotechnology and life sciences were carried out of a total of 2437 projects.[274] The last years there has been a slight decline in funding for projects in biotechnology and life sciences in line with overall decrease in funding for the ISTC.[275] In the biotechnology/life sciences area (covering work on control of highly infectious diseases, surveillance, monitoring and risk assessment, food safety, biosafety and biosecurity upgrades at key institutes) around $180 million (30% of total funding) has for ISTC reached 9000 biological scientists.[276] [277] The EU part of the total funding of new projects for 2004 was 29%. By 2000 access had been gained to 30 of about 50 non-military BW-related institutes. The DOE IPP had also funded contracts with 15 former Soviet BW-related institutes, 10 of which have also been funded by the ISTC. Together these have provided access to 15 out of 20 key former BW institutes. A substantial part of the funding has gone to key institutes belonging to the organization Biopreparat. The U.S. government

[273] Gambier, D., Session 2, p. 11 and 13, in (eds. K. N. Luongo, J. R. Della Ratta, D. Averre, and M. Martellini), Cooperation on Bio-Initiatives in Russia and the NIS: Towards a True Partnership, Analysis and Report from the September 28-29, 2006 Conference, Partnership for Global Security and Landau Network-Centro Volta, Fall, 2007.

[274] *ISTC, Annual Report for 2006*, at http://www.istc.ru/

[275] Luongo, K. N., Analysis and Recommendations, in (eds. K. N. Luongo, J. R. Della Ratta, D. Averre, and M. Martellini), *Cooperation on Bio-Initiatives in Russia and the NIS: Towards a True Partnership, Analysis and Report from the September 28-29, 2006 Conference*, Partnership for Global Security and Landau Network-Centro Volta, Fall, 2007, p. 6.

[276] Luongo, K. N., D. Averre, J. R. Dela Ratta and M. Martellini, *Advancing International Cooperation on Bio-Initiatives in Russia and the CIS, Findings and Report from the April 26-27, 2005 Conference*, Ransac and Landau Network-Centro Volta, Spring, 2006, p. 8.

[277] Meyer, U., "ISTC Involvement in biotechnology and life science programs", Presentation at the Conference Advancing International Cooperation on Bio-initiatives in Russia and the CIS, Rome, Italy, April 25-27, 2005.

has indicated that its assessment is that no offensive BW research was carried out at funded partner institutes.[278] [279] [280]

The EU has designated a total of €125 million for ISTC/STCU (€100 million for ISTC and €25 million for STCU) former weapons scientist assistance through 2006.[281] Canada only acceded to ISTC in March 2004 but is initiating a program in the biological area and has already funded 13 Biotechnology and Life Sciences projects through the ISTC aimed at the redirection of scientists.[282] Canada is though also like the EU reassessing the role of the science centres. It has been suggested that the ISTC could be more "pro-active" in promoting the non-proliferation aims as it has the ability to bring the main actors round the table from the former BW establishments.[283]

The Vision of STCU with the donor parties the U.S., the EU and Canada is to further develop STCU into a sustainable science and technology partner for Ukraine, Georgia, Uzbekistan, Azerbaijan and Moldova. To Support R&D activities of scientists and engineers, formerly involved with weapons of mass destruction and their means of delivery. In the coming years, STCU will accelerate the development of alternative sources of funding. To further support the development of partnerships, STCU will create a marketing function and invest in new marketing initiatives.[284] The U.S. wants to focus less on sponsoring individual projects and more on a broader approach addressing the end state sustainability of institutes with former weapons scientists. There is a trend also from Canada and the EU to show more selectivity in their project funding decisions, to better match these projects to Canadian and EU priorities. This will

[278] Einhorn, R. J. and M. A. Flournoy, *The Challenges, Volume 2, Protecting Against the Spread of Nuclear, Biological and Chemical Weapons, An Action Agenda for the Global Partnership*, CSIS Report, January 2003.

[279] Meyer, U., "ISTC Involvement in biotechnology and life science programs", Presentation at the Conference Advancing International Cooperation on Bio-initiatives in Russia and the CIS, Rome, Italy, April 25-27, 2005.

[280] Dekker-Bellamy, J., Analysis in *Next Generation Threat Reduction, Bioterrorism's challenges and solutions*, New Defence Agenda, Biblioteque Solvay Brussels, 25 January, 2005, pp 37-48.

[281] European Communities, EU Cooperation with the NIS in Science and Technology, The European Commission , 2005, at http://europa.eu.int/comm/research/nis/en/istc.html

[282] Vestergaard, C., Foreign Affairs of Canada, Chemical & Biological Weapons Global Partnership, Personal communication, April, 2005.

[283] Gambier, D., Session 3, in (eds. Averre, D., K. N. Luongo and M. Martellini), *Advancing bio threat reduction, findings from an international conference*, Landau Network Centro-Volta and Russian American Nuclear security Advisory Council, 2004, p. 8.

[284] STCU, information at home page, at http://www.stcu.int/

mean moving from fewer to larger project activities for the STCU.[285] If funding continues through the science centers the EU must have a mechanism for and become much more active in setting priorities for projects to be funded, to monitor them and follow-up the results better.[286] During 2006 there was a dramatic increase (53.4%) in project funding reversing the downward trend since 2004. In the area of biotechnology, agricultural sciences and medicine 10 new projects were funded and the total number thus reaching 65. Of these 20 were completed resulting in marketable technologies.[287] One approach could be to create a new stronger demand-driven project selection process for government funded ISTC and STCU projects. The amount of funding for new projects in 2006 for the biotechnologies, agricultural sciences and medicine area was $2.6 million.[288]

5.2 The G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction

The G8 Global Partnership was launched at Kananaskis in 2002 and will support specific cooperation projects, initially in Russia, to address non-proliferation, disarmament, counter-terrorism and nuclear safety issues. The Global Partnership was also formed to better coordinate the ongoing international non-proliferation and threat reduction programs. The participating states have pledged financial support up to $20 billion over 10 years to address the threat of WMD. The U.S. pledged to contribute $10 billion of the targeted money, and the EU have pledged to contribute €1 billion over ten years, (the UK will contribute $750 million, Canada CD$1 billion ($743 million), Germany $1.5 billion, Italy $400 million and Japan initially $200 million and France will contribute €750 million) and Russia will contribute $2 billion. Thirteen additional countries have joined the

[285] *STCU Annual Report 2006*, p. 5, at http://www.stcu.int/documents/stcu_inf/reports/annual/2006/2006_Annual_Report_(EN).pdf 2007-08-29.
[286] Roffey R., Session 3, in (eds. K. N. Luongo, J. R. Della Ratta, D. Averre, and M. Martellini), *Cooperation on Bio-Initiatives in Russia and the NIS: Towards a True Partnership, Analysis and Report from the September 28-29, 2006 Conference*, Partnership for Global Security and Landau Network-Centro Volta, Fall, 2007, p. 15.
[287] *STCU Annual Report 2006*, p. 12, at http://www.stcu.int/documents/stcu_inf/reports/annual/2006/2006_Annual_Report_(EN).pdf 2007-08-29.
[288] *STCU Annual Report 2006*, at http://www.stcu.int/documents/stcu_inf/reports/annual/2006/2006_Annual_Report_(EN).pdf 2007-08-29.

G8, Finland, the Netherlands, Norway, Poland, Switzerland and Sweden (2003), and Australia, Belgium, the Czech Republic, Denmark, Ireland, the Republic of Korea, and New Zealand (2004).[289]

The leaders of the G8 also adopted principles to prevent terrorists, or those that harbour them, from gaining access to materials or weapons of mass destruction. Guidelines were also adopted for new or expanded cooperation projects. Curbing the proliferation of biological weapons was an essential element of the Global Partnership:[290]

- promote the adoption, universalization, full implementation and, where necessary, strengthening of multilateral treaties (including the Biological and Toxin Weapons Convention) and other international instruments whose aim is to prevent the proliferation or illicit acquisition of weapons and materials of mass destruction;
- develop and maintain appropriate effective measures to account for and secure biological items (i.e. biosecurity);
- develop and maintain appropriate effective physical protection measures at facilities that house biological items (i.e. biosafety);
- develop and maintain effective border controls, law enforcement efforts and international cooperation to detect, deter and interdict in cases of illicit trafficking in biological items, for example through installation of detection systems, training of customs and law enforcement personnel and cooperation in tracking these items;
- develop, review and maintain effective national export and transhipments controls over items on multilateral export control lists (including the Australia Group), as well as items that are not identified on such lists but which may nevertheless contribute to the development, production or use of biological weapons; and
- adopt and strengthen efforts to minimize holdings of dangerous pathogens.

[289] U.S. Department of State, the G-8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction, Fact Sheet, 24 Aug. 2004.
[290] Statement by G8 leaders, Kananaskis Summit, 2002, at URL http://www.g8.gc.ca/2002Kananaskis/globpart-en.asp 2007-11-05.

At Knanaskis the question of biosecurity was debated but in the end it was not mentioned, but for the U.S. issues like BW were said to remain a very high priority.[291] The negotiations at the Kananaskis summit became difficult and due to this, there are still some differences of interpretation of the outcome of this summit. Russia insisted on only two sole priorities: the North West Russian nuclear submarines dismantlement, and secondly, the chemical weapons destruction program. Other members of the G8 had and have also wider issues as priorities including biosecurity.[292] It has though been pointed out that donor countries should refrain from making political issues of the problems in the biological area.[293] What has then the EU done to fulfil its Kananaskis commitment of €1 billion? The EU (Community and member states) has committed around €690 million for WMD non-proliferation and disarmament over the last 10 years and of these €125 million for redirecting former weapons scientists through ISTC and STCU.[294] [295] The main part of the funding has been allocated to destruction of chemical weapons and in the nuclear safety area.

At the Evian summit 2003 there was not much mention of the biological area except that progress had been made with improving safety and security of biological research facilities.[296] An action plan on capacity building against terrorism was agreed and a Counter-Terrorism Action Group was created. In the health area it was agreed to fight HIV/AIDS, tuberculosis and malaria, encourage research on diseases mostly affecting developing countries, provide extra funds to eradicate polio and improve cooperation against SARS.[297] [298]

At the Sea Island summit 2004 it was stated: Bioterrroism poses unique, grave threats to the security of all nations, and could endanger public health and disrupt

[291] Global Partnership Update, May 2004.
[292] Deffrennes, M., Presentation in Next Generation Threat Reduction, Bioterrorism's challenges and solutions, New Defence Agenda, Biblioteque Solvay Brussels, 25 January, 2005.
[293] Kobyakov, D. and V. A. Orlov, *Global partnership: What's next?* Report prepared for the Geneva Centre of Security Policy, April, 2005, p. 14, at http://www.sgpproject.org/publications/KobyakovOrlovApril2005GPWhatisnext.pdf 2007-11-14.
[294] Walker, P. F., "Kananaskis at Five: Assessing the Global Partnership", Table 1, Global Partnership Pledges and Commitments, 2002-2006, *Arms Control Today*, Vol. 37, No. 7, September, 2007, p. 49.
[295] G8 Heiligendamm, *GPWG Annual Report 2007*, Consolidated Report Data, Annex A, at http://www.g-8.de/Content/EN/Artikel/__g8-summit/anlagen/gp-report-annex,templateId=raw,property=publicationFile.pdf/gp-report-annex 2007-11-06.
[296] G8 Evian Summit, *Senior Officials Group Annual Report*, presented at the G8 Heads of State and Government, Evian, June, 2003, at http://www.g8.fr/evian_report
[297] G8 Evian Summit, *Chairs summary*, 3 June, 2003, at http://www.g8.fr
[298] G8 Evian Summit, Health, a G8 action plan, June, 2003, at http://www.g8.fr

economies. Commitment to concrete national and international steps to expand or, where necessary, initiate new biosurveillance capabilities to detect bioterror attacks against humans, animals, and crops; improve prevention and response capabilities; increase protection of the global food supply; and respond to, investigate, and mitigate the effects of alleged uses of biological weapons or suspicious outbreaks of disease and undertake cooperative biosafety and biosecurity projects. The BTWC was stated to be a critical foundation against biological weapons proliferation. Its prohibitions should be fully implemented, including enactment of penal legislation.[299] [300] [301] [302] In the health area it was agreed on an action plan to develop a HIV vaccine[303] and to eradicate polio.[304]

At the St. Petersburg G8 meeting 2006 there was no mention of bioterrorism or initiatives on biological threat reduction but instead only the importance of the BTWC and its implementation. One major initiative promoted by Russia was on the fight against infectious diseases.[305] Much of this involves supporting the work done by WHO, OIE and FAO. The initiatives focus on HIV/AIDS, tuberculosis, malaria, measles and polio prevention. It also includes improved international surveillance and monitoring of infectious human or animal diseases.[306] This was a comprehensive long-term strategy for global action to fight infectious diseases. One issue was the provision of adequate financing, including through the mobilisation of resources to replenish the Global Fund to Fight AIDS, Tuberculosis, and Malaria. In this regard, Russia has taken an innovative approach - to reimburse the Global Fund all the money it has spent on financing corresponding projects in Russia. Through this action the Global Fund will receive an additional $200 million. The G8 also stated its intention to strengthen the global capacity to fight avian flu. Russia has proposed to increase preparedness for possible avian influenza pandemic, by designating the State Research Centre of Virology and Biotechnology, Vector as the WHO

[299] Sea Island Summit 2004, *G8 Action plan on non-proliferation*, June, 2004.
[300] Sea Island Summit 2004, *G8 Global partnership annual report*, G8 Senior Group, June, 2004.
[301] "US Ambassador to Russia Alexander Vershbow last week outlined Bush administration proposals to help prevent bioterrorist acts and WMD proliferation", *Global Security Newswire*, 26 April, 2004.
[302] "G8 Bioterrorism Experts Group Meeting", Meeting summary, U.S. Department of State, Washington DC, September 30, 2004.
[303] "G8 Action to Endorse and Establish a Global HIV Vaccine Enterprise", June, 2004, at URL http://fpc.state.gov/fpc/33504.htm
[304] "G8 Commitment to Help Stop Polio Forever", June, 2004, at http://fpc.state.gov/fpc/33494.htm
[305] Putin Vladimir, "The upcoming G8 Summit in St. Petersburg: Challenges, Opportunities, and Responsibility", *Media World*, 1 March, 2006, at http://www.kremlin.ru/eng/speeches/2006/03/01/1152_type104017_102507.shtml 2007-10-03.
[306] G7/G8 St, Petersburg Summit Document, "Fight against Infectious Diseases", 16 July, 2006, at http://www.g7.utoronto.ca/summit/2006stpetersburg/infdis.html 2007-09-03.

Collaborating Centre on Influenza for Eurasia and Central Asia and the provision of other technical assistance. For this purpose alone Russia intends to disburse $45 million.[307]

At the 2007 Heiligendamm G8 summit the G8 confirmed their previous commitments on counter-terrorism and specified areas for further joint work.[308] During 2007 G8 partners, except Russia, involved in biological projects have indicated at a meeting that they believe that more should be done in this area in preparation for the summit but this did not come up on the agenda. [309] A review was presented on the progress on fighting HIV/AIDS, tuberculosis and malaria.[310] The G8 leaders also supported a Russian proposal to establish a regional HIV centre to be financed by Russia.[311] The G8 also confirmed their commitments on preventing the proliferation of WMD and the Global Partnership as well as international treaties like the BTWC.[312] [313] [314] In the half way review of the global partnership against the spread of WMD it was noted that some partners will also undertake work in areas not fully addressed so far like biosecurity and biosafety. On the other hand Russia stated that its priority continues to be the dismantlement of decommissioned nuclear submarines and chemical weapons destruction.[315] [316] Cooperative bio-safety and bio-security projects are being undertaken mainly by the U.S., but also on a very small scale by France, Sweden, and the UK.

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[307] Kondakov, A., "Main Outcomes and Follow-up to the Russian G8 Presidency", 3 November, 2006, at http://www.oecd.org/document/41/0,3343,en_2649_34359_37701929_1_1_1_1,00.html

[308] G8 Summit Heiligendamm 2007, "G8 Summit Statement on Counter Terrorism – Security in the Era of Globalisation", at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-ct.pdf 2007-09-03.

[309] Council of the European Union, Six-monthly Progress Report on the Implementation of the EU Strategy against the Proliferation of Weapons of Mass Destruction, Brussels, No. 11024/07, 19 June, 2007, at http://register.consilium.europa.eu/pdf/en/07/st11/st11024.en07.pdf 2007-08-30.

[310] G8, Summit 2007 Heiligendamm, "A Review of the Work of the G8 in the Field of Tackling the Three Pandemics HIV/AIDS, Tuberculosis and Malaria", at http://www.g-8.de/Content/EN/Artikel/__g8-summit/anlagen/2007-11-05-health-review.property=publicationFile.pdf 2007-11-06.

[311] "G8 leaders support regional HIV vaccine centre proposal", *RIA Novosti*, 16 July, 2006, at http://en.rian.ru/russia/20060716/51420573.html 2007-11-06.

[312] G8, Summit 2007 Heiligendamm, "Growth and Responsibility in Africa", 8 June, 2007. at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-africa.pdf 2007-09-03.

[313] G8 Summit 2007, Heiligendamm, "Statement on non-proliferation", at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-nonprolif.pdf 2007-09-03.

[314] Walker, P. F., "Kananaskis at five: Assessing the Global Partnership", *Arms Control Today*, Vol. 37, No. 7, September, 2007, pp. 47-52.

[315] G8 Summit Heiligendamm 2007, "Global Partnership Review", at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-gp-review.pdf 2007-09-03.

[316] G8 Summit Heiligendamm 2007, *Report on the G8 Global Partnership*, at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-gp-report.pdf 2007-09-03.

Under the G8 France pledged €750 million. France has in the biological area set up a partnership with Russia, to develop effective tools to combat the bio-terrorist threat such as for medical therapies and diagnostics. Cooperation is also done concerning quality assurances and biosecurity at Obolensk and Vector.[317] France allocated €5 million 2003-2004 for the biological area. Seven research projects were decided in 2004 and four projects dealing with new therapeutic molecules, new diagnostics, environmental monitoring and a French/Russian review of biosafety and biosecurity in biological facilities were initiated in 2006.[318]

Under the G8 Canada pledged CD$1 billion. Canada plans to increase its activities under the Canadian Biological Non-Proliferation Program to raise awareness among a larger number of donor countries of the need for sustained attention to this area, and to implement specific projects to strengthen biosafety and biosecurity in Russia and NIS countries. The aim is to advance adherence to the BTWC, improve physical protection measures and secure biological items, address illicit trafficking in biological items, to impose use of export controls and minimize holdings of dangerous biological pathogens. Canada became member of ISTC 2004 and has funded through the ISTC 26 projects in the biological area dealing with biosafety and biosecurity (CD$259.8 + 346.1 million from June 2002 to March 2007).[319] [320] [321]

Under the G8 the United Kingdom pledged £750 million. In the biological area the UK has focused on Georgia with two projects (one on £0.2 million ($405000) in 2003-2004).[322] For 2007 there is mention of small biological projects being developed in the G8 project data list and a funding of £1.9 million (funds expanded June 2002 to March 2007).[323]

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[317] "France contribution to the G8", Commissariat à l'energie atomique, France, 2005.

[318] G8 Summit Heiligendamm 2007, *GPWG Annual Report 2007*, Consolidated Report Data, Annex A, at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-gp-report-anx.pdf 2007-09-03.

[319] G8 Summit Heiligendamm 2007, *GPWG Annual Report 2007*, Consolidated Report Data, Annex A, at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-gp-report-anx.pdf 2007-09-03.

[320] Global Partnership Program, "Making a difference", Ministry of Foreign Affairs and trade Canada, FR2-3, 2006.

[321] Strengthening the global partnership, "Fact sheet for Canada", at http://www.sgpproject.org/Donor%20Factsheets/Canada.html 2007-08-30.

[322] The Global Partnership, *Fourth Annual Report*, United Kingdom, Department of Trade and Industry, FCO, and MOD, 2006, at http://www.dti.gov.uk/files/file36547.pdf 2007-08-30.

[323] G8 Summit Heiligendamm 2007, *GPWG Annual Report 2007*, Consolidated Report Data, Annex A, at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-gp-report-anx.pdf 2007-09-03.

The European Union contribution to the G-8 global partnership has been provided through two different mechanisms; the European Community TACIS programme and the European Union Joint Action on non-proliferation and disarmament in Russia. The EU bio-related projects are funded under the employment of former weapon scientists. However, nothing specific is committed to biological projects. Projects were previously funded via the TACIS programme[324] to the ISTC and STCU where €125 million ($150 million) has been committed from 2002 to 2006 (ISTC €100 and STCU €25 million).

The G8 members have reaffirmed their pledged commitment of $20 billion over ten years. It was reaffirmed that proliferation challenges will be addressed worldwide including the retaining of Iraqi and Libyan scientists involved in past WMD programmes. Other recipient candidates, Kazakhstan, Georgia, Uzbekistan and Ukraine have also been discussed but no agreement could be reached but in reality Ukraine is now a recipient.[325] [326] [327] In an assessment of the G8 Global Partnership it is stated that Russia has declined to discuss the issue of biological security within the Global Partnership and very little has been done in this area since Kananaskis.[328] Russian academic proposals on the question of bioterrorism and biosecurity never reached the St. Petersburg Summit. Russia has consistently said that chemical weapons and nuclear issues are the priority for the G8 Global Partnership. Until now far less than one percent of the pledged funding for G8 Global Partnership is intended for the biological area and the reasons for this has been discussed by Potter.[329] According to John Bolton the issues like biological weapons were going to remain a very high priority even if it is not the Russian priority.[330] According to U.S. senator Lugar not enough is

[324] The EU contribution to the G-8 global partnership has been provided through two different mechanisms; the European Community TACIS programme and the European Union Joint Action on non-proliferation and disarmament in Russia.

[325] "Ukraine Selected as Next G-8 Global Partnership Recipient", U.S. Official Says, *Global Security Newswire*, October 14, 2005, at http://www.nti.org/d_newswire/issues/2004/10/14/D2519DEB-8CB1-40EDB3C6-4C048577A5B5.html

[326] Sehling, R., and M. B. Nikitin, "Ukraine and the Global Partnership: An opportunity for progress", *Strengthening the Global Partnership Issue Brief*, No 3, March, 2005

[327] "Global Partnership Update", January 2005. http://www.sgpproject.org/publications/GPUpdates/GPUpdateJan2005.pdf, 8 March 2005.

[328] CSIS, *Assessing the G8 Global Partnership: From Kananaskis to St: Petersburg, Strengthening the Global Partnership Project*, Center for Strategic and International Studies, Washington, July, 2006, at http://www.sgpproject.org/publications/SGPAssessment2006.pdf

[329] Potter, W., Statement at the International Conference, "G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction", Moscow, 23 April 2004 (available at http://www.pircenter.org/rus/club/steno.html

[330] "Interview with John Bolton in preparation for Sea Island summit", in *Global Partnership Update*, Sea Island Edition, No 4, May, 2004, at http://www.sgpproject.org

being done in the biological area where there are still closed facilities that may not participate in CTR activities.[331] It would be in the U.S., EU and Russian interest in finding an agreement on how to handle the problem of the closed Ministry of defence facilities due to the growing risk of proliferation in the biological area why confidence-building measures should as a first step be initiated. Some experts have also proposed adopting cooperative threat reduction mechanisms to India, Pakistan and North Korea.[332]

5.3 WHO, OIE and FAO disease surveillance, biosafety and biosecurity.

A major development for the WHO is the revision of the International Health Regulations (IHR) and the development and implementation of the Global Outbreak Alert and Response Network (GOARN) comprised of 110 linked networks to provide real-time alerts of outbreaks and to support response activities including the Global Public Health Intelligence Network (GPHIN).333 [334] [335] [336] [337] The WHO Biosafety programme assists Member States in achieving a uniform biorisk management approach including on biosafety and biosecurity.[338] [339] The aims are to raise biosafety awareness, reduce the risk of natural or deliberate release of agents of communicable diseases from laboratory facilities and during transport; support adoption and implementation of WHO laboratory biosafety and biosecurity guidelines. One activity is to monitor, ascertain, and provide guidance for containment of smallpox in two official repositories (Vector, Russia and the Center for Disease Control, U.S.). WHO has

[331] U.S. Department of State, "Persistent diplomacy prerequisite for nonproliferation advances, Senator Lugar lists 12 breakthroughs to be pursued for WMD security", International Information Programs, The Washington File, 11 August, 2004.
[332] Goodby, J. E., D. L. Burghart, C. A. Loeb and C. L. Thornton, *Cooperative Threat Reduction for a New Era*, National Defense University, September 2004
[333] *WHO Public Health Response to Biological and Chemical Weapons*, 2nd ed., 2002, at http://www.who.int/emc/book 2nd edition.htm.
[334] "WHO's response to the threat of the deliberate use of biological and chemical agents to cause harm", *Weekly epidemiological record*, No 34, 77, pp. 281-288, 23 August 2002, at http://www.who.int/wer.
[335] "WHO Global Outbreak Alert & Response Network", http://www.who.int/csr/outbreaknetwork.
[336] *WHO Health Report 2007, A Safer Future, Global Public Health Security in the 21st Century*, WHO Geneva, 2007, at http://www.who.int/whr/2007/en/index.html 2007-09-11.
[337] *WHO Office in Lyon, Department of Communicable Disease Surveillance & Response, Report of activities, 2001-2004*, WHO/CDS/CSR/LYO/2004.17
[338] *World Health Organization, Laboratory Biosafety Manual*, Third Edition, 2004, at http://www.who.int/csr/resources/publications/biosafety/en/Biosafety7.pdf
[339] *WHO Biorisk Management, Laboratory biosecurity guidance*, Department of communicable disease surveillance and response, WHO/CDS/EPR/2006.6, September 2006.

declared that it is satisfied with Russian laboratory safety at the facility Vector, Novosibirsk where strains of smallpox virus are kept.340 341 Perhaps the failure to follow appropriate biosafety practices is now the greatest threat for the reappearance of SARS or Polio.[342] [343]

The World Organisation for Animal Health (OIE) and the Food and Agriculture Organisation (FAO) support and assist national governments with disease control programmes and sponsor regional and national animal disease control programmes.[344] They are involved in a joint initiative called the Global Framework for the progressive control of trans-boundary diseases (GF-TADs) within which a specific Global Early Warning System (GLEWS) and response component is envisioned with the participation of the WHO for zoonotic and food-borne diseases.[345] [346] FAO has a well-defined mandate to provide assistance to countries in the field of animal health and through its emergency prevention system.

5.4 The G7+ Health Security Initiative

In 2001 the G7+ group of countries, the U.S., Canada, Japan, Germany, the UK, Italy and France as well as the European Commission and Mexico, agreed to a concerted global action to strengthen the public health preparedness and response to the threat of WMD-terrorism.[347] A Global Health Security Action Group (GHSAG) was formed to implement agreed actions. This includes sharing of information and experiences on preparedness and response plans, collaboration of laboratories (including BSL4), development of risk communication and management methods, promotion of mutual assistance as means to counter attacks and training for health staff. They also agreed to strengthen the smallpox vaccine reserves of the WHO from existing 600 000 to 200 million doses. An

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[340] "WHO declares itself satisfied with Russian lab safety procedures", *Associated Press*, 25 October 2002.
[341] "The World Health Organization, Programme to facilitate *Variola virus* Research", at http://www.who.int/csr/disease/smallpox/research/en/
[342] *WHO, Department of Communicable Disease Surveillance and Response, Biosafety, Programme of work for the 2004-2005 biennium*, WHO Geneva, 2004.
[343] WHO, Department of Communicable Disease Surveillance and Response, Biosafety Project Proposals 2005, WHO Geneva, 2004.
[344] "OIE international health standards", at http://www.oie.int/eng/normes/en_norm.htm
[345] "First meeting for the OIE/FAO regional steering committee of GF-TADS for Asia and the Pacific", 7-9 Mar. 2005, at http://www.oie.int/eng/press/en_050322.htm
[346] Global Early Warning System for major animal diseases, including zoonoses (GLEWS), WHO, OIE and FAO, at http://www.who.int/zoonoses7outbreaks/glews/en/index.html 2008-01-02
[347] G7 Health Ministers' Meeting, "Statement of G7 Health Ministers meeting", Ottawa, 7 November 2001, at http://www.g8.utoronto.ca/health/ottawa2001.html 2007-12-13.

exercise in 2003 was held to evaluate smallpox plans and communications.[348] [349] The aim is to build joint surveillance networks and the group has worked on issues of vaccine development and production, approaches for enhancing national and international preparedness and response to outbreaks of disease (specific focus on smallpox, anthrax and influenza pandemics), outbreak investigations and strengthening public health emergency response and detection.[350] Reaching a common agreement on standards and cooperation among laboratories in participating countries, as well as assistance to other countries has also been a main area of importance.[351]

5.5 OECD, Biological Research Centres.

An example of an initiative to secure dangerous pathogens by establishing biological resource centres (BRC) is carried forward by OECD, a group of thirty-one advanced industrial countries (including the EU as one member).[352] The aim is to establish a global network of BRCs (Biological Research Centres) and to harmonise national standards and regulations to ensure the availability of rare biological resources and permit free exchange of microbial cultures. To certify and enforce the agreed standards on a national basis, the OECD Task Force will set up an accreditation system. The task force is mandated to develop best practices on security and access to biological resources. Each participating government will select a certifying agency, which will conduct periodic checks of biosafety and biosecurity at the participating BRCs. The BRC standards will though probably be fairly modest and general in nature.[353] [354] There is a

[348] "Canada leads bioterror test: Fictitious smallpox outbreak hits Vancover. Eight countries put their health officials through simulated crisis to assess reactions, communications", *The Gazette*, 9 September, 2003.

[349] Commission of the European Communities, Communication from the Commission to the Council and the European Parliament on Cooperation in the European Union on Preparedness and Response to Biological and Chemical Agent Attacks (Health Security), Brussels, 2 June, 2003, Doc. COM(2003) 320 final.

[350] U.S. Department of State, "Fifth Ministerial Meeting on the Global Health Security Initiative", Paris, France, 10 Dec. 2004.

[351] "The G7 Health Ministers Meeting", Statement, London, 14 Mar. 2002, at http://www.g8.utoronto.ca/health/london2002.html

[352] OECD International Futures Programme (IFP), Chairman's summary, "promoting responsible stewardship in the Biosciences: Avoiding potential abuse of research and resources", Frascati, Italy, Sep. 17-19 2004, Summary available at http://www.oecd.org/dataoecd/30/56/33855561.pdf

[353] Organization for Economic Cooperation and Development, *Biological Resource Centers: Underpinning the Future of Life Sciences and Biotechnology*, Paris: OECD, March 2001,

[354] OECD, "Series on Harmonisation of Regulatory Oversight in Biotechnology" no. 32, ENV/JM/MONO(2005)5, An introduction to the biosafety consensus documents of OECD's working group for harmonisation in biotechnology, 22 February 2005.

European Biological Resource Centres Network (EBRCN) initiated by the European Commission through the Common Access to Biotechnological Resources and Information (CABRI).[355] In addition there is an international network[356] and the OECD has prepared guidelines on biosecurity in connection with BRCs.[357]

5.6 The Biological and Toxin Weapons Convention (BTWC) and biosecurity.

There is no other forum than the BTWC where questions concerning biological weapons or bioterrorism can be dealt with in a comprehensive way and since the Fifth Review Conference much of the attempted work has been of a patchwork nature trying to move forward on limited issues and in specific organizational or regional contexts. In general there are few States Parties that have appropriate implementing legislation in place and assistance is needed on a broad range of issues from legal to the training of administrators, law enforcement and customs officials.[358] [359] [360] The importance of strengthening national infectious disease surveillance in order to improve global surveillance and capabilities for rapidly responding to naturally occurring or deliberate diseases has been pointed out.[361] Biosecurity was one topic for discussion during the 2003 BTWC (Biological and Toxin Weapons Convention) expert meeting in Geneva. In 2006 the European Union adopted a Joint Action in support of the Biological and Toxin weapons Convention (BTWC). First, it seeks to promote the universality of the BTWC and secondly it is to assist States Parties with the development of national

[355] The European Commission Common Access to Biotechnological Resources and Information (CABRI) , at http://www.cabri.org/description.html 2007-12-13.
[356] OECD, Biological resource centres, underpinning the future of life sciences and biotechnology, Paris, March, 2001, at URL http://www.oecd.org/dataoecd/55/48/2487422.pdf
[357] OECD, "Best practice guidelines on biosecurity for BRCs", 2007, at http://www.oecd.org/dataoecd/6/27/38778261.pdf 2007-09-10.
[358] Sims, N., "Towards the BWC Review Conference: Diplomacy still in the doldrums", *Disarmament Diplomacy*, No. 82, Spring 2006.
[359] Feakes, D. and G. Pearson, "Achieving the outcomes of the Sixth Review Conference", pp 37-45, *Disarmament Forum*, No. 3, 2006.
[360] Pearson, G., "Maximizing the security and improving oversight of pathogenic microorganisms and toxins", *Briefing Paper No. 5, (Second Series), Strengthening the Biological Weapons Convention*, July, 2003.
[361] "Biological Weapons Convention Experts meeting, 19-30 July, 2004, Experts Exchange Ideas for Strengthening National and International Measures against Infectious and Deliberate Diseases UN News from Geneva", August 2, 2004, at http://www.acronym.org.uk/docs/0407/doc09.htm

implementation legislation of the BTWC.[362] [363] It is proposed that the BTWC should be the main forum for promoting global biosecurity but at the same time not hindering, but rather enhancing and promoting work, in other international forums to achieve improved security and safety in biotechnology and to prevent bioterrorism and development of biological weapons.

5.7 Export control regime, the Australia Group.

Export control involving licensing and oversight of specific trade will delay access to WMD related technologies, goods and know-how and thus delay WMD-programmes development. The Australia Group has helped to harmonize the export control systems of partners. Due to the enhanced threat of biological and chemical terrorism there has been agreement to widen the export controls on CBW (Chemical and Biological Weapons) related items.[364] [365] The lists of agents and equipment have been extended as well as introducing control on technology that can be used to produce equipment of CBW relevance. The Australia Group has also issued common guidelines for partner countries to use. There is also a so called catch all clause meaning that a non-listed item can be controlled if a state gets such information that indicates that this item is aimed for CBW-programmes or CBW-terrorism activities. In the European Union there is common Community regime for the control of exports of dual-use items and technology by the Council that are contained in an EU regulation that is regularly updated.[366]

5.8 UN Security Council resolution on preventing proliferation of WMD.

According to the United Nations Security Council (UNSC) resolution adopted 2004 states are requested to adopt and enforce ‘appropriate, effective’ laws and

[362] EU Joint Action in Support of the Biological and Toxin Weapons Convention, at http://www.euja-btwc.eu/ 2007-12-13.
[363] United Nations, Portugal on behalf of the European Union, Assistance and cooperation in the framework of the implementation and universalisation of the BTWC, Geneva, BWC/MSP/2007/WP.5, 10 December, 2007.
[364] “Australia Group concludes new chem.-bio control measures”, *Arms Control Today*, July/August, 2002, p 21.
[365] Australia Group, Press release, June, 2007, at http://www.australiagroup.net/en/releases/press_2007.htm 2007-09-24.
[366] Council of the European Union, Council Regulation (EC) amending and updating Regulation (EC) No 1334/2000 setting up a Community regime for the control of exports of dual-use items and technology, Brussels, 7 July, 2004, Doc 11121/04.

measures, such as export and border controls, to prevent non-state actors from acquiring and manufacturing WMD or related materials. States should adopt national rules and regulations where it has not been done. It is significant that the resolution was adopted under Article VII of the UN Charter, which recognizes punitive actions to preserve peace and security.[367] [368] States should also report on their legislation in areas relevant also for biosafety and biosecurity. There is now a publicly available data-base with national legislation reported from 112 BTWC States Parties and 7 signatory States Parties of a total of 124 UN member states.[369]

5.9 Other organisations including NGOs activities in support of biosafety/ biosecurity and threat reduction.

One of the few recommendations in the Weapons of Mass Destruction Commission's, WMDC (Blix Commission) report that deal with biological weapons was No. 35. "Governments should pursue public health surveillance to ensure effective monitoring of unusual outbreaks of disease and develop practical methods of coordinating international responses to any major event that might involve bioweapons. They should strengthen cooperation between civilian health and security-oriented authorities, nationally, regionally and worldwide, including in the framework of the new International Health Regulations of the World Health Organization. Governments should also review their national biosafety and biosecurity measures to protect health and the environment from the release of biological and toxin materials. They should harmonize national biosecurity standards".[370] Common international minimum bio-standards and the exchange of best practices are urgently needed, including in the EU. This work should be done involving a wide range of stakeholders and be transparent so as to achieve

[367] United Nations Security Council resolution 1540 (2004) of 28 April 2004, UN document S/RES/1540(2004), 28 April 2004., at http://www.un.org/Docs/sc/unsc_resolutions04.html, On 27 April 2006, the Security Council adopted resolution 1673 (2006), which renewed the mandate of the committee for a further two years and decided that the committee should intensify its efforts to promote the full implementation of resolution 1540.

[368] "Security Council Unanimously Adopts Resolution on Denying Terrorists WMD", *Arms Control Today*, May, 2004, p. 34.

[369] United Nations Security Council 1540 Committee, Legislative data-base, at http://disarmament2.un.org/Committee1540/legalDB.html

[370] *Weapons of Terror, Freeing the World of Nuclear, Biological and Chemical Arms*, The Weapons of Mass Destruction Commission, EO Grafiska, Stockholm, 2006, p. 121.

wide acceptance of the standards taking note of work done by WHO,[371] OIE, FAO, OECD[372] and CEN[373] as well as by others.[374] [375] [376] [377] Another example is making biological or toxin terrorism an international crime which would clearly establish a powerful norm, would facilitate detection and interdiction as well as promoting international cooperation.[378] [379]

The Henry L. Stimson Center in Washington, in a study sponsored by the Canadian government, has developed a new way for sustainable approaches for engagement of former weapon scientists in Russia and FSU states. The idea is to provide the private industry with incentives as employers of former weapons scientists which could then result in sustainable employment for scientists in commercial biotechnology enterprises. It involves a new model of engagement building on a long-term partnership with the private sector. This would mean that the private sector in donor countries would directly cooperate with the private sector in the recipient country. It is only the private sector that has the required managerial and organisational capacity for employment that will be able to redirect scientists in the long term. It can be noted that this model is not meant to replace other ways for threat reduction but can be seen as complementary and a new way of doing business. Non-proliferation funds should be used to give commercial companies incentives to cooperate with partners in targeted countries for support programs. Now when the supported country like Russia has an improving economy it is reasonable that these partnerships and cooperative projects are jointly funded. A Public-Private Partnership (PPP) should be established to manage government non-proliferation investments.[380] [381] This

[371] *WHO Biorisk Management, Laboratory biosecurity guidance*, Department of communicable disease surveillance and response, WHO/CDS/EPR/2006.6, September 2006.
[372] *OECD Best practice guidelines on biosecurity for BRCs, 2007*, at http://www.oecd.org/dataoecd/6/27/38778261.pdf 2007-09-10.
[373] *CEN Laboratory Biorisk Management*, CEN European Committee for Standardisation, at http://www.biorisk.eu/documents/draft_document.PDF 2007-09-10.
[374] International Council for the Life Sciences, at http://www.iclscharter.org/home.html 2007-11-06.
[375] EBSA European Biosafety Association, at http://www.ebsaweb.eu/ 2007-11-06.
[376] Tucker, J., "A strategy for international harmonization of biosecurity standards under SCR 1540", Presented at Workshop on U.N. Security Council Resolution 1540 as it pertains to biological weapons, Palais des Nations, Geneva, 3 December, 2004.
[377] Atlas, R., "Globalizing biosecurity", *Biosecurity and bioterrorism: Biodefense strategy, practice, and science*, Vol. 3, No. 3, 2005, pp. 51-60.
[378] Meselson, M. and J. Robinson, "A Draft Convention to Prohibit Biological and Chemical Weapons under International Criminal Law", *The Fletcher Forum of World Affairs*, Vol. 28, No. 1, 2004, pp. 57-71.
[379] Kellman, B., "Draft Model Convention on the Prohibition and Prevention of Biological Terrorism", *Terrorism and Political Violence*, London, Vol. 14, No 4, 2002, pp 163-208.
[380] *The Pathogen for Peace Initiative: Expanding Resources to Address Neglected Diseases, Promote Economic Development, and Support Sustained Scientific Engagement*, The Henry L. Stimson Center, July, 2006.

model could for example be tested by EU Russian cooperation in the field of biotechnology. A careful analysis would be required of potential projects and companies in Russia and the EU to be given support for an initial test. In the U.S. there is a non-profit association USIC (U.S. Industry Coalition) of 150 companies and universities to facilitate commercialisation for the U.S. scientist redirect programs of today.[382]

There are several other NGOs in U.S. that actively take part in or monitor threat reduction activities like the Nuclear Threat Initiative (NTI). It funds projects promoting disease surveillance, preventing misuse of the life sciences and strengthen public health preparedness, development of diagnostics and vaccines. One project has focused on examining the anti-plague system of the former Soviet Union regarding biosecurity and proliferation of biological agents, and the potential for converting the system for broader public health and bioterrorism surveillance, with particular emphasis on institutes in Uzbekistan, Kazakhstan, and Georgia.[383] [384] Another organisation which has for long time worked on these issues is the The National Academies (NAS) has had a cooperation programme with Russia since 1997 involving joint research on dangerous pathogens funded by the CTR programme. Recently a comprehensive review was carried out on Russian biotechnology with a focus on infectious diseases, public health and bioterrorism. 30 institutes were visited excluding institutes belonging to the Ministry of Defence. The report recommended focusing on surveillance, diagnostics and countermeasures as well as exploiting biotechnology potential of commercialising scientific results.[385] The Center for Nonproliferation Studies at the Monterey Institute for International Studies carries out extensive studies covering biological issues in Russia and NIS including a recent major study on the anti-plague system. The Partnership for

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[381] *The 2010 initiative expanding resources to address public health challenges, promote economic development, and support sustained scientific engagement and non-proliferation*, Concept paper, Stimson Center, 2006, at http://www.stimson.org/cnp/pdf/2010_Concept_Paper.pdf 2007-09-19.

[382] Kellett, F. P., *USIC and the Initiatives for Proliferation Prevention: A survey of companies doing business in the former Soviet Union*, The Henry L. Stimson Center, Report No. 60, March, 2007.

[383] NTI Annual Report 2006, Seeing the danger is the first step, at http://www.nti.org

[384] NTI, List of projects in biological area, at http://www.nti.org/b_aboutnti/b7_events.html 2007-11-06.

[385] *Biological Science and Biotechnology in Russia, Controlling Diseases and Enhancing Security*, National Research Council of the National Academies, Washington D.C., NAS Press, 2006.

Global Security (PGS) (previously named RANSAC) has organised a series of international conferences to promote discussions on threat reduction in the biological area (see list of references). The RAND Corporation has also carried out studies focused on the U.S. CTR program and the diversion of expertise and critical information from WMD weapons complexes of the former Soviet Union.[386] Other organisations deal with the topic of threat reduction on an *Ad Hoc* basis but it can be noted that there are very few in Europe except Landau Network – Centro Volta, and Stockholm International Peace Research Institute (SIPRI). The World Bank funds projects with a focus on public health in Russia and FSU such as HIV/AIDS, tuberculosis, avian influenza and pandemic preparedness.[387] The World Bank finances a number of projects in Russia and one is the Tuberculosis and AIDS Control Project 2003-2008 with a loan of $150 million.[388] Scientific cooperation has and can take place also through the NATO-Russia cooperation through the NATO Russia Council's (NRC) Committee for Science and Security Programme where one of seven priority areas is CBRN protection.[389]

The Center for Strategic and International Studies (CSIS) in Washington covers a broad area concerning security studies including biosecurity and threat reduction issues. CSIS has also with the Swedish Institute of Foreign Affairs (UI) and the Swedish Defence Research Agency (FOI) in Sweden carried out a study to initiate direct cooperation and joint projects between a group of European and Russian institutes and a series of meeting were held in Stockholm to develop ideas which were 2006 presented in a report. The group agreed on a series of recommendations and a number of proposals for collaborative work. There has though been no continuation of this work at this stage.[390] A Finnish Russian Joint Biotechnology Laboratory (JBL) was established at Turku University after a high-level political decision in 1989. The cooperative work is carried out in the area of applied biosciences with a funding of around $0.5 million annually. There

[386] Parachini, J. V., *et. al.*, *Diversion of Nuclear, Biological, and Chemical Weapons Expertise from the Former Soviet Union, Understanding an Evolving Problem*, Documented Briefing, RAND Corporation, National Security Research Division, 2005, at http://www.rand.org/pubs/documented_briefings/2005/RAND_DB457.pdf 2007-10-15.

[387] The World Bank list of projects, at http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/0,,category:country~menuPK:51559~pagePK:221246~piPK:95913~theSitePK:40941,00.html 2007-08-30.

[388] At http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/RUSSIANFEDERATIONEXTN/0contentMDK:20354081~menuPK:703141~pagePK:141137~piPK:217854~theSitePK:305600,00.html 2007-10-15.

[389] The NATO-Russia scientific cooperation the NRC Committee on Science for Peace and Security NRC (SPS), at http://www.nato.int/science/about_sps/nato_russia.htm 2007-11-07.

[390] Macby, J., Rapporteur, Strategic Study on Bioterrorism, FOI, UI, IMEMO and CSIS, 2006

have during the years been a number of workshops and joint projects carried out. There are also plans to develop a diagnostic centre in Turku for cooperation with Russia and other EECA countries.

Fermentation vessel at former BW plant (Photo K. S. Westerdahl FOI)

6 Discussion and recommendations

The continuing appearance of highly virulent emerging and re-emerging communicable diseases highlights the need for coordinated preparedness in support of global public health. A disease outbreak in one country can be spread internationally in a matter of hours or days. Outbreaks of infectious diseases continue to have significant consequences for public health, agricultural and the global economy. Timely and detailed surveillance of infectious disease outbreaks or epidemics is essential for most states security. This is particularly so for diseases which may have major impacts on health and international trade, and also for the ability to detect and recognize the possible deliberate release of an infectious agent. The outbreaks of highly pathogenic avian influenza (H5N1) highlighted the need for improved international cooperation in detecting such diseases and mounting an effective well coordinated rapid response.[391] The rapidly increasing problem of antimicrobial drug resistance that has already rendered a growing number of infectious diseases harder and more costly to treat with available drugs should also be a priority when it comes to develop countermeasures. Most crucial is the ability to detect and identify novel or unusual human, animal or plant diseases rapidly and specifically so that surveillance is a real-time process. Effective monitoring of infectious diseases, which includes timely reporting, better coordination between the animal and human health communities, building and improving laboratory capacities, and being transparent including sharing of samples in accordance with national and international regulations, conventions and the exchange of reliable data on outbreaks are essential parts of preventing and fighting outbreaks of diseases. New infectious diseases and new strains of already known pathogens emerge periodically. The consequences of an outbreak of infectious disease resulting from deliberate use of a pathogenic microorganism could in addition be at least as devastating as naturally occurring infections, and possibly more so. Russia also made the fight against infectious diseases a priority at the St. Petersburg G8 summit 2006. As people, knowledge and products increasingly move across borders as well as information being easier to get hold of through the worldwide web and more widespread expertise has on the other hand made it easier to acquire dangerous pathogens (BW-agents), materials or know-how.

One obvious area in line with this is to increase cooperation on and coordination of the surveillance networks for human, animal and plant diseases, diagnostic

[391] Brown I., *et. al.*, Rapport de Mission, *Mission to Russia to assess the avian influenza situation in wildlife and the national measures being taken to minimize the risk of international spread*, OIE, Paris, October, 2005.

capabilities, drugs and vaccine development, training and preparedness planning in Russia or other EECA countries as well as in developing countries. In addition supporting existing global networks of the World Health Organization (WHO), such as the Global Outbreak Alert and Response Network (GOARN) and similar OIE systems are important. Measures should be taken to further strengthen global surveillance mechanisms like the Global Early Warning System (GLEWS) as well as helping EECA and developing countries improve, as appropriate, the capacity of their national systems. There is a need for the quickest possible initial response from the outset of any human pandemic for example influenza and to develop concepts for rapid response teams that could be used for emergencies due to natural or deliberate outbreaks. The EU could set up such specific rapid response teams to be used in a crisis that can be used for support in bio-preparedness planning, in cases of bioterrorism and training in Russia and other EECA countries. One aim could be to help states in collaboration to establish similar multipurpose task forces. These EU teams could when fully developed be used for emergencies in the EU or outside the EU. Increased consultation and coordination of preparedness, prevention, response, and containment measures among nations is required. This cooperation should be done through partnership with interested states by providing technical assistance and training experts, building capacities, improving biopreparedness for future emerging infectious diseases, including through future-oriented scientific and clinical research projects. This should be done at the same time as taking into account the aspect of preventing proliferation in the biological area.

A more flexible and effective surveillance system in Russia and other EECA countries that will be well integrated in the European and global surveillance systems for human, animal and plant diseases should be supported. The capabilities for diagnostics, development of medical countermeasures like vaccines and basic R&D on priority pathogens should be supported. As an example it is most unfortunate that no cooperative type activities have been possible to initiate at the Russian anti-plague institutes although the need is great. The disparate systems for epidemiological surveillance of both human and animal diseases at the Russian anti-plague institutes and stations as well as at other institutes should be strengthened and better integrated with other systems [392] Preparedness for infectious disease outbreaks is a priority in Russia and other EECA countries and incentives should be provided for public health institutes to play a more active role. They need incentives to prepare for emergencies,

[392] Potter, W., “Statement at the International Conference, G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction”, Moscow, 23 April 2004, at http://www.pircenter.org/rus/club/steno.html

develop preparedness and response plans, and improve communication and information sharing as well as for setting up field teams.

The effect of the forecasted climate changes will also mean that the pattern of diseases in for example Northern Europe but also Russia, Ukraine and Belarus will change which is so far not well studied to enable good preparedness planning. Outbreaks of infectious diseases in Russia or other EECA countries and their capacity for early detection and preparedness to handle these will have implications for their neighbours like the European Union including the Nordic countries. The global warming will cause an increase in incidences of intestinal infectious diseases in the northern part of Russia where there is permafrost that might no longer be permanent so that water and sewages systems might be damaged in addition to flooding. There will also be a change in patterns of disease vectors like mosquitoes and ticks that can spread diseases. In Russia malaria has increased six times during the last 10 years. West Nile fever broke out in Astrakhan, Volgograd and Krasnodar regions in 1999 and there is a risk of new outbreaks due to the climate changes. Other diseases are Dengue fever, Crimean Congo hemorrhagic fever and Omsk hemorrhagic fever. Tick borne diseases like Lime and other rickettsiosis can also become more of a problem. Due to the risk that areas with permafrost will no longer have permafrost means that areas with anthrax spores in the soil can result in increased risks of infections. The knowledge on the risks due to global warming are not well known in Russia, Ukraine or Belarus why research on this should be a priority and could be a good area for European cooperation as the perceived problems are of mutual concern.

To this can be added that a new post Cold War security situation now exists in Europe against which the threat reduction programs initiated during the Cold War must be viewed. Terrorism has become a major threat to international peace and security and the changed international security environment means that non-proliferation and disarmament activities are now also truly global problems. Not least due to the global risks from biological weapons, bioterrorism, outbreaks and spread of infectious diseases and rapid developments in biotechnology. The fight against bioterrorism will need the active cooperation of not least Russia and other EECA states with their vast knowledge base concerning dangerous pathogens and toxins. Measures are needed to achieve a real and lasting partnership for our own security in Europe. There would also be a need for an umbrella agreement between EU and Russia and other EECA countries to cooperate on protection against bioterrorism. Partnership cooperation in this area could have commercial possibilities and could at the same time be confidence-building. R&D programmes could be initiated to develop improved protection for civilian populations with projects focusing on measures such as to secure pathogen

collections, development of rapid identification and detection methods, develop medical counter-measures or support basic research on priority pathogens. Here the EU Seventh Framework Program (FP7) for R&D could be one way to enhance cooperation. In addition the relatively small sums of funding needed to improve biosecurity and bio-preparedness are well spent from a neighbour and global perspective in order to decrease the availability of pathogens and know-how. There should be a review of the present situation regarding biosafety and biosecurity in respective countries. A global strategy for biosecurity to establish international standards for safe and secure handling of pathogens and toxins should be promoted.[393] It has been proposed that global biosecurity standards are urgently needed.[394] [395] [396] The EU should promote and develop biosecurity standards inside the EU but also in cooperation outside the EU with Russia and other EECA countries. What measures will be needed has been asked in the European Commissions Green Paper on bio-preparedness?[397]

One of the challenges is to promote work on preparedness against outbreaks of serious diseases that constitute a global security threat, improve international cooperation to prevent the risk of BW/bioterrorism and at the same time preventing proliferation of BW knowledge and dangerous biological agents that could be misused. Joint research and development programs with the EU could focus on dangerous pathogens of mutual concern, improving capabilities for detection and diagnostics. If the science centres (ISTC and STCU) were reformed they could be most useful for supporting this cooperation and new types of partnership.

Strengthening countries general preparedness, disease surveillance capabilities, diagnostic capabilities as well as level of biosafety and biosecurity will reduce on a national basis the risk of bioterrorism. There needs to be a set of criteria used when deciding type of activities and/or geographical areas that are of priority for cooperation. In order to channel funding to the areas of greatest proliferation

[393] Roffey, R. and F. Kuhlau, "Enhancing biosecurity: the need for a global strategy", Appendix 14A, pp. 732-748, in *SIPRI Yearbook 2006, Armaments, Disarmament and International Security*, Stockholm International Peace Research Institute, Oxford University Press, 2006.
[394] Tucker, J., "Preventing the Misuse of Pathogens: The need for global Biosecurity Standards", Arms Control Today, June, 2003.
[395] Atlas, R. M. and J. Reppy, "Globalizing biosecurity", Biosecurity and bioterrorism: Biodefense strategy, practice, and science, Vol. 3, No. 3, 2005, pp 51-60.
[396] Kellman, B., "Draft Model Convention on the Prohibition and Prevention of Biological Terrorism", *Terrorism and Political Violence*, London, Vol. 14, No 4, 2002, pp. 163-208.
[397] European Commission, Green Paper on Bio-preparedness, Brussels, Doc. COM(2007) 399, 11 July, 2007.

concern a graded approach could be used for example divided into four levels in order of priority[398]:

1. States which have had previous advanced and large BW-programmes;

2. States that recently have had previous BW-programmes or been part of such;

3. States with low levels of biosafety and biosecurity but still work with or possess collections with dangerous pathogens; and

4. States that requests support, that work with or possess dangerous pathogens, where the level of biosafety and biosecurity is low, the epidemiological surveillance systems are inadequate and terrorism activities are a concern.

The risk of proliferation of know-how, technologies, expertise and biological agents is a global problem. The West has engaged Russia and former Soviet Union republics in cooperation for over fifteen years to prevent proliferation of WMD related materials, technologies and know-how through the so called CTR (Cooperative Threat Reduction) or other similar programs. These programs activities are reviewed. The political situation and the economic situation have changed for Russia why the cooperation is changing towards a more true partnership. The previous threat reduction activities in the biological area have been difficult due to politics and lack of transparency from the Russian government. One example is that the biological area has not become one part of the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. There are also still a number of challenges for cooperation and partnership in the area of infectious diseases and biotechnological R&D in Russia and other EECA countries. There is still a limited involvement of international biotechnology/pharmaceutical companies in Russia. One can also say that the concept of redirecting former weapons scientists is fading as time passes and the question is which are the future needs. The interest in and funding for ISTC/STCU type projects is also decreasing in Russia and the West. There is a trend that the overall CTR programs that the U.S. funds in the biological area are being increased but that the U.S. Department of Defense is moving its support from Russia to other EECA countries or other parts of the world due to problems encountered. One significant change the last years is that the support is being redirected increasingly towards epidemiological surveillance, biosafety and biosecurity as well as medical countermeasures or biotechnology aspects. The

[398] Roffey, R., *From Bio Threat to EU Biological Proliferation Prevention Cooperation*, Background paper 4, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html 2007-03-10.

US has concluded that the transparency these programs have resulted in has given the government "high confidence" that no offensive BW research is ongoing.

A new broader type of proliferation prevention partnership should be developed and could provide new opportunities for all involved including for the EU. Strategies are needed for limiting and achieving the restructuring of remaining BW infrastructure so that activities can be sustained even after assistance programmes are reduced and eventually terminated. Russia's and other EECA countries former biological weapons infrastructure remains a prime target for those interested in illicitly acquiring weapons, material or know-how. It is also clear that proliferation prevention programmes should be extended beyond Russia and into other nations of concern, two such countries that should be a priority now is Belarus and Ukraine. Then other states in Central Asia and the Caucasus that have not yet received CTR type support should be targeted not forgetting the Middle East, North Africa and parts of Asia. States should actively engage in the work of international organizations like WHO, OIE, FAO or OECD to promote biosafety and develop biosecurity practices as this will help to achieve standards that can over time become generally accepted worldwide. The EU should here take on a more prominent role also for setting standards outside Europe. There is also a need for an initiative on non-proliferation education and training.[399] There are also some other proposals and ways of working to promote new activities in the biological threat reduction area.[400] [401] [402] [403] [404] [405]

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[399] United Nations, Study on Disarmament and Non-proliferation Education, (Japan and Sweden key proponents), Resolution 57/60, 22 November 2002.

[400] *The Pathogens for Peace Initiative: Expanding Resources to Address Neglected Diseases, Promote Economic Development, and Support Sustained Scientific Engagement*, The Henry L. Stimson Centre, Washington D.C., July, 2006.

[401] Phillips, K., Presentation in *Next Generation Threat Reduction, Bioterrorism's challenges and solutions*, New Defence Agenda, Biblioteque Solvay Brussels, 25 January, 2005.

[402] *Strategic Study on Bioterrorism*, UI, CSIS, IMEMO and FOI, Report FOI, 2006, and Mackby J. and O. Dahlman, Bioterrorism and a layered approach to biodefence, Strengthening the Global Partnership, Issue Brief, No. 5, October, 2005.

[403] Roffey, R., *From Bio Threat to EU Biological Proliferation Prevention Cooperation*, Background paper 4, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html 2007-03-10.

[404] Luongo, K. and I. Williams, "The nexus of globalization and next-generation non-proliferation, tapping the power of Market-based solutions", *Nonproliferation Reviews*, Vol. 14, No. 3, November 2007.

[405] Chyba, C. F., "Biotechnology and the challenge to arms control", *Arms Control Today*, October, 2006.

In general the past cooperative threat reduction (CTR) programs over more than fifteen years must be said to have been successful in general in their achievements. Unfortunately a too small part of these programs have though been devoted to the biological area. It can be noted that the U.S. has by far been the principle fund provider for threat reduction support in the biological area over the whole period. Why this is the case is probably due to a number of reasons. Other states have only lately initiated small programs in comparison in this area, like the United Kingdom, Canada, France and Sweden. A number of countries have during this period including the EU supported redirection of former weapon scientists through the science centres, the International Science and Technology Centre in Moscow (ISTC) and the Science and Technology Centre Ukraine (STCU), supporting research in the life sciences including biotechnology and on infectious diseases in general. During these fifteen years there is a trend that can be noted that threat reduction funding is directed more towards public health issues such as epidemiological surveillance, biosafety/biosecurity, diagnostic methods and to common research priorities in the area of biotechnology away from conversion and elimination of BW infrastructures. The question is then if the public health issues and concerns can and are covering the non-proliferation concerns that were the main reason for these threat reduction programs?

In many cases political constraints have severely limited how far non-proliferation support programs could go and what they could achieve. A state's willingness to cooperate will depend on a calculation of the former BW program's and involved scientists importance to its perceived national security and other geopolitical considerations, compare for example with the Iraqi situation.[406] An underlying issue is whether countries that pose particular risks would be prepared to provide adequate cooperation to achieve the aims set up for support programs. There are technical constraints on support due to the need to have accurate information from the recipient country and being able to verify it and ensure that assistance does not aid a covert BW-capability that is kept in secret. This is extremely difficult if the recipient country is not fully open and transparent concerning previous activities. Political fluctuations will of course also influence the progress and the atmosphere of more or less cooperation.

The expressed fears at the beginning of the 1990s that Russian or former Soviet republics BW-scientists and technicians would emigrate in large numbers have not materialized. Nevertheless, rumours maintain that a few scientists have sold their services to states of concern. Generally, however, former Russian WMD scientists have been unwilling to leave Russia for long periods. The internal brain

[406] Squassoni, S., *Globalizing cooperative threat reduction: A survey of options*, CRS Report to Congress, 15 April, 2004.

drain has been larger than the external. Nearly all of those who left Russia for a shorter or longer period went to the US or other Western countries where the laboratories are well-equipped and financial resources are available.[407] Many that left were leading scientists in their fields and as their research were of international standing this made it easier to get positions abroad. Scientists from the Ministry of Defence institutes were not aloud to leave.

A concern in the case of Russia is that threat reduction programmes have so far not been able to initiate contacts with the military microbiological facilities subordinated to the Russian Ministry of Defence with support or to initiate a confidence-building process.[408] Scientists at these institutes are still prevented from international contacts in the West or cooperation. The civilian facilities belonging to the organization Biopreparat, have in many cases been opened to foreign support. There are though problems with access to the anti-plague institutes under the Ministry of Health and Social Development and there are no reasons why they should not participate in cooperation programs as they work on public health issues and in many cases on dangerous diseases.[409] It is still not known how the situation is concerning biosafety/biosecurity measures at many institutes in Russia. If the situation is similar to those institutes in Central Asia there would be a need for much international support. It has been difficult to address cooperation with Russia related to implementing presidential agreements from the beginning of the 1990's.[410] Questions still remain on the status of facilities, equipment and personnel of the previous Soviet programme on biological weapons. Even if there is slowly progress being made on the issues of access and transparency much more could be expected from the Russian Governments side. The previous unsupportive attitude to threat reduction activities in the biological area has so far not changed. The problems have damaged US-Russian relations in this area for a long time. Statements by Russian officials that there has not even been an offensive BW program are of course not helpful in this respect. This situation has to be resolved through

[407] Roffey, R., "Need for enhanced support for threat reduction in the biological area for redirecting production facilities", Presented at the Non-proliferation and Disarmament Cooperation Initiative (NDCI) Conference, London, United Kingdom, 4-5 March 2004.
[408] Luongo, K. N., Averre, D., Della Ratta, R. and Martellini, M., "Building a forward line of defense security former Soviet biological weapons", *Arms Control Today*, July/Aug. 2004, at http://www.armscontrol.org/act/2004_07-08/Luongo.asp 2007-11-08.
[409] Ouagham-Gormley, S. B., Plagued by Errors: New Approach Needed to tackle Proliferation Threats from Anti-Plague System, *Arms Control Today*, March, 2006.
[410] Anthony, I., *The role of the EU in international non-proliferation and disarmament assistance*, Geneva Centre for Security Policy occasional Paper Series, No. 44, October, 2004.

diplomatic means in order to make progress.[411] [412] One result of this situation is that the U.S. DOD is redirecting its threat reduction activities away from Russia towards other former Soviet Union republics.

There have for a long time been problems in the contacts between the U.S. Departments responsible for threat reduction programs in the biological area and Russian Ministries why agreements have been sought on lower levels of the government including directly with involved institutes. This is in contrast with the situation in the former Soviet republics where there has been no problems with achieving agreements with governments and Ministries to initiate threat reduction programs and to discuss the national priorities for involved institutes or with access to or cooperation with specific institutes. Some U.S. officials feel that the Russian government should play a greater role also for funding projects for redirecting scientists as the U.S. funding for Russia is decreasing. In addition there is a need, according to the U.S. officials, to again assess how successful the CTR bio-proliferation programs have been and also assess if there still remains a biological weapons proliferation threat from Russia.[413] It should also be mentioned that now the World Bank and the Global Fund to Fight AIDS, Tuberculosis and Malaria have major efforts directed at Russia and that these are bigger than U.S. funding for biological threat reduction in Russia.[414]

What is required of Russia is a transformation from a passive support recipient to an active partner. This means that Russia should be more active and have a greater role in planning of this kind of cooperative activities but first Russia has to be convinced that the biological area is still of concern and a priority. Here a political change is needed and that the Russian government becomes more supportive. This means that similar to how threat reduction programs are carried out in the Central Asian republics the actions taken and plans for improvements at institutes is part of a government plan for upgrading biosafety/biosecurity as well as decisions for the type of R&D to support. This also means that Russia has to also fund these kinds of activities. Concerning biosecurity very little has been

[411] Averre, D., pp 51-56, in *Next Generation Threat Reduction, Bioterrorism's challenges and solutions*, New Defence Agenda, Biblioteque Solvay Brussels, 25 January, 2005.

[412] Roffey, R., "Lessons learnt from the former Soviet BW programme and threat reduction activities", Presented at the Workshop on Lessons learned from the Soviet, Iraqi and South African Bio-programmes as well as Bio-terrorist attacks", Institute Francais des Relations Internationales, Paris, France, 20 September 2004.

[413] Douglas, M., Session 2, p. 12, in (eds. K. N. Luongo, J. R. Della Ratta, D. Averre, and M. Martellini), *Cooperation on Bio-Initiatives in Russia and the NIS: Towards a True Partnership, Analysis and Report from the September 28-29, 2006 Conference*, Partnership for Global Security and Landau Network-Centro Volta, Fall, 2007.

[414] *Biological Science and Biotechnology in Russia, Controlling Diseases and Enhancing Security*, National Research Council of the National Academies, Washington D.C., NAS Press, 2006, p. 65.

achieved so far. In this area too it would be helpful if there was a national review available on the present situation concerning biosafety and biosecurity at facilities in Russia. It has been proposed that Russia reach an agreement on an action plan for biosecurity with some Western partners as this could be beneficial for widening cooperation.[415] It is important that the support given is not a one-time investment but that it is followed by actions for maintaining equipment, investments or training. Focus for the threat reduction programs have been to build infrastructure and capacities at former Soviet facilities in order to allow them to become self-sustaining commercial enterprises. There are and have been many hurdles in doing this. like lack of access to sensitive facilities, inadequate government support, poor infrastructure and communications, lack of experience of putting together and managing market-oriented business plans, inability to focus on the markets demand, IPR (intellectual property rights), regulatory issues, and meeting international GMP/GLP standards.[416]

The present situation in the biological area points to a very weak support from the Russian government for on-going activities in their present form and political initiatives are needed by the EU to promote these issues on a political level. It has to be discussed how funding from several EU pillars can be achieved, for example dealing with public health, food safety, export control, research and law enforcement etc. could all support proliferation prevention projects. Now the EU has a financial instrument for this in the Instrument for Stability.[417] There is an urgent need to look at potential mechanisms by which such multipurpose cooperation could be achieved keeping the non-proliferation aims of the activities. A broad political discussion will be needed involving several political areas to find a new and improved EU policy on cooperative proliferation prevention with a public health and biosecurity focus.

Funding is and has been a problem for the biological area in contrast to the nuclear and chemical areas for political and other reasons as they have been given higher priority. For a compilation of funding for biological CTR projects

[415] Kobyakov, D. and V. A. Orlov, *Global partnership: What's next?* Report prepared for the Geneva Centre of Security Policy, April, 2005, at http://www.sgpproject.org/publications/KobyakovOrlovApril2005GPWhatisnext.pdf

[416] Averre, D., K. N. Luongo and M. Martellini, *Advancing bio threat reduction, findings from an international conference*, Landau Network Centro-Volta and Russian American Nuclear security Advisory Council, 2004.

[417] Regulation (EC) No. 1717/2006 of the European Parliament and the Council of 15 November 2006 establishing an instrument for stability, Official Journal of the European Union, L 327/1, 24 November, 2006, at http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_327/l_32720061124en00010011.pdf 2007-10-15.

see a SIPRI report from a Pilot Study for the European Commission[418] and from the G8 Summit in Heiligendamm.[419] There is a need for increased funding levels not least due to the enhanced risk of bioterrorism and the still urgent needed support for infectious disease control required in Russia, other EECA countries and also worldwide. One obstacle has been how to know that the funds are used for what they were supposed to be used for and that no diversion occurs. The Science Centres have devised mechanisms to try and handle this. It is though clear that a small part of the funds for a project often is diverted in order to get a project approved in the recipient country but there is no information on how usual this is or the amounts involved.

In order to achieve lasting results concerning redirecting scientists or to achieve self-sustainability of commercialisation attempts a long-term approach has to be found. For research there is also a need for longer term projects so scientists can see a future in a new research area. At the same time a careful review is needed of which research groups and areas of research that have reached international standards which should be one priority for support. Here a dialogue with governments is necessary for discussions on priorities for funding from a scientific point of view. It would be beneficial to initiate cross border competitive grants programs. The selection of research projects should then be done jointly by Russia, other EECA countries and Western partners. The EU Seventh Framework Program (FP7) is such a cross-border initiative also for international cooperation but if Russian and other EECA scientists shall be able to compete and participate in various research consortia they will need special support and it would also be needed to set priorities for the type of research in order to also meet non-proliferation aims. Special support could be set a side for young scientists that might become future scientific leaders in their fields. It is important to increasingly integrate Russian and other EECA science communities in international networks by promoting international publishing in English, participation in international conferences and joint projects with foreign partners.

There is a need for better coordination among the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction donors, to establish a common strategy for support also in the biological area. This is also the case for

[418] Kuhlau, F., *Overview of ongoing international activities aimed towards preventing proliferation of biological technology, material and expertise that may be used for hostile purposes*, Annex to report: R Roffey, From Bio Threat Reduction to Biological Proliferation Prevention Cooperation, SIPRI, 2005.

[419] G8 Summit Heiligendamm 2007, *GPWG Annual Report 2007*, Consolidated Report Data, Annex A, at http://www.g8.utoronto.ca/summit/2007heiligendamm/g8-2007-gp-report-anx.pdf 2007-09-03.

the governments, biotechnology industry and scientific community in the biological area. On the Russian side they claim that cooperation with biotechnology industry is the pathway to transforming their institutes. On the other side Western companies have not favoured Russia for investments in biotechnology but instead other areas such as India or China. Even if most biological institutes are situated in Russia there are also a number in other EECA countries where the biosecurity situation is even worse than in Russia.[420]

The Russian government has identified biotechnology as a target industry for the 21st century. This could provide a commercial platform for former BW-facilities that could help to address the critical gaps in healthcare, and support the development of innovative medical techniques. The EU could investigate the potential benefits of greater cooperation in biotechnology.[421] A clear strategy is needed from Western partners on how to reach the proliferation aims so that cooperation is well focused on the areas of technology or institutes of most concern. Priority should be given to facilities that are known or which recipient country declares as having been part of a previous BW-programme as they still might have agents of weapon grade, special sensitive equipment left and know-how of sensitive nature. One difficulty will always be to match the right company with the right scientists. There is now an organisation for National Industry Coalition in Russia and also a biotechnology association that could be used to help with match making. One problem is though that in those cases where there have been Western ventures in the biotechnology area they have largely been unsuccessful. The first step must be that the Russian government creates the right conditions for investments in this area including infrastructure development. One of the key problems now is how to find ways of operating partnership programs in the changing Russian political environment.[422] The focus for commercialization should not be on the high tech-end, the strictly regulated pharmaceutical industry with its high investment needs and long-term strategic plans, but rather in the agricultural, food industry or for diagnostic methods. It has been proposed to promote public-private partnerships (PPP) to help in implementing the threat reduction programs that could implement a new model for sustainable non-proliferation and economic development. According to the

[420] Luongo, K. N., D. Averre, J. R. Dela Ratta and M. Martellini, *Advancing International Cooperation on Bio-Initiatives in Russia and the CIS, Findings and Report from the April 26-27, 2005 Conference*, Ransac and Landau Network-Centro Volta, Spring, 2006.

[421] Luongo, K. L., D. Averre, R. D. Ratta and M. Martellini, "Building a forward line of defense, securing former Soviet biological weapons", Arms Control Today, Vol. 34, No. 6, 2004.

[422] Rao, J., US State Department, in Luongo K. N., D. Averre, J. R. Dela Ratta and M. Martellini, *Advancing International Cooperation on Bio-Initiatives in Russia and the CIS, Findings and Report from the April 26-27, 2005 Conference*, RANSAC and Landau Network-Centro Volta, Spring, 2006, p. 10.

Stimson Center ongoing study significant commercial opportunities could be derived from effective engagement of Russian other EECA countries bioscientific communities while promoting non-proliferation.[423] A careful analysis should also be carried out of the potential benefits to European biotechnology industry enhancing the engagement in cooperative activities in Russia and other EECA countries. This should take into account various European countries comparative advantages in specific areas.[424] Some argue that there can be a danger in directing funding towards commercialisation as it might decrease the non-proliferation aspects of the projects.[425]

Russia has not been willing to take up the biological area in the framework of the G8 Global Partnership as chemical weapons destruction and nuclear submarine dismantlement issues are their priority. There seems to be less support from Western governments to do something to prevent bio-proliferation in Russia and other EECA countries which is most unfortunate. The future of the Science Centres is by no way clear today and it is viewed by some influential governments as less relevant to continue to provide short-term grants to scientists through the ISTC and STCU. The international non-proliferation commitments such as the BTWC sets a norm but as long as there is no control or verification mechanism it has not and probably will not be sufficient to prevent covert BW activities. Other commitments like the G8 Global Partnership is very limited as it so far only involves declarations but no joint actions in the biological area. Other initiative like UNSC 1540 will strengthen and promote implementation of the BTWC and national legislation but it is too early to evaluate the preventive effect it will have on potential terrorists determined to acquire dangerous biological agents. The Australia Group's export control regime has had a preventive effect but it has clear limitations due to the difficulties to detect illicit transfers of microbial pathogens.

The EU has very good relations in general with Russia, can use a broad range of instruments like trade, research, public health, agriculture and industrial relationships to promote good cooperation and at the same time achieve the non-

[423] Stimson Center, *The 2010 initiative: Expanding Resources to Address Public Health Challenges, Promote Economic Development, and Support Sustained Scientific Engagement and Nonproliferation*, at http://www.stimson.org/cnp/?SN=CT20050721888 2007-09-11.

[424] Roffey, R, 2004, "Need for enhanced support for threat reduction in the biological area for redirecting production facilities", Presented at the Non-proliferation and Disarmament Cooperation Initiative (NDCI) Conference, London, United Kingdom, 4-5 March 2004.

[425] Boureston, J. and M. B. Nikitin, *Improving the ISTC/STCU science centres' programmes to support worldwide non-proliferation objectives*, Background paper 8, Presented at the European Commission, UNIDIR/ISIS/SIPRI Conference on Strengthening European Action on Non-Proliferation and Disarmament – How can Community Instruments Contribute, Brussels, December 7-8, 2005, at http://www.sipri.org/contents/expcon/euppconfmaterials.html

proliferation aims. The EU now also has the Instrument for Stability for financing these types of issues. The difficulty lies partly in the complex internal EU structure for decision making. There is a need to have a strong coordination role in the EU that can set the goals that should be achieved for threat reduction or assistance programs and is able to evaluate on-going activities. There is now the EU WMD Monitoring Centre that could perhaps play a role here and supported by the ECDC in its area of competence. So far EU's engagement in the biological area has only been through the Science Centres and only then in a passive manner by agreeing to projects presented to the centres but not actively searching for projects, this in contrast to the U.S. way of operating. So far, the European funding has and is focused on nuclear safety and destruction of chemical weapons and scientist redirection efforts. The EU has its special structure and security policy is still largely a matter for member states of the first pillar. In general Russia is of overriding importance in foreign relations for the whole EU but also for non-proliferation support. As the EU has determined that Russia is a middle income country which will require a lower level of financial assistance the support for Russia will decrease in relation to previous years. Cooperation has now to be enhanced or continue in the framework of the European Neighbourhood and Partnership Instrument and through the Seventh Framework Programme (FP7).[426]

Help is needed for example with realistic business plans, intellectual proprietary rights, patent issues, identify viable products, identify markets and provide training. Another difficult problem is still to achieve international standards for GMP (Good Manufacturing Practice), GLP (Good Laboratory Practice), biosafety or biosecurity. Also in this area the EU could benefit from cooperation and would have much to offer. To achieve a more focused approach in areas of specific support and assistance the EU should consider if separate centres of excellence devoted primarily to promoting diagnostics, epidemiological surveillance, biosafety and biosecurity including research and training would enhance efficiency. It can be proposed that one such potential centre could have its focal point at the ECDC with subsidiary laboratories for implementation and training in Russia for example at TEMPO (Non-commercial Partnership Center of Modern Medical Technology) or other EECA countries. Potentially such centres could be engaged also in non-proliferation training in the biological area.

[426] Luongo, K. N. *et.al.* Analysis and recommendations, in (eds. K. N. Luongo, J. R. Della Ratta, D. Averre, and M. Martellini), *Cooperation on Bio-Initiatives in Russia and the NIS: Towards a True Partnership, Analysis and Report from the September 28-29, 2006 Conference*, Partnership for Global Security and Landau Network-Centro Volta, Fall, 2007, p. 6.

The future role of the science centres has to be considered as there seems to be a decreasing support for them from several Western governments in addition to this there has been very limited support for them, since their establishment, in the Russian administration. There is no clear view among the funding partners on how to reform the centres or how a modified mandate would look like. In the EU this difficulty is clearly seen and in addition the EU responsibility for the centres has recently been transferred to the Directory General for Research of the European Commission. For a long time the European Commission has been rather passive in its way to handle project proposals and there is no pro-active engagement to get proposals in special areas or from specific institutes. Proposals are agreed or rejected for European funding but without giving the reasons behind. Now the quality of the research has for the EU become much more of a priority than before. New cooperation and partnership efforts should go through radically reformed ISTC and STCU applying well specified criteria for funding. The difference being that the funding partners should be more focused and list priorities for the type of work to be granted. This would benefit funders as they would have better insight, understanding and possibilities to influence the research so that it becomes a more active cooperation. It should be considered if there is not a need for an organizational unit to achieve the goal of establishing a clear EU point of contact for these kinds of issues. Time has showed that it is not efficient or sufficient to continue handle these questions in the EU and Member States as has been done until now.

6.1 Summary of recommendations

1. The EU should based on the new Instrument for Stability develop a concrete action plan for how to enhance EU cooperation with Russia and other EECA countries in the biological area. This would require concrete plans for cooperation in different areas like public health, promoting biotechnology ventures, R&D in priority areas, which can be combined with the EU's non-proliferation aims in the biological area. Develop guidelines and priorities for EU cooperative proliferation prevention and assistance activities. All relevant stakeholders in the EU should be involved in this process not just those directly responsible for non-proliferation issues.
2. Negotiate an agreement with the Russian government for an EU cooperative proliferation prevention programme in the biological area with a focus on public health, biotechnology and biosecurity. This has to be part of a long-term strategy involving financial and political commitment on both sides to prevent proliferation, with the focus on

technology and institutes of most concern, in supporting public health, R&D, biotechnology development, agriculture, environment, and potential commercial collaboration.

3. Initiate similar agreements with the other EECA countries for EU cooperative proliferation prevention programmes.

4. The EU should take initiatives to radically reform the science centres (ISTC and STCU) to fit with the type of cooperative proliferation prevention and assistance activities that will be the result of the above proposed review of activities.

5. The EU should promote active collaboration in the biological area in the framework of the G8 Global Partnership, press for a implementation agreement with Russia in the biological area not focusing on past BW activities but on areas of mutual and future concern.

6. The EU should initiate a study on the possible creation of one or several centres of excellence for collaboration on bio-preparedness and biosecurity/biosafety training as well as supporting epidemiological surveillance training affiliated to for example the ECDC (European Centre for Disease Control). The activities could include setting up specific rapid response teams that can be used for support in bio-preparedness planning and training in EECA countries. One aim could be to help states in collaboration to establish similar multipurpose task forces. These EU teams could when fully developed be used for emergencies in the EU, for outreach activities for the BTWC, for directed and focused cooperation with EECA countries and also for global outreach by EuropeAid for developing countries, during natural disasters, humanitarian crisis and in conflict areas. Russia and other EECA countries have experiences in the area of bio-preparedness and when it comes to field teams that could be a good base for cooperation. Engage Russia and other EECA countries in cooperative work reviewing the present situation regarding biosafety and biosecurity in respective countries and based on this formulate any requirements for support programs.

7. Encourage Russia to allow Ministry of Health and Social Development anti-plague institutes and Ministry of Defence facilities to participate in Global Partnership and CTR type cooperation.

8. Examples of cooperation could be:

   a. Support, enhance and improve coordination of surveillance networks for human, animal and plant diseases and integrate them in EU and international networks through collaborative projects, training and improving diagnostic capabilities and upgrading laboratory capacities. Include local diseases in the projects like HIV/AIDS, tuberculosis and hepatitis C as examples to promote local participation in Russia and other EECA countries.

   b. Studies of the effects of climate changes on the pattern of infectious diseases in for example Northern Europe but also Russia, Ukraine and Belarus that will change. This is so far not well studied but could enable forecasting models and developing good preparedness planning. Outbreaks of infectious diseases in Russia or other EECA countries and their capacity for early detection and preparedness to handle these will have implications for their neighbours like the European Union including the Nordic countries.

   c. The EU could investigate the potential benefits of greater cooperation in biotechnology R&D and commercialisation. The areas in biotechnology in addition to R&D would be diagnostic methods and the agricultural or food industry rather than the strictly regulated pharmaceutical industry with its high investment needs and long-term strategic plans. Public-private partnerships should be promoted to help in implementing this kind of assistance programs that could implement a new model for sustainable non-proliferation and economic development of mutual benefits. Significant commercial opportunities could be derived from effective engagement of Russian/FSU bio-scientific and biotech communities while promoting non-proliferation aims. It is only the private sector that has the required managerial and organisational capacity to employ and will be able to redirect scientists in the long term. Non-proliferation funds should be used to give commercial companies incentives to cooperate with

partners in targeted countries for support programs. Now when the supported country like Russia has an improving economy it is reasonable that these partnerships and cooperative projects are jointly funded.

d. One area could focus on prevention of bioterrorism and enhancing biosecurity R&D programmes could be initiated to develop improved protection for civilian populations of mutual benefit. Part of this could be projects focusing on biosafety and biosecurity measures to secure pathogen collections, development of rapid identification and detection methods, develop medical counter-measures or support basic research on priority pathogens. The consequences of an outbreak of infectious disease resulting from deliberate use of a pathogenic microorganism could in addition be at least as devastating as naturally occurring infections, and possibly more so.

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8 List of abbreviations and acronyms

AMC	Advanced Market Commitments for vaccines
BCR	U.S. Bio-Chem Redirect Program
CBW	Chemical and Biological Weapons
BEP	U.S. Biosecurity Engagement Program
BII	U.S. Bio Industry Initiative
BTRP	U.S. Biological Threat Reduction Program
BRC	Biological Research Centres (OECD)
BSL	Biosafety Levels
BTEP	U.S. Biotechnology Engagement Program
BTWC	Biological and Toxin Weapons Convention
BW	Biological Weapons
BWIE	U.S. Biological Weapons Infrastructure Elimination program
CABRI	Common Access to Biotechnological Resources and Information
CBRN	Chemical Biological Radiological and Nuclear
CBM	Confidence-Building Measures (in the framework of the BTWC)
CEN	European Committee for Standardisation
CDC	U.S. Center for Disease Control
CIMIT	Center for Innovative Medicine and Integrated Technology (U.S.)
CRDF	U.S. Civilian Research and Development Foundation
CRL	Central Reference Laboratory (NIS)
CTR	Cooperative Threat Reduction Program
CWC	Chemical Weapons Convention
DHHS	U.S. Departments of Health and Human Services
DOD	U.S. Department of Defense
DOS	U.S. Department of State

DOE	U.S. Department of Energy
DTRA	U.S. Defense Threat Reduction Agency
EBRCN	European Biological Resource Centres Network
ECDC	European Centre for Disease Prevention and Control
EECA	Eastern European and Central Asian countries [427] formerly called NIS
EU	European Union
ENPI	European Neighbourhood Partnership Instrument (EU)
EPA	Environmental Protection Agency
ERA	European Research Area (EU)
EWRS	Early Warning and Response System (epidemiological surveillance system, EU)
FAO	United Nations Food and Agriculture Organisation
FY	Fiscal Year
FSU	Former Soviet Union
G8	Group of eight leading industrial countries
GAVI	Global Alliance for Vaccines and Immunization
GLEWS	Global Early Warning System (WHO, OIE and FAO)
GHSAG	Global Health Security Action Group (G7+)
GLP	Good Laboratory Practice
GMP	Good Manufacturing Practice
GMT	Good Microbiological Technique
GOARN	Global Outbreak Alert and Response Network (WHO)
GPEI	Global Polio Eradication Initiative
GPHIN	Global Public Health Intelligence Network
HSC	Health Security Committee (European Commission)

[427] EECA, formerly called the New Independent States NIS: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

IICSI	Iraqi International Center for Science and Industry
INTAS	International Association for the promotion of cooperation with scientists of the former Soviet states
IPP	U.S. Initiatives for Proliferation Prevention
IPR	Intellectual Property Rights
ISTC	International Science and Technology Centre, Moscow, Russia
MDG	Millenium Development Goals (UN)
NADR	U.S. Nonproliferation, Anti-terrorism, Demining, and Related Programs
NAS	U.S. National Academies of Science
NIS	Newly Independent States of the former Soviet Union (includes in this report all these states except Estonia, Latvia and Lithuania now part of EU)
NGO	Nongovernmental Organisations
NDPHS	Northern Dimension Partnership in Public Health and Social Well-being (EU)
NTI	Nuclear Threat Initiative
OECD	Organisation of Economic Cooperation and Development
OIE	World Organisation for Animal Health
PCA	Partnership and Cooperation Agreement (Russia and EU)
RABIIT	Russian – American BioIndustry Initiative Integrated Toxicology Testing program
RAPS	U.S. Regulatory Affairs Professional Society
RAS-BICHAT	Rapid Alert System for BC-Attacks and Threats (EU)
R&D	Research and Development
RF	Russian Federation
SARS	Severe Acute Respiratory Syndrome
STCU	Science and Technology Centre, Kyiv, Ukraine
TACIS	Technical Assistance to the Commonwealth of Independent States

TADR	U.S. Threat Agent Detection and Response network
TB	Tuberculosis
TEMPO	Noncommercial Partnership Center of Modern Medical Technology
UNICEF	United Nations Children's Fund
UK	United Kingdom
UNSCR	United Nations Security Council Resolution
USDA	U.S. Department of Agriculture
USIC	U.S. Industry Coalition
WHO	World Health Organisation
WMD	Weapons of Mass Destruction
WTO	World Trade Organisation