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Breaking out of the CTR mold?

Canada's recent biosecurity partnership with Kyrgyzstan could create a new model for preventing brain drain, showing it has learned a lot from the Cooperative Threat Reduction program—both good and bad.

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In April 2009, Canada signed a bilateral agreement with Kyrgyzstan to implement a comprehensive, $40 million biosecurity, biosafety, and bioweapons nonproliferation program.[1] Preceded by extensive consultations with foreign donors and the United States, the new Canada-Kyrgyz nonproliferation program is modeled on the U.S.-based Cooperative Threat Reduction (CTR) program and integrates lessons learned from the U.S. experience.[2] The CTR program has been relatively successful in limiting the proliferation of bioweapons in the former Soviet Union. However, Canada has the opportunity to avoid certain CTR pitfalls and could enhance its focus on, for example, how to strengthen bio-engagement activities (also referred to as brain-drain prevention). In this regard, Canada would do well to break out of the CTR mold by exploring *alternative* approaches to bioweapons nonproliferation.

Bioweapons proliferation threat in Kyrgyzstan. Although Kyrgyzstan didn't contribute actively to the Soviet Union's bioweapons program, the country houses several biological research facilities specializing in human and animal diseases that pose a proliferation threat. For instance, Kyrgyzstan's anti-plague facilities, which are responsible for monitoring naturally occurring plague, anthrax, cholera, and hemorrhagic fever, collect new strains of these diseases annually and store them in buildings that have crumbling infrastructure and little or no security.[3] Besides the risk of theft by outsiders or insiders, there is also the possibility that the absence of biosafety equipment and insufficient safety training for new recruits could lead to the accidental release of a pathogen.

Additionally, although the personnel in these labs didn't work directly on Soviet bioweapons projects, they do isolate, work with, and handle pathogens that have a bioweapons relevance and are

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skilled in training others to work with such agents in laboratory and field conditions. Thus, there is the potential for the transfer of their highly valued knowledge to malign agents. This is all the more serious because Kyrgyzstan is located on Central Asia's drug and WMD-related trafficking routes. As Kyrgyzstan does not receive support under the CTR, Canada's involvement has the potential to reduce the threats that come from trafficking.

Defining Canada-Kyrgyzstan cooperation. This partnership will address numerous aspects of biosecurity in Central Asia.[4] Ottawa will upgrade security and safety activities at several biological facilities, train personnel in biosafety best practices, and support research projects employing Kyrgyz bioscientists through the International Science and Technology Center.

In order to serve Kyrgyzstan's long-term needs, Canada will support the construction of a new Biosafety Level 3 (BSL-3) facility to consolidate several institutes' pathogen collections under the Kyrgyz Ministries of Health and Agriculture and the National Academy of Sciences.[5] The facility also will serve as a central laboratory to conduct research on dangerous pathogens. In addition to bringing all pathogens under one roof, the facility will include an electronic pathogen accounting system to replace the existing paper-based system, allowing personnel to more accurately track the movement and use of dangerous disease strains. Consolidation of pathogen collections is one of the lessons learned from the CTR program, which moved from establishing long-term security, safety, and accounting upgrades at individual facilities to encouraging consolidation at a central location when possible, thereby reinforcing security and decreasing the program's cost.

In terms of urgent needs, Canada will fund emergency security upgrades at three anti-plague centers in Bishkek, Osh, and Karakol. This will help ensure pathogen safety until the strains can be moved to the central repository, due to be operational in 2013. Specifically, communication systems (e.g., phones and radios) at these locations will be upgraded. The lack of such systems had affected scientists who isolate pathogens in the field or transport them across the country. At times, they would be incommunicado for several days or weeks, thus creating a potential breach in the pathogens' chain of custody. Three new vehicles also will be provided to transport dangerous biological material. Although it seems like a small step, previous pathogen transports were made via private cars or motorcycles due to funding shortages.

Canada also will be engaged in brain-drain prevention by supporting eight research projects in Kyrgyzstan, which, according to Canadian officials, employ 115 Kyrgyz scientists and technicians. Ottawa sponsors the creation of a biosecurity and nonproliferation

culture by funding training projects dealing with issues such as bioweapon-related export controls, Biological Weapons Convention implementation, biosafety, biosecurity, and nonproliferation. In addition, to promote the harmonization of biosafety guidelines, Canada has funded the translation of World Health Organization biosafety guidelines and is also working with the Kyrgyz Ministries of Health and Agriculture to review and update Kyrgyz safety guidelines to include nonproliferation and security requirements.[6]

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Learning from, not mirroring, the CTR program. Although the CTR program has been successful in improving the security of tangible assets (i.e., upgrading safety and security systems, consolidating dangerous pathogen collections, improving pathogen accounting, building secure laboratories, and dismantling dangerous sites), the program has not lived up to its potential as far as protecting less tangible assets (e.g., bioweapons-related knowledge).

Indeed, brain-drain prevention under the CTR program is based on the principle that bioscientists should be encouraged to remain at their former facilities in order to ensure that they do not proliferate and, furthermore, are supported in this endeavor. Such an approach was appropriate in the late 1990s when these programs began because the Soviet Union's breakup increased the risk of scientists fleeing the country and heightened the risk that they might help rogue states or terrorist groups. CTR also operated with little intelligence, and the sense of urgency that came after 9/11 reinforced the CTR program's focus on quickly engaging targets of opportunity.

These circumstances meant that little effort was invested in collecting data on how Soviet bioweapon scientists, technicians, and engineers worked to develop biological weapons—whether individually or as part of a team. Without any investigation into these knowledge relationships, it has been impossible to determine accurately whether the CTR program is focused on those individuals who pose the greatest proliferation threat. This rather straightforward information could provide important clues about whether the bioweapons-related knowledge they possess is personal (i.e., unique to a specific individual) or communal (i.e., shared by a group of scientists or technicians)—which could lead to significant policy implications.

People with personal knowledge can carry their unique weapons-relevant skills wherever they might go. Therefore, they should continue to receive nonproliferation support in the form of research

grants, among other things, regardless of whether they remain at their former facilities. On the other hand, scientists who possess communal bioweapons knowledge should be engaged differently. Because their collective knowledge depends on the integration of the individual skills of each team member, breaking up these former teams reduces proliferation risks. These individuals should be encouraged and supported to leave their former facilities or work with different teams on different kinds of projects. Similarly, understanding whether a former bioweapons organization had a training mission in Soviet times may also provide clues about the ability of individual scientists to transfer their knowledge efficiently to others.

Surprisingly, the CTR program may inadvertently contribute to enhancing, rather than decreasing or eliminating, the proliferation threat. Indeed, by keeping scientists in their original facilities, often still working with their Soviet-era colleagues, the program actually contributes to the preservation of communally held skills and knowledge instead of allowing these skills to decay by breaking up the teams. On the other hand, because it doesn't support individuals who leave their former facilities, the program leaves the door open to proliferation of personally held knowledge. Moreover, CTR-funded research projects primarily deal with biodefense, employing scientists to investigate pathogens that they have worked on in the past for bioweapons purposes. It does not specifically target former bioweapon scientists who were educators, such as scientists at antiplague facilities. Addressing each of these issues is an opportunity to improve the nonproliferation of bioweapons knowledge.

Breaking out of the CTR mold. It is perhaps this understanding of bioweapons knowledge that will be the greatest boon to the Canada-Kyrgyz partnership. If Canada fully absorbs CTR's lessons and adjusts accordingly, the Canada-Kyrgyz partnership has the potential to become a model for future proliferation-related brain-drain projects. Among the most important points the program leaders should keep in mind:

Don't fall prey to quantitative metrics. Although CTR boasts large numbers of scientists involved in cooperative research projects, gross figures do not accurately reflect the nonproliferation value of these projects—not only because these numbers have, at times, been over-inflated by counting one individual working on several projects multiple times but also because numbers do not reflect the specific weapons-related knowledge these individuals possess. To be most useful, the Canadian program should systematically gather data on scientists' and technicians' past work and understand how Soviet-era work practices produced different types of bioweapons-specific knowledge that require different nonproliferation responses. Keeping such individuals and groups as far removed

from bioweapons-related activities as possible, including biodefense research, and focused instead on public health projects, would be in the best interests of nonproliferation.

Study the local security, economic, and social environment in which individual facilities operate. Facilities located on or near illicit trafficking routes or in depressed local economies should receive priority funding because they are more vulnerable to proliferation threats. Additionally, by supporting or complementing existing local projects, Canada could save money and avoid redundancies. For example, the Swiss Tropical Institute is working with several of the institutes engaged in the Canadian program to study and improve the surveillance of brucellocis in Kyrgyzstan.[7] Canada should join this project or fund research dealing with other endemic diseases, leaving the study of brucellosis to the Swiss partner. CTR has rarely taken into account the local environment, thus missing an opportunity to refine its engagement policy. A small investment in detailed, targeted studies could prove enormously helpful to designing and implementing Canadian-funded nonproliferation activities.

By systematically targeting individuals with bioweapons knowledge and adjusting programmatic responses based on the type of knowledge they possess and the local environment, Canada will greatly increase the nonproliferation value of its program and truly prevent the proliferation of bioweapons-related knowledge. ■

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NOTES

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