The Anti-plague System in the Newly Independent States, 1992 and Onwards: Assessing Proliferation Risks and Potential for Enhanced Public Health in Central Asia and the Caucasus

by

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Executive Summary

This report focuses on the status of the anti-plague (AP) system in ten republics of the former Soviet Union (FSU). Although the circumstances described in this report relate mainly to the period 1992 – 2004, many of the systems and their facilities that we describe experience the same difficulties in 2007. However, some significant changes have taken place since 2004 at AP facilities located in countries that have become the beneficiaries of assistance programs such as the U.S.-funded Cooperative Threat Reduction (CTR) Program. These changes – and sometimes the lack thereof – will be the subject of a future publication.

After the Soviet Union's dissolution in December 1991, the centralized Moscow-controlled state AP system disintegrated into smaller national systems within the Newly Independent States (NIS). During the 1990s, national AP facilities had to contend for their survival on many fronts. From the administrative point of view, AP facilities had to counter attempts by national authorities to merge the AP system with the Sanitary Epidemiological System (SES)—a Soviet-era organization responsible for many traditional public health functions such as water and food sanitation and vaccine campaigns, but one without adequate expertise in dealing with highly dangerous diseases. In effect, if these attempts had succeeded, the AP systems would have been placed under the authority of the SES, thus threatening their survival and retention of unique expertise. The battle was most pronounced in Kazakhstan and Uzbekistan—inheritors of the largest number of AP facilities from the Soviet Union. The struggle ended in the late 1990s when an outbreak of human plague occurred in Kazakhstan, convincing most national governments of the importance of maintaining the AP systems as independent organizations. The exception was Moldova, where the AP system was entirely dismantled.

Only in Georgia was the AP system safe from the pressure to reorganize. The Georgian government chose to place the AP system at the center of its national public health system and transferred several other public health organizations with a wide array of functions and responsibilities under its authority. However, these circumstances generated a different set of challenges, as this report shows.

The economic crisis that followed the Soviet Union's dissolution also threatened the survival of the AP systems in the NIS. Most AP facilities experienced an average 50 percent decrease in their budgets and a loss of personnel that reached a staggering 80 percent in some cases. Although most of the AP institutes and stations established during Soviet times were still operational in 2004, they were in various states of disrepair and insolvency. As a result, their scientific activity and output were low, hovering between 20 and 50 percent of what it was during the Soviet era.

The combination of these circumstances adversely affected the security and safety of the AP facilities and severely curtailed their ability to perform disease surveillance, research, and training. With insufficient funds to maintain infrastructures, most of the facilities visited by the James Martin Center for Nonproliferation (CNS) staff during 2002-2004 had deteriorated and physical security features were absent or in poor condition. Alarm systems installed in Soviet times were out of order in most cases. Perimeter walls or fences surrounding AP facilities were often broken or badly damaged,

leaving them vulnerable to unauthorized intruders. Physical security features at laboratory buildings and pathogen collection rooms were woefully inadequate—often consisting only of ordinary padlocks and wax seals, which would not prevent a potential intrusion. To make matters worse, personnel background checks, which were customary in Soviet times, were no longer conducted due to a lack of financial, administrative, and technical means.

Safety conditions were in a similar poor state. After 1992, funds allocated by national authorities were insufficient to replace obsolete equipment or to purchase the basic material to conduct laboratory work, such as agar, substrates, and glassware. AP scientists worked with highly dangerous pathogens without basic biosafety equipment, such as glove boxes and filtered ventilation systems. In addition, many AP facilities were, and still are today, located in residential areas or city centers, thus creating the potential for an outbreak in the civilian population caused by pathogens escaping from a laboratory or culture collection as a result of an accident or deliberate act.

Disease surveillance programs were also in disarray. With obsolete equipment, sharply reduced funding, and a lack of qualified personnel, disease surveillance activities had on average decreased 60 percent since Soviet times. AP personnel generally concentrated their efforts and meager resources on heavily populated areas, leaving more isolated areas unvisited by surveillance teams. Some areas had not been surveyed since the Soviet Union's dissolution. When teams were sent out in the field, the length of disease surveillance campaigns was decreased from the usual two to three months per year in Soviet times, to one or two weeks. In addition, AP personnel concentrated their surveillance efforts on a smaller number of diseases than previously, generally only plague and cholera.

These circumstances generated three types of proliferation risks with varying degrees of gravity: risks pertaining to the diversion of pathogens, brain drain, and transfers of equipment.

One of the most serious threats was the possibility that insiders or outsiders would purloin pathogens housed at AP facilities. Most AP institutes and regional stations possessed unique collections of pathogenic bacterial, fungal, and viral strains collected over many years during the Soviet era and, to a lesser extent, after their home nations became independent. Some of these pathogens had characteristics—virulence and antibiotic resistance—that made them ideal raw material for states or terrorist groups seeking to acquire biological weapons. Considering the lack of physical security and the openness of AP facilities' territories, the risk of unauthorized access to pathogens was high.

An equally important proliferation threat was brain drain. Although few non-Russian AP facilities were directly involved in the Soviet biological warfare (BW) program, they retained two categories of personnel that posed proliferation threats: personnel who worked on projects sponsored by the Soviet BW program, and personnel who have gained experience from working with pathogens of BW relevance. Indeed, many AP staff members, including scientists and technicians, were highly educated in the biological and epidemiological characteristics of some of the world's deadliest pathogens. They were also accustomed to working with low-tech equipment and under harsh field conditions—two characteristics that appeal to states or terrorist groups intent on secretly acquiring and operating a BW program. AP personnel were poorly paid, with

average salaries lower than the national or regional average. In addition, several AP facilities were, and still are today, located on or near illicit trafficking routes for drugs and weapons and areas where various terrorist groups operate. These circumstances dramatically increase the risks that personnel might be co-opted by criminal or terrorist groups.

The possibility that equipment and supplies, meager as they were, might be stolen and used by criminals or terrorists could not be ignored. However, taking into consideration that most of the laboratory equipment in use at AP facilities was obsolete and in bad repair, the proliferation threat posed by diverted equipment was not significant. In addition, due to the shortage of laboratory equipment in AP facilities, any theft would have been immediately discovered and the likely thief identified.

As this report recounts, AP systems in the NIS clearly posed numerous proliferation risks. Simultaneously, however, these systems also hold the key to raising the level of public health in the NIS, including Russia. AP institutes and stations possess unique expertise that today is in short supply throughout the world, and some of it may be so specialized as to be nonexistent elsewhere. With international assistance, this expertise could be put to work once again to protect Europe's southeastern flank from imported infectious diseases. In addition, AP facilities house collections of bacterial, fungal, and viral pathogens that could be utilized by teams of FSU and Western scientists for basic research and development of anti-microbial drugs and vaccines. A side benefit of such collaborative research is that adequately funded AP specialists would be less susceptible to recruitment by proliferating states and terrorist groups than poorly paid specialists. Potentially, the AP institutes could be highly beneficial to their national populations, offer valuable know-how for the control of infectious diseases elsewhere in the world, and for maintaining culture collections of interest to both science and industry. Although the United States has spearheaded an effort under the CTR Program to improve the security of biological research facilities and improve disease surveillance in Central Asia and the Caucasus, the level of engagement of AP facilities in this program was minimal in 2004 and is still wanting today. It is worthwhile noting that other than the United States, western countries, most notably European countries, have so far not involved themselves in assisting AP systems in the NIS. (The reasons behind the suboptimal circumstances of AP facilities, together with an evaluation of international assistance programs supporting the AP system, were the subject of an article written by Sonia Ben Ouagrham-Gormley, published in 2006;[1] found in Annex 1 of this report.)

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Introduction

This is the second report on the history of the former Soviet Union's (FSU) anti-plague (AP) system written by Sonia Ben Ouagrham-Gormley, Alexander Melikishvili, and Raymond A. Zilinskas. The first report was published in five discrete but contiguous articles in the February 2006 issue of *Critical Reviews in Microbiology*,[2] and on the James Martin Center for Nonproliferation Studies (CNS) website.[3] In the first report, the authors concentrated on the Soviet AP system as it existed and operated until the Soviet Union's dissolution in December 1991. In this second report, the authors explore the AP system's recent history, spanning from 1992 to 2004. Although the authors completed their field research on the AP system in 2004, more recent information from outside sources has been included selectively in some chapters as appropriate.

Based on information derived from site visits, interviews of AP personnel, and reports commissioned from AP facilities in the NIS, this report concentrates on clarifying the post-Soviet status of AP or public health systems in ten countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Ukraine, and Uzbekistan. The authors describe the structural changes in national AP systems that occurred between 1992 and 2004, AP facilities' work programs and staffing patterns, the security of their microbial and viral culture collections, the proliferation threat stemming from these facilities, and the conditions under which AP personnel monitor naturally occurring foci of dangerous diseases.

Belarus presents a special case because it does not have an AP system, nor did it ever have one. However, when we started this project, we were unaware that Belarus had no AP system, so one of us visited the country and, as with other countries, met with government public health officials and scientists working for its premier microbiological research institute. After having invested much work into investigating the Belarus public health status and proliferation potential, and having found information of pertinence to our study, we decided to include a chapter on this country.

This report describes and analyzes both the proliferation potential and the public health impacts of the AP systems in the ten countries listed above. Each country is covered in its own chapter, and each of the ten chapters outlines the history of the nation's AP system and describes the public health activities of the nation's AP system; international activities that involve the nation's AP system; and the proliferation potential of the nation's AP system.

It is important to note that the situation of some AP facilities has dramatically changed since 2004, due to security and safety improvements conducted under the auspices of U.S.-funded nonproliferation programs such as the CTR Program; particularly significant developments in this regard have taken place in Kazakhstan, Uzbekistan, and Georgia. These programs and today's situation of the AP system will be the subject of a future report.