

Chapter VI: The Anti-plague System of Kyrgyzstan

1. History of the Kyrgyz Anti-plague System

Plague outbreaks in neighboring China, Iran, and Afghanistan were the main reason why Tsarist authorities opened eight medical observation outposts along the Semirechenskaya *oblast*-China border in 1897. At the time the Semirechenskaya *oblast* incorporated the entire territory of present-day Kyrgyzstan and it was administered by the Central Asian general-governorship directly appointed by and accountable to the Tsar. The first medical observation outpost was established in the settlement of At-Bashy (Naryn province of Kyrgyzstan) on February 6, 1897.¹³⁸ However, the deterioration of the epidemiological situation continued, with plague outbreaks in the mountainous Tyan Shan region of Kyrgyzstan occurring in 1907, 1908, 1910, and 1913. After the Bolshevik Revolution of 1917 and the overthrow of the Tsarist government, Kyrgyzstan's Soviet authorities responded to a plague outbreak in the village of Bashkaindy in 1928 by establishing an AP laboratory in Frunze, Kyrgyzstan's capital, in 1929. The nascent Kyrgyz AP system expanded in the 1930s and thus was able to provide epidemiological monitoring to the rest of the country. AP laboratories were set up in Przhevalsk (northeastern Kyrgyzstan), Osh (southern Kyrgyzstan), and At-Bashy (in the north).¹³⁹ In 1939, the AP laboratory in Frunze was upgraded to an AP station and the three AP laboratories were placed under its administrative control. In 1943, the At-Bashy AP laboratory was reorganized into a field AP station, followed by similar reorganizations of AP facilities in Przhevalsk and Osh in 1947. Throughout the Soviet period, the official title of the AP station in Frunze was the Central AP Station or Republic AP Station. In Soviet times, the Central AP Station was directly subordinate to the Main Directorate of Quarantine Infections of the Soviet MOH. Until 1949, the Russian Scientific-Research AP Institute "Microbe" (in Saratov, Russia) oversaw the activities of the Central AP Station in Kyrgyzstan. From 1949 until 1991, the Scientific-Research AP Institute of Central Asia (now A.M. Aikimbayev Kazakh Center for Quarantine and Zoonotic Diseases in Almaty, Kazakhstan) provided methodological and scientific guidance and oversaw epidemiological activities carried out by the Kyrgyz AP system.¹⁴⁰ In April 2001, the Central AP Station was renamed the Republic Center of Quarantine and Especially Dangerous Infections (RCQEDI). It is subordinate to the Kyrgyz MOH.

2. Public Health Activities of the Kyrgyz Anti-plague System

As of May 2003, the Kyrgyz AP system was comprised of the RCQEDI in the capital Bishkek and field AP stations in At-Bashy, Karakol, and Osh¹⁴¹ (see Figure 7). The Kyrgyz AP system employed 156 persons in 2003, including 23 physicians, 8 zoologists, 42 laboratory technicians, and 61 auxiliary personnel (disinfectors, sanitary workers, drivers, guards, etc.). The RCQEDI was comprised of a Plague Laboratory, a Bacteriological Laboratory, a Cholera Laboratory, a Laboratory of Arboviruses, a Zoological-Parasitological Department, and a Vivarium. RCQEDI's public health activities included epidemiological monitoring of natural plague foci, as well as sites where other highly dangerous diseases occurred.

Figure 7. Organizational Structure of the Kyrgyz Anti-plague System



As of 2003, natural plague foci covered 16 percent of Kyrgyzstan's territory (188,500 sq. km). As a result of systematic epizootic studies of the environment from 1939 to 1955, the Kyrgyz AP service discovered and mapped the boundaries of two natural plague foci—Tyan Shan and Alay. The Tyan Shan natural plague focus is the largest, covering 12,000 sq. km located in the northern part of the country. The Alay natural plague focus covers 3,500 sq. km in southern Kyrgyzstan. In 1974, The Kyrgyz AP system discovered a third focus – Talas, in western Kyrgyzstan. The Talas focus is about the same size as the Alay focus. There are two main natural plague hosts in Kyrgyzstan—the grey marmot in the north (Tyan Shan focus) and red marmot in the south (Talas and Alay foci). In Soviet times the Kyrgyz AP system carried out massive vector elimination campaigns during which epidemiological teams sprayed large quantities of DDT pesticide into rodent burrows. These measures reduced the ectoparasite population of rodents, thus epizootic activity declined by 50-100 percent over a territory of 10,000 sq. km. The *Y. pestis* strains isolated in Kyrgyzstan were sent to the Scientific-Research AP Institute of Central Asia in Almaty, Kazakhstan, for further research and scientific studies.¹⁴²

The last plague outbreak in Kyrgyzstan was in 1942 on the territory of the Tyan Shan focus and involved the Aq-Bulan and Qayrma villages in Issyk Kul *oblast*. According to the RCQEDI administration, as of May 2003, the last time *Y. pestis* was recovered in Kyrgyzstan was in 1998.

During the Soviet era, the Central AP Station and its subordinated field AP stations dispatched 12-15 epidemiological teams to monitor the natural plague foci annually. After independence, due to the cutoff of state funding, the Kyrgyz AP system could deploy only 2-3 epidemiological teams for 20-25 days annually. During July-August 2002, the RCQEDI sent two epidemiological teams; their responsibility was to survey 2,500-3,000 sq. km of territory where the natural plague hosts were the most active. However, this still does not yield enough epizootic data to construct an accurate picture of the epidemiological situation within a given focus. With its meager budget (for 2002, it was 3,164,000 Kyrgyz Soms [KGS] or approximately \$70,000), the RCQEDI could not afford to send employees to check on the work conditions at the sanitary-

quarantine checkpoints located in the vicinity of the ports of entry on the border with China, even though sanitary protection of the state borders from import of especially dangerous infectious diseases to this date remains one of its primary functions. The RCQEDI management admitted to CNS staff that the aforementioned sanitary-quarantine checkpoints were old and very poorly equipped mobile trailers.¹⁴³

The Kyrgyz AP system took over epidemiological control of cholera in Kyrgyzstan after a cholera epidemic struck the Autonomous Republic of Karakalpakstan in Uzbekistan in 1965. In Soviet times, the Central AP Station used to send *V. cholerae* strains to the Scientific-Research AP Institute in Rostov, Russia. After independence, whenever regional or district-level bacteriological laboratories of the SES isolate strains of *V. cholerae*, these strains are sent to the RCQEDI for further analysis and confirmation.

In 1984, the Kyrgyz AP system was given responsibility for controlling anthrax. Since then, AP specialists have found 1,235 sites from which anthrax bacteria are recoverable. Before the USSR's dissolution, the Central AP Station sent whatever *Bacillus anthracis* strains it recovered to the Irkutsk Scientific-Research AP Institute in Russia for analysis. After 1992, the cutbacks in government funding have forced the Kyrgyz AP system to reduce the epidemiological monitoring of these anthrax bacteria containing sites. Nevertheless, between 1992 and 2003, 1,235 soil samples were tested for anthrax bacteria; of these, 647 were positive. Of the sites from which these came, 498 were covered with concrete slabs and 368 were fenced off to prevent farm animals from grazing in fields containing contaminated soil. The geographic distribution of anthrax-containing sites is skewed towards the northern provinces of Chuy (485 sites) and Issyk Kul (124 sites). Preoccupation with zoonotic diseases such as anthrax contributed to the development of good working relations between the Kyrgyz AP system and the Kyrgyz veterinary system. With regard to anthrax, the epidemiological situation is tense in the southern provinces of Kyrgyzstan, where there has been a steady rise in human cases, mostly attributed to the improper slaughter of infected cattle.¹⁴⁴ It bears noting that after the 2001 U.S. anthrax letter scare, the RCQEDI administration decided to destroy the strains of *B. anthracis* it had in its culture collection.¹⁴⁵

Apart from plague, anthrax, and cholera, the public health mandate of the RCQEDI includes brucellosis, TB, tick-borne encephalitis, rabies, rickettsial diseases, tropical fevers, spotted typhoid, leptospirosis, yersiniosis, and ornitosis. However, the expansion of RCQEDI's responsibilities was not matched with a corresponding increase in state funding, leaving the organization struggling harder than ever with the problem of limited resources and increased responsibilities.¹⁴⁶

The chronic lack of state funding had resulted in cutbacks on performing routine building maintenance and as a result the infrastructure was crumbling. This was evidenced by leaking water pipes on the center's first floor. The majority of the laboratory equipment used by the Kyrgyz AP system is antiquated, increasing the likelihood of accidents that could pose a major public health hazard if not quickly contained. While RCQEDI staff appears to follow Soviet-era instructions with regard to its work with pathogens of especially dangerous infectious diseases, the biosafety level nevertheless is low due to the bad state of the infrastructure. Further, the accounting of pathogens was carried out on paper logs, which could be easily forged, tampered with or even destroyed. In Soviet times, Kyrgyz AP specialists underwent rigorous specialization

training at the Rostov Scientific-Research AP Institute. After independence, such training is no longer available and, therefore, the overall level of professionalism among the Kyrgyz AP personnel has sharply decreased. As the RCQEDI director told CNS staff, there is a dire need for reinstating educational exchange programs that would allow him to send young Kyrgyz AP specialists for professional training to AP institutes in Kazakhstan or Russia.¹⁴⁷

3. International Activities that Involve the Kyrgyz Anti-plague System

The Kyrgyz AP system in 2003 was completely funded by the MOH and, as far as we were able to discern, received no outside assistance of any substance. RCQEDI's director mentioned that some years previously, they had received assistance during a cholera outbreak from Doctors Without Borders, but this seemed to be limited to re-hydration solutions and antibiotics. As of this writing, Kyrgyzstan has not signed a bilateral agreement with the U.S. so it therefore remains outside the CTR Program.

4. Analysis of the Kyrgyz Anti-plague System's Weaknesses and Proliferation Potential

There is no sign of any Kyrgyz AP facility having taken part in the Soviet BW program. This being the case, the main proliferation threats emanating from the Kyrgyz AP system are related to the physical protection of pathogens during their transport from remote field AP stations to the RCQEDI and their subsequent storage at the RCQEDI's Museum of Live Cultures. In 2003, pathogens collected in the field were transported by any available means to Bishkek, including unguarded personal automobiles and motorcycles. The physical security of the building housing the RCQEDI was obviously inadequate, with broken fences and poorly trained part-time guards.