REEMERGING DISEASES

# Stalking a Killer in Russia's Prisons

**A program to vanquish tuberculosis from an entire Russian region may provide a new model for battling an old scourge**

Two years ago, when microbiologist Alex Goldfarb launched a program in Russia to treat prisoners infected with tuberculosis, he got a nasty surprise. He and his colleagues at the nonprofit Public Health Research Institute (PHRI) in New York City thought their effort, funded with a $12 million grant from financier George Soros, would face mostly routine, easily treated cases. But "when the first lab data began to accumulate, we were shocked," Goldfarb says. About 25% of prisoners were infected with strains resistant to two or more front-line drugs—several-fold higher than had been assumed.

Alarms over a global resurgence of TB have been sounding for nearly a decade, and a thick report (www.soros.org/tb) issued last month by Harvard Medical School and Soros's Open Society Institute documents one of the epidemic's most alarming aspects: the global spread of drug-resistant strains. Nowhere is the problem more acute than in Russia, particularly in its teeming prisons—what Goldfarb calls "the epicenter of a worldwide epidemic of multidrug resistance."

In a fresh approach to tackling the nightmare, PHRI, working with the World Health Organization (WHO) and the British nonprofit Medical Emergency Relief International (MERLIN), is combining a traditional treatment program with a targeted attack on drug-resistant strains, the largest ever mounted. The effort, which will treat both civilians and the prison population throughout the Russian region of Tomsk, will provide a model for other wider campaigns against TB in Russia, say public health experts. "The new approaches piloted in Tomsk," predicts Paul Farmer of Harvard Medical School, "will have broad application throughout the region and beyond."

After the disintegration of the Soviet Union in 1991, the public health system collapsed, opening the door to a resurgence of TB. Russia was poorly equipped to deal with the epidemic. The standard treatment is a 6-month course of four drugs; because symptoms can disappear after a couple of months, fooling people into thinking they're cured, the protocol calls for health workers to stand over patients while they take their pills, a system called DOTS, for Directly Observed Therapy Short-Course. But in Russia, because of a drug shortage and the health care breakdown, patients often fail to see treatment regimens through to the end, allowing resilient bugs to flourish—particularly in the country's prisons.

"If you purposely designed a program to show the world multidrug-resistant TB and spread it, this is it," says Lee Reichman, director of the National Tuberculosis Center at New Jersey Medical School in Newark. Prisoners become infected even before they are tried as they are kept in crowded holding cells, often for years. Convicts with TB are removed to a Soviet-built network of 60 "TB prisons," but not before they've spread the bug. "This is Siberia; it's cold. They keep the windows closed," conditions that help the airborne bacterium get around, notes Reichman. PHRI's Barry Kreiswirth, who runs the institute's TB molecular biology lab, says overcrowding is so bad that prisoners often sleep in shifts. There's also lots of turnover to speed disease transmission: People often are incarcerated for petty offenses, says the medical director of the Tomsk TB project, epidemiologist Michael Kimerling of the University of Alabama, Birmingham, so the government occasionally offers a general amnesty to reduce the crowding, creating a constant flow of TB-ridden ex-convicts. As the PHRI people are fond of putting it, the prison system is an "epidemiological pump" that pours out about 300,000 people a year, of whom 10,000 have active TB.

**Den of infection.** New program hopes to rein in Russia's skyrocketing TB problem, incubating in milieus like this prison barracks.

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About 20% of the Russian prisoners are thought to carry drug-resistant varieties, particularly the prominent "W" family, which Kreiswirth first identified in New York during the epidemic of TB among AIDS victims in the early 1990s. Scientists have yet to determine how the W strains have evolved and spread, but "at the very least," says Kimerling, "it shows the potentially global nature of drug-resistant strains."

In the meantime, Tomsk—a region about 5000 kilometers east of Moscow—is being prepped as the largest proving ground yet for a new strategy against multidrug-resistant TB. Called DOTS-Plus, it was first tested in a small program run by Farmer in Peru; WHO officially endorsed it last year. The regimen involves hammering drug-resistant cases with a battery of so-called "second-line" drugs for as long as 2 years. Targeted by the Tomsk program will be about 800 civilians with TB among Tomsk's population of 1 million as well as 1200 patients in the region's TB prison. Of the new cases in the prisons, sputum samples so far show that about 30% are caused by multidrug-resistant strains. Funded for 2 years with $4 million from Soros and the European Union, the Tomsk program is equipping local prison and civilian labs to perform duties from looking at sputum smears to bacterial cultures to drug testing, and to pipe samples directly to labs in Moscow and Boston. Several groups of Russian doctors have been sent to Reichman's center in Newark to learn the latest treatment protocols.

Scheduled for launch last month, the program now won't get off the ground until March. "The main reason for delaying is to make damn sure it works properly," says microbiologist Tim Healing of MERLIN. More time is needed to round up an adequate drug supply; sloppy treatment could spawn superbugs resistant to everything. "We have only a tiny, tiny handful of drugs that can potentially cure these patients," says Nancy Bankin, an epidemiologist at the Centers for Disease Control and Prevention in Atlanta. "If we lose those, we'll have strains that are totally incurable."

The Tomsk TB Project is seeking additional support from other TB initiatives in Russia, such as a $150 million campaign against both TB and AIDS that the World Bank is about to launch. Kimerling hopes the program will run at least 5 years—enough time, he says, to gauge its effectiveness against the most vicious TB strains.

—CONSTANCE HOLDEN