

The Continuing Specter of Disease: Tuberculosis in the Russian Federation

Joshua Farquhar

For the last two years, the public discussion surrounding global health has focused almost entirely on COVID-19. In the meantime, other historic and dangerous diseases have taken a backseat. Nevertheless, other endemics are worthy of discussion; these diseases, and potential lifesaving solutions, must also be granted attention if global progress on public health is to be achieved. This paper explores the tuberculosis endemic in the Russian Federation (RF), focusing mostly on multi-drug resistant (MDR) TB. While overall rates of tuberculosis have declined in Russia over the course of the 21st century, incidence is still far higher than in most nations, and MDR-TB makes progress more difficult. Two potential strategies are explored. The first strategy includes a public education campaign targeted at changing certain behaviors that contribute to the creation of multi-drug resistant strains. The second involves investment in new treatment options by the Russian government. Each of these policies possesses certain limited benefits but also has weaknesses leading to lack of solvency. As a result, the author suggests implementing both as a two-pronged approach. Each has the advantage of mitigating the weaknesses of the other, and would, therefore, be exponentially more successful if coupled.

Keywords: Russia, tuberculosis, drug resistance, global health

Introduction: The Nature of the Problem

Those living in Western countries generally have the luxury of living without the specter of tuberculosis (TB), but the residents of Eastern Europe do not. After the breakup of the Soviet Empire, the efforts of the central government to control tuberculosis collapsed, and the disease spread like wildfire. For the last few decades, Russia has experienced a tuberculosis endemic. The importance of this issue has been felt throughout centuries; despite the countless diseases humanity has suffered during the course of history, tuberculosis has killed more people than any other. The disease is still a leading cause of death worldwide (“Global Tuberculosis Report 2021”).

The prevalence of tuberculosis in the Russian Federation is felt on both a local and global level. Within Russia itself, the human toll is, of course, the most catastrophic. In 2019 alone, TB claimed over 10,000 Russian lives (Kanabus). Additionally, tuberculosis brings with it a real and staggering financial burden for the infected. The European Respiratory Journal concluded in 2014 that, on average, those who contract TB suffer a cost equivalent to “58% . . . of reported annual individual income and 39% . . . of reported household income.” Many are forced to take loans or sell household items to survive this monetary pressure (Tanimura).

The impact of tuberculosis in Russia is also felt globally. According to the World Health Organization, substantial progress in the global fight against multi-drug resistant tuberculosis will require “particular efforts” in ten countries, with Russia being one (“Global Tuberculosis Report 2021” 20). Estimates predict that, if TB continues along current projections, it will mean the loss of 28 million people and \$984 billion between 2015 and 2030 (“Global Economic Impact”). That loss roughly equates to the population of Venezuela (“Countries”) and the economy of Turkey (“GDP”). Combatting tuberculosis in Russia is a vital part of mitigating such human and economic tolls.

Barriers to a TB Solution in Russia

Studies note a trend in steadily dropping infections, as seen in Figure 1. This figure graphs incidence of TB per 100,00 people in Russia from the year 2000 to 2020. As can be gathered from the steep downward slope, cases of tuberculosis are far less common than they were twenty years ago. A casual researcher of the tuberculosis endemic in Russia may be tempted to conclude that the problem is vanishing.

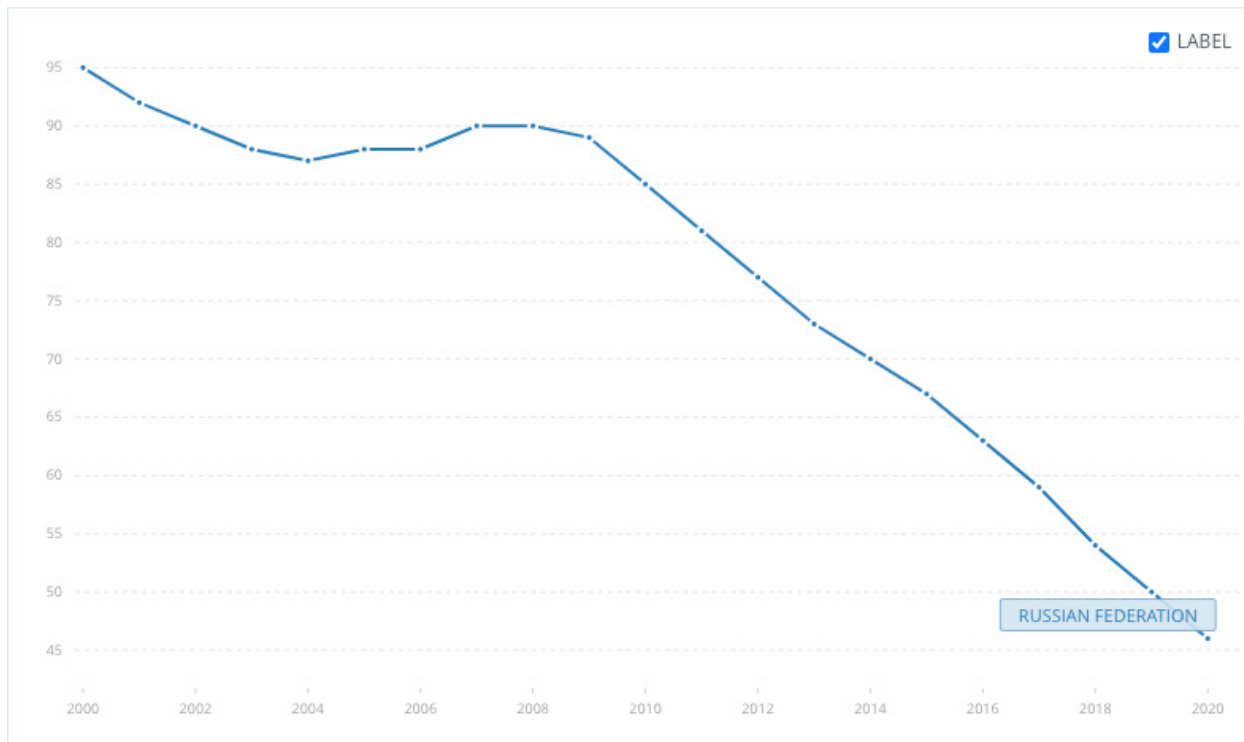
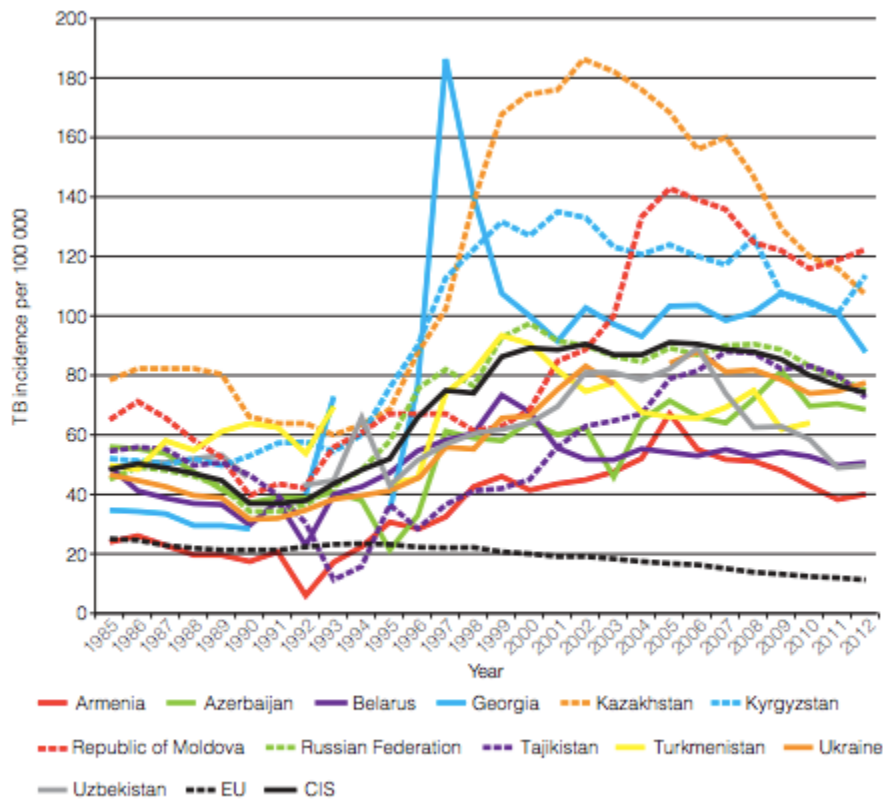


Figure 1: World Bank, 2020 (“Incidence of Tuberculosis”)

Indeed, rates of TB infection have decreased drastically in the Russian Federation since about 2008, dropping from 90 cases per 100,000 to 46 (as of the year 2020) (“Incidence of Tuberculosis”). However, as is often the case, a single graph cannot tell the whole story. While 46 in 100,000 does constitute relative improvement, it is still a far cry from the international average. In the United States the rate is 2.4 per 100,000 (“Data and Statistics”); it is 5 in Germany (“Report on Epidemiology”). In Croatia, with a GDP per capita equal to Russia (“Real GDP per Capita”), the rate is 6.6 (“Croatia”). In addition, even during these years of progress, multi-drug resistant tuberculosis (MDR-TB) and HIV-TB coinfection have maintained powerful footholds within Russia (“New Profile”). In fact, the World Health Organization placed the RF on its 2021-2025 list for high-burden countries for MDR-TB and HIV-associated TB (“WHO Releases New Global Lists”).

Searching for the source of the problem, it is vital to look at when incidence skyrocketed: after the collapse of the Soviet Union. Figure 2 illustrates that almost all former Soviet republics experienced some measure of skyrocketing tuberculosis infections in the early to mid-1990s (“Trends”). Charting each year from 1985 to 2012 shows the incidence of TB per 100,000 people in various post-Soviet countries. In the early 1990s, following the collapse of the USSR, these nations invariably experienced higher rates of infection and the measures used to limit the spread of TB also collapsed. According to the National Academy of Sciences, prevention and treatment of tuberculosis were strongly controlled by the federal government of the Soviet Union, but when that system broke down the health problem was exacerbated (“New Profile”).



Source: WHO, 2014.

Figure 2: European Observatory on Health Systems and Policies, 201 (“Trends”)

The National Academy explains in further detail some of the primary reasons TB gained such momentum during this period following Soviet dissolution. Of particular note, poverty increased. By 1999, 43.4% of Russians were living under the poverty line of \$5.50 per day (“Russia Poverty Rate”). Experts consider poverty a risk factor for TB because it causes people to more commonly live in close quarters with less air flow. As tuberculosis is airborne, this makes the bacteria more likely to spread (“TB and Poverty”). Another cause of increased infection was higher crime rates which caused bacteria to spread through close prison quarters; higher migration into Russia which brought infected migrants into Russia; and military conflicts which led to transmission between Russian soldiers and residents of other nations (“The New Profile”). Finally, and most importantly, the Russian healthcare system was horribly degraded. During the Soviet Union, healthcare was under central control and, consequently, under certain quality regulations. After it collapsed, so did many of those requirements. In 1996, five years after the dissolution of the Soviet Union, the *American Journal of Public Health* reported that maintenance and training were poorly conducted in Russia, equipment and

physicians were underfunded, and no effective system of quality management existed (Barr 307).

In addition, the problem extends beyond tuberculosis itself; the disease has evolved and become more powerful. Multi-drug resistant (MDR) TB, a more dangerous form of the bacteria, is becoming more common worldwide. Figure 3 illustrates how many cases of MDR TB were detected worldwide from 2009 to 2016 according to WHO global reports (Lange). It is important to note that cases tripled from 2009 to 2016.

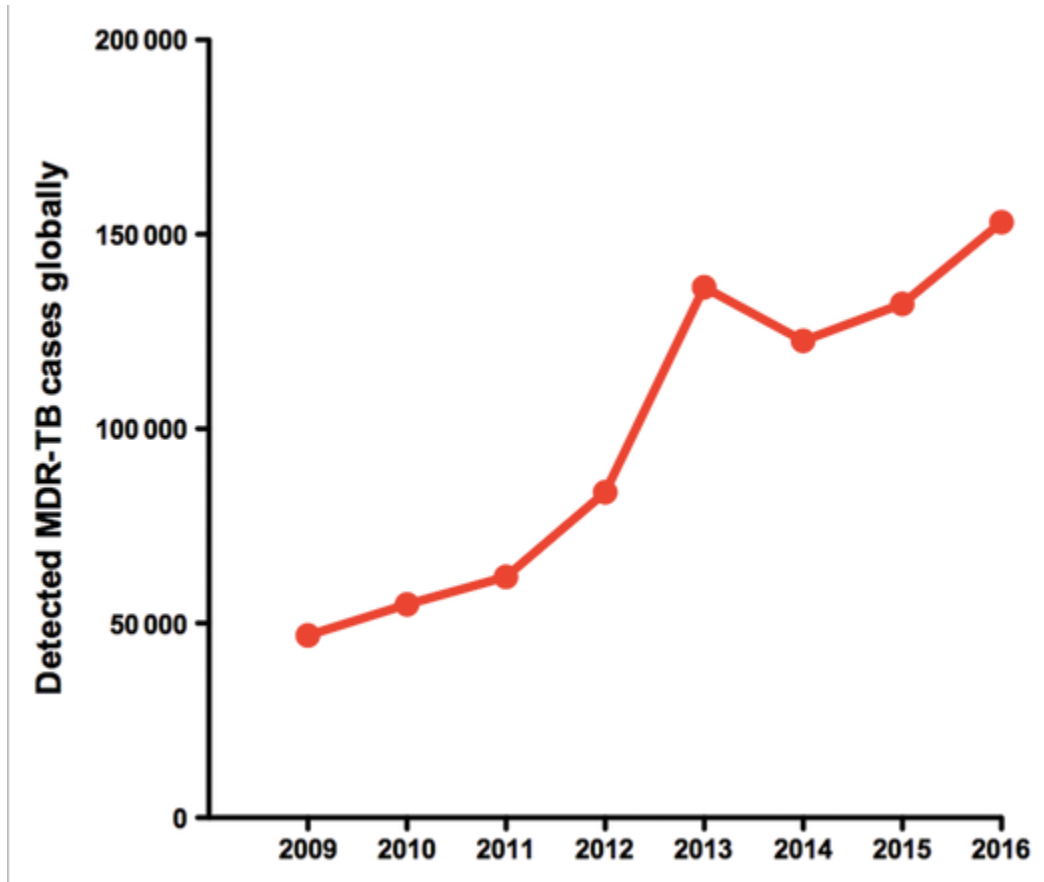


Figure 3: Official Journal of the Asian Pacific Society of Respiriology (Lange)

Not only is MDR-TB growing globally, it is extremely prevalent within Russia. A primary cause of this evolution has been the fractured and degraded health system (Wingfield) which often leads to incomplete treatment. Incomplete treatment can create MDR-TB by, in effect, acting as a vaccine in favor of the bacteria. The treatment is enough to teach the bacteria how to respond and build up their defenses but not enough to wipe them out. This is problematic as it creates a situation where the regularly prescribed full course of treatment becomes insufficient, and a more intense form is required. The Wilson Center provides some insight as to the causes of incomplete TB treatments in Russia when it explains that much of the issue is a result of “unreliable drug supplies, unsupervised therapy, poor management, and a lack of political will” (Hoffman). Research in *The American Journal of Respiratory and Critical Care Medicine* confirms that screening activities were greatly decreased after the Soviet collapse due to lack of funding, in addition to drug supplies becoming irregular (Yablonskii). That said, the medical establishment is not the only party at fault. Lack of public knowledge regarding how to appropriately respond after contracting TB has exacerbated the problem and contributed to the development of multi-drug resistant TB. Researchers from Far Eastern Medical University and Harbin Medical University found that one of the primary issues in TB treatment is patient compliance related to length of therapy. As they explain,

"Patients become progressively tired as the treatment advances, especially those ones with drug resistance, whose regimens usually last for 24 months or even more. That, combined with insufficient awareness about consequences of intermitted treatment, leads patients to drop out from the treatment, usually as soon as symptoms disappear" (Bykov 15). In other words, as TB patients become weary of the lengthy treatment plan, they decide to drop out as soon as they start to feel better. Their improvements are not, however, a sign of total recovery from TB. Once they drop out, the bacteria become stronger and the treatment often becomes pointless. An additional cause of MDR-TB in Russia, also resulting from public ignorance, is the easy availability of first-and-second-line antibiotics, coupled with a lack of education among the general populous on how to treat tuberculosis ("Trends"). As The European Observatory on Health Systems and Policies explains, over-the-counter access to pharmaceutical drugs limits the ability of professionals to influence the amount, size, and timing of an individual's doses ("Trends"). When people feel sick, they buy and take some antibiotics, thinking that will help. In reality, taking too few doses may end up strengthening the bacterial defense mechanism against the drug. The World Health Organization sums up the problem well in the 2021 Global Tuberculosis Report when they point out that the Russian Federation is one of the ten nations accounting for 70% of the global gap between "estimated global incidence of MDR/RR-TB each year and the number of people enrolled in treatment in 2020" (Global Tuberculosis Report 2021, 20). MDR TB is a continuing problem in Russia, for which a solution must be found.

Potential Policies

Unfortunately, many of the factors contributing to the tuberculosis endemic are socioeconomic in nature. As discussed above, issues such as low living standards, unemployment, and migration continue to spread the disease ("The New Profile"). In general, countries with higher standards of living tend to suffer less with TB because living conditions are less crowded, while lower levels of migration reduce disease spread as fewer groups of people come into contact with one another. While broad-reaching economic policies aimed at these issues would certainly help in the fight against TB, they would also require large-scale changes to Russian political and economic systems. Since redesigning the government of Russia is not a viable option, more finely tuned strategies need to be considered.

A more targeted potential medical solution would be to improve awareness and education on tuberculosis in the Russian Federation. This campaign need not discuss the existence nor danger of tuberculosis itself. Rather, it should be centered on the means by which MDR-TB develops and the importance of finishing treatment. Over the last decade, numerous countries have conducted campaigns aimed at educating the public on the proper use of antibiotics and the importance of finishing treatments. According to the peer-reviewed journal *BMJ Global Health*, these campaigns are most effective when utilizing messages based rigorously on "scientific evidence" and the specific context in which their target audience operates (Huttner). Mikhail Perelman of the Moscow Medical Academy seems to agree with the idea of a public awareness campaign when he argues that more public education on how to maintain health would make TB much less likely to spread within Russia ("The New Profile"). The benefit of this potential strategy is that it includes the Russian people in their fight against tuberculosis. Instead of top-down policies and requirements that simply ask for compliance, an education campaign would inform the populace of measures they can take to reduce the evolution and spread of multi-drug resistant strains of tuberculosis. However, a clear disadvantage of this plan is that it comes with a level of uncertainty. Scholars submit that more research is still needed on the effectiveness of such campaigns. Therefore, the investment may do little in the way of influencing public behavior. An additional disadvantage is that this strategy does not solve for the fact that funding for proper treatments can be unreliable. The medical industry relies on government funds, and the government's problems are left unaddressed. Therefore, the public may be

convinced to demand treatments that are not always available.

A second potential solution would be for the Russian government to invest in second-line treatment options. In this context, second-line treatment simply means treatment designed to counter tuberculosis bacteria that are resistant to the typical regimen of drugs (i.e. MDR-TB). Unfortunately for the Russian public, second-line treatment is expensive (“Tuberculosis”). The Russian public is already struggling to afford needed medicines (Cichowlas), and this is further complicated by the problem of drug irregularity discussed earlier in the paper. Investment by the Russian government in second-line treatments could have the two-pronged benefit of offsetting the high costs of treatment for the general public, as well as increasing the availability of needed drugs within the country. In fact, now is an ideal time for such an investment as new and more effective forms of treatment for MDR-TB have recently been developed. A 2020 study in the *American Journal of Respiratory and Critical Care Medicine* published the results of extensive multicountry research on the efficacy of these novel drugs. It found these drugs to be highly effective and highlighted “the need for urgent expanded access” (Franke 111). In fact, these drugs have an early effectiveness rate of 85%, compared to 60% for older treatments (Miller). A prime advantage of investing in these new treatments is that most patients could follow a fully-oral regimen of treatment. In 2020, the WHO officially recommended expanded access to fully-oral regimens as an alternative to the more outdated treatment plan, which requires injections and tends to take longer. Patients find it easier to complete this treatment plan (“WHO Urges Countries”), which reduces the risk of MDR-TB developing further resistance to drugs. This is important in the Russian context, as one of the leading causes of MDR-TB development is patients electing not to finish treatment. The main disadvantage to such a strategy is that government possession of the treatment does not guarantee the citizenry will take advantage of it. Easy access to antibiotics (and therefore the illusion of simple self-treatment) may reduce the amount of people who seek official treatment. The overall reduction in TB reporting since the pandemic (Global Tuberculosis Report 2021) may have the same effect. Early detection is important for successfully treating MDR-TB (Bykov), and these factors may therefore reduce the nationwide efficacy of investment in second-line treatments.

Recommendation

It must be noted that, despite continued high rates of infection, Russia has made objective progress in the fight against tuberculosis over the course of the 21st century. Thus, part of the solution must be to continue many of the programs the Russian government has already implemented. However, because of the high incidence of drug-resistant strains, these must be bolstered by some new innovations. While both of the potential solutions addressed above possess their own disadvantages, many of these would be offset by the advantages of the other. The public education campaign could be hindered by the lack of treatment available, but investment in second-line drugs would minimize this roadblock. Investment in treatment would be less effective if the citizenry did not take advantage of treatment plans, but the campaign would likely increase the proportion of people who seek and finish treatment for MDR-TB.

The public education campaign would likely increase the number of Russians who seek professional treatment of their MDR-TB, fulfilling the recommendation in the 2021 WHO Global Tuberculosis Report that TB-affected nations focus on increasing levels of diagnosis. Even before the existence of COVID-19, reporting in the European region was dropping substantially, and Russia was the European country most responsible for the decline globally. Figure 4 charts the decline of TB diagnosis notifications in Europe from 2016 to 2020, showing the rates drop by approximately 30% (Global Tuberculosis Report 2021).

Trends in case notifications of people newly diagnosed with TB by WHO region, 2016–2020

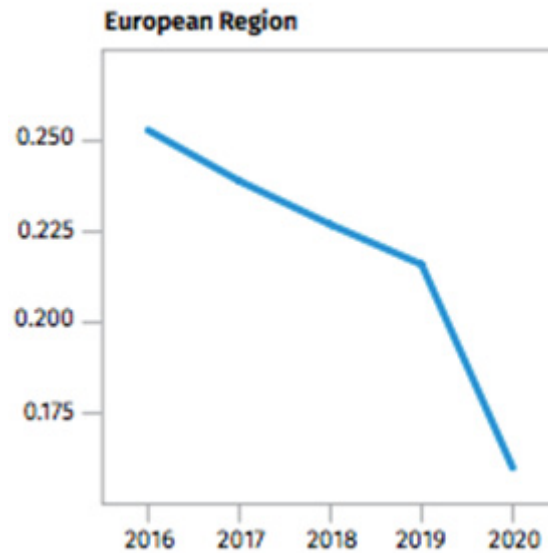


Figure 4: WHO Global Tuberculosis Report 2021

Investment, by bolstering availability of treatment within Russia, would tackle the problem of not enough MDR-TB infected people receiving the necessary care. As discussed above, the WHO reports that there are 10 countries that make up 70% of the gap between the incidence of MDR-TB and the number of people receiving treatment, and Russia is on that list (Global Tuberculosis Report 2021). Lack of treatment is a serious problem that must be addressed if Russia is to continue its successful fight against tuberculosis and see incidence rates drop to the levels known in most developed countries.

These two policies would be far more effective in tandem than either would be as a single-handed approach. In short, if coupled, their effectiveness would likely increase exponentially.

Conclusion

In 2003, American couple Rick and Francene adopted a 13-month-old from Russia. Upon returning to the United States, they brought their new son for his first doctor's appointment in America, and he was tested for tuberculosis. While chest x-rays came back negative, they elected to have a follow-up x-ray conducted six months later. This one returned shockingly different results. Before the family even made it home, the doctor's office called to inform them that their son did, in fact, have TB. Treatment was not easy: it involved months of almost daily injections. Two years later, Rick and Francene adopted another boy from Russia. He also tested positive for latent tuberculosis. Like his elder brother, he underwent treatment. Years later, both children had grown into strong and healthy boys, and neither even remembered their times of treatment. Francene later commented, "For others who may receive a TB diagnosis and must undergo treatment, I would say, if a 13-month-old child can do it, anyone can . . . Treatment is nothing like it used to be, and you can still live your life" ("Rick and Francene's Story").

The above story paints a tragically accurate picture of the modern TB endemic ravaging Russia. It highlights that the disease is far too common, even amongst the youngest members of society. Yet it also stresses that, although treatment can be complicated, it is well-proven and effective. Tuberculosis is well under control across vast regions of the world. Through public education and investment in second-line treatment, the Russian

government has the potential to strengthen the fight against the disease and, over time, become one of those regions.

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