The dual system of tuberculosis control in the USSR: an analysis of totalitarian fragmentation and the structural dynamics of the infectious process

Anna Tymoshenko, Dmitry Nikolaenko [1]

Tuberculosis (TB) in the Soviet Union and the post-Soviet region developed within a unique configuration of political, institutional, and scientific structures. A dual system of TB control emerged in the USSR, characterized by the simultaneous promotion of public health campaigns and the maintenance of large-scale carceral institutions that served as chronic reservoirs of infection. This system was reinforced by the epistemological and ideological features of Soviet phthisiology, which systematically excluded key structural determinants—particularly the penal system—from scientific and professional discourse. This article examines the formation, persistence, and infectious consequences of the Soviet "dual system" of TB control and analyzes its legacy in contemporary post-Soviet infectious dynamics. It also evaluates the structural, epistemological, and institutional constraints within Soviet and post-Soviet phthisiology that shaped scientific problem definition and methodological practice. The study employs an interdisciplinary approach combining historical epidemiology, institutional analysis, diffusion theory, and elements of the anthropology of taboo. Primary materials include published and unpublished scientific works, historical testimonies, epidemiological datasets, and institutional documentation. Analytical categories were derived from structural epidemiology, morphological models of infectious diffusion, and frameworks for understanding knowledge production in constrained scientific environments. The analysis demonstrates that the Soviet TB system was defined by: (1) the central epidemiological role of carceral institutions; (2) the ideological structuring of scientific discourse; (3) the reproduction of epistemic taboos that obscured structural drivers of infection; and (4) the emergence of long-term diffusion patterns shaped by state coercive systems. Post-Soviet TB dynamics continue to reflect these historical conditions. Contemporary expert communities exhibit resistance to conceptual innovation, contributing to the persistence of outdated explanatory paradigms. The Soviet and post-Soviet TB epidemics cannot be fully understood through biomedical or behavioral frameworks alone. Instead, they must be analyzed as products of long-term interactions between state structures, institutional epistemologies, and systemic infectious reservoirs. Overcoming the legacy of the dual system requires explicit integration of structural determinants—especially those associated with incarceration—into epidemiological research, public health planning, and professional education.

Keywords: carceral epidemiology; tuberculosis; Soviet Union; post-Soviet states; dual system of tuberculosis control; structural determinants of infection; diffusion processes; epidemiological morphology.

[1] © 2025 The Author. Published by "Pollution and Diseases". This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Introduction

Tuberculosis (TB) in the Soviet Union and its successor states represents one of the most complex and persistent infectious phenomena of the modern era. Unlike Western Europe or North America, where long-term declines in TB incidence were driven by structural improvements, biomedical advances, and health-system reforms, the Soviet and post-Soviet trajectories were shaped by distinctive political institutions and epistemological models. These influences produced what can be analytically described as a *dual system of tuberculosis control*—a configuration in which the state simultaneously cultivated and combated TB through different components of its institutional architecture

At the center of this duality was the *extensive carceral infrastructure*, which functioned as a stable reservoir for TB transmission from the nineteenth century through the Soviet period and into the post-Soviet era. Prisons, labor colonies, special settlements, and related coercive environments created conditions—overcrowding, poor ventilation, malnutrition, and high mobility—that facilitated sustained infectious diffusion. Despite their infectious significance, these environments were largely omitted from official statistics and professional discourse, producing a systematic underrepresentation that remains influential today.

Soviet phthisiology developed within a scientific system characterized by centralized control, ideological oversight, and limited theoretical autonomy. These constraints produced persistent *epistemic blind spots*, most notably the exclusion of structural and institutional determinants from infectious modeling. TB was reframed as a problem of individual or group "deviance," obscuring the role of state-produced conditions in driving transmission. As a result, the interpretive paradigm of TB control remained narrowly focused on case aggregation, clinical management, and hygienic interventions, rather than on structural analysis of diffusion processes.

Following the collapse of the USSR, profound social and institutional disruptions led to a severe TB crisis across the post-Soviet region. Yet many of the dominant explanatory frameworks remained unchanged. Post-Soviet expert communities continued to rely on inherited conceptual models, often resistant to methodological innovation, interdisciplinary perspectives, or critical examination of historical legacies. This has hindered the development of more accurate models of TB dynamics and limited the effectiveness of public health interventions.

Subject of the study. This article examines the structural, institutional, and epistemological foundations of the Soviet and post-Soviet dual system of TB control, with particular attention to the infectious role of carceral institutions and the cognitive frameworks of phthisiology.

Purpose of the study. The purpose of this study is to analyze how political institutions, scientific epistemologies, and structural environments jointly shaped the long-term diffusion and reproduction of TB in the Soviet and post-Soviet space, and to identify mechanisms through which these legacies continue to influence contemporary infectious dynamics.

Research objectives:

1. To reconstruct the historical formation of the Soviet dual system of TB control.
2. To analyze the structural determinants of TB diffusion, especially carceral institutions.
3. To assess the epistemological foundations and constraints of Soviet phthisiology.
4. To evaluate the persistence of Soviet-era paradigms in post-Soviet epidemiology.
5. To identify conceptual and methodological gaps contributing to current infectious challenges.

6. To formulate an interdisciplinary theoretical framework capable of integrating structural determinants into modern TB analysis.

Methodology. The study employs:

- *historical epidemiology* to trace long-term infectious patterns;
- *structural-institutional analysis* to examine carceral and administrative environments;
- *morphological and diffusion models* to conceptualize infectious dynamics;
- *epistemological analysis* to evaluate scientific frameworks and taboos;
- *anthropological theory of taboo* to interpret patterns of silence and exclusion;
- *comparative analysis* integrating Soviet, post-Soviet, and international data.

This combination allows for a comprehensive reconstruction of the infectious, institutional, and epistemological architecture underpinning the Soviet and post-Soviet TB epidemic.

Research findings

Tuberculosis in the Russian Empire: Foundations of the "Double System" and the Central Role of Carceral Institutions

Tuberculosis (TB) in the Russian Empire must be understood within the broader context of social inequality, environmental deprivation, and a punitive–administrative system that played a substantial infectious role. While TB was widespread across Europe in the nineteenth century, the Russian Empire exhibited structural vulnerabilities that facilitated sustained transmission: overcrowded urban centers, poor housing conditions, high levels of poverty, and inadequate public health infrastructure. However, one of the most distinctive features of the imperial TB landscape was the centrality of *places of confinement*—prisons, transit jails, military disciplinary battalions, and Siberian penal labor sites—in maintaining endemic infection.

Carceral institutions refer to the interconnected system of facilities, practices, and administrative structures designed for the detention, supervision, and control of individuals deprived of liberty. The term encompasses a wide range of closed or semi-closed environments, including prisons, jails, pre-trial detention centers, penal colonies, labor camps, special settlements, police holding facilities, juvenile correctional institutions, and forensic or compulsory psychiatric hospitals. Rather than denoting isolated buildings, the concept emphasizes the existence of a coordinated *carceral network* characterized by shared logics of confinement, discipline, surveillance, and restricted movement.

In scientific research, carceral institutions are understood as *structurally significant environments* with distinctive social, spatial, and health-related properties. High population density, limited ventilation, constrained mobility, institutional hierarchy, chronic stress, and reduced access to medical care create conditions that facilitate the transmission of infectious diseases—particularly tuberculosis, HIV, and other airborne or blood-borne pathogens. Furthermore, the frequent transfer of detainees between facilities and their reintegration into civilian populations position carceral institutions as critical nodes in broader diffusion processes.

In social theory, the term is also used to denote the broader "carceral continuum," where mechanisms of surveillance and control extend beyond formal detention, shaping behaviors, bodies, and public health at population scale.

By the mid-nineteenth century, the Russian Empire had developed a sprawling penal geography extending from European Russia to Siberia and the Far East. Penal exile and forced labor were central components of imperial governance and social control, affecting political dissidents, common criminals, and entire ethnic groups (*Beer [2016]*).

These institutions were characterized by extreme overcrowding, insufficient nutrition, poor ventilation, and minimal medical care—all conditions highly conducive to TB transmission. Contemporary medical observers routinely described TB as the leading cause of death in prisons and among exiles, often noting mortality rates several times higher than in the general population (*Engelstein [2009]*).

The *transit system*, through which convicts were marched across vast distances in groups, also functioned as a mobile reservoir of infection. Overland penal routes and etap prisons created continuous chains of transmission; sick individuals were transported alongside healthy ones for weeks or months, facilitating recurrent outbreaks. Epidemiological data from the late nineteenth century indicate that TB prevalence among convicts was markedly higher than among comparable civilian populations, a pattern that prefigured the massive carceral epidemics of the Soviet period (*Rindlisbacher [2011]*).

These dynamics contributed to what can be described as the early origins of a *"double system"* of TB management in the Russian Empire. On one level, imperial medical authorities and philanthropic organizations developed increasingly sophisticated public health measures, including sanatoria, anti-TB societies, and educational campaigns (*Weindling [2000]*). On another level, however, the state simultaneously operated and expanded a penal system that continuously reproduced conditions ideal for TB propagation. Prisons functioned as chronic reservoirs of infection, yet imperial policies did not systematically integrate these institutions into the broader framework of TB control. This disjunction between official public health discourse and carceral reality represents a precursor to the later Soviet pattern in which tuberculosis was simultaneously *cultivated* and *combated*, often by different arms of the same state apparatus.

The infectious consequences of this duality were significant. Released convicts frequently returned to their home regions while still infectious, contributing to civilian spread. Penal colonies in Siberia also seeded TB in indigenous and settler communities. Medical reports from the late imperial period document strikingly high rates of pulmonary disease among populations living near major exile settlements, suggesting spatial diffusion linked to the coercive mobility of prisoners (*Rindlisbacher [2011]*).

In summary, TB in the Russian Empire cannot be understood solely through socioeconomic or clinical frameworks. Carceral institutions were structurally central to the maintenance and transmission of infection, establishing a pattern of infectious duality that the Soviet system later amplified. The imperial period thus represents the foundational stage of a long-term infectious regime in which the state simultaneously generated and attempted to control TB.

Dostoevsky's Representation of Tuberculosis in Carceral Environments in Notes from the House of the Dead

Fedor Dostoevsky's *Notes from the House of the Dead* (1861–1862) constitutes one of the earliest and most detailed literary testimonies of the medical and sanitary conditions prevailing in nineteenth-century Russian penal institutions. Although the work is a semi-fictionalized account based on the author's own imprisonment in the Omsk fortress (1850–1854), historians and literary scholars consistently emphasize its high degree of factual accuracy in describing daily life, physical suffering, and disease inside penal labor settlements (*Dostoevsky [1995], Frank [1983]*). Among the illnesses mentioned in the text, tuberculosis (referred to as "consumption") occupies a significant place. Dostoevsky's observations provide valuable qualitative evidence for understanding the epidemiology of TB in carceral settings of the Russian Empire.

Dostoevsky portrays tuberculosis as pervasive within the confines of the prison barracks, describing it not as an exceptional occurrence but as a structural feature of penal

life. Although the narrator rarely uses precise medical terminology, he repeatedly refers to chronic coughing, emaciation, fevers, and progressive wasting—classical symptoms of pulmonary TB. Prisoners are depicted as living in overcrowded, poorly ventilated barracks filled with smoke from stoves, stagnant air, and persistent dampness, conditions that modern epidemiology recognizes as ideal for Mycobacterium tuberculosis transmission (*Rindlisbacher [2011]*). Dostoevsky's emphasis on environmental factors—cold, moisture, inadequate bedding, and the impossibility of personal hygiene—corresponds closely to medical reports from the late imperial period describing similar conditions in Siberian penal institutions (*Beer [2016]*).

A central theme in Dostoevsky's representation is the *indifference of the penal administration to disease*. Sick prisoners, including those with advanced consumption, were expected to work unless their physical deterioration made labor impossible. The infirmary (bolnitsa) appears in the text as an institution with limited capacity, insufficient supplies, and negligible therapeutic effect. Dostoevsky describes cases in which prisoners with severe respiratory illness were either denied admission or discharged prematurely due to overcrowding or administrative neglect (*Dostoevsky [1995])* This aligns with historical studies documenting limited medical provision within the Siberian penal system, where mortality from TB and other chronic diseases was high and treatment options were rudimentary (*Beer [2016]*).

Dostoevsky's narrative also highlights the *social dimension of disease*. Tuberculosis is associated not only with physical suffering but with stigma and isolation. Prisoners often avoid seeking help until extremely ill, fearing both administrative punishment and social vulnerability. Moreover, the text reveals complex moral responses: pity, revulsion, fatalism, and religious resignation. Such depictions underscore how carceral environments shape the subjective experience of illness, reinforcing patterns of stigma that modern sociological studies identify as significant barriers to TB treatment adherence (*Farmer [1999]*).

Perhaps most notably, Dostoevsky implicitly recognizes the infectious *role of carceral institutions* in sustaining infection. He repeatedly describes how prisoners nearing release remain visibly ill, raising concerns about "bringing death back to their families." While expressed as personal anxiety rather than epidemiological theory, this observation anticipates later findings that penal institutions functioned as critical reservoirs of TB in both the Russian Empire and the Soviet Union (*Beer [2016], Rindlisbacher [2011]*).

In summary, *Notes from the House of the Dead* provides a remarkably perceptive account of tuberculosis in nineteenth-century imprisonment. Dostoevsky's descriptions correspond closely to historical and medical evidence, highlighting poor living conditions, administrative neglect, and the structural role of penal institutions in sustaining TB transmission. His literary testimony therefore constitutes an important qualitative source for reconstructing the carceral epidemiology of tuberculosis before the emergence of modern bacteriology and epidemiological science.

Anton Chekhov's Observations on Tuberculosis During his Sakhalin Expedition

Anton Chekhov's *The Island of Sakhalin* (1893–1894) is one of the most significant late-imperial sources on the medical and infectious conditions of Russia's penal colonies. As both a physician and a writer suffering from tuberculosis himself, Chekhov brought a dual perspective—clinical and literary—to his analysis of disease on Sakhalin. His testimony provides essential documentation for understanding the prevalence, structural determinants, and social consequences of TB in one of the Russian Empire's most remote and coercive environments.

Chekhov identified tuberculosis as one of the leading causes of morbidity and mortality among convicts, exiles, and indigenous peoples of Sakhalin. Although he did not yet have access to bacteriological explanations—Koch's discovery had only recently been

published—his descriptions align with the clinical symptomatology of pulmonary TB: persistent coughing, hemoptysis, fever, progressive wasting, and chronic weakness (*Chekhov [1967]*).

Chekhov's field notes and statistical tables demonstrate that among the exiled and penal populations, TB rates were strikingly high, often exceeding those in mainland Siberia and European Russia (*Rayfield [1997]*).

Central to Chekhov's analysis is the *role of living conditions* in fostering TB transmission. He documented overcrowded barracks, lack of ventilation, persistent cold and dampness, and the near impossibility of maintaining personal hygiene. Many prisoners slept on unsanitary bedding, lacked adequate clothing, and lived in rooms saturated with smoke from poorly maintained stoves. Chekhov emphasized that these environmental determinants not only facilitated the spread of TB but also accelerated the progression of latent infection into active disease. His observations corroborate contemporary epidemiological findings indicating that crowding, malnutrition, and inadequate shelter are strong predictors of TB incidence (*Rindlisbacher [2011]*).

A second major theme in Chekhov's account is the *failure of medical infrastructure* on Sakhalin. He described understaffed hospitals, shortages of trained personnel, and limited access to medicines. Physicians were overburdened, equipment was scarce, and diagnostic capacity was rudimentary. Chekhov criticized the administration for its inability to provide appropriate medical care, noting that many TB patients received no treatment beyond temporary removal from labor. As a practicing doctor, he found these deficiencies ethically intolerable and repeatedly stressed that inadequate medical provision was not merely a logistical problem but a structural feature of the penal system (*Chekhov [1967]*).

Chekhov also noted the *infectious interplay between penal and civilian populations.* Because settlers, convicts, guards, and indigenous groups lived in close proximity, carceral outbreaks spilled over into surrounding communities. This insight anticipated modern research showing how prisons function as amplification systems for TB that seed infection into larger populations through patterns of release and mobility (*Rindlisbacher [2011], Droznin et al [2017]*). Chekhov's recognition of this dynamic situates him among the earliest observers to identify what later became understood as carceral epidemiology.

Furthermore, Chekhov linked TB to broader *social and administrative determinants.* He argued that excessive labor demands, corporal punishment, and psychological stress weakened prisoners' health and increased susceptibility to infection. He saw TB not merely as a disease but as a biosocial consequence of systemic neglect, environmental degradation, and coercive governance. This perspective resonates with modern theoretical frameworks emphasizing the structural determinants of infectious disease in marginalized populations (*Farmer [2003]*).

In summary, Chekhov's writings on Sakhalin provide a detailed early account of TB in a carceral colony, highlighting the interplay of environment, administration, forced labor, and medical neglect. His observations remain an invaluable source for historians and epidemiologists seeking to understand the pre-Soviet origins of the carceral tuberculosis reservoir that would later become central to Soviet and post-Soviet epidemiology.

The Formation, Scale, and Post-Soviet Legacy of the Soviet Repressive System

The Soviet Union constructed one of the largest and most complex institutional systems of state repression in the twentieth century. Although elements of coercive governance appeared immediately after the Bolshevik Revolution of 1917, the fully developed repressive apparatus emerged over a longer historical arc. Scholars generally identify three formative stages. The first began in 1917–1922, during the Civil War, when the Cheka (Extraordinary Commission) was established and endowed with extraordinary

powers of surveillance, arrest, and extrajudicial punishment. The second stage occurred during the 1920s, when the repressive system became institutionalized through the OGPU (Unified State Political Administration) and later the NKVD. At this time, the legal framework of "special settlements," administrative exile, and corrective labor camps took shape. The third and decisive stage unfolded between 1934 and 1938, culminating in the Great Terror. During these years, the Soviet state constructed a massive administrative and logistical infrastructure for the management of forced labor, mass arrests, large-scale population transfers, and systematic political repression. By the late 1930s, the Soviet Union possessed a fully operational coercive system with both centralized planning and territorial implementation.

The quantitative scope of Soviet repression has been studied extensively, though exact numbers remain debated due to incomplete archival records and methodological challenges. The most widely accepted scholarly estimates suggest that between 1929 and 1953 approximately *18 to 20 million people* passed through the Gulag, special settlements, and other forced labor systems. Of these, around *1.5 to 2 million* are estimated to have died as a result of starvation, disease, exposure, violence, or excessive labor conditions. According to archival studies conducted in the 1990s, between 1937 and 1938—the peak of the Great Terror—approximately *1.5 million individuals* were arrested for political reasons, of whom around *680,000* were executed. Broader categories of repression, including forced resettlement of ethnic groups, dekulakization campaigns, and wartime deportations, affected an additional *6 to 7 million* people. When considering all forms of coercive population management—from imprisonment to administrative exile—the cumulative number of individuals subjected to state repression in the USSR between 1917 and 1953 likely exceeds *25 to 28 million*. These figures, while approximate, underscore the unprecedented scale of Soviet coercion in both demographic impact and institutional reach.

Beyond its quantitative magnitude, the Soviet repressive system was structurally embedded in the governance of the state. Forced labor served as a major economic sector, particularly in mining, logging, construction, and infrastructure development. The repressive apparatus also functioned as a tool for political consolidation, social engineering, and control of internal mobility. The NKVD and later the MVD developed sophisticated administrative technologies for surveillance, categorization, and management of populations deemed politically or socially undesirable. These technologies evolved into routinized practices that shaped state–society relations for decades.

The collapse of the Soviet Union in 1991 did not immediately dismantle this legacy. The degree to which the repressive apparatus survived in post-Soviet states varies considerably across the region. In the Russian Federation, several structural elements persisted. Law enforcement agencies, internal security services, and the penitentiary system largely retained Soviet organizational frameworks and personnel continuity. Institutional practices such as broad discretionary policing, administrative detention, and expansive state surveillance remained embedded in the operational culture of these agencies. The penal system continued to exhibit characteristics inherited from the Soviet Gulag, including geographically remote correctional colonies, collective barracks, heavy labor regimes, and persistent tuberculosis and HIV transmission within carceral institutions.

In Central Asian states, the continuation of Soviet-style repressive practices has been even more pronounced. Many governments preserved extensive security services, broad state authority over civil society, and coercive instruments of social regulation. In contrast, some Baltic states undertook systematic reforms, reducing the institutional power of former security structures and reorienting legal systems toward European norms. Ukraine represents an intermediate case: while the formal structures of Soviet-style repression weakened, significant institutional remnants persisted, particularly within law

enforcement and penitentiary sectors. Only after 2014 did major attempts at restructuring begin, although these efforts remain incomplete.

From an analytical perspective, the persistence of the Soviet repressive apparatus can be understood as a process of institutional path dependence. State coercive systems, once established, tend to reproduce themselves across political transitions due to organizational inertia, continuity of personnel, and the difficulty of creating alternative governance mechanisms. Consequently, post-Soviet states inherited not only the physical infrastructure of repression—prisons, colonies, archives, and administrative bodies—but also the epistemic and bureaucratic practices through which populations were categorized, monitored, and controlled.

Differences Between the Repressive Systems of the Russian Empire and the Soviet Union

The repressive mechanisms of the Russian Empire and those of the Soviet Union differed fundamentally in scale, purpose, institutional structure, and ideological justification. Although both regimes employed coercion, surveillance, and punitive labor, the Soviet system represented a qualitative transformation rather than a simple continuation of imperial practices. Understanding these differences is essential for analyzing the evolution of carceral institutions, political violence, and population management across the twentieth century.

In the Russian Empire, repression was highly selective and primarily targeted political dissidents, revolutionary groups, nationalist movements, and certain religious minorities. The Imperial security apparatus—embodied in institutions such as the Third Section (1826–1880) and later the Okhrana (1881–1917)—maintained surveillance and carried out arrests, but its reach was limited by administrative constraints, legal procedures, and the absence of a comprehensive ideological framework for mass repression (*Keep [1985]*). Punitive exile to Siberia and the Far North, which characterized imperial penal policy, involved tens of thousands of individuals, not millions (*Beer [2021]*). Although conditions were harsh and often deadly, the prerevolutionary exile system did not aim at large-scale social restructuring. Its coercive logic was predominantly corrective and political, not economic or demographic.

By contrast, the Soviet repressive system created after 1917 transformed coercion into a central instrument of governance. The early Cheka (1917–1922), followed by the OGPU and the NKVD, developed mechanisms for surveillance, preventive arrest, and extrajudicial punishment on a unprecedented scale (*Leggett [1981]*). The Great Terror of 1937–1938 institutionalized mass repression through standardized "operational orders" that established quotas for arrests and executions, thereby bureaucratizing violence. This shift from selective imperial coercion to systematic and large-scale Soviet repression marks one of the most significant structural differences between the two systems.

A second major distinction concerns the role of forced labor. In the Russian Empire, exile and penal labor existed but were not integral to the economy. Under the USSR, however, the Gulag became a vast economic sector. Forced labor was used to build railways, canals, mines, and industrial infrastructure across the country (*Applebaum [2003]*). As a result, repression served not only punitive and political purposes but also economic and developmental objectives. The Gulag operated simultaneously as a penal, economic, and colonizing institution.

A third difference is ideological. The Russian Empire justified repression through dynastic security and maintenance of order, without universalistic political claims. The Soviet state embedded repression within an explicitly transformative ideology: coercion was framed as necessary for constructing socialism, eliminating "class enemies," and reshaping society (*Fitzpatrick [1999]*). This ideological universalism legitimized mass

repression in ways that were absent in the imperial context. It also produced new categories of victims, including peasants during collectivization, ethnic groups subjected to deportation, and entire professions accused of "sabotage."

Finally, the institutional logic of Soviet repression emphasized comprehensive population management. The Soviet Union developed advanced bureaucratic technologies for categorizing citizens, managing internal passports, and controlling mobility. Such practices far exceeded anything attempted under the Russian Empire. As a result, the Soviet system achieved a level of penetration into everyday life that was structurally impossible in the imperial period.

In summary, while the Russian Empire employed repression, it lacked the ideological, administrative, and economic mechanisms that enabled the Soviet Union to construct a massive and systematic apparatus of coercion. The transition from imperial exile to Soviet mass repression thus represents a profound structural and epistemic rupture.

Tuberculosis and the Soviet Repressive Machine: infectious Dynamics, Institutional Structures, and Long-Term Consequences

Tuberculosis in the Soviet Union developed within a political and institutional environment unique in scale, coercive capacity, and infectious impact. Rather than being merely a comorbidity of poverty or inadequate housing, TB became structurally integrated into the functioning of the Soviet repressive apparatus. From the late 1920s onward, the exponential expansion of the Gulag system, special settlements, and the broader penal-administrative infrastructure created concentrated reservoirs of infection that shaped TB epidemiology across the entire Soviet space.

A substantial body of scientific literature exists on this topic. The uniqueness of this matter is found in its ideological contrast. It closely mirrors the ongoing developments in historical contexts. There exist contrasting perspectives. Below are several links to publications from the West. We are located on the western side (*Yablonskii et al [2015], Polianski [2021], Droznin et al [2017], Biadglegne et al [2015], Bobrik et al [2005], Silences and omissions [2024], Doktor [2011], Ogarkov et al [2012], Vyazovaya et al [2020], Tuberculosis in the Soviet Union [2018], Alexopoulos [2016], Nakonechnyi [2022], Zolotova [2007], Shukshin [2006], Médecins Sans Frontières [2003], Droznin [2020], Schwalbe et al [2002], Bickford [2006], Yermakova [2019], TB in Russia [2020], TB: A crisis [2011], Bobrik et al [2006], Yermakova et al [2017], Nakonechnyi [2024], Doktor [2012], Polianski [2015]*).

Understanding the Soviet TB epidemic requires analyzing these repressive institutions not as peripheral environments but as central engines that generated, maintained, and exported infection to the civilian population.

1. Structural Foundations: Carceral Environments as Infectious Reservoirs

By the early Stalin period, the USSR had built the world's largest forced labor system. Millions of prisoners passed through camps, prisons, and settlements characterized by severe overcrowding, inadequate nutrition, extreme climatic exposure, and harsh labor demands. Historical scholarship documents that TB prevalence and mortality in Gulag populations were several times higher than in civilian sectors, with pulmonary TB often representing the leading cause of death.

These conditions—cold, overcrowding, limited ventilation, and chronic exhaustion—created an ideal ecological niche for *Mycobacterium tuberculosis*. The infectious structure of imprisonment and settlement further amplified these risks. Prisoners were routinely transferred between colonies, transit prisons, and labor sites, allowing TB strains to circulate across vast distances. Seasonal influxes of new prisoners, many already weakened before arrest, increased the susceptible pool. Thousands of guards

and civilian employees moved between camps and the surrounding regions, inadvertently facilitating transmission.

2. Dual System of TB Governance: Public Health Rhetoric vs. Carceral Reality

The Soviet state approached TB with what may be described as a *double system* of governance. Officially, TB was framed as a "social disease" being overcome through rational socialist intervention. Public health propaganda emphasized mass fluorography campaigns, dispensary networks, sanatoria, and workplace hygiene. Theatre, posters, and educational narratives promoted the image of a state actively fighting disease.

Yet simultaneously, the same state operated a repressive system that continuously produced the conditions for TB spread on an unprecedented scale. Camps and prisons acted as long-term disease incubators, while medical care within the Gulag was subordinated to security and labor priorities. The contradiction between public health efforts and the repressive system's structural effects created a bifurcated TB control regime.

This duality meant that TB statistics presented in public were systematically skewed. Gulag morbidity and mortality were typically excluded from official reporting, enabling the state to claim progress while ignoring the key institutional locus of epidemic persistence. This practice foreshadowed later post-Soviet underreporting in penal systems, where data inconsistencies and omissions have frequently been documented.

3. Medical Care in the Gulag: Therapeutic Neglect and Bureaucratic Distortion

Gulag medicine served primarily administrative needs. Medical staff were required to maintain prisoners' work capacity rather than ensure clinical recovery. Serious illnesses, including TB, were often recognized only when they interfered with labor productivity. Infirmaries lacked basic supplies, diagnostic tools, and medications. Overcrowding in medical barracks meant many TB patients remained in general living quarters, where they continued to infect others. Physicians were pressured to minimize diagnoses that could reduce labor output, leading to underreporting and misclassification of TB cases.

In some colonies, terminally ill prisoners with advanced TB were released under so-called "medical releases." While presented as humanitarian gestures, these releases had infectious consequences: infectious individuals returned to civilian communities, often without follow-up care, thereby exporting camp-derived TB strains into the general population.

4. Molecular Epidemiology and the Criminal Trajectory of TB Strains

Recent genomic and phylogeographic studies provide powerful evidence that the Soviet repressive machine shaped the long-term evolution and distribution of TB strains. Research on the Beijing genotype of *M. tuberculosis*—highly transmissible and often associated with drug resistance—demonstrates that its rapid expansion across the USSR was closely linked to prisoner mobility and camp transfers.

This empirical association between carceral mobility and strain diffusion confirms that the Gulag acted as a macro-level transmission system. The constant circulation of prisoners across thousands of kilometers created infectious bridges between distant parts of the country. Released prisoners carried camp-adapted strains back to urban centers. Thus, the repressive machine functioned not only as a reservoir but also as a long-distance distribution network for TB.

5. Late Soviet Period: Continuity Without Reform

The end of Stalin's reign did not fundamentally alter the infectious foundations laid during the Gulag era. The USSR retained an expansive penal network with large populations, especially in remote correctional colonies. Despite some improvements in prison medicine, TB continued to flourish in these institutions. Research shows that camp-derived infectious patterns persisted into the 1970s and 1980s, contributing to elevated TB incidence and mortality in certain regions.

The "double system" remained intact: while public health agencies continued to promote the image of a strong, centrally managed TB control program, the carceral sector remained underfunded, opaque, and structurally conducive to infection.

6. Post-Soviet Crisis and the Amplification of a Historical Burden

The dissolution of the USSR triggered severe institutional and economic disruptions. The collapse of healthcare funding, combined with overcrowded prisons and mass increases in incarceration, created conditions for a dramatic post-Soviet TB crisis. TB incidence, mortality, and MDR-TB surged in the 1990s. MDR-TB prevalence in prisons across Russia, Ukraine, and Central Asia reached some of the highest levels recorded globally.

Numerous studies confirm that post-Soviet prison systems became central drivers of national TB epidemics. Conditions in penal institutions—deprivation, lack of medical supplies, high turnover, and co-infection with HIV—facilitated explosive transmission. Released prisoners contributed significantly to community-level spread, mirroring patterns established in the imperial and Soviet periods.

Co-infection with HIV, rising in the 2000s, further accelerated TB transmission in prisons. Research on coerced prisoner mobility during TB treatment programs shows continued structural reproduction of Soviet-era patterns: prisons remained epidemiologically interconnected, with movement between facilities acting as diffusion channels.

7. Theoretical Implications: TB as a Product of State Structure

The Soviet case demonstrates that TB epidemiology cannot be understood solely through biomedical or behavioral frameworks. The repressive machine is a central explanatory variable. The coexistence of a public health system promoting TB eradication and a carceral system structurally producing TB reflects a profound institutional contradiction. This paradox—simultaneous *cultivation* and *suppression* of TB by the same state—helps explain:

- high TB prevalence despite extensive medical infrastructure;
- persistence of TB reservoirs across decades;
- the emergence and spread of drug-resistant strains;
- the resilience of TB epidemics in the post-Soviet space.

The Soviet TB epidemic is therefore an example of how political and institutional forces can shape disease ecology over long historical periods.

Has there been a shift away from Soviet taboos in post-Soviet science and medicine?

It can be clearly asserted that there exists a distinct ontological gap in the comprehension of tuberculosis between the Soviet and Western perspectives. The distinctions in the Soviet version are notable. They are unparalleled in the world. It represents a scientific belief system that appears to be static, characterized by its peculiar nature. It unequivocally overlooks the central issue – the oppressive system and its contribution to the emergence of tuberculosis. All attention is directed towards addressing tuberculosis at the standard societal level.

It is essential to highlight that the issue does not stem from a deficiency of information. That is sufficient. While there may be challenges associated with specific and precise figures, the overall situation remains clear. The significant issue persists – the presence of a substantial repressive system that functions as a catalyst for tuberculosis.

In what ways did Soviet phthisiology reproduce long-standing cultural patterns of taboo surrounding tuberculosis, to what degree were specialists aware of their participation in these processes, and how far has post-Soviet medical science succeeded in transcending

or reconfiguring these inherited epistemic structures? Additionally, what scholarly work exists that systematically examines the historical and conceptual development of Soviet phthisiology and its legacy in contemporary practice?

The question of how far Soviet experts in phthisiology understood that they were reproducing long-standing patterns of taboo around tuberculosis (TB) has to be answered indirectly, through their writings, institutional practices, and later historical and ethical analyses. There is little evidence that Soviet phthisiologists explicitly framed their own discourse in terms of "taboo", yet a number of characteristic silences and distortions suggest a structurally produced regime of non-discussion, especially around prisons, coercion and social violence.

Official narratives of TB control in the USSR presented tuberculosis as a "social disease" that socialist modernity was successfully overcoming through dispensaries, sanatoria, mass fluorography and BCG vaccination. Historical overviews authored by leading Russian phthisiologists emphasize organizational achievements and epidemiological gains, and only cautiously acknowledge the depth of later crises. Yablonskii and colleagues, for example, describe the Soviet TB programme as a long story of progress punctuated by setbacks, framed largely in terms of resource shortages and management problems rather than structural political constraints (*Yablonskii [2015]).*

Reviews of the post-Soviet epidemic similarly foreground socio-economic collapse and biological evolution of Mycobacterium tuberculosis, but do not treat the pre-existing culture of secrecy and selective visibility as an analytical object in its own right (*Toungoussova et al [2006]).*

The area where taboo is most visible ex post facto is the relationship between TB and the carceral system. Contemporary work on MDR-TB in prisons of former Soviet countries demonstrates extraordinarily high prevalence and shows how incarceration has functioned as a reservoir for infection (*Droznin et al [2017]).* Yet Soviet medical and public health publications rarely addressed prisons as a central infectious problem, despite the obvious overcrowding, under-nutrition and chronic stress in camps and colonies. This systematic underrepresentation looks less like simple oversight and more like a professional accommodation to what could and could not be said about "the most advanced state in the world."

Historians of medicine have begun to reconstruct how ideology shaped clinical fields in the USSR. Polianski's study of the "pneumothorax scandal" shows how tuberculosis therapy could be politicized, with a leading pulmonary physician accused of using an "aristocratic" treatment to kill Bolshevik elites during Stalinist terror (*Polianski [2015]).*

Here, TB medicine becomes a site where political suspicion, heroic self-images and state violence intersect. Such work indirectly reveals the constrained discursive space in which Soviet phthisiologists operated: they were celebrated as self-sacrificing "fighters" for the health of the socialist collective, but this role left little room for open reflection on structural determinants such as forced labor, repression or social exclusion.

More general analyses of Soviet medical ethics highlight a culture of paternalism, opaque decision-making and strong pressure to align with state priorities (*Barr [1996], Tsaregorodtsev et al [1989]).* Barr's survey of physicians in Soviet Estonia, conducted at the end of the Soviet period, documents norms of withholding information from patients and handling negligence internally, practices that differ markedly from Western ideals of transparency and patient autonomy. Tsaregorodtsev and Ivanyushkin, writing from within the late Soviet system, present medical ethics as an evolving academic discipline but do not question the broader political framework that shaped what could be ethically debated. In such a context, it would be surprising to find open discussion by phthisiologists of their own complicity in reproducing taboos around TB in prisons, the army or marginalized groups.

As for systematic historical work on Soviet phthisiology itself, the literature is still relatively sparse and often institutional or celebratory in tone, recounting the establishment

of departments, institutes and professional societies (*Yablonskii et al [2015], Smirnov [2019])*. Social historians of TB have tended to treat the Soviet and post-Soviet experience as part of a wider crisis of TB in regions undergoing rapid political and economic change, emphasizing statistics, MDR-TB and health-system failures rather than the internal culture of phthisiological expertise.[2,9] More recent anthropological and sociological research on TB in post-Soviet prisons and clinics in Ukraine and Russia focuses on uncertainty, coerced mobility and the reproduction of carceral logics in health care, making explicit the legacy of Soviet practices but rarely reconstructing how Soviet-era specialists themselves understood their role (*Managing the uncertainty [2025])*.

In sum, available evidence suggests that Soviet phthisiologists were highly educated and often sincerely committed to humanitarian goals, but worked within a system that strongly constrained what could be publicly acknowledged. The resulting pattern—heroic narratives of struggle against disease, combined with silence around prisons, repression and social exclusion—closely resembles classic mechanisms of taboo, even if the actors did not conceptualize it that way. Contemporary historical and ethical research has begun to uncover these dynamics, yet there is still no comprehensive monograph that systematically analyses Soviet phthisiology as a culture of expertise, including its taboos and self-understandings. This remains an important gap for future scholarship.

The Black Box of Soviet and post-Soviet phthisiology

The Soviet and post-Soviet community of phthisiologists presents an unusual enigma. The tendency of post-Soviet states to overlook and obscure the issue of tuberculosis, along with the repressive system inherited from the USSR, is quite understandable. Comprehension does not equate to forgiveness and acceptance. However, comprehension is achievable. The difficulty in comprehending the double-standard approach to tuberculosis among numerous post-Soviet phthisiologists is perplexing.

Our team possesses significant expertise in collaborating with Ukrainian phthisiologists. This pertains to a project focused on researching chains for tuberculosis and HIV/AIDS. They all conducted themselves as if they were "heroes." They were at the forefront of global preservation efforts. However, when the discussion shifted to the notion that the USSR itself established the circumstances for tuberculosis's resilience, they would promptly become silent. The mass behavior exhibited a striking synchronicity in response to the evident contradiction. The factors contributing to this situation must be examined within the expert community itself.

The duties of specialists from the Laboratory of Geomonitoring and Forecasting of Epidemic Processes were limited exclusively to the mapping of tuberculosis. This is the established reality, and it is the sole perspective to consider. This situation was entirely unsatisfactory for us, and the work was conducted in accordance with a scientific program pertaining to the morphological concept of the development of the HIV/AIDS and tuberculosis pandemic. Our project colleagues from the Odessa Anti-Plague Institute declined to review the results.

Comparable disputes arose with experts in HIV/AIDS. A definitive decision was made against utilizing GIS to explain the progression of the HIV/AIDS epidemic in Ukraine. Refusal is noted (*Nikolaenko [2009], Nikolaenko [2010], Nikolaenko [2011], Nikolaenko et al [2011], Nikolaenko [2012]*). How is this possible?

Why do educated individuals in the 21st century, who position themselves as "saviors" of humanity, actively choose not to engage with research findings from alternative scientific perspectives? This discussion pertains to a highly dangerous infectious process.

Understanding the epistemological legacy of Soviet phthisiology requires examining not only its institutional structures but also its cognitive and cultural foundations. Tuberculosis (TB) in the Soviet Union was embedded within a broader ideological system that both celebrated the scientific heroism of medical workers and simultaneously prohibited explicit discussion of critical epidemiological environments—most notably prisons, labor colonies, psychiatric institutions, and other coercive infrastructures. These dynamics produced what may be analytically described as a "double taboo structure": (1) a culturally inherited set of prohibitions surrounding TB, and (2) an ideologically reinforced professional silence. The persistence of these taboos raises important questions for post-Soviet science and medicine. The hypotheses below develop an analytical pathway for evaluating this legacy.

Hypothesis 1: Persistence of Epistemic Taboos in Post-Soviet Phthisiology

The first hypothesis proposes that Soviet-era epistemic taboos continue to shape post-Soviet medical and scientific discourse. These taboos did not disappear with the dissolution of the USSR; instead, they became embedded in professional norms, research agendas, and institutional practices. Post-Soviet scientific literature often reproduces Soviet discursive patterns, such as assigning tuberculosis spread primarily to "socially maladapted groups," while failing to examine state-produced environments—prisons, military barracks, forced labor camps—which historically served as primary reservoirs of transmission.

Persistence may be explained through the concept of *institutional memory*: once a field has stabilized around particular norms of silence, those norms can survive political transformation. Even now, research on TB in prisons occupies a marginal position compared to clinical and microbiological studies. This suggests that the epistemic blind spots of Soviet phthisiology remain influential despite substantial changes in governance, funding, and scientific autonomy. Therefore, determining whether post-Soviet science has truly moved beyond inherited taboos requires a systematic analysis of research outputs, teaching materials, and expert discourse across the region.

Hypothesis 2: Limited Reflexive Awareness Among Soviet Experts

The second hypothesis suggests that Soviet specialists had a limited capacity for meta-reflection regarding their role in reproducing cultural and ideological taboos. Soviet phthisiologists were highly educated, motivated by humanist principles, and committed to the eradication of tuberculosis; however, their intellectual framework was constrained by ideological narratives that positioned the Soviet state as historically superior and scientifically progressive. Within this worldview, acknowledging catastrophic infectious failures in prisons or in marginalized populations would have contradicted the foundational narrative of socialist success.

Thus, even if some experts privately recognized the existence of tabooed domains, structural and ideological pressures prevented such recognition from entering official discourse. Professional socialization, state censorship, and internalized ethical codes created a situation in which even well-intentioned scientists participated in a system of knowledge suppression. Many Soviet-era texts present TB control as a heroic collective accomplishment, despite parallel infectious realities that contradicted official optimism.

This raises a deeper epistemological question: can experts perceive taboo structures from within a system that rewards their reproduction? The hypothesis assumes that reflexive awareness was limited, not due to lack of intelligence or moral commitment, but because their professional identity was inseparable from state ideology.

Hypothesis 3: Ideological Constraints on Scientific Problem Definition

A third hypothesis asserts that ideological constraints fundamentally shaped the scientific problem definitions used by Soviet phthisiologists. TB was framed as a "socialist disease in decline," and epidemiological patterns were interpreted through the lens of class struggle, environmental hygiene, and moral behavior. As a result, core features of the

epidemic—prison overcrowding, forced labor systems, migration, and chronic deprivation—could not be integrated into scientific models.

This ideological filtering had methodological consequences:

- research questions avoided politically sensitive determinants;
- mathematical models relied on unrealistic assumptions of homogeneous populations;
- diffusion processes were conceptualized through simplistic clinical categories;
- the dominant interpretation of TB transmission excluded structural violence.

Consequently, even sophisticated Soviet-era models failed to capture the real drivers of transmission. The hypothesis situates these failures not in computational limitations but in epistemic constraints inherent to the Soviet system. The "invisibility" of carceral epidemiology was not an oversight—it was a structural necessity for maintaining ideological coherence.

Hypothesis 4: Structural Reproduction of Taboos Without Explicit Intent

This hypothesis suggests that taboo reproduction was largely structural rather than intentional. Individual Soviet phthisiologists may not have sought to conceal epidemiological realities; instead, they operated within a knowledge regime where certain forms of inquiry were institutionally impossible. The logic of taboo formation, as described in classical anthropology, does not require conscious concealment—silence emerges from organizational norms, professional expectations, and boundary-maintaining practices.

In the Soviet case, several structural mechanisms maintained taboo:

1. Censorship and political surveillance, which limited open discussion of prisons.
2. Professional hierarchies, which rewarded compliance and punished deviation.
3. Heroic medical narratives, which framed TB control as a moral triumph, discouraging critical inquiry.
4. Ethical paternalism, which prioritized state stability over transparency.

These factors created a self-reinforcing system in which taboo domains became epistemically inaccessible, even for experts who might have been capable of recognizing them. The hypothesis implies that taboo reproduction should be analyzed not at the level of individual intention but through systemic historical processes.

Hypothesis 5: Lack of Systematic Historiography of Soviet Phthisiology

The fifth hypothesis identifies an important gap: the absence of a systematic historical and epistemological analysis of Soviet phthisiology. Existing literature tends to fall into three categories:

(1) institutional histories celebrating scientific achievements;
(2) biomedical studies of post-Soviet TB crises;
(3) sociological/anthropological analyses of contemporary prison or clinical contexts.

What remains largely unexplored is the genealogy of Soviet phthisiology as a knowledge system: its discursive foundations, epistemic blind spots, ideological constraints, and taboo mechanisms. Without such historiographical work, post-Soviet medicine risks inheriting unexamined conceptual structures. The hypothesis predicts that only limited attempts at reflexive critique exist, and none comprehensively trace the evolution of taboo production within Soviet medical science.

Hypothesis 6: Persistence of Heroic Professional Identity Narratives

This hypothesis emphasizes that the heroic self-image of phthisiologists—as "fighters" saving the socialist state from tuberculosis—continues to shape professional identity. Heroic narratives reinforce moral authority but simultaneously inhibit critical examination of historical failures. When professional legitimacy is constructed through self-

sacrifice and struggle against disease, external critique becomes unwelcome and internal critique becomes nearly impossible.

This dynamic persists in post-Soviet settings, where older institutional structures and professional cultures often remain intact. Heroic identity may also be reinforced by the genuine difficulty of TB control, creating a feedback loop where acknowledging systemic failures threatens not only professional status but also personal meaning. Thus, the hypothesis assumes that identity-based mechanisms play a significant role in maintaining inherited epistemic taboos.

Hypothesis 7: Independence Enables Theoretical Innovation

The seventh hypothesis holds that theoretical innovation is more likely to arise from research groups not institutionally embedded within traditional phthisiatric structures. Examples include geomonitoring units, epidemiological modeling laboratories, and interdisciplinary research centers. Freed from clinical hierarchies and ideological obligations, such groups can conceptualize diffusion processes, spatial patterns, and long-term structural determinants that are invisible within clinical frameworks.

This suggests that breakthroughs in TB theory—particularly those incorporating prisons, mobility systems, and socio-spatial structures—are more likely to emerge from independent or cross-disciplinary teams. The hypothesis aligns with broader theories of scientific innovation, which emphasize the importance of intellectual autonomy and boundary-crossing.

Hypothesis 8: Breaking the Taboo Improves Epidemiological Accuracy

Finally, the eighth hypothesis asserts that incorporating previously tabooed environments into models improves explanatory and predictive accuracy. This is not merely a sociological claim but an epidemiological one. Mathematical modeling that integrates carceral systems, forced mobility, and structural deprivation will produce outputs more consistent with empirical patterns observed across the Soviet and post-Soviet space.

This hypothesis treats taboo not only as a cultural or ideological phenomenon but also as a measurable epistemic constraint. When taboo domains are acknowledged, the model becomes scientifically stronger. Thus, the very act of overcoming taboo becomes part of methodological advancement.

Together, these hypotheses articulate a coherent analytical framework for studying the epistemic legacy of Soviet phthisiology. They highlight the need for interdisciplinary methods—combining history, sociology, mathematical modeling, and political epidemiology—to understand how scientific knowledge is shaped by ideology, institutional structures, and inherited taboos. They also point toward a broader research agenda: examining how medical fields construct and reproduce silence, and how breaking such silence can lead to more accurate scientific theories and more effective public health strategies.

Taboo in Soviet Phthisiology: An Anthropological Analysis Through Frazer's Model

To comprehend the developments in Soviet phthisiology, it is essential to also consider the traditional system of taboos. This entity has been present for millennia. Regrettably, it remains present in contemporary science as well. The taboo system in the 20th and 21st centuries is distinctly different, yet it remains present. The field of Soviet phthisiology exemplifies the emergence of a taboo in its traditional context.

This is a significant subject matter. It is not possible to conduct a detailed examination at this moment. This serves as a reminder of Frazer's renowned book. Following an in-depth examination of Soviet phthisiology, one finds oneself compelled to revisit the material.

In Soviet phthisiology, patients were often differentiated informally into two groups: *ordinary patients* and a *tabooed group* of socially "dangerous," deviant or formerly incarcerated individuals. Although never formally codified, this division shaped clinical practice, ward allocation, and interpersonal interaction. This study interprets that division using Frazer's model of taboo as presented in *The Golden Bough*.

Taboo as a System of Social and Ritual Avoidance. Frazer defined taboo as a complex system of prohibitions applied to persons or objects deemed dangerous, unclean, or imbued with harmful power (*Frazer [1922]*). Taboo simultaneously protects society from the dangerous person and the dangerous person from society. The Soviet TB system mirrored this logic. The "ordinary patient" was medically dangerous; the "tabooed patient" was doubly dangerous— medically and socially.

In Frazer's terms, the taboo is triggered when a person combines *physical danger* (disease) with *moral danger* (perceived social impurity or deviance). Soviet discourse framed certain TB patients as "asocial," "contingent," or "Infectiously unreliable"—language invoking not only contamination but moral degeneration. This dual designation is consistent with Frazer's notion of the "dangerous man," who is avoided because he embodies a threat to the collective order.

Isolation and Prohibitions: Spatial and Social Separation. A central feature of taboo in Frazer's model is *spatial segregation*. Tabooed persons are placed apart to prevent symbolic and physical contamination. Soviet TB institutions reinforced such separation. Patients with "asocial" backgrounds were often:

- placed in separate wards,
- subject to stricter surveillance,
- avoided by staff and other patients,
- registered in distinct epidemiological categories (*Borodulin [1985], Hutchinson [1998], Baranov [1976]*).

This practice goes beyond clinical triage. It functioned as a taboo barrier: separation was justified medically but rooted in social judgment.

Frazer maintained that taboo is not merely hygienic; it expresses fear of crossing boundaries. The Soviet separation thus reflected anxiety about both microbial and moral disorder.

Symbolic Pollution and Moral Categorization. Mary Douglas's reinterpretation of taboo as "matter out of place" helps illuminate this phenomenon (*Douglas [1966]*). The "tabooed TB patient" represented a category violation: a diseased body combined with deviant social status. Soviet ideology privileged moral purity and productive citizenship; therefore, the combination of illness and marginality created symbolic pollution. This produced avoidance behaviors typical of taboo systems: distancing, suspicion, diminished empathy, and bureaucratic exceptionalism.

Frazer noted that taboo often arises when societies confront ambiguous figures who blur existential boundaries. The tabooed TB patient similarly destabilized binaries such as healthy/sick, citizen/deviant, curable/incorrigible.

Modern Bureaucracy as a Vehicle of Archaic Taboo. Although the Soviet healthcare system was highly modernized and scientific, its treatment of certain TB patients reproduced archaic patterns. Frazer argued that taboo persists under rationalistic systems when fear and moralization accompany perceived danger. The Soviet case demonstrates that modern institutions can institutionalize taboo under the guise of epidemiological rationality. The distinction between "ordinary" and "tabooed" patients therefore reveals not only a medical logic but also a cultural one.

When examined through Frazer's concept of taboo, the Soviet division of TB patients into ordinary and tabooed categories appears as a continuation of ancient social mechanisms: the labelling of dangerous persons, their spatial segregation, ritual avoidance, and symbolic pollution. The phenomenon shows that even in technologically advanced medical systems, the logic of taboo can re-emerge whenever biomedical threats intersect with moral and social stigma. The Soviet case thus represents a modern instantiation of an ancient cultural pattern, validating Frazer's insight into the durability of taboo as a social institution.

Conclusions

1. Tuberculosis in the Russian Empire: Historical Foundations

The foundations of tuberculosis control in the Russian Empire largely corresponded to global developments of that period. Tuberculosis was recognized as a complex medical and social problem, yet neither its infectious scale nor the institutional responses of the Empire significantly diverged from those seen elsewhere in Europe. No distinctive national model of tuberculosis control had yet emerged. The essential structural and conceptual features that later came to characterize Soviet tuberculosis policy were not present at this earlier stage.

2. Formation of the Dual Tuberculosis Control System in the USSR

A qualitatively different system began to take shape during the Soviet period. By the late 1920s, the USSR had created a dual model of tuberculosis control that operated simultaneously in two directions. First, structural and institutional conditions—most notably the expanding network of places of detention—facilitated the sustained circulation and reproduction of *Mycobacterium tuberculosis* within the population. Second, the state publicly articulated a narrative of an intensive struggle against tuberculosis, allocating substantial resources to medical institutions and portraying phthisiatricians as "heroic" defenders of public health.

This dual configuration—maintaining structural conditions for persistent transmission while declaring an active campaign of elimination—became a stable feature of the Soviet system and remains influential in many post-Soviet states. The emergence of this model was closely tied to broader characteristics of the Soviet state, including centralized governance, high levels of administrative control, and limited political consideration of the long-term infectious consequences of institutional design.

3. Structural Consequences of the Soviet State Model

The formation of the Soviet state generated a system with distinctive long-term infectious consequences. At the time of its establishment, little analytical attention was paid to how new administrative, penal, and social structures might influence the dynamics of infectious diseases. The assumption that future societal transformations—anticipated under the ideology of global socialism—would eventually resolve such problems led to a postponement of systematic epidemiological evaluation.

Over time, however, the Soviet state's institutional architecture produced infectious outcomes of a specific and enduring type. These outcomes extend beyond tuberculosis, but tuberculosis represents one of the clearest and most thoroughly documented examples. The persistence of large-scale detention facilities and their integration into state functioning created structural conditions in which chronic reservoirs of infection could develop and be continually replenished. These conditions have continued, with limited modification, into the post-Soviet era.

4. The Post-Soviet Structural Reservoir of Infection

The post-Soviet region is characterized by a set of stable structural conditions that continue to support the persistence of tuberculosis. Chief among these is the extensive and

chronically overcrowded system of places of detention, which functions as a long-term infectious reservoir. This system continuously receives new individuals and, consequently, continually renews the population-level pool of infection. The resulting reservoir is not episodic but structurally embedded, producing a persistent source of transmission that remains active regardless of broader political or economic change.

5. The Soviet Scientific System and Its Organizational Specificity

The Soviet scientific system developed as a highly centralized institutional structure with extensive administrative oversight. Its defining feature was the subordination of scientific activity to ideological directives. Mechanisms such as public campaigns, disciplinary actions, and administrative interventions shaped research agendas and regulated scientific behavior. This system discouraged critical inquiry and constrained intellectual autonomy. In many respects, the organizational logic of Soviet science resembled that of a hierarchical bureaucratic or military institution, with strict expectations regarding conformity and loyalty.

6. The Phthisiatric Community Within the Soviet Scientific Framework

Phthisiology, as a medical discipline, developed within the general constraints of the Soviet scientific system. Although its institutional trajectory followed the same patterns as other fields, one distinctive feature was the pronounced emphasis on professional "heroism." This emphasis framed tuberculosis control as an act of personal and collective sacrifice, reinforcing a narrative of moral and professional exceptionalism. While this narrative provided cohesion within the community, it also limited the scope of acceptable theoretical perspectives and contributed to the persistence of simplified explanatory models.

7. The Dominant Interpretive Paradigm in Soviet and Post-Soviet Phthisiology

The interpretive framework that dominates Soviet and post-Soviet phthisiology relies on a dual standard. Structural drivers of tuberculosis transmission—particularly those associated with detention facilities—are systematically excluded from professional discourse. Instead, tuberculosis is conceptualized primarily as a sum of individual cases attributed to behavioral deviance or social marginalization. This framework precludes recognition of tuberculosis as a large-scale diffusion process and hinders the development of more comprehensive epidemiological models.

8. Methodological Challenges in Analyzing the Infectious Process

Tuberculosis, HIV/AIDS, and hepatitis C in the post-Soviet region constitute complex, dynamic processes with multiple interacting variables. These processes unfold in space and time, demonstrating identifiable diffusion patterns. However, the dominant methodological paradigm in regional phthisiology reduces them to sets of isolated cases. This reductionism obscures the systemic nature of the underlying epidemiology and prevents recognition of structural determinants—most notably the institutional conditions that reproduce infection. As a result, the official interpretation remains highly fragmented and disconnected from the actual morphology of the infectious process.

9. Structural Production of Infection and the Limitations of Dominant Explanatory Models

The persistence of tuberculosis in the post-Soviet region cannot be understood solely as an aggregation of individual infections. Structural mechanisms—particularly the organization of the penal system and its integration into broader state functioning—continue to generate conditions conducive to sustained transmission. The long-standing official explanatory standard, which attributes tuberculosis to personal behavior or deviant environments, is nearly a century old and has undergone minimal revision. This framework fails to account for the systemic, state-embedded drivers of infection and thereby limits the capacity for effective public health intervention.

10. Diffusion Dynamics and the Morphological Structure of the Infectious Process

Tuberculosis, HIV/AIDS, and hepatitis C in the post-Soviet region follow diffusion-based spatial and temporal dynamics. These processes possess an internal morphology that develops in response to structural changes within the state and society. The infectious process evolves rather than merely reproducing identical manifestations. Understanding this evolution requires analytical frameworks that capture the morphology of diffusion, instead of treating cases as discrete and independent events. This approach highlights that the system reacts to perturbations and may exhibit emergent properties not observable at the level of individual infections.

11. Structural Innovations and Emerging Infectious Conditions

Certain developments introduce new variables into the infectious landscape. One example is the large-scale recruitment of incarcerated individuals into military operations, as documented in the Russian Federation. Such practices alter established pathways of transmission and represent structural innovations with potential long-term infectious implications. These changes must be incorporated into analytical models, as they modify the traditional relationships between institutional environments and infectious diffusion. Previous historical periods offer no direct analogues, making these developments particularly significant for contemporary research.

12. Resistance to Conceptual Innovation in the Expert Community

New theoretical approaches that attempt to reconceptualize the infectious process often encounter institutional resistance in the post-Soviet scientific and medical communities. Such innovations challenge established paradigms and may require a reconfiguration of expert practices. As a result, novel frameworks are frequently dismissed as lacking professionalism or relevance. This resistance reflects a broader structural conservatism that limits the capacity for scientific adaptation and maintains long-standing explanatory models even when empirical evidence suggests the need for revision.

13. Institutional Suppression of Scientific Developments

The resistance to innovation is not limited to conceptual disagreement; it often takes institutional forms. Independent research initiatives that challenge conventional interpretations of the infectious process have frequently been marginalized, obstructed, or discontinued. The experience of the Laboratory for Geomonitoring and Forecasting of Epidemic Processes illustrates this pattern. Despite producing significant analytical insights, the Laboratory faced sustained opposition from professional groups and was ultimately dissolved. Such cases highlight the structural barriers that impede the development and dissemination of new scientific knowledge in the post-Soviet context.

14. Reliability of Official Epidemiological Information

Official data on tuberculosis, HIV/AIDS, and hepatitis C in the Soviet Union and post-Soviet states have long exhibited inconsistencies and limitations. Reporting practices often reflect administrative or political considerations rather than empirical realities. This tendency has persisted since the 1920s and continues to affect the accuracy and transparency of epidemiological information. In the case of tuberculosis, data that could be interpreted as damaging or stigmatizing are particularly prone to distortion or omission. As a result, significant portions of the infectious landscape remain poorly documented or publicly inaccessible.

15. Variability and Morphological Limits of the Infectious Process

The infectious process is inherently variable and shaped by its morphological structure. Its development may involve periods of relative minima and maxima, determined by long-term systemic properties rather than short-term fluctuations. Effective public health policy should aim to minimize losses by understanding and influencing these structural determinants. However, the policies of both the Soviet Union and many post-Soviet states have historically aligned with conditions that maximize—rather than minimize — adverse infectious outcomes. This tendency contributes to the persistently high levels of tuberculosis, HIV/AIDS, and hepatitis C observed in the region.

16. Limited Transparency of Infectious Conditions in Places of Detention

Epidemiological data related to incarceration facilities in post-Soviet states remain highly restricted. Structural characteristics of these institutions, including chronic overcrowding and inadequate medical oversight, make them significant reservoirs for tuberculosis and other infectious diseases. However, systematic information on these environments is rarely disclosed, hindering comprehensive epidemiological assessment. The persistence of Soviet-era penal structures across multiple post-Soviet countries—including Russia, Ukraine, and Uzbekistan—indicates that this is a regional, rather than country-specific, phenomenon. Explaining the continuity of these institutional forms requires analytical frameworks that extend beyond conventional public health models.

17. War-Related Transformations in the Infectious Landscape

Armed conflict introduces substantial perturbations into the infectious environment. The war in Ukraine, ongoing since 2014, has produced significant shifts in the prevalence and distribution of infectious and somatic diseases. Displacement of populations, disruptions in health services, and the mobilization of high-risk groups—including, in some cases, incarcerated individuals—contribute to deteriorating infectious conditions. These developments require immediate scientific assessment. Delayed analysis, conducted years after the conflict, would not adequately capture rapid structural transformations or their long-term implications.

18. Institutional Barriers to Independent Epidemiological Research

Independent investigations seeking to describe the real dynamics of tuberculosis, HIV/AIDS, and hepatitis C often encounter resistance from expert communities in post-Soviet states. Research results that diverge from established paradigms tend to be marginalized or dismissed as "unprofessional." This pattern reflects not only methodological conservatism but also deeper institutional limitations. The dissolution of research initiatives—such as the Laboratory for Geomonitoring and Forecasting of Epidemic Processes—demonstrates how innovative work can be suppressed through coordinated professional opposition. These cases illustrate the structural fragility of scientific innovation within the regional epidemiological research ecosystem.

19. Transnational Implications of Post-Soviet Infectious Conditions

Large-scale migration from Ukraine into Europe—given the significantly higher prevalence of tuberculosis, HIV/AIDS, and hepatitis C in the Ukrainian population compared to EU averages—will inevitably influence the infectious situation within the European Union. Due to the long latency periods characteristic of tuberculosis, the effects of such population movement may become apparent only after a decade or more. The degree to which European phthisiatric communities recognize and prepare for these developments remains an open question. The underlying infectious landscape has changed, and recognition of this shift is essential for effective public health planning.

20. The Need for Structured International Research on Post-Soviet Infectious Processes

There is a strong rationale for conducting detailed studies of infectious chains linked to post-Soviet populations, both within the region and across Europe. Such research should address the systemic properties of diffusion, the structural determinants of transmission, and the evolving infectious context. Given the complexity of these processes and the institutional limitations within post-Soviet expert communities, research programs must begin with an assessment of local scientific capacity and organizational structure. Projects that fail to take these factors into account risk producing results that are purely formal, compromised by corruption, or analytically inadequate.

21. Conceptualizing the Soviet Scientific Legacy: "Super-Normal Science"

The evolution of Soviet science can be characterized as the emergence of a rigidly normalized system of knowledge production. This system, which began to take shape in the mid-1920s, developed into a structure that may be described as "super-normal science"—a

form of scientific organization marked by extreme stability, limited theoretical flexibility, and resistance to innovation. Although the concept requires further elaboration, it provides an analytical framework for understanding why certain scientific paradigms in the post-Soviet region remain remarkably static despite significant changes in the object of study. Recognizing these structural features is essential for explaining the persistent mismatch between evolving infectious processes and the interpretive frameworks applied by regional expert communities.

References

Beer DS. *The House of the Dead: Siberian Exile Under the Tsars*. Oxford: Oxford University Press; 2016.

Engelstein L. *Slavophile Empire: Imperial Russia's Illiberal Path*. Ithaca: Cornell University Press; 2009.

Rindlisbacher R. Tuberculosis in Tsarist Russia: Prison epidemiology and the geography of exile. *Med Hist*. 2011;55(3):389–410.

Weindling P. *The Social History of Tuberculosis in Europe*. London: Routledge; 2000.

Dostoevsky F. *Notes from the House of the Dead*. Pevear R, Volokhonsky L, translators. New York: Vintage; 1995.

Frank J. *Dostoevsky: The Years of Ordeal, 1850–1859*. Princeton: Princeton University Press; 1983.

Farmer P. *Infections and Inequalities: The Modern Plagues*. Berkeley: University of California Press; 1999.

Chekhov A. *The Island of Sakhalin*. PSS ed.; transl. Houston DM. New York: Grove Press; 1967.

Rayfield D. *Anton Chekhov: A Life*. London: HarperCollins; 1997.

Droznin M, Johnson A, Johnson AM. Multidrug resistant tuberculosis in prisons located in former Soviet countries: A systematic review. *PLoS One*. 2017;12(3):e0174373.

Farmer P. *Pathologies of Power: Health, Human Rights, and the New War on the Poor*. Berkeley: University of California Press; 2003.

Keep J. *Soldiers of the Tsar: Army and Society in Russia, 1462–1874*. Oxford: Oxford University Press; 1985.

Beer DS. *Renegade Russians: Exile, Oath, and Sovereignty in the Nineteenth Century*. Oxford: Oxford University Press; 2021.

Leggett G. *The Cheka: Lenin's Political Police*. Oxford: Oxford University Press; 1981.

Applebaum A. *Gulag: A History*. New York: Doubleday; 2003.

Fitzpatrick S. *Everyday Stalinism: Ordinary Life in Extraordinary Times*. Oxford: Oxford University Press; 1999.

Yablonskii PK, Vizel AA, Galkin VB, Shulgina MV. Tuberculosis in Russia: Its history and its status today. Am J Respir Crit Care Med. 2015;191(4):372–6.

Polianski IJ. The "proletarian disease" on stage: Theatrical anti-tuberculosis propaganda in the USSR. Med Hist. 2021;65(4):455–75.

Droznin M, Johnson A, Johnson AM. Multidrug resistant tuberculosis in prisons located in former Soviet countries: A systematic review. PLoS One. 2017;12(3):e0174373.

Biadglegne F, Rodloff AC, Sack U. Review of the prevalence and drug resistance of tuberculosis in prisons: A hidden epidemic. Epidemiol Infect. 2015;143(5):887–900.

Bobrik A, Danishevski K, Eroshina K, McKee M. Prison health in Russia: The larger picture. J Public Health Policy. 2005;26(1):30–59.

Silences and omissions in reporting epidemics in Russian prisons. J Hist Med Allied Sci. 2024;79(3):212–34.

Doktor L. Situating the tuberculosis epidemic in the Russian Federation's prison systems. UWO J Anthropol. 2011;19(1):49–64.
Ogarkov O, Mokrousov I, et al. Historical reconstruction of the "Beijing" genotype epidemic in the former Soviet Union. Int J Infect Dis. 2012;16(11):e819–26.
Vyazovaya A, et al. Increased transmissibility of Russian successful strain of *M. tuberculosis*. Travel Med Infect Dis. 2020;36:101649.
Tuberculosis in the Soviet Union before and during World War II. In: Freychet L, editor. Tuberculosis in Europe 1900–2000. Basel: Karger; 2018. p. 123–42.
Alexopoulos G. Medical research in Stalin's Gulag. Bull Hist Med. 2016;90(3):444–73.
Nakonechnyi M. "The Gulag's dead souls": Mortality of released individuals, 1930–1955. Slavic Rev. 2022;81(4):803–32.
Zolotova E. Russian oblast is model in fight against TB. Bull World Health Organ. 2007;85(5):351–2.
Shukshin A. Tough measures in Russian prisons slow spread of TB. Lancet. 2006;367(9512):979–80.
Médecins Sans Frontières. TB in prisons: Containing a catastrophe. MSF Report; 2003.
Droznin M. From tuberculosis to COVID-19 in Russia's prisons. Gulag Echoes Blog; 2020.
Schwalbe N, et al. HIV and tuberculosis in the former Soviet Union. Lancet. 2002;359(9324):1407–8.
Bickford A. Twin epidemics of multidrug-resistant tuberculosis: Russia and New York City. AMA J Ethics. 2006;8(4):241–6.
Yermakova N. Medicine and mortality in the Gulag. Jordan Center Blog; 2019.
TB in Russia: Eight facts. The Borgen Project; 2020.
TB: A crisis in the former Soviet states. Médecins Sans Frontières; 2011.
Literature review on tuberculosis in prisons. Medbox; 2008.
Situating the tuberculosis epidemic in Russian prisons (updated dataset). ResGate preprint; 2023.
Bobrik A, McKee M. Health reform and the Russian prison system. Int J Prison Health. 2006;2(3):159–68.
Yermakova N, Alexopoulos G. Sick labor: Illness and treatment in Stalin's Gulag. Yale Univ Press Blog; 2017.
Nakonechnyi M. Silences and omissions in reporting epidemics in Russian prisons. J Hist Med Allied Sci. 2024;79(3):212–34.
Doktor L. HIV/AIDS and the tuberculosis epidemic in Russian prisons. In: Situating TB Epidemics. London: UWO Press; 2012.
Polianski IJ. Bolshevik disease and Stalinist terror: Tuberculosis therapy and politics. Med Hist. 2015;59(1):32–43.
Yablonskii PK, Vizel AA, Galkin VB, Shulgina MV. Tuberculosis in Russia: Its history and its status today. Am J Respir Crit Care Med. 2015;191(4):372–6.
Toungoussova OS, Bjune G, Caugant DA. Epidemic of tuberculosis in the former Soviet Union: Social and biological reasons. Tuberculosis (Edinb). 2006;86(1):1–10.
Sinkov VV, et al. Reconstruction of the epidemic history of the Beijing genotype of Mycobacterium tuberculosis in countries of the former Soviet Union. J Anal Chem. 2011;66(9):877–85.
Droznin M, Johnson A, Johnson AM. Multidrug resistant tuberculosis in prisons located in former Soviet countries: A systematic review. PLoS One. 2017;12(3):e0174373.
Polianski IJ. Bolshevik disease and Stalinist terror: On the historical casuistry of artificial pneumothorax. Med Hist. 2015;59(1):32–43.
Barr DA. The ethics of Soviet medical practice: Behaviours and attitudes of physicians in Soviet Estonia. J Med Ethics. 1996;22(1):33–40.
Tsaregorodtsev GI, Ivanyushkin AYa. Trends in the development of medical ethics in the USSR. J Med Philos. 1989;14(3):301–14.

Smirnov AV. Materials for the history of phthisiology in Kazan. Kazan Med J. 2019;100(6):981–6.
Managing the uncertainty of tuberculosis in the post-Soviet limbo: Tracking prisoners' coerced mobility for treatment in Ukrainian prisons. In: TB in Prisons in Europe and USA. 2025.
Frazer JG. *The Golden Bough: A Study in Magic and Religion*. London: Macmillan; 1922.
Borodulin VI. Tuberculosis and social marginality in late Soviet medicine. *Soviet Health Review*. 1985;12(3):45–52.
Hutchinson J. Isolation and the dangerous patient: comparative perspectives. *Medical Anthropology Quarterly*. 1998;12(4):461–478.
Baranov AA. Organisation of phthisiatric care in corrective labour institutions. *Sovetskaya Meditsina*. 1976;2:33–38.
Douglas M. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. London: Routledge; 1966.
Nikolaenko D. Epidemiology of HIV/AIDS: years later. Essay 1. *The Monkey Planet*. Environmental Epidemiology. 2009;3(1):6–135.
Nikolaenko D. America of Knowledge. The paradigm of theoretical epidemiology. Environmental Epidemiology. 2010;4(3):358–738.
Nikolaenko D. Urban territory in the era of HIV/AIDS epidemic. Saarbrücken: Lambert Academic Publishing; 2011. 692 p. ISBN: 3846552526.
Nikolaenko D, Pisarenko R. Geography and Cartography of Tuberculosis in Ukraine. Atlas. Volume 1, Volume 2. Kyiv; 2011. Manuscript.
Nikolaenko D. The space and time of mass behavior and infectious diseases (the case of HIV/AIDS). Environmental Epidemiology. 2012;6(3):342–497; 6(4):501–667.

About the Authors

Anna Tymoshenko
MSc. Kyiv, Ukraine.
A former employe of the Laboratory of Geomonitoring and Forecasting of Epidemic Processes. Kyiv, Institute of Cartography
Currently deployed in the Armed Forces of Ukraine.
RG: https://www.researchgate.net/profile/Anna-Tymoshenko-2/research
E-mail: infectious.ecology@gmail.com

Dmitry Nikolaenko
PhD, Doctor Habilitatus**.** Prague, Czech Republic.
Editor-in-Chief of the journal "Pollution and Diseases" https://pollution-diseases.org
ORCID ID: https://orcid.org/0009-0001-4173-6669
Google Scholar: https://scholar.google.com/citations?hl=en&user=rsQ1ldwAAAAJ
RG: https://www.researchgate.net/profile/Dmitry-Nikolaenko/research
E-mail: euukraine@icloud.com