Prison Health in Russia: The Larger Picture

ALEXEY BOBRIK*, KIRILL DANISHEVSKI, KSENIA EROSHINA and MARTIN McKEE

ABSTRACT

Russia, despite recent legal reforms, still has one of the highest rates of imprisonment in the world. There are many reports of the adverse conditions in Russian prisons, often highlighting the consequences for health, in particular risks of HIV, tuberculosis, and other infectious diseases. However, there are no reviews of the broader health issues in the Russian penal system. This paper reviews the available information on the health of the imprisoned population in Russia and the factors underlying it. It was undertaken by means of a search of Russian and international literature, including unpublished sources, supplemented by in-depth interviews with 27 key informants from the Ministry of Justice, prison administration, and non-governmental organizations. Published and unpublished data from the ministries of health and justice were used to describe the demographic characteristics of the imprisoned population and compare it with the general population. Although convicts are drawn disproportionately from disadvantaged groups in the society and are detained in adverse physical conditions, the standardized mortality ratio from all causes is slightly over one-third of that in the overall Russian male population. This is mainly explained by an eight-fold lower mortality from external causes and a more than two-fold lower mortality from cardiovascular disease. These far outweigh the increased mortality from infectious diseases. The chances of survival of young men in Russia may actually be improved by being in prison, highlighting the need for policies that reduce the overall level of violence and other external risks, such as dangerous driving habits, in Russian society. Yet while conditions are improving in Russian prisons, with death rates falling, there are still many avoidable deaths and high levels of mental illness and infectious disease. There is also much that is not known about the health of Russian convicts, with what is available reflecting what is measured rather than what is important.

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INTRODUCTION

The life of a prisoner anywhere is harsh, but in Russia it is especially so. While the excesses of the gulag are now history (1), a United Nations inspector visiting a pre-trial detention center in Moscow in the mid-1990s commented that he would need the literary skills of Dante or the artistic skills of Hieronymus Bosch to describe fully the horrors with which he was confronted (2). Prison conditions are a legitimate matter of public health concern. Such conditions can be expected to impact adversely on the health of prisoners; a population that is typically drawn overwhelmingly from the most underprivileged and marginalized groups in society (3) and which has often experienced poor living conditions, a chaotic lifestyle (4), malnutrition and inadequate access to medical care (5) long before incarceration.

Conditions in prisons can also impact adversely on the general population (6). In England, in the 17th and 18th centuries, jurors and judges were at risk from "jail fever" (7). Nowadays, the risk of spread of tuberculosis and meningococcal infection is recognized (8,9) and one Russian study reported that ex-prisoners accounted for up to 20% of new cases of tuberculosis, and 57% of smear-positive cases, among the civilian population (10). In 1997, at the peak of the tuberculosis epidemic in Russian correctional facilities, 428 cases were recorded among prison staff (11). The emergence of HIV has brought a new risk, as there are reports of community outbreaks following amnesties and subsequent release of convicts (12–14).

Although much has been written about the relationship between prisons and health in Russia, in particular by those working on prison reform, policy-makers have focused largely been on infectious disease, and in particular tuberculosis (15–22) and HIV (23–25). No attempt has been made to assemble the available information systematically on the range of health outcomes and to describe critically the overall health impact of the Russian prison system. This paper begins to fill this gap.

METHODS

The goal of the study was to assemble the available information about health in the Russian prison system and so provide a

situational analysis that could inform prison health policy. The study was confined to those prisons under the authority of the Ministry of Justice, while recognizing the existence of other settings in which individuals may legally be confined (see below). Information was identified by means of a systematic search process.

Medline was searched using MeSH terms "Prisons" and "Prisoners" and related key words: prison health, jail, detention center, inmate, detainee, and Russia*. The records of the Central Medical Library of Russia were searched using the key words (in Russian): prison health, jail, detention center, inmate, detainee. In each case, original papers were obtained and cited references were followed up.

Data were extracted from published statistics on health in detained populations:

- Ugolovno-ispolnitel'naya sistema Rossii. Statisticheskii sbornik. MYu, GUIN 2003 (Criminal Justice System of Russia]. Statistical materials. Ministry of Justice, 2003)
- Harakteristika osuzhdennyh k lisheniyu svobody. Po materialam special'noi perepisi 1999 goda. Pod red. Prof. A.S.Mihlina M. Yurisprudenciya 2001 (Characteristics of convicted persons. Materials of the special census. 2001).
- Harakteristika podozrevaemyh i obvinyaemyh, soderzhashihsya v sledstvennyh izolyatorah. Po materialam special'noi perepisi 1999 goda. Pod red. Prof. A.S.Mihlina M. Yurisprudenciya 2000 (Characteristic of detainees. Materials of the special census. 2000).
- Sostoyanie zdorov'ya kontingentov, soderzhashihsya v uchrezhdeniyah ugolovno-ispolnitel'noi sistemy Rossiiskoi Federacii v 2002 godu. Statisticheskie materialy. MYu RF, GUIN, Medicinskoe upravlenie. 2003; (Health status of people contained in the institutions of the criminal justice system of Russia in 2002. Statistical materials. Ministry of Justice, 2003).
- Smertnost' naseleniya Rossiiskoi Federacii 2002 god. Statisticheskie materialy. Oficial'noe izdanie MZ RF, Departamenta organizacii i razvitiya medicinskoi pomoshi naseleniyu, CNIIOIZ. Moskva 2003 (Mortality of population of Russia in 2002. Statistical materials. Ministry of Health, 2003).

The literature review was supplemented by 27 in-depth interviews with key informants identified by snowball sampling, with recruitment continuing until saturation was reached and new issues no

longer arose. Our key informants included five senior staff in the medical service of the penitentiary directorate of the Ministry of Justice, three of whom had specialized knowledge of specific health issues; the heads of prison medical services in seven Russian regions; senior staff from non-governmental agencies working in Russia in on prison health reform and human rights; and individuals involved in international assistance projects such as the Prison Health Group of the Task Force on Communicable Disease Control in the Baltic Sea Region. The interviewees from the Ministry of Justice also supplied a great deal of unpublished data or undertook ad hoc analyses for us.

We (AB and KE) conducted interviews in Russian and English, seeking information on major health problems in the prison system and printed sources of information that documented those problems. We extracted data from internal documents and analyzed health data using standard demographic and epidemiological methods, such as age standardization.

THE RUSSIAN PENAL SYSTEM

The Russian state has many methods of detention at its disposal, involving several different ministries (Table 1). The overwhelming majority of detainees are held in facilities under the control of the Ministry of Justice. These facilities comprise pre-trial detention centers (SIZOs – Sledstvenny Isolator); correctional colonies (IK – Ispravitelnaya Kolonia) and settlements (IKS – Ispravitelnaya Kolonia-Posele); and prisons (VK – Vospitatelnaya Kolonia). The last of these hold about 5% of those convicted, where the crime is especially grave or the individual is a habitual offender. We focus in this paper primarily on prisons, correctional colonies, and correctional settlements under the control of the Ministry of Justice, with occasional reference to pre-trial detention centers. Henceforth the term *penitentiary* is used to include settlements, colonies, and prisons, with those held therein being referred to as *convicts*. Individuals in pre-trial detention centers are referred to as *detainees*.

Until the late 1990s, the imprisonment rate in Russia was the highest in the world, but in 2000 a major legal reform reduced the population in penitentiaries by 200,000. In late 2002, there were 1,014 Ministry of Justice facilities, containing 877,000 people, a rate of 670/100,000 population (26,27). For comparison, the USA, with

Table 1: The prison system in the Russian Federation

Ministry	*Institutions*
Main Directorate of Corrections of the Ministry of Justice	Pre-trial facilities (SIZOs). Correctional colonies, of two types: (a) IK settlements (IKS) – open prisons, in which convicts do not wear uniforms and prisons live in dormitories or apartments within the prison perimeter, and where, with permission, relatives can live with convicts. Convicts are typically first-time offenders serving under 5 years for non-premeditated crimes. (b) Correctional colonies (IK) – isolated facilities enclosed by wire and patrolled by armed guards and dogs. Convicts live in dormitories but must be guarded when moving between areas of the colony. Colonies are of three types: general, strict, and special (convicts committing especially grave crimes). Each colony is divided into three levels of severity: light (for those who have not committed any disciplinary violations for a designated period), general (standard regime), and strict, with increasing restrictions in each. Prisons – 13 in Russia (with one for women, one for convicts with tuberculosis). Prisons are en closed by high walls and fences, patrolled by armed guards and dogs. Convicts are confined in cells holding 5–30 people, which they leave only to work, take exercise, or receive visitors. Convicts include those sentenced to more than five years, where the court has decided that some of the sentence will be in a prison, and those committing disciplinary violations in an IK. Educational colonies for minors (VK). Prison hospitals.

Table 1 *(continued)*

Ministry	*Institutions*
Main Directorate to Serve Public Order of the Ministry of the Interior	Police cells; Temporary arrest facilities; Special intake institutions (for those suspected of a crime but with no permanent place of residence or whose identity is in doubt).
Ministry of Defence	Disciplinary battalions, for serving personnel convicted under military law.
Ministry of Health	Special psychiatric hospitals, for convicts found guilty but insane or seriously mentally disturbed, as well as those who become mentally ill while serving sentences. Non-violent first offenders may also be sent to general psychiatric hospitals.
Ministry of Education	Special secondary schools, for those aged 11–14 years. Special vocational schools, for those aged 14–18 years.

Source: Moscow Center for Prison Reform http://www.prison.org/english/rpstabo.htm.

the highest rate in the world, imprisons 702 people per 100,000 population.

More detailed information come from a series of censuses of this population, the most recent in 1999 (28,29). Over 90% of convicts were adult males, with 4–5% females and a similar number juveniles. More than 85% were between 20 and 49 years old, with nearly 60% under 30 years old (with fewer than 3% under 18).

Only 1.3% of convicts had a university degree, 14.9% had vocational-level training (technikums and Professionalno-Technicheskoye Uchilische), 78.5% secondary education, and 5.3% primary education. For comparison, a household survey undertaken in Russia in 2001 found, in the general male population aged 20–60 years, corresponding figures of 22.5, 39.1, 29.4, and 8.9% (30).

More than 90% of imprisoned convicts were recognized as "able-bodied." Nearly 60% of convicts, however, did not work or study and had no definite source of income during the period immediately

preceding detention. Those in captivity typically had very little social support. Nearly 70% of convicts were unmarried at the time of arrest. This compares with 23% of the Russian male population aged 20–60 years in the 2001 survey mentioned above. Among those who had been married, in over 30% of cases the relationship had already broken down at the time of the census. Almost 50% of convicts received no outside support, such as parcels, food, or money. Between 50 and 80% of detainees had no visitors over the previous 3-months.

PHYSICAL CONDITIONS IN THE PRISON SYSTEM

Much has been written about physical conditions in Russian prisons, with many individual reports of poor sanitary and living conditions (31–35), and detailed information from across Russia collected by the Moscow Helsinki Group (36). Overcrowding is prevalent. Officially, the minimum space for each inmate, as set out in the Federal Law ratifying the Convention for Protection of Human Rights and Basic Freedoms, is 4 m^2. However, the regulations required to implement these provisions specify less space: Article 99 of the Penal Code of the Russian Federation, as well as the regulations of the Sanitary Epidemiological Service, are lower at 2 m^2 in correctional colonies; 2.5 m^2 in prisons; 3 m^2 in prison hospitals; and 3.5 m^2 in juvenile correctional institutions. In reality, even these standards have not been adhered to for many years, with the worst conditions in the pre-trial detention centers. This situation has worsened since the late 1980s, with the penal budget covering no more than 60% of expenditure and, for some budget lines, only 20% (37). Thus, by 2000, average space per person in pre-trial detention centers was only 1.7 m^2 and as low as 0.5 m^2 in some facilities (38). Since 2000 the situation has improved slightly.

The effects of overcrowding are exacerbated by the poor state of many buildings, some over a century old. Reports on physical conditions catalogue inadequate ventilation, with high humidity (39), and inadequate lighting. While penitentiaries have lavatories, many pre-trial detention centers lack flush toilets so that detainees must use buckets. Virtually all penitentiaries have showers or bath houses, but some are subject to frequent interruptions of water supply and many have no hot water in living areas.

Although official nutritional standards exist, differentiated in terms of the physiological needs of the convicts and climatic conditions (40), some research has challenged the appropriateness of these standards, for at least some categories of convicts (41,42). As with other budget items, food allocations are often insufficient to comply with nutritional standards as most correctional institutions have farms. Convicts may receive food from their families or purchase extra supplies from prison shops.

ASSESSING THE HEALTH OF THE PRISON POPULATION IN RUSSIA

Our analysis of mortality is constrained by the high level of aggregation of data, so that, despite exhaustive efforts, we could only obtain total numbers by cause. Between 1991, the last year of the USSR, and 1997, crude death rate among convicts in Russian penitentiaries (all ages) rose more than two-fold, subsequently recovering through 2002 (Figure 1).

However, the aggregate figures conceal separate trends for specific causes of death. The early and mid-1990s saw a marked decline in deaths from injuries, likely reflecting a reduction in industrial production taking place in penitentiaries. This decline was, however, more than compensated for by an increase in deaths from infectious

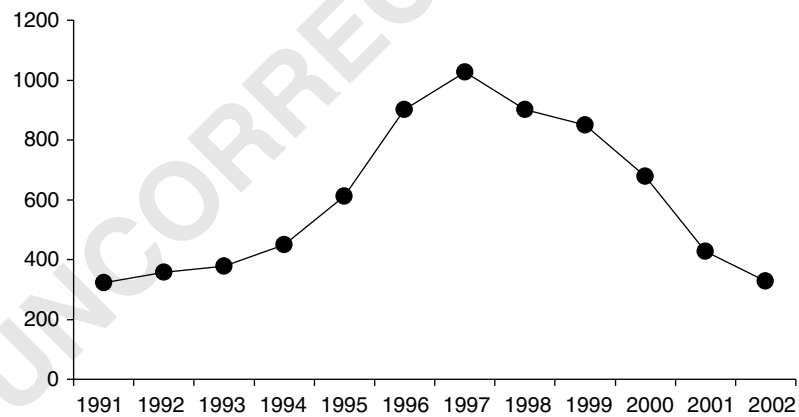

Figure 1
Crude mortality rate in Russian penitentiaries (per 100,000). *Source*: Ministry of Justice, unpublished data

diseases and in particular tuberculosis, which by 1997 accounted for 49.2% of prison deaths, and cardiovascular diseases, which accounted for 18.2% of all deaths in the same year. The steady decline in death rates since 1997 is due almost entirely to the reduction by approximately 90% in deaths from tuberculosis (Figure 2). By 2002, the prison death rate from tuberculosis, 43/100,000, was close to the rate for the Russian male population aged 0–64 years, 40/100,000. The declining mortality from tuberculosis in prisons was taking place at a time when tuberculosis mortality in the general male population was steadily increasing.

In 2002, the latest year for which data are available, the three leading contributors to the crude prison death rate of 327.8/100,000 were cardiovascular diseases (32%), infectious diseases (27%), and external causes (14%) (Figure 3).

The situation in pre-trial detention centers (SIZOs) is inevitably somewhat different, as the health of convicts is much more closely related to their circumstances prior to arrest. Statistics on health are also influenced by the fact that all detainees undergo a compulsory medical examination, with a chest X-ray and laboratory tests for certain infections. Thus, *incident* rates of hepatitis A and B in SIZOs are 3 times higher than those in penitentiaries. As might be expected, the pattern of mortality is also different from that in penitentiaries.

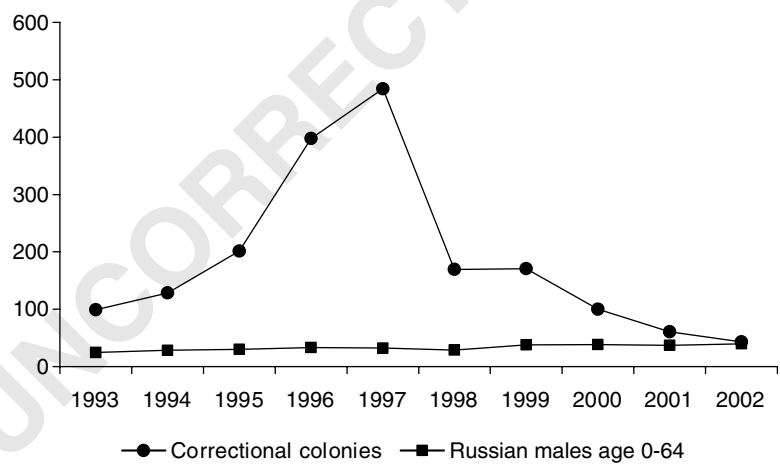

Figure 2
Mortality from tuberculosis in Russian penitentiaries and the Russian male population (age 0–64 years) (per 100,000). *Source*: Ministry of Justice, unpublished data

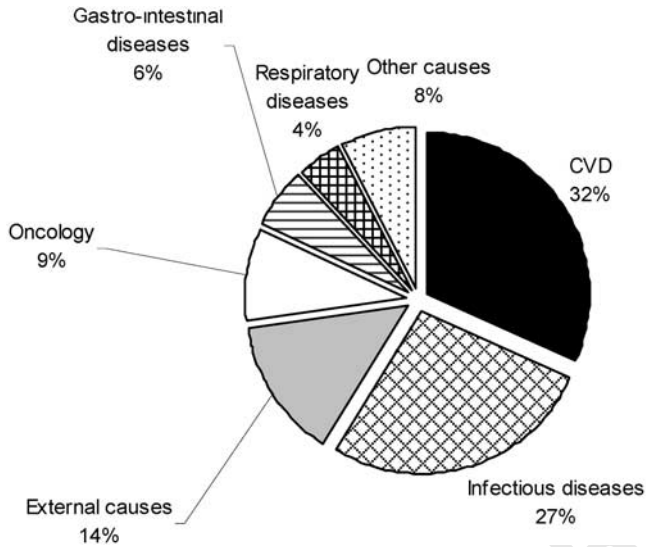

Figure 3
Causes of death in penitentiaries, 2002 (104). *Source*: Sostoyanie zdorov'ya kontingentov, soderzhashihsya v uchrezhdeniyah ugolovno-ispolnitel'noi sistemy Rossiiskoi Federacii v 2002 godu. Statisticheskie materialy. MYu RF, GUIN, Medicinskoe upravlenie. 2003; 107

In 2002, the overall death rate was less than 10% of that in penitentiaries (24.33 vs. 327.79 per 100,000) with lower rates for all major categories of death. The contribution of different causes to overall mortality is shown in Figure 4.

Crude death rates, while providing a measure of the overall burden of mortality, cannot be used to assess whether prisons are more or less dangerous than the societies in which they exist. The populations are not comparable in terms of basic demographic parameters. Our ability to take account of differences is constrained by the availability of aggregate mortality data only for the prison population. To overcome this limitation, we used the technique of indirect standardization. We applied the age-specific mortality rates seen in the male Russian population to the estimated number of convicts (derived by applying the age distribution in the 1999 prison census to the 2002 mid-year prison population (43, 44)), in each age-band in Russian penitentiaries in 2002 and compared our results with the observed total number of deaths. We showed that the actual

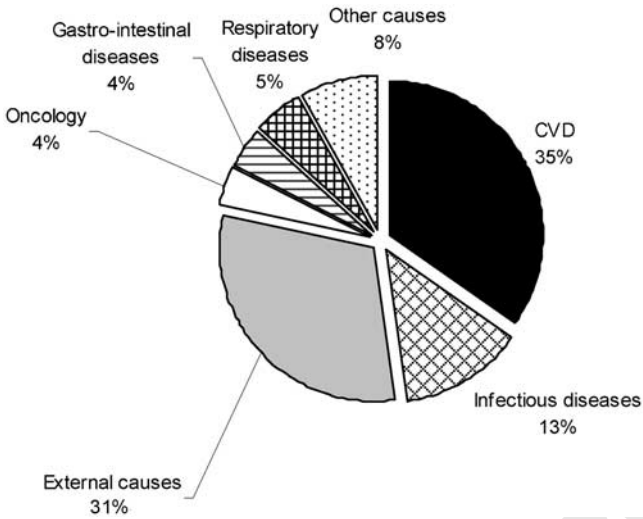

Figure 4
Causes of death in pre-trial detention centers, 2002 (104). *Source*: Sostoyanie zdorov'ya kontingentov, soderzhashihsya v uchrezhdeniyah ugolovno-ispolnitel'noi sistemy Rossiiskoi Federacii v 2002 godu. Statisticheskie materialy. MYu RF, GUIN, Medicinskoe upravlenie. 2003; 107

number of deaths is just over a third of what might be expected (Table 2), with a standardized mortality ratio (SMR) of 0.397.

Our analysis was further limited by the availability of data on deaths by cause in each age group in the prison population. To provide an approximate comparison, we set the overall prison figures against the death rates in the general male Russian population aged 20–60 years. It appears that the difference is due largely to lower rates of cardiovascular diseases in prisons (104.12 vs. 355.6 per 100,000 in 2002, SMR = 0.463, 762 deaths), and external causes (49.87 vs. −459.7 per 100,000, SMR = 0.125, 365 deaths). These rates are so much lower as to compensate for the somewhat higher mortality of Russian convicts from infectious diseases (89.77/100,000 vs. 32.3/100,000, 657 deaths).

Inevitably, national figures conceal considerable regional variations. Thus, in 2002, while the overall incidence of tuberculosis in penitentiaries was 2,028/100,000, it varied among the seven main Russian regions (so-called Federal Okrugs), from 2,163 per 100,000 to 4,173 per 100,000. Mortality varied from 22 per 100,00 to 121 per 100,000 (45).

Q1

Table 2: Computation of expected mortality (indirect age adjustment) for Russian male convicts

Age (years)	*Overall death rate from all causes (per 100,000) among males in Russia (103)*	*Estimated number of convicts (based on the mid-year number of 731,878 and age distribution of Russian convicts (28, 29) in 2002)*	*Expected deaths in convicts*	*Observed deaths in convicts*
15–19	194	87,094	169	
20–29	507	305,925	1,550	
30-39	809	201,998	1,634	
40–49	1,558	96,608	1,505	
50–59	2,959	40,253	1,191	
Totals		731,878	6,049	2,399

Source: Ministry of Justice, unpublished data and Goskomstat.

Data on mortality provide an incomplete picture of health in prisons, but the information available to us on non-fatal disorders was also incomplete. Some was available from health surveys in penal institutions in the second half of the 1990s (46, 47), where recorded episodes of illness were dominated by

- respiratory diseases – 23.5% (viral acute respiratory infections, chronic non-specific lung diseases, pneumonia, etc.);
- mental disorders – 19.6% (chronic alcoholism, drug addiction, etc.),
- infectious diseases – 17.3% (e.g. tuberculosis, STIs,) and
- skin diseases – 10.9% (e.g. scabies, pediculosis).

For trend data, it would be necessary to look at conditions for which notification systems exist; these are primarily for psychiatric and infectious conditions.

Even before the 1980s, reports indicated that up to 50–60% of those in Soviet prisons had psychiatric disorders (48,49), although this needs to be interpreted in the light of the Soviet psychiatric paradigm (50). By the late 1990s, this situation had worsened considerably, especially because of the rapid spread of drug use in Russian society (Source: Sostoyanie zdorov'ya kontingentov, soderzhashihsya v uchrezhdeniyah ugolovno-ispolnitel'noi sistemy Rossiiskoi Federacii v 2002 godu. Statisticheskie materialy. MYu RF, GUIN, Medicinskoe upravlenie. 2003; 107, Figure 5). In 2002, Russian penitentiaries contained 96,915 (11% of convicts) people with a diagnosis of drug-dependency, 61,579 (7%) with a diagnosis of alcoholism, and 120,517 (14%) with other psychiatric diseases. In addition to mental illness that exists prior to imprisonment, it must also be recognized that the process of adaptation to prison conditions is often extremely difficult, frequently resulting in depression and anxiety (51,52).

Of all the health problems in Russian prisons, tuberculosis has attracted the most attention (53–59). Even in 1991, when the rate was at a historic low, the incidence of tuberculosis in penal institutes far exceeded that in the population at large. Cure rates were also low, with 74.2% becoming smear negative and 64.4% achieving cavity

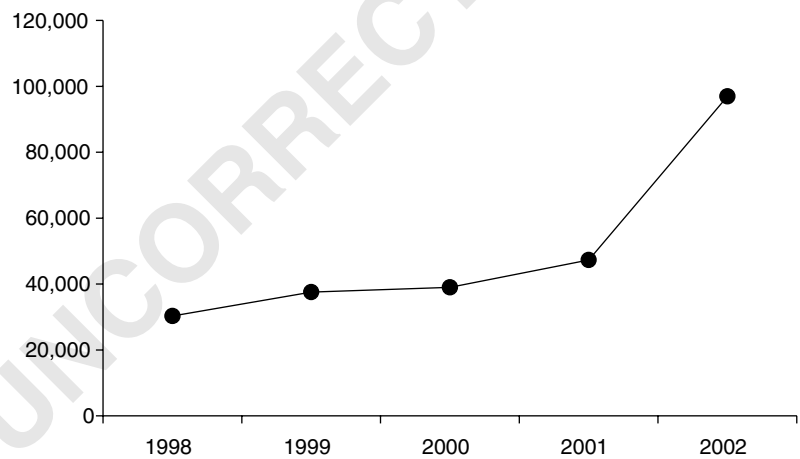

Figure 5
Number of convicts registered as drug-dependent in Russian penitentiaries. *Source*: Ministry of Justice, unpublished data

closure (60). Over the following decade, the incidence in the penal system increased four-fold, reaching 4,055/100,000 (Figure 6), with a death rate from tuberculosis of 485/100,000. In some facilities, the incidence rate reached 7,000 per 100,000. The situation has, however, improved since 2000.

The emergence and rapid spread of multi-drug-resistant tuberculosis was identified in the mid-1990s in Russia (61). One study has reported rifampicin resistance in 80% of isolates from a sample of Russian prisons (62), while another reported rates of multi-drug resistance in 34% of new cases and 55% of previously treated cases (63). Rates of resistance seem to vary considerably between regions, with one study in Orel reporting a rate of multi-drug resistance of 12%, although this was still twice as high as in the general population in that region (64). These developments pose a serious challenge to a penal system that is insufficiently flexible to adapt to changing circumstances. The effective management of multi-drug-resistant tuberculosis requires carefully planned use of second-line drugs under tightly controlled circumstances. As Médecins Sans Frontières (MSF) have noted, second-line drugs are used in many Russian regions without clear guidelines, appropriate infrastructure, trained personnel, or follow-up for patients released for prison on treatment. MSF

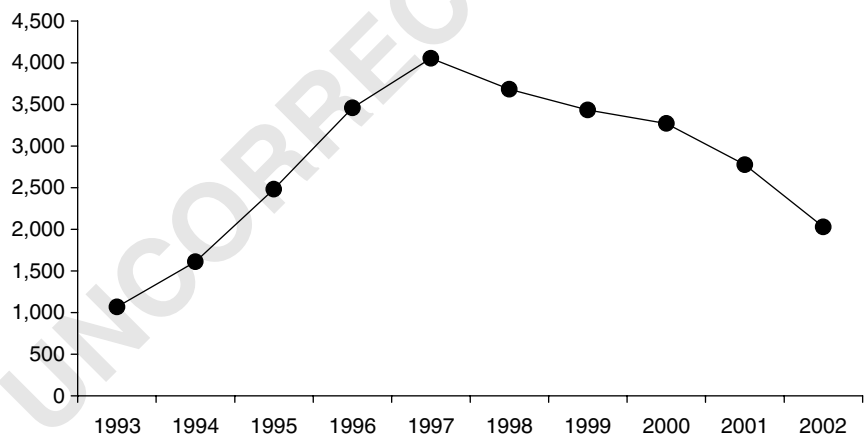

Figure 6
Tuberculosis incidence in Russian penitentiaries (per 100,000). *Source*: Ministry of Justice, unpublished data

highlights the substantial risk of the emergence of super-resistant tuberculosis and reports that obstacles created by the Russian Ministry of Health that prevent them delivering effective treatment have caused them to withdraw from treatment programs (65).

Information also exists on sexually transmitted infections (STIs) among Russian prisoners, with reports dating back to the 1920s when surveys among prisoners in Kazan (66) and Penza (67) found a prevalence of syphilis of 14% and of gonorrhea at 11%. During the 1990s, the incidence of syphilis in the Department of Justice Facilities has increased almost 17 times (Figure 7). A report from the Nizhny Novgorod pre-trial detention center in the late 1990s noted an incidence of syphilis that was 27 times higher than in the general population and of gonorrhea that was 14 times higher. Rates among females were 8–10 times higher than among men (syphilis – 9,220.8/100,000 vs. 877.6/100,000) (68–70).

More than 90% of incident cases of STI are detected on admission to pre-trial detention centers and so represent infections contracted outside institutions. Isolated reports of outbreaks occur in penal facilities, such as the infection with syphilis of 76 convicts at a correctional colony in the Krasnodar region (71), but it seems likely that the true scale of the problem is underestimated.

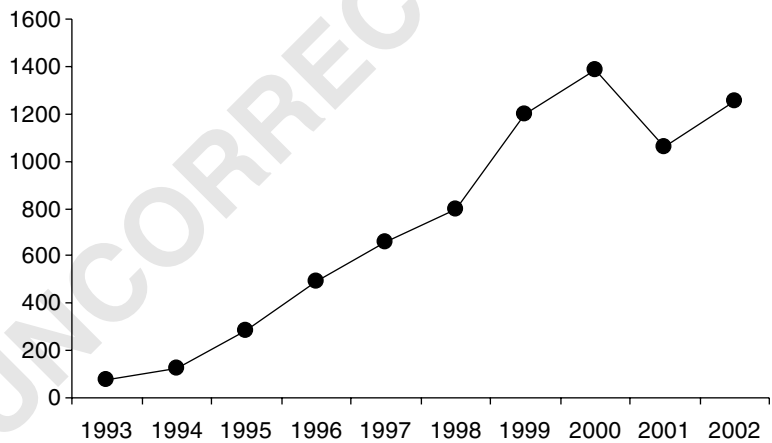

Figure 7
Syphilis incidence rate in Russian penitentiaries (per 100,000). *Source*: Ministry of Justice, unpublished data

Inevitably, there has been an increase in the number of HIV-infected convicts (Figure 8), reflecting the situation in the Russian population as a whole, where the disease has taken hold among intravenous drug users (72). By late 2002, the registered number of persons in the Russian penal system living with AIDS exceeded 36,000 (4% of the prison population), and accounted for about 20% of the known burden of AIDS in Russia.

Between 2002 and 2003, there was a decline of 1,000 in the number of HIV-infected convicts. Key informants identify three factors:

- the decline in the prison population;
- decisions by many prisons to release those living with HIV/AIDS early; and
- a decline in the coverage of HIV screening.

Although somewhat less has been written about it, there is now a substantial risk of co-existent HIV and multi-resistant tuberculosis, a combination that is rapidly fatal.

It is likely that most of those infected with HIV have been infected outside the prison system. The extent of HIV transmission within prisons is unknown but this lack of information is not unique to Russia. In 2001, 260 prisoners became HIV-infected in a correctional

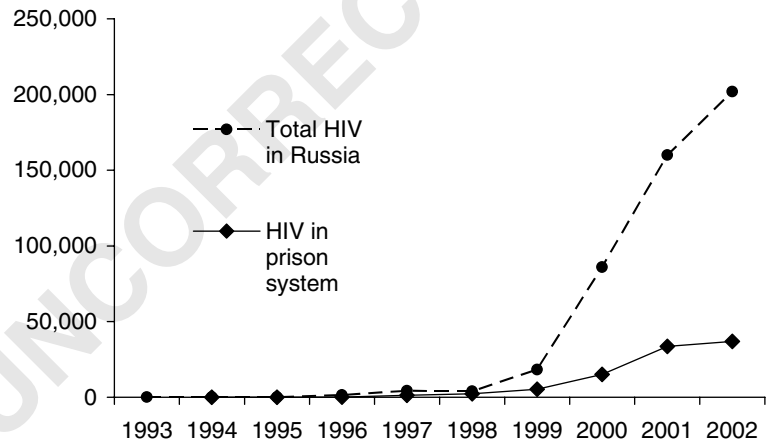

Figure 8
Officially registered HIV cases in Russian penitentiaries and in Russia in general. *Source*: Ministry of Justice, unpublished data and Ministry of Health

colony in Tatarstan (Central Russia), mainly through intravenous drug use. So far this was the only officially registered HIV outbreak in prison. In 2003, a cross-sectional study conducted by the Open Health Institute and the Ministry of Justice, with financial support from the World Bank, undertook comprehensive screening of all convicts in two Russian correctional colonies. This revealed one new HIV case among more than 3,000 prisoners who were serologically negative on admission (unpublished data).

The incidence of hepatitis B in the Russian penal system doubled between 1990 and 1995 (from 71.2 to 156.9 per 100,000), remaining steady until 2002, a rate that was over 3 times that in the general population. In 2002, the overall rate in penal facilities fell to 96.9/100,000, although in prisons in some Russian regions it was over 300/100,000. In 2002, the incidence of hepatitis C in penal institutions was 26.5/100,000, which is almost 4 times higher than in the population of Russia at large.

DISCUSSION

As the first attempt to bring together key elements from a considerable volume of literature, much of it in Russian, for an international audience, it is inevitably subject to many limitations.

1. It is dependent on the information that is collected about health of prisoners. As already noted, this is essentially limited to deaths and to certain infectious and psychiatric disorders.
2. As illustrated in Table 1, there are many settings in which people can be detained in Russia and the available statistics only cover some, albeit, the most important of them.
3. Data on the occurrence of various disorders are critically dependent on the systems in place to detect them, which will vary between the different elements of the penal system and the population outside. Thus, reports of sexually transmitted infections come predominantly from the pre-trial detention centers as individuals are tested on admission.
4. In contrast to the detailed, disaggregated data available on deaths in the civilian population, it has only been possible to get data aggregated into broad categories.

Consequently, several of the comparisons made in this paper are not strictly equivalent, with the comparator being, for example, the male population of working age, even though it is almost certain that the aggregated figures for the prison population contain a small number of women and older men. Nonetheless, with the data available, we believe that this is the most appropriate comparison.

There are also methodological issues to consider.

1. Mortality rates in the penal system are calculated using mid-year prison population as the denominator. This can lead to a significant overestimation because of high turnover, as the total number of people passing through the penal system each year is somewhat higher. For example, a 1998 study of active tuberculosis in federal correctional institutions in Canada reported a rate of 41.7/100,000 but, after adjustment for the turnover rate of 40%, this fell to 29.8/100,000, which is comparable to the rate in the population represented in Canadian penitentiaries (73).
2. Many countries, including Russia, offer compassionate release to convicts suffering from severe illnesses, with the consequence that deaths that would otherwise occur in prisons are recorded as occurring in the general population. According to official statistics, in 2002, 1,016 Russian convicts were released on grounds of serious illnesses (0.4% of all those released). However, key informants privately acknowledge a degree of underreporting as seriously ill convicts are often released officially for other reasons, such as good behavior.
3. Research on mortality of people released from penitentiary institutions has noted a high risk of death shortly after discharge, especially from drug overdoses. This may be explained by the reduced tolerance to opiates during imprisonment (74–77). A recent case–control study in Russia found an almost five-fold elevation of the risk of cardiac death among men who had a history of being under arrest for three days or more, with the increased risk remaining at 2.8 times even after adjustment for behaviors such as smoking and hazardous drinking (78).

Adjustment for these factors is not possible with available data, but if it were, the first would be expected to reduce the observed death rate

while the second would increase it. The main conclusion is that such comparisons must be treated with great care. However, while noting this caveat, the gap between the observed and expected death rates is so large that it seems unlikely that it could be explained by these factors.

This is in marked contrast to many other studies of mortality among prisoners. In England in the early 1800s, the death rate among convicts was about 5 times higher that that in the general population (79). Yet, even at that time, a report from France revealed, large differences between prisons, with mortality in 1815–1818 ranging from 24.5 to 251.9 per 1,000 convicts (80).

Moving nearer to the present, in 1972 the death rate among prisoners in Tennessee, USA was 20 times higher than that in the general population (81). In the 1990s the death rate in Canada's penitentiaries was twice the national average for males in the same age bands (82). That study found that more than half of prison deaths were due to violent causes – suicide, poisoning (most often accidental drug overdose), and homicide. In federal Canadian prisons, deaths from drug overdose are 50 times and from suicide are 10 times more common than in the general population. This pattern of mortality, dominated by external causes, is rather typical for the penitentiaries in industrialized countries (83,84). The exception is the USA where, at the beginning of the 1990s, AIDS became the leading cause of death in prisons (85–87). However, since 1998, when American prisoners gained access to anti-retroviral therapy, there has been rapid decrease in AIDS-related mortality (88).

It should also be noted that some American studies found lower death rates for some causes of death among detainees and prisoners in comparison with the non-incarcerated population (89), although like Russia, the United States is a country with a high death rate for some external causes in the general population. Thus, despite a violent prison environment, in 1994, the homicide rate in American penitentiaries (4.7/100,000) was half that in the general population (9.7/100,000). Unsurprisingly, deaths from traffic injuries and firearms, which are among the leading causes of premature death among young American adults, are almost negligible in the prison population (90).

The large decline in tuberculosis mortality among Russian convicts in 1998 requires comment, although our explanation remains speculative.

- Many of those at greatest risk of death may have died before then.
- There may have be some reporting problems, because of the transition of penitentiaries from Ministry of Interior to the Ministry of Justice in that year.
- There may have been selective release of the most severely ill in some places, perhaps encouraged by an amnesty that took place that year.

The finding of an apparently lower mortality among Russian convicts than among the general population may seem counter-intuitive, but, while caution is necessary with comparisons, it may be explained by the very high death rate from violence among men of the same age in the Russian population. In these circumstances, imprisonment, even in circumstances that are often indescribably bad, may actually increase one's chances of survival. The decreased mortality among Russian convicts from cardiovascular disease cannot be explained by differences in age distribution. It is likely that it partly reflects the growing evidence of a causal role for episodic heavy drinking in sudden cardiac deaths in Russia (91), with convicts being relatively protected from this exposure. In interviews some prison officials, they privately revealed that unclear and "politically sensitive" causes of death (such as drug overdose) tend to be registered under a "more appropriate for prisons" label of cardiovascular disease. This can inflate the figures for cardiovascular deaths in penitentiaries so the true difference may be even greater.

We see a need for much more research on mortality among prisoners in Russia, and in particular for studies that include those who are released from prison. Some insights will, however, be provided by case–control studies currently under way, looking at the determinants of premature male mortality (92) and of tuberculosis infection in Russia.

With caveats in mind, especially the possibility that convicts close to death may be released to die elsewhere (a question being examined in an ongoing study in Samara), the magnitude of the decline in mortality in recent years is encouraging. Largely reflecting concerns

about the contribution of tuberculosis in prisons, there has been a major effort by Russian and international bodies to tackle this issue. Indeed, some Russian officials have criticized the scale of this effort as giving disproportionate attention to individuals they see as undeserving (93).

Our findings do not provide any grounds for complacency. In a sheltered environment such as a prison, with ready access to health care, death rates should be negligible. Clearly this is not the case. Especially in the early 1990s, Russian prisoners were exposed to considerable overcrowding with inadequate ventilation that greatly increased the risk of respiratory infections (especially tuberculosis). Although the majority of infections reported are likely to have originated outside the penal system, there are continuing risks from unprotected homosexual relationships and unsafe tattooing (94,95). Albeit in smaller quantities and not as regularly as outside, illegal drugs do find their way into the Russian penal system (96).

The health of prisoners is also placed at risk by the poor quality health care system, which has suffered from severe, long-term underfunding. Financial constraints, exacerbated by inappropriate legislation, have prevented the authorities from taking account of the specific needs of the most vulnerable and disadvantaged prisoners. Some improvement during the 1990s indicates a commitment to reform by the Ministry of Justice.

Imprisonment should be seen as an opportunity to tackle the health needs of prisoners, especially as many are drawn from a population that has existed on the margins of Russian society, often with little social support. For many convicts and detainees, imprisonment is one of a few opportunities to obtain much needed health care and counseling.

The concentration in the penal system of individuals with mental disorders, alcoholism, drug addiction and infectious diseases creates a unique possibility for implementation of a wide range of effective public health interventions (97). Properly organized correctional health services can make a major contribution to society at large by offering health care and health promotion, by detecting and treating any infectious diseases, and by providing hepatitis B immunization. A recent evaluation found that a peer training program among drug-dependent convicts in a Siberian correctional colony achieved a

significant reduction in tattooing and an increase in knowledge about HIV and in condom availability (98).

A particular need is for services that bridge the divide between prison and society outside, linking convicts to community services after release, and by assisting in the process of community reintegration. For convicts on treatment for tuberculosis, effective interaction between the prison and civilian health services and social protection institutions is particularly important to ensure continuity of treatment. These links are often poorly developed (99–101), although there are examples, as in Ivanovo, where effective coordination with civil authorities has been established, boosting the percentage of patients continuing treatment after release from 51% to a still less than adequate 80% (102).

In conclusion, the chances of survival of young men in Russia may actually be improved by being in prison, highlighting the need for policies that reduce the overall level of violence and other external risks, such as dangerous driving habits, in Russian society. While conditions are improving in Russian prisons, with death rates falling, there are still many avoidable deaths and high levels of mental illness and infectious disease. There is also much that is not known about the health of Russian prisoners, with available information reflecting what is measured rather than what is important.

Those in prisons in Russia, as elsewhere, are largely drawn from a population that has existed on the margins of society, often receiving little of the support that is needed for effective integration into that society on discharge, support that includes the ability to make healthy choices and obtain effective health care. Although the situation in Russian prisons is improving, there is still a long way to go.

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