laboratory notification without a linking physician notification has been received. On this background, 89% sensitivity for physician notification, providing complementary clinical-epidemiologic data, in culture-positive cases seems high compared with previous reports on the evaluation of notification systems based on physician notification only. The sensitivity and efficiency of the surveillance system can still be improved with limited resources by combining computerised flagging systems for missing information in an individual case with the recently introduced remote access from all the regional registers to the NIDR database using encrypted internet technology.

In conclusion, high sensitivity for culture-confirmed tuberculosis cases can be achieved in an integrated system for infectious disease surveillance by incorporating mandatory laboratory notification. This will strengthen the understanding on the burden of disease caused by tuberculosis, as well as facilitate the detection of clusters of recent transmission when submission of strains for molecular typing is associated with laboratory notification.

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ORIGINAL ARTICLES

Surveillance report

PULMONARY TUBERCULOSIS IN TWO REMAND PRISONS (SIZOs) IN ST PETERSBURG, RUSSIA

T Lobacheva [1], V Sazhin [2], E Vdovichenko [2], J Giesecke [1]

The tuberculosis (TB) situation in the Russian penitentiary system has received much attention. We performed a descriptive epidemiological study of TB in two St Petersburg remand prisons (SIZOs). The medical databases of the TB divisions in these prisons were searched for all diagnosed cases of TB from 1 January 2000 to 31 December 2002. The main diagnostic method was chest x ray.

The total number of reported TB cases in these two remand prisons during this three-year period was 876. Out of these, 432 were diagnosed at entry to prison, and 444 developed the disease during incarceration, with the proportion diagnosed during incarceration increasing over time. The majority of cases were aged under 30 years.

TB incidence in Russian remand prisons is still very high and needs to be monitored closely.

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Introduction

Reliable data on tuberculosis (TB) incidence in the Soviet Union are lacking. There is, however, strong reason to believe that the incidence has increased considerably since 1991. According to official national figures, the incidence was 34/100 000 in 1991 and 90/100 000 in 2000 [1]. The TB problem has received much attention both in Russia and western countries [2,3]. The high incidence of TB in Russian prisons is of particular concern [4-6]: a search of the databases MEDLINE and CAplus yielded 45 publications since 1980 on TB in Russian prisons. However, 25 of these were published in Russian only. There have been several initiatives from international organisations to assist national authorities in their control efforts among prisoners [7]. TB in prison is not an isolated problem – especially not in a remand prison – since incompletely treated patients may well spread the disease in the general population after release [8-10].

All suspected criminals are held in remand prisons (SIZOs) while awaiting trial. According to Russian legislation, prisoners on remand should be held in a SIZO for no more than 12 months. In 2002 this time period was cut to 6 months. However, before 2002, delays in bringing cases to trial led to overcrowding of SIZOs [1] with suspects being held for several years. If convicted, prisoners are transferred to regular prisons in the countryside known as 'colonies'.

St Petersburg is one of the largest cities in Russia, with a population of approximately 5 million. According to official data, TB incidence in the city was 44/100 000 in 2002 and 40/100 000 in 2003 [11], about half the average national incidence. These figures include all TB cases registered in St Petersburg: city residents, homeless people, prisoners and migrants.

The 'incidence' of TB in a Russian prison is defined as the number of diagnosed cases during a year, divided by the average number of prisoners during the year (sum of the monthly average, divided by 12), expressed as cases per 100 000 prisoners per year. It should be noted that these figures include cases diagnosed at entry into prison, as well as those diagnosed during incarceration.

Several articles about the TB situation in the Russian prison system only present data from the prison colonies [12,13], although it is acknowledged that the SIZO is the first place where prisoners are at high risk for contamination [8]. We have found only a few published articles that try to analyse the TB situation in pre-trial SIZO facilities in detail [14,15]. This study aims to describe the epidemiology of pulmonary TB in two SIZOs in St Petersburg.

Material and Methods

The city has six SIZOs - four in the city and two in the district (Leningrad oblast). One of them houses female prisoners and one teenager in addition to adults. At entry into a SIZO each detainee undergoes a health examination including blood tests and fluorographic screening. This method helps to rapidly separate people with pulmonary changes from those without. For the latter, chest x ray is repeated every 6 months during their stay in the SIZO. Patients with pulmonary changes and clinical symptoms indicative of pneumonia are given a test therapy of about two weeks with broad-spectrum antibiotics. If positive changes in x ray and symptoms persist, then the case is diagnosed as TB. Diagnosis is not based only on radiographic examination and absence of response to broad spectrum antibiotics but also, if possible, on microbiological confirmation by smear sputum microscopy and culture of sputum. Laboratory results, including susceptibility testing, assist the diagnosis and choice of proper treatment. Both previously treated and previously untreated patients receive therapy with four antituberculosis drugs in the SIZO.

We analysed TB rates for two SIZOs in St Petersburg: SIZO-1, which is the largest and well-known remand prison in St Petersburg, commonly known as 'Kresty' because of its two cross-shaped buildings, and SIZO-4. This choice was made because SIZO-1 has the largest medical division for prisoners with TB, and SIZO-4 admits prisoners aged under 18 years. Both SIZOs take only male prisoners. Before summer 2002, SIZO-1 and SIZO-4 held three to four times their official capacity. The number of people in the SIZOs declined considerably after this, because of a general amnesty and the change of legislation for remand prisoners in mid-2002.

We searched the registers of the TB divisions of the two SIZOs for all cases (876) diagnosed during the three-year period from 1 January 2000 to 31 December 2002 and ascertained all TB cases who were considered free from TB on admission, but who were later diagnosed with TB (444). Of the 735 cases in SIZO-1, 360 were diagnosed at entry into prison, and 375 during their prison stay (for 109 of these latter cases we have only limited information, since the prison ledger was destroyed in May 2000). Among the 141 cases in SIZO-4, 72 came into prison with TB and 69 developed TB during incarceration. Each TB case was diagnosed and classified as described above. This was in accordance with standard diagnostic procedures accepted in the Russian Federation.

The data collected for each TB case were: date of entry into the SIZO, date of birth, dates of initial and subsequent chest x rays, date of confirmed TB diagnosis, and TB type. The type was defined from the x ray picture as focal, infiltrative, disseminated, lympho-nodal, or pleural.

Results

The officially reported rate of TB in SIZO-4 remained almost constant for the three years (P value > 0.10). For SIZO-1 the incidence dropped significantly (P < 0.006) from 2000 to 2001, but then rose significantly (P<0.006) again in 2002 [TABLE 1].

TABLE 1

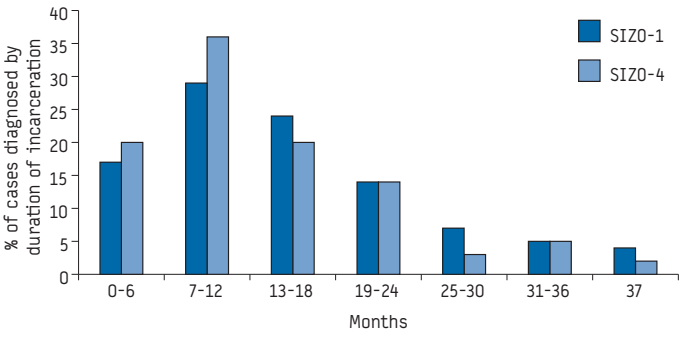
Annual tuberculosis rates in two SIZOs in St. Petersburg, 2000-2002

	Year	Reported 'incidence' at entry and during incarceration (per 100 000)	Reported incidence during incarceration only (per 100 000)
SIZO-1	2000	4088	2369
	2001	2106	869
	2002	3190	1507
SIZO-4	2000	1651	600
	2001	1583	900
	2002	1598	913

Among those who were deemed free from TB at entry but later developed TB, only 6 out of 266 (2%) in SIZO-1 and 2 out of 69 (3%) in SIZO-4 were diagnosed during their first 2 months in prison. The peak time for being diagnosed was at the end of the first year and the beginning of the second year of imprisonment. Almost half of these cases were diagnosed within one year of arrival in the SIZOs, and two thirds within 18 months [FIGURE]. However, these figures do not represent the true risk for prisoners over time, since the denominator of still-detained prisoners is decreasing all the time. The proportion of people who developed tuberculosis during their stay in both SIZOs is almost 50% of all registered cases.

FIGURE

Average time spent in remand at diagnosis of tuberculosis in two SIZOs[1], 2000-2002



1. TB cases diagnosed at entry were excluded.

The majority of TB patients were under 30 years old (SIZO-1: 62-68% and SIZO-4: 70-83%). SIZO-4 holds more young people, but during the study period there was not a single case of TB in a prisoner under 18 years of age.

Among prisoners who were diagnosed during incarceration in SIZO-1, infiltrative TB was most common in 2000, but in 2001 focal TB accounted for 50% of cases. Disseminated TB, which requires more intense and prolonged therapy, remained common accounting for 11%-22% of cases. In SIZO-4 about 60% of all the cases that developed during imprisonment were infiltrative tuberculosis [TABLE 2].

TABLE 2

Types of tuberculosis developed during incarceration in two SIZOs in St. Petersburg, 2000-2002

	Year	Focal (%)	Infiltrative (%)	Disseminated (%)	Lymph nodes (%)	Pleuritis (%)
SIZO-1	2000	21	59	20	-	-
	2001	51	36	11	1	1
	2002	40	36	22	1	-
SIZO-4	2000	40	60	-	-	-
	2001	32	61	3	3	-
	2002	28	61	11	-	-

Discussion

The present situation with TB in prison in St Petersburg city and region is still serious, and the annual rate for 2000 (3199/100 000) was higher than the average for the entire Russian penal system (2828/100 000) [1].

As shown in Table 1, overall TB incidence in SIZO-1 and SIZO-4 remains high. The highest reported TB rate in the period was seen in 2000; the apparent increase in 2002 was probably due to the amnesty in the middle of this year, which will have affected the denominators used for calculation of the statistics.

Official Russian calculation of TB incidence in SIZOs includes cases diagnosed at entry as well as during incarceration. When evaluating prevention, it might be advantageous to differentiate between these two, since with the present way of reporting incidence figures would be high whether or not a single case of TB developed during incarceration.

One could argue that some of the patients in our study probably spent a large part of their life in prison, with only short periods of freedom in between, and that it would thus make little difference if they happened to be diagnosed at entry or later. However, all prisoners have a final x-ray before release from pre-trial detentions. For re-apprehended persons with TB, the result of that x-ray test is used to determine whether the case is developed in SIZO or is brought from outside.

Successful case finding, rapid isolation and adequate treatment of TB cases in remand prison will reduce TB transmission within prison. This in turn will decrease occurrence of disease in recidivist prisoners and reduce in some way prevalence of disease at entry to prison. Persons re-apprehended in the remand prison several times during the one-year period must be counted only once. Furthermore, incidence figures would be considerably more reliable if person-years in prison could be used as the denominator instead of the average number of prisoners during a year. This would probably require a more automated system of record-keeping, since the present manual ledger system would make such calculations difficult.

Another problem for descriptive epidemiology is double registration of cases. In the SIZO there is usually only a weak attempt to retrieve information from the civil tuberculosis dispensary on previously diagnosed TB. A number of cases are thus probably registered both in the SIZO and in the city due to the lack of a shared public health surveillance system.

The proportion of the number of TB cases in St Petersburg SIZOs that developed during incarceration increased [14], for example, in SIZO-1 it increased from 30% to 44% for the period 1998-1999, and for SIZO-4 - from 29% to 42% for the same time period. In both SIZOs the proportion of cases that developed during incarceration was close to half of the total reported cases by the end of the study period. In comparison, this percentage in the Voronezh region of Russia was estimated to be between 6% and 10% in 1995-1999 [15]. The proportion of newly detected cases during the stay in a SIZO is rarely presented in the literature: for example, 26% of all TB cases in the penitentiary system of Arkhangelsk region of Russia were detected in one of the SIZOs in 1996-1997, but the percentage of people who developed TB while detained in these SIZOs was not stated [17].

Undoubtedly, the situation with many prisoners awaiting trial in overcrowded cells will contribute to spread of infection. In order to prevent violence and conflicts within the SIZO, prisoners are also frequently moved between cells, which will further increase the mixing of susceptible and infectious prisoners.

Co-infection with HIV may well be another problem. The number of HIV-infected people in the prison system has increased. In 1995 the first patient with HIV was registered in St Petersburg. At the end of 2002 in the prison system of the city, 113 patients were registered with HIV and TB [16].

WHO guidelines recommend sputum smear microscopy as the standard method for TB diagnosis [18]. For economical and practical reasons, these guidelines are not yet implemented in the Russian penitentiary system. At present, fluorographic screening at entry to the SIZO, repeated at six-month intervals and combined with a short-course test treatment with antibiotics is the main method for early tuberculosis detection in this setting, especially as the prison system in St Petersburg does not have its own TB laboratory. Combining smear sputum microscopy with x ray would probably be the optimal diagnostic method for screening in SIZOs. The absence of information on previous treatment, as well as the low number of sputum cultures with resistance testing performed, increases the risk for development of multi-drug resistant TB during the prison stay. Of all TB cases registered in the penitentiary system of the Russian Federation, 16-19% have positive sputum smear, and 23% of them were multi-drug resistant in 2001 [1].

Even if tuberculosis in remand prisons in Russia constitutes a big problem, one should realize that these institutions are often the first to offer socially maladapted people good diagnostic facilities and adequate treatment with antituberculosis drugs. One of us has compared the prison system to a sieve, in which socially disadvantaged persons at high risk for TB are found and diagnosed [Victor Sazhin, personal communication, 2002].

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ORIGINAL ARTICLES

Surveillance report

A MEDICAL LOCUM SERVICE AS A SITE FOR SENTINEL INFLUENZA SURVEILLANCE

J Turner [1], H Kelly [2]

Surveillance of influenza in the countries of the European Union includes a sentinel network of general practitioners reporting cases of influenza-like illness (ILI), the collection of specimens for virological testing, and laboratory reporting of influenza diagnoses. In Victoria, Australia we have a similar sentinel surveillance system, with ILI defined by fever, cough and fatigue, and influenza seasons described by thresholds. The coordination of sentinel general practices can, however, be time consuming and expensive. For the last two influenza seasons we have used a deputising medical locum service as a sentinel site for influenza surveillance. We are not aware of such a service being used as a sentinel site elsewhere in the world. In both retrospective and prospective comparisons, we have shown that ILI surveillance patterns from sentinel general practices are very similar to those from the locum service. Because of its timeliness, flexibility, patient mix and geographic spread, locum service surveillance is able to supplement sentinel ILI surveillance and may also have a role in the recognition of emerging disease patterns. This is likely to be true not only in Australia but also in countries of the European Union.

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Key words: Influenza, surveillance, Australia

Introduction

Surveillance of influenza in Europe includes a wide range of activities, but most countries use at least three approaches: a sentinel network of general practitioners (GPs) who report cases of influenza-like illness (ILI); the collection of specimens for virological testing; and laboratory reporting of influenza diagnoses [1]. Most surveillance networks use case definitions to identify ILI [1] and threshold indicators to describe the intensity of influenza activity. Data are delivered on a weekly basis [2], with the ILI rate reported per 100 000 population [3]. This provides an integrated clinical and virological system under the auspices of the European Influenza Surveillance Scheme (EISS) [4]. In addition, routine influenza surveillance plays a central role in the European influenza pandemic preparedness plan [5].

In Victoria, Australia we use a similar system, including general practice sentinel surveillance of influenza-like illness (ILI) with laboratory support [6]. We use a case definition for ILI [7] and describe thresholds for influenza seasons [8]. The coordination of sentinel surveillance in general practice can, however, be expensive, time consuming and demanding for busy practices. Over the past two influenza seasons we have used a deputising medical locum service as a sentinel site for ILI surveillance. This report aims to introduce the concept of a locum service as a potential sentinel surveillance site and to compare ILI surveillance from the locum service with that from sentinel general practices.

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Methods

The influenza season usually occurs from late autumn (May) to early spring (September) in temperate regions of the southern whemisphere (weeks 18 to 39 inclusive). During this period the Victorian Infectious Diseases Reference Laboratory (VIDRL) coordinates sentinel surveillance, conducted through selected general practices in Melbourne and regional Victoria [6]. A national case definition for ILI, of fever (or history of feverishness), cough and fatigue/malaise, has been used in routine sentinel surveillance since 2003 [7]. In 2003 and 2004 the average number of metropolitan GPs contributing to surveillance was 41 from 16 practices. There is at least one general practice per 200 000 population in the metropolitan area, as recommended in Australia's influenza pandemic plan [9].

Sentinel GPs are required to complete a weekly tally sheet indicating the total number of consultations and the number of consultations for ILI. This is faxed to VIDRL and entered onto a database for each sentinel site. At their discretion, GPs are also able to collect a combined nose and throat swab for selected patients with an ILI. The swab is sent to VIDRL for testing by a multiplex PCR identifying influenza A (H1N1), influenza A (H3N2), influenza B, parainfluenza, respiratory syncytial virus, adenovirus and picornaviruses (enteroviruses and rhinovirus) [10]. In 2004, oligonucleotide primers to detect all known influenza viruses replaced primers aimed specifically at currently circulating H1 and H3 sub-types. Aliquots of all specimens positive for influenza are forwarded to the World Health Organization Collaborating Centre for Reference and Research on Influenza in Melbourne for virus strain typing.

As a supplement to traditional general practice surveillance, we have explored the use of a medical locum service as a sentinel surveillance site. Ethics approval was obtained from the Ethics Committee of the Department of Human Services in Victoria for extension of surveillance to the Melbourne Medical Locum Service (MMLS). MMLS provides a deputising medical service to patients in their homes, within an approximate 35 km radius of central Melbourne, a city of 3.7 million people. This radius covers the same area as the sentinel general practice locations in Melbourne [FIGURE 1].