Health-systems efficiency in the Russian Federation: tuberculosis control

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Objective To conduct a comprehensive assessment of the case-mix of patients admitted to tuberculosis hospitals and the reasons for their admission in four Russian regions: Ivanovo, Orel, Samara and Vladimir. We also sought to quantify the extent to which efficiency could be improved by reducing hospitalization rates and re-profiling hospital beds available in the tuberculosis-control system.
Methods We used a standard questionnaire to determine how beds were being used and who was using the beds in tuberculosis facilities in four Russian regions. Data were collected to determine how 4306 tuberculosis beds were utilized as well as on the socioeconomic and demographic indicators, clinical parameters and reasons for hospitalization for 3352 patients.
Findings Of the 3352 patients surveyed about 70% were male; the average age was 40; and rates of unemployment, disability and alcohol misuse were high. About one-third of beds were occupied by smear-positive or culture-positive tuberculosis patients; 20% were occupied by tuberculosis patients who were smear-negative and/or culture-negative; 20% were occupied by patients who no longer had tuberculosis; and 20% were unoccupied. If clinical and public health admission criteria were applied then < 50% of admissions would be justified and < 50% of the current number of beds would be required. Up to 85% of admissions and beds were deemed to be necessary when social problems and poor access to outpatient care were considered along with clinical and public health admission criteria.
Conclusion Much of the Russian Federation's large tuberculosis hospital infrastructure is unnecessary when clinical and public health criteria are used, but the large hospital infrastructure within the tuberculosis-control system has an important social support function. Improving the efficiency of the system will require the reform of health-system norms and regulations as they relate to resource allocation and clinical care and implementation of lower-cost approaches to case management for patients with social problems. Additionally, closer attention will need to be paid to the management of staff numbers in the tuberculosis system.

Keywords Tuberculosis, Pulmonary/therapy; Hospitals, Special/utilization; Hospital costs; Hospital bed capacity; Bed occupancy; Hospitalization; Inpatients; Efficiency, Organizational; Health care surveys; Cross-sectional studies; Russian Federation (*source: MeSH, NLM*).

Mots clés Tuberculose pulmonaire/thérapeutique; Hôpital spécialisé/utilisation; Coûts hôpital; Capacité lits hôpital; Occupation lit hôpital; Hospitalisation; Malade hospitalisé; Efficacité fonctionnement; Enquête système de santé; Etude section efficace; Fédération de Russie (*source: MeSH, INSERM*).

Palabras clave Tuberculosis pulmonar/terapia/utilización; Costos de hospital; Hospitales especializados; Capacidad de camas en hospitales; Ocupación de camas; Hospitalización; Pacientes internos; Eficiencia organizacional; Encuestas de atención de la salud; Estudios transversales; Federación de Rusia (*fuente: DeCS, BIREME*).

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Introduction

The Russian Federation's health-care system is characterized by centralized planning and administration, government financing, and the provision of services to the public.[1] There are several vertical programmes and related infrastructure for diseases deemed priorities, including tuberculosis (TB), sexually transmitted infections, diabetes, vaccine-preventable diseases and HIV/AIDS. In 2001, there were 9.1 hospital beds per1000 population, compared with 2.4 per 1000 for the United Kingdom and 4.1 per 1000 in the European Union.[2] An extensive primary care network comprising polyclinics, ambulatory care centres and feldsher stations also exists, but focuses on referral rather than gatekeeping and the management of patients. (Feldshers are medical/surgical practitioners who do not have full professional qualifications or status.)

Globally, the Russian Federation ranks twelfth in terms of the total number of new TB cases that occur each year.[3] After a period of decline starting in the 1960s, the case-notification rate almost tripled during the 1990s, reaching 90.7 per 100 000 population in 2000.[4] Similarly, the death rate from TB rose from 8 per 100 000 in 1991 to 20 per 100 000 in 2001.[4] A large verticalized network of specialized institutes, dispensaries, hospitals, outpatient clinics, sanatoria and rural feldsher points exists to detect and treat cases; this network includes about 80 000 beds designated specifically for treating patients with TB. Box 1 provides further details of how TB control is implemented.[5, 6]

With support from international and bilateral agencies, new laws are being adopted to gradually implement standard international practices in TB control.[7–9] Data from 2003 show that 25% of the population is covered by the internationally recommended control strategy known as DOTS.[3] In 2003 a new regulation (prikaz) was implemented to enforce the use of standardized drug regimens; and in 2004 a prikaz was approved that introduced a recording and reporting system similar to that recommended in the DOTS strategy.[10, 11]

Despite these developments, there is considerable scope for improving efficiency in the extensive TB-control system. Studies have shown that implementation of the DOTS strategy could substantially lower treatment costs for new smear-positive patients,[12] that inpatient care accounts for more than 50% of total TB-control costs,[13] that health-system financing and provider-payment systems create perverse incentives for the use of lengthy and repeated hospitalizations (beyond those stipulated in the regulations),[14] and that to compensate for inadequate social-support systems for TB patients, providers use sophisticated practices to enable lengthy admissions during winter.[15] This contrasts with other countries that have a high burden of TB but where treatment is generally provided on an outpatient basis and it is unusual for patients to be hospitalized for long periods of time and large networks of TB hospitals do not exist.[3]

While these previous studies have identified frequent and lengthy hospitalizations and the factors that lead to these practices, they have not included a comprehensive assessment of the case-mix of patients admitted to TB hospitals and the reasons why patients are admitted: they have focused on new smear-positive or culture-positive patients in Group IA and not cases in Groups IB or II–VII (Box 1). Nor have they attempted to quantify the extent to which the existing number of beds and admissions could be reduced. To address these gaps, we conducted a detailed study of the utilization patterns of TB hospitals in four Russian regions. The study was designed to answer three questions. First: what kinds of patients are using the inpatient infrastructure of TB hospitals? Second: why are these patients being admitted? Third: what scope exists for reducing the use of the inpatient infrastructure in TB hospitals?

Box 1. **Russian system for detecting and managing tuberculosis (TB) cases**[6]

Historically, case-finding and diagnosis have used mass population screening, fluorography, X-rays and to a lesser extent bacteriology.

Patients are classified into nine major groups.

Group 0. These are individuals with TB-like changes in their lungs that are of "doubtful activity"; these individuals are not registered with the TB authorities under any other classification; they are known as suspected TB cases.

Group IA. These are individuals with active TB; this category includes true new cases and patients who have had a relapse.

Group IB. These are individuals for whom treatment has failed; this category also includes people with chronic TB; it includes patients with both drug-sensitive and drug-resistant TB.

Group II. This group includes patients whose condition is improving after an active phase of TB; these are usually patients transferred from **Group IA**.

Group III. This group comprises patients clinically cured of pulmonary TB.

Group IV. This group comprises people who are contacts of patients with active TB or who have been in contact with infected livestock.

Group V. Patients in this classification have extrapulmonary TB.

Group VI. This group is made up of children and teenagers at high risk of developing the disease; generally they are identified through a tuberculin skin test.

Group VII. These individuals have residual changes in their lungs after pulmonary TB and are at an increased risk of reactivation of the disease.

Treatment is based on individualized regimens that include a mixture of first-line and second-line antituberculosis and immune-modulating drugs as well as surgical interventions. Many TB patients are monitored for long periods after successful clinical treatment as are patients with inactive TB who according to international TB control approaches would be not classified as TB patients.

The internationally recommended TB control strategy known as DOTS recommends making a diagnosis primarily by using sputum-smear microscopy, treating patients with standardized short-course treatment regimens using first-line antituberculosis drugs, and classifying patients into three groups (new, relapse or re-treatment). Treatment outcomes for new cases are defined after 6 or 8 months of treatment, depending on the length of the standardized drug regimen used.

Methods

A cross-sectional bed census was conducted in TB facilities in four Russian regions: Ivanovo, Orel, Samara and Vladimir. These regions were chosen because collaborative links had been established among study investigators through projects funded by WHO, the United States Agency for International Development and the United Kingdom Department for International Development. The

Table 1. **Summary geographical, demographic, socioeconomic and tuberculosis (TB) infrastructure indicators for four-study regions and the Russian Federation, 2001**

Indicator	Region				Russian Federation
	Ivanovo	Orel	Samara	Vladimir	
Location	200 km south-east of Moscow	300 km south-west of Moscow	Volga region, south-east of Moscow	Borders Moscow	–
Population	1.3 million	0.9 million	3.3 million	1.7 million	144 million
Average income[a]	2828	NA[b]	7562	4352	7100
Unemployment[c]	11	10	6	9	8
Human Development Index rating[d]	0.7	NA	0.8	0.7	0.8
Years of life expectancy	63	NA	65	64	67
No. of TB hospitals	8	1	12	5	602
No. TB beds	890	716	1 580	829	81 425
No. TB doctors	112	52	205	71	12 119
No. TB nurses	316	272	385	304	37 253

[a] Purchasing power parity in US$.
[b] NA = not available.
[c] Percentage of the adult population of working age that is unemployed.
[d] The Human Development Index is a summary measure of human development. By combining indicators of real purchasing power (per capita gross domestic product), education (adult literacy), and health (life expectancy at birth), the index provides a more comprehensive measure of development than does gross national product alone. The highest score that can be achieved is 1; the lowest is 0.

Sources:
Central Intelligence Agency. *The world factbook: Russia,* http://www.cia.gov/cia/publications/factbook/geos/rs.html.
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NV Antonova, Deputy Head of Specialized Medical Care Division, Health Care Organization and Development Department, Ministry of Health, Russian Federation, personal communication, March 2005.

regions vary in terms of location, geographical size, population size, mean income level and number of TB-control facilities. Summary indicators for each region and the country as a whole are shown in Table 1.

A questionnaire was designed by a multidisciplinary study team; it was piloted in each of the four regions and refined through discussions with Russian and international experts (e.g., senior staff in specialist TB research institutes at federal level, chief TB doctors in each region where the survey was to be undertaken, WHO staff), including some that were bilingual. TB physicians in the four regions were trained to use the questionnaire. These physicians surveyed how all of the specialized TB beds were utilized on one day in Orel and Samara, and due to time and logistical constraints, collected data on large representative samples in Ivanovo (86% of all beds) and Vladimir (82% of all beds). The dates of the surveys varied for logistical reasons and to allow data to be collected for both summer and winter. Ivanovo was surveyed in September 2003 and the survey was repeated in March 2004; Orel was surveyed in September 2003; Samara was surveyed in November 2003; and Vladimir was surveyed in February 2004. The TB specialist in charge of each hospital ward was responsible for data collection. The patients' variables for which data were collected included socioeconomic and demographic indicators, clinical parameters, reasons for hospitalization and the classification of the case according to the Russian system in use in mid-2003 (Box 1).[7]

The cross-sectional study design required to understand the use of TB hospital beds is not compatible with collecting data on treatment outcomes; moreover such data were not necessary to answer our three study questions. Nonetheless, given the importance of treatment outcomes and the fact that they may vary according to whether treatment is provided on an inpatient or outpatient basis, this issue is addressed in the discussion section of the paper.

All data were entered into an Excel spreadsheet (version 7.0) and analysed in Excel and by using Stata software (version 8.0). Analysis was done in two stages. In the first, three major analyses were done: the socioeconomic and demographic data across regions were summarized and compared; bed utilization was quantified and compared across regions by identifying the percentage of beds occupied by each of the groups of patients in the Russian classification system and the percentage of beds that were unoccupied; and the frequency with which different reasons for hospitalization were reported were summarized and compared across regions.

In the second stage, we assessed the percentage of patients that would require admission, and the percentage of available beds that would be needed, for five sets of admission criteria. These admission criteria were defined in consultation with Russian experts and reflected clinical, public health, social and health-system justifications for admission. To assess the percentage of existing beds that would be required under each scenario, we assumed that the optimal average bed occupancy rate was 80%.[16]

Findings

A total of 3352 patients were surveyed, and the occupancy levels and reasons for utilization of 4306 beds were determined. Socioeconomic and demographic indicators for patients are summarized in Table 2. About 70% of patients were male; 13–19% were children; and 5–10% were elderly. The average age was 40. There were high rates of alcohol misuse among patients (32–49%), disability (17–39%) and unemployment (27–41%). In Ivanovo, 7% of patients were homeless. Rates of unemployment, disability, alcohol misuse, homelessness and the distribution of patients between rural and urban areas varied among the four study regions as did rates of multidrug-resistant TB.

The utilization of beds according to the Russian classification of cases is illustrated in Fig. 1. Around 25–30% of beds were occupied by patients in Groups IA or IB and 5–7% of patients were smear-positive or culture-positive. Overall, about 20% of beds were occupied by patients in Groups IA or IB who were not smear-positive or culture-positive (i.e., bacteriologically negative, BK-) at the time of the study, but numbers varied across oblasts (range = 7–23%). Patients in Groups II–VII (patients who no longer had active TB or who had extrapulmonary TB) also occupied about 20% of beds, but again numbers varied among oblasts (range = 18–32%). The numbers of patients with extrapulmonary TB within this group were small (data not shown). Overall, about 20% of beds were unoccupied (range = 8–37%). In every region at least one- third of beds were either unoccupied or occupied by patients who did not have active TB; in two regions (Orel and Ivanovo) the figure was > 50%.

When physicians were asked what was the single most important reason for hospitalizing a patient, the answers most frequently mentioned were that: the patient needed chemotherapy for TB, hospitalization was required according to existing regulations, the patient needed to be hospitalized to confirm or exclude the diagnosis of TB, the patient needed to be isolated to prevent transmission to others or to allow immunity to TB to develop, or the patient needed surgery (Table 3). Other reasons included on the questionnaire were rarely given as the main reason for admission (detailed data available from the authors).

The percentage of patients for whom admission would be required and the percentage of existing beds that would be needed according to different sets of clinical, public health, social and health-systems criteria are shown in Table 4. If clinical and public-health criteria were used, around 40–50% of patients would need to be admitted, and 40–50% of existing beds would be required (Table 4, scenario 1). If homeless patients were admitted to hospital in addition to those meeting clinical and public-health criteria (scenario 2) then about 50% of patients would require admission and 40–50% of beds would be needed. When alcohol misuse is added as a justification for admission (scenario 3), approximately 60% of patients would need to be admitted and 45–70% of beds would be required. When poor access to health services is added as a reason for admission (scenario 4), approximately 65–80% of patients would need to be admitted and about 50–80% of available beds would be needed. The averages across all regions are 77% of patients would need admission and 71% of existing beds would be needed. When clinical and public-health reasons, homelessness, lack of access to health facilities and an extended set of social reasons (patients with poor living conditions and/or no care at home) are all considered to justify admission, around 75–80% of patients would need to be admitted and 65–85% of existing beds would be needed. The average across all regions is 78% of patients would need admission and 76% of beds would be needed.

Discussion

Our study suggests that much of the Russian Federation's TB hospital infra-

Table 2. **Socioeconomic and demographic characteristics of patients in tuberculosis facilities in four regions in the Russian Federation, by season of survey, 2001**

Indicator[a]	Region (season of survey)					Total
	Ivanovo (summer)	Ivanovo (winter)	Orel (summer)	Samara (winter)	Vladimir (winter)	
No. of beds counted	750	750	601	1580	625	4306
No. of patients surveyed	527	587	379	1285	574	3352
Male	373 (71)	414 (71)	267 (70)	870 (68)	442 (77)	2366 (71)
Mean age (all patients)	40	41	39	36	40	39
Children aged 0–14	86 (16)[d]	78 (13)[d]	68 (18)[d]	239 (19)[d]	71 (12)[d]	542 (16)[d]
Patients aged ⩾ 65	51 (10)	56 (10)	37 (10)	66 (5)	41 (7)	251 (8)
Pensioners (women aged ⩾ 55 and men aged ⩾ 60)	49 (9)	63 (11)	49 (13)	114 (9)	21 (4)	296 (9)
Live in rural area	177 (34)	181 (31)	223 (59)	386 (30)	207 (36)	1174 (35)
Homeless	37 (7)	37 (6)	20 (5)	6 (0.5)	24 (4)	124 (4)
Unemployed[b]	106/346 (31)	144/412 (35)	139/243 (57)	330/808 (41)	155/437 (35)	874/2 246 (39)
Disabled	199 (38)	202 (34)	63 (17)	350 (27)	224 (39)	1038 (31)
Have multidrug-resistant TB	108 (20)	118 (20)	63 (17)	118 (9)	46 (8)	453 (14)
Misuse alcohol[c]	175/435 (40)	246/502 (49)	120/304 (39)	317/1 005 (32)	218/491 (44)	1076/2 737 (39)

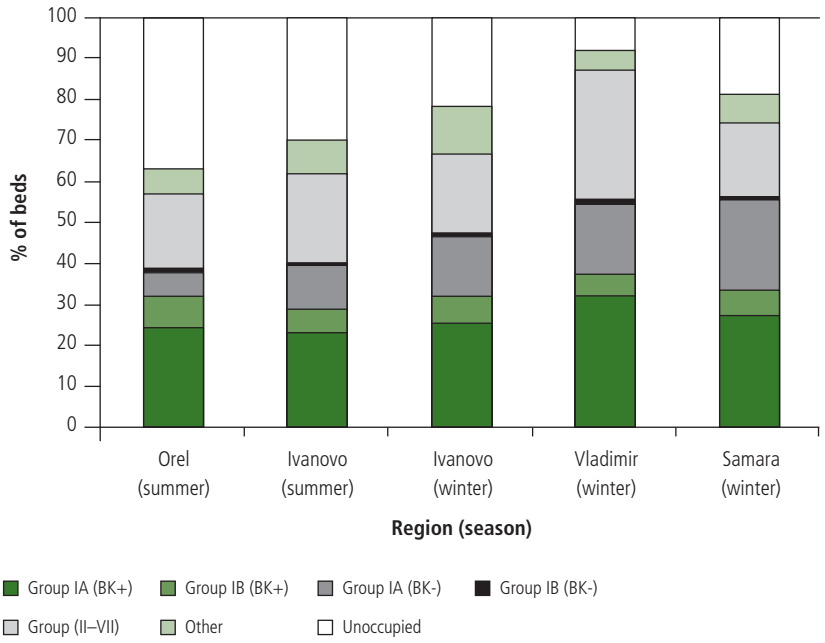
[a] Values are numbers (percentages) unless otherwise specified.
[b] For unemployment the denominator is the number of adults of working age: for men, it is those aged > 18 years and ⩽ 60 years; for women, it is those aged > 18 years and ⩽ 55 years.
[c] The denominator is the number of adults aged ⩾ 18 years.
[d] Figures in parentheses are numerator ÷ denominator.

structure (80 000 beds or about 1000 per region) is not used according to clinical and public-health criteria, and a large share of hospital beds are used for social reasons and because patients have difficulty in accessing outpatient care. In the four regions that we surveyed, about half of admissions were justified and half of the beds would be required if clinical and public-health criteria were applied but up to 81% of admissions would be justified and 85% of beds would be needed when clinical, public health, social and health-system factors are considered.

Despite some differences in the demographic, geographical and socioeconomic characteristics of the regions and patients studied, the broad similarity across regions was striking in terms of the percentage of patients who would need admission when different criteria were used. This is in line with previous studies of TB control in the Russian Federation that have identified consistency in case management, costs and average length of hospital admission across regions as well as the important social-support function played by TB hospitals.[9, 13–15] This consistency suggests that our results are likely to be applicable to the rest of the country's 88 regions.

If our results can be generalized, there is substantial potential for reallocating beds set aside for specialized TB care (that is, these beds could be used for other purposes or when this is not possible, fewer beds could be allocated for TB care), thus generating savings. In 1999, the cost of a bed-day for TB patients was consistently estimated at around US$ 3.00.[13] If beds were used only for patients requiring admission for clinical and public-health reasons, more than half of the existing 80 000 beds set aside for specialized TB care (on average about 500 per oblast) could be reallocated, resulting in savings of around 15 million bed-days and US$ 45 million per year. For comparison, about US$ 245 million was spent on TB control in the Russian Federation in 2003,[3] while in 2004 the government secured additional external funding from the World Bank and the Global Fund to fight AIDS, TB and Malaria (a combined worth of more than US$ 100 million over five years). Moreover, existing bed-day costs are part of a system in which salary levels are low (doctors' salaries are below the national average); there is inadequate funding for operating costs; and there is limited recent investment in buildings and equipment.

Fig. 1. **Use of beds according to Russian classification of tuberculosis cases, by region and season, Russian Federation, 2001.** (See Box 1 for definitions)



Groups denoted BK+ were smear- and/or culture-positive at time of survey.
Groups denoted BK- were smear- and culture-negative at time of survey, or smear-negative with no culture results, or culture-negative with no smear results.
Groups II–VII do not have active tuberculosis, except for Group V (extrapulmonary TB).
Numbers in Group V were small (see text).

WHO 05.157

Cost savings would be much higher if bed-day costs were more in line with the country's middle-income status and with the US$ 16.00 cost per day reported before the 1998 financial crisis.[12]

Of course, reallocation only makes sense if alternative services that both cost less and are at least as effective as the existing use of inpatient care can be developed for patients with social problems and poor access to health facilities and if cost-savings from the reallocation of specialist TB beds are available for reinvestment in such services. Evidence from other countries shows that outpatient care for TB patients is feasible, effective and costs less than inpatient care,[17–20] but in these settings social problems, such as alcohol misuse, are less common. Alternatives to inpatient care that have already been discussed in the Russian context include establishing shelter-type facilities that offer minimal clinical care, strengthening outpatient services and social support, and using isolation wards for treatment in general hospitals that have spare capacity.[14, 21] Our findings suggest that assessing the costs and effectiveness of these alternatives and comparing them with existing care should be a priority. It is encouraging that data from recently introduced social-support programmes for TB patients in several Russian regions suggest that they can substantially improve treatment outcomes (from a treatment success rate of 65% to above the WHO target of 85%), with budgets of about US$ 20 000 per region per year (equivalent to the cost of operating 18 beds for one year).[22]

As noted in the Methods section, our study design did not allow us to compare treatment outcomes for inpatients and outpatients, and it would have been difficult to do this since almost all patients are treated as inpatients. Nonetheless, our study demonstrates that even if some patients are being hospitalized because physicians believe this is the best way to ensure a good treatment outcome, many beds are unoccupied or occupied by patients who have already completed treatment. Two further limitations of our study are that the reasons treating physicians gave for hospitalizing patients were based on their own observation and judgement and that the data illustrate bed-use at only one point in time and seasonal variation may exist. We tried to

Table 3. **Primary reasons given by physicians for need to hospitalize patients with tuberculosis (TB) in four regions of the Russian Federation, 2001**

Reason given for hospitalization	Region (season of survey)					Total [a]
	Ivanovo (summer)	Ivanovo (winter)	Orel (summer)	Samara (winter)	Vladimir (winter)	
Chemotherapy for TB	257 (49)	337 (57)	182 (48)	821 (64)	296 (52)	1893 (57)
Hospitalization required by regulations	58 (11)	22 (4)	60 (16)	154 (12)	60 (10)	354 (11)
Hospitalized to confirm or exclude diagnosis of TB	57 (11)	104 (18)	21 (6)	16 (1)	11 (2)	209 (6)
Requires isolation to prevent transmission	8 (2)	14 (2)	4 (1)	3 (0.3)	41 (7)	70 (2)
Surgery	34 (6)	39 (7)	12 (3)	38 (3)	28 (5)	151 (5)
Clinical condition requires hospitalization	11 (2)	5 (1)	13 (3)	70 (5)	2 (0.3)	101 (3)
Requires isolation to strengthen immune system	0 (0)	0 (0)	0 (0)	20 (2)	0 (0)	20 (1)
Unlikely to complete course of medication if discharged	11 (2)	2 (0.3)	12 (3)	13 (1)	15 (3)	53 (2)
Outpatient care is not accessible from patient's home	24 (5)	12 (2)	7 (2)	2 (0)	4 (1)	49 (2)
Poor living conditions at home	3 (1)	6 (1)	21 (6)	68 (5)	22 (4)	120 (4)
Homeless	5 (1)	8 (1)	3 (1)	5 (0.4)	6 (1)	27 (1)
No care available at home	3 (1)	1 (0.2)	6 (2)	1 (0.1)	7 (1)	18 (1)
Patient insists on hospitalization	2 (0.4)	0 (0)	4 (1)	1 (0.1)	0 (0)	6 (0.2)
Disability needs to be evaluated	0 (0)	0 (0)	4 (1)	1 (0.1)	1 (0.2)	7 (0.2)
Other	54 (10)	37 (6)	30 (8)	72 (6)	81 (14)	274 (8)
Total	**527 (100)**	**587 (100)**	**379 (100)**	**1285 (100)**	**574 (100)**	**3352 (100)**

[a] Values are numbers (percentage).

overcome these limitations by investing time in training doctors to use the questionnaire and by collecting data during both summer and winter.

The success of infectious disease-control programmes is often determined by the constraints posed by the health systems in which they operate.[23, 24] In the Russian Federation, there are six major barriers to the rationalization of the TB control system. First: hospital funding is based on the number of beds and bed occupancy. This preserves existing structures and provides perverse incentives for providers to maintain the number of beds and to hospitalize patients with TB.[9, 14] Reallocating beds requires making changes to mechanisms of resource allocation and provider-payment systems for both TB control and the health system as a whole.[14] Second: previously, regulations stipulated long periods of hospitalization for patients with TB.[8, 9, 25–27] With the recent introduction of Ministry of Health Executive Order 109 these regulations have been formally abandoned but since the order does not explicitly specify new criteria for hospital admission previous regulations may still be used as a reference.[10] Third: large numbers of staff are employed in TB-control facilities (17 860 doctors, 37 253 nurses, 18 515 hospital attendants and 18 500 ancillary staff). About one-third of the cost savings that could be made from reallocating beds is related to staff costs.[13] Reducing or redistributing staff is politically difficult. Any reductions would need to be linked to improvements in pensions; current pension provision encourages staff to remain in their posts beyond retirement age. Fourth: outpatient services for TB care and social support for patients who are unemployed and/or misuse alcohol are poorly developed.[9, 14, 15] Fifth: cost savings made from reallocating or reducing the number of beds would not necessarily be reinvested in TB control.[14] Financing regulations (as in many other industrialized countries) prevent a shift of funds from health to social sectors and prevent a pooling of health-sector and social-sector budgets. For TB control to benefit from the reallocation of hospital infrastructure, and for such reallocation to be supported by existing stakeholders, it is essential that cost savings are reinvested in the TB-control system. For instance, funds could be used to provide incentives to staff to improve performance and outcomes and to strengthen weak outpatient and social-support services. The flexibility to reinvest savings would be facilitated by the introduction of global budgets for providers of TB services, which would provide flexibility to reallocate existing resources without a loss of income. Sixth: the prevailing experiences and attitudes of stakeholders (both staff and patients) may lead to strong resistance to change; this may be based on the view that inpatient care is necessary to ensure good outcomes and because patients expect to be hospitalized.[28]

In the short term, these constraints mean that significant improvements in the efficiency of TB-control programmes that are based on optimal use of beds are unrealistic. However, in the medium term it should be feasible to positively influence stakeholders' attitudes, revise existing approaches of resource allocation, introduce more efficient provider-payment systems, implement phased reductions in the number of hospital beds and staff, change existing regulations governing the management of patients with TB, and strengthen outpatient care and social-support services. Encouragingly, a two-day workshop in Vladimir in 2004 with stakeholders from the federal and local levels, which was held to discuss the findings presented in this paper, indicated that there was a broad consensus on the need to gradually reduce the reliance on inpatient care and the steps that would be needed to achieve this.[21]

Our findings have important policy implications for TB-control systems in

Table 4. **Number of patients with tuberculosis (TB) requiring hospitalization and percentage of existing beds needed under five different sets of admission criteria, by region and season, Russian Federation, 2001**

Admission criteria	Region (season)										Total	
	Ivanovo (summer)		Ivanovo (winter)		Orel (summer)		Samara (winter)		Vladimir (winter)			
	Patients[a]	Existing beds needed (%)	Patients	Existing beds needed (%)	Patients	Existing beds needed (%)	Patients	Existing beds needed (%)	Patients	Existing beds needed (%)	Patients (%)	% of existing beds needed
Scenario 1[b]	243 (46)	41	279 (48)	47	179 (47)	37	627 (49)	50	237 (41)	47	1565 (47)	45
Scenario 2[c]	254 (48)	42	293 (50)	49	188 (50)	39	629 (49)	50	255 (44)	51	1619 (48)	47
Scenario 3[d]	297 (56)	50	359 (61)	60	216 (57)	45	804 (63)	64	351 (61)	70	2027 (60)	59
Scenario 4[e]	391 (74)	65	424 (72)	71	245 (65)	51	1007 (78)	80	386 (67)	77	2453 (73)	71
Scenario 5[f]	406 (77)	68	442 (75)	74	308 (81)	64	1031 (80)	82	427 (74)	85	2614 (78)	76

[a] Values in parentheses are the percentage of all current TB patients that fit the specified criteria.
[b] Scenario 1 = clinical + public health. Clinical and public health reasons considered to justify admission are one of more of: being currently smear-positive or culture-positive; having multidrug resistant tuberculosis; having an unsatisfactory clinical condition (bedridden or in need of intensive care); undergoing preoperative or postoperative surgical care.
[c] Scenario 2 = clinical + public health + homelessness. As for Scenario 1 plus any patients who do not meet the clinical criteria but who are homeless.
[d] Scenario 3 = clinical + public health + homelessness + misusing alcohol. As for Scenario 2 plus any additional patients considered to be misusing alcohol.
[e] Scenario 4 = clinical + public health + homelessness + alcohol misuse + health-systems factors. As for Scenario 3 plus any additional patients for whom an outpatient facility is not accessible and/or the treating physician considers that the patient is unlikely to finish treatment if discharged.
[f] Scenario 5 = clinical + public health + homelessness + alcohol misuse+ health-system factors + extended social reasons. As for Scenario 4 plus any additional patients for whom there is no care available or who would have to return to poor living conditions at home.

the Russian Federation and other countries of the former Soviet Union, where similar systems exist and where TB hospitals shoulder not only the cost of extensive periods of clinical care but also a substantial burden of nonclinical social support. Improving the efficiency with which existing resources are used will require health-system norms and regulations to be reformed as they relate to planning, financing and clinical care; this will take time. National and international agencies need to focus on medium-term to long-term improvements in the health-care systems in general rather than on short-term change. ■

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Résumé

Efficacité des systèmes de santé en Fédération de Russie : la lutte antituberculeuse

Objectif Conduire une évaluation globale d'un éventail de cas hospitalisés dans des établissements spécialisés dans la tuberculose et des raisons de leur admission dans quatre régions russes : Ivanovo, Orel, Samara et Vladimir. Nous avons également cherché à déterminer dans quelle mesure l'efficacité pourrait être améliorée en réduisant les taux d'hospitalisation et en restructurant les lits d'hôpitaux disponibles dans le système de lutte antituberculeuse.

Méthodes Nous avons utilisé un questionnaire type pour déterminer de quelle façon les lits étaient utilisés et qui les utilisait dans les établissements spécialisés dans la tuberculose de quatre régions russes. Les données ont été recueillies afin de déterminer comment 4306 lits affectés à la tuberculose étaient utilisés et également concernant les indicateurs socio-économiques et démographiques, les paramètres cliniques et les raisons de l'hospitalisation de 3352 malades.

Résultats Sur les 3352 patients étudiés, environ 70 % étaient des hommes ; l'âge moyen était de 40 ans et les taux de chômage, d'incapacité et d'alcoolisme étaient élevés. Près du tiers des lits étaient occupés par des patients tuberculeux à frottis positif ou à culture positive ; 20 % étaient occupés par des patients tuberculeux à frottis négatif et/ou culture négative ; 20 % étaient occupés par des patients qui n'avaient plus la tuberculose ; et 20 % étaient inoccupés. Si des critères d'admission cliniques et de santé publique étaient appliqués, moins de 50 % des admissions seraient justifiées et moins de 50 % du nombre actuel de lits s'avéreraient nécessaires. Jusqu'à 85 % des hospitalisations et des lits ont été jugés nécessaires lorsque les problèmes sociaux et d'accès aux soins ambulatoires étaient pris en compte au même titre que les critères cliniques et de santé publique.

Conclusion Lorsque l'on utilise des critères cliniques et de santé publique, une grande partie de l'importante infrastructure hospitalières consacrée à la tuberculose en Fédération de Russie est superflue, mais cette infrastructure du système de lutte antituberculeuse joue un rôle de soutien social non négligeable. Il faudra, pour améliorer l'efficacité de la lutte antituberculeuse, entreprendre une réforme des normes et des réglementations du système de santé qui ont trait à l'allocation des ressources et aux soins cliniques et mettre en œuvre des méthodes moins coûteuses de prise en charge des cas pour les patients présentant des problèmes sociaux. En outre, une attention accrue devra être portée à la gestion des effectifs dans le système de lutte antituberculeuse.

Resumen

Eficiencia de los sistemas de salud en la Federación de Rusia: control de la tuberculosis

Objetivo Realizar una evaluación integral de los casos de pacientes ingresados en hospitales de tuberculosis y de las razones de su ingreso en cuatro regiones de Rusia: Ivanovo, Orel, Samara y Vladimir. Decidimos además determinar en qué medida podía mejorarse la eficiencia reduciendo las tasas de hospitalización y reclasificando las camas de hospital disponibles en el sistema de control de la tuberculosis.

Métodos Utilizamos un cuestionario estándar para determinar cómo estaban utilizándose las camas y quiénes las ocupaban en los centros de tuberculosis de las cuatro regiones rusas mencionadas. Se reunieron datos para determinar cómo se utilizaban 4306 camas de tuberculosis, así como sobre los indicadores socioeconómicos y demográficos, los parámetros clínicos y los motivos de hospitalización de 3352 pacientes.

Resultados De los 3352 enfermos encuestados, alrededor del 70% eran hombres; su edad media era de 40 años; y las tasas de desempleo, discapacidad y consumo abusivo de alcohol eran altas. En torno a una tercera parte de las camas estaban ocupadas por enfermos de tuberculosis con baciloscopía positiva o cultivo positivo; el 20% lo estaban por tuberculosos con baciloscopía negativa y/o cultivo negativo; un 20% estaban ocupadas por pacientes que ya no sufrían tuberculosis; y el 20% estaban libres. Aplicando criterios de admisión clínicos y de salud pública, menos del 50% de los ingresos estarían justificados, y se necesitaría menos del 50% del número actual de camas. Cuando se tuvieron en cuenta los problemas sociales y el escaso acceso a la atención ambulatoria además de los criterios antes mencionados, se estimó que hasta un 85% de los ingresos y las camas eran realmente necesarios.

Conclusión Gran parte de la amplia infraestructura hospitalaria dedicada a la tuberculosis en la Federación de Rusia es innecesaria si nos atenemos a unos criterios clínicos y de salud pública, pero la infraestructura de hospitales en el contexto del sistema de control de la tuberculosis cumple una importante función de apoyo social. Para mejorar la eficiencia del sistema habrá que reformar las normas y disposiciones relativas a la asignación de recursos y la atención clínica, y aplicar enfoques de bajo costo a la gestión de los casos de pacientes con problemas sociales. Además, deberá potenciarse la gestión de los trabajadores empleados en el sistema de atención de la tuberculosis.

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