

Barriers to sustainable tuberculosis control in the Russian Federation health system

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Abstract The Russian Federation has the eleventh highest tuberculosis burden in the world in terms of the total estimated number of new cases that occur each year. In 2003, 26% of the population was covered by the internationally recommended control strategy known as directly observed treatment (DOT) compared to an overall average of 61% among the 22 countries with the highest burden of tuberculosis.

The Director-General of WHO has identified two necessary starting points for the scaling-up of interventions to control emerging infectious diseases. These are a comprehensive engagement with the health system and a strengthening of the health system. The success of programmes aimed at controlling infectious diseases is often determined by constraints posed by the health system. We analyse and evaluate the impact of the arrangements for delivering tuberculosis services in the Russian Federation, drawing on detailed analyses of barriers and incentives created by the organizational structures, and financing and provider-payment systems. We demonstrate that the systems offer few incentives to improve the efficiency of services or the effectiveness of tuberculosis control. Instead, the system encourages prolonged supervision through specialized outpatient departments in hospitals (known as dispensaries), multiple admissions to hospital and lengthy hospitalization.

The implementation, and expansion and sustainability of WHO-approved methods of tuberculosis control in the Russian Federation are unlikely to be realized under the prevailing system of service delivery. This is because implementation does not take into account the wider context of the health system. In order for the control programme to be sustainable, the health system will need to be changed to enable services to be reconfigured so that incentives are created to reward improvements in efficiency and outcomes.

Keywords Tuberculosis, Pulmonary/prevention and control; Delivery of health care/organization and administration/economics; Financing, Health; Insurance, Health, Reimbursement; Health services misuse; Directly observed therapy; Evaluation studies; Russian Federation (source: MeSH, NLM).

Mots clés Tuberculose pulmonaire/prévention et contrôle; Délivrance soins/organisation et administration/économie; Financement, Santé; Remboursement assurance maladie; Mauvais usage service santé; Thérapie sous observation directe; Etude évaluation; Fédération de Russie (source: MeSH, INSERM).

Palabras clave Tuberculosis pulmonar/prevenición y control; Prestación de atención de salud/organización y administración/economía; Financiamiento de la salud; Reembolso de seguro de salud; Mal uso de servicios de salud; Terapia por observación directa; Estudios de evaluación; Federación de Rusia (fuente: DeCS, BIREME).

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Voir page 222 le résumé en français. En la página 222 figura un resumen en español.

Introduction

Throughout the 1990s the Russian Federation witnessed a marked increase in the incidence of tuberculosis (TB); rates tripled during this period to reach a level of 90 cases per 100 000 population (1). Since 1995, demonstration projects using WHO's approved TB control strategy (directly observed treatment, or DOT) have been initiated in the hope that the expansion of this model would halt the rise in incidence. However, despite

evidence of good clinical outcomes achieved in the demonstration projects expansion of this practice in the Russian Federation has thus far been limited. Although economic evaluations have shown that this strategy is cost-effective and minimizes the time spent in hospital, patients with TB continue to undergo prolonged hospitalization (2, 3). These lengthy stays have been attributed to traditional clinical and pathophysiological concepts of TB that encourage hospitalization and differ from those advocated by WHO and the international community. Inter-

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national agencies are aware that health-system financing may also affect the efficient implementation of TB control programmes but no systematic analyses have explored this idea.

Health-care systems have an organizational structure, resources and financing and use these to deliver services (4). The DOT strategy, however, focuses principally on changing service delivery without making explicit recommendations about other components of the health system. However, WHO is now increasingly encouraging a more detailed analysis of the health-system context before and during implementation of DOT for TB control (M. Ravigliani, personal communication, 2003). Although changes in clinical practice may be achieved by introducing clinical guidelines, structural and political impediments to change are difficult to overcome, thus limiting the sustainability of the benefits of improved clinical management (5).

The Russian Federation has one of the lowest case-detection rates for new smear-positive cases of TB and the lowest rate of treatment success using DOT of the 22 countries identified by WHO as having a high burden of TB (6).

The objective of this study was to identify how the organization, financing and provider-payment mechanisms of the Russian Federation health system create incentives and barriers that affect the delivery of DOT. The experience in Samara oblast, which in 2001 was committed to introducing DOT, is used to illustrate and examine these issues in detail. Samara oblast is the site of a collaborative project involving scientists from the United Kingdom and the Russian Federation; the project is supported by the United Kingdom Department for International Development. The oblast has a population of 3.3 million. The average income in Samara is similar to the Russian average. Samara was one of the first regions to implement mandatory health insurance as part of the health financing reforms introduced by the Russian Federation (7).

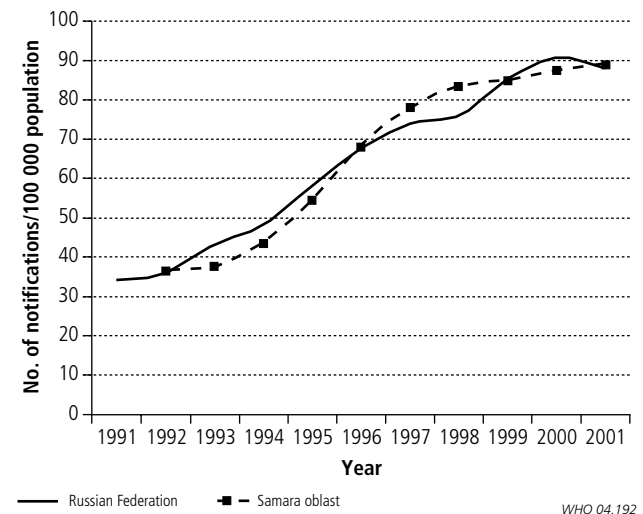
Notification of new TB cases in the past decade in Samara mirrored that in the Russian Federation as a whole (Fig. 1), and in 2001 the incidence reached a level of 89.2 cases per 100 000 population, tripling over the previous decade as it had in the Russian Federation. The region has a well established TB control network of specialized outpatient and inpatient services; there is also a good surveillance system that regularly collects data on notifications, prevalence, financing, provider payments and health-service utilization, thus allowing us to make a detailed analysis of patient data and funds used for TB services.

Methods

Both qualitative and quantitative research methods were used in three stages over a two-year period starting in June 2001. In order to generate hypotheses, in the first stage we analysed financing and organizational arrangements as part of a rapid situational assessment undertaken with the Oblast Health Department at the start of the project funded by the UK Department for International Development (8). This helped us articulate our null hypothesis: WHO-approved TB control methods can be implemented and sustained without changes to the financing of the health system. This stage was followed by site visits, collection of further data on service utilization and financing, and an analysis for hypothesis testing.

The framework used for the analysis of the health system focused on the organizational structure, financing, allocation

Fig. 1. Notifications of new tuberculosis cases in the Russian Federation and Samara oblast, 1991–2001



of resources and service delivery. A systemic rapid assessment and monitoring toolkit developed for concurrent analysis of health systems and TB programmes was used to guide the analysis (9). This toolkit comprises two elements. The horizontal assessment investigates the health system within which the infectious disease programme is embedded from a variety of perspectives. The vertical assessment investigates the specific infectious disease programme. The toolkit has the advantages of other rapid assessment approaches as well as providing an opportunity to make a more in-depth longitudinal assessment of specific areas, such as the political economy, financing of the health system, service delivery and societal attitudes, in order to provide a better understanding of these contextual issues.

The Oblast Health Department allowed the project team to have access to financial data, the oblast's TB register, and anonymized information on TB patients being cared for in primary care and secondary care settings. Two databases were constructed from these data. The first comprised information on 12 000 TB patients treated in hospital over the period 1999–2002; the second comprised information on 100 000 patients and more than 500 000 episodes of community-based attendance for pulmonary TB during the same period. (The second database included information on all recent notifications of TB cases, the contacts of patients with TB, suspected cases of TB, and patients with TB who had been cured but were still under supervision.) Data were analysed using SPSS statistical software.

Further official and unofficial documentary evidence was obtained by analysing publications from multiple sources including regulatory documents from the Russian Federation's regional health organizations, patients' records from clinical units in Samara, reports of projects financed by international organizations and papers published in academic and professional journals.

In the final stage of the study we conducted in-depth interviews with key stakeholders including senior managers, policy-makers, economists and clinicians in order to confirm and triangulate the findings and validate our hypothesis.

Ethical approval was obtained from the local ethics committee, which had been established at the start of the project with support from the project.

Findings

Organizational structure

The Oblast Health Department and the Territorial Health Insurance Fund plan, pool resources and allocate money to health insurance companies that are responsible for financial risk management and for purchasing health services from providers. In effect a purchaser–provider system exists.

The TB control system comprises four vertical subsystems each with its own separate financing stream. These subsystems are: the screening services (which use X-ray fluorography), the TB control system in prisons and pre-trial detention centres, the hospital-based services, and the primary or community health care-based services.

The hospital network comprises nine TB dispensaries (specialized outpatient departments), one regional TB hospital and four sanatoria. At the psychiatric hospital a further 60 beds are dedicated to treating TB patients who have mental illnesses. Community-based services comprise 5 TB departments and 31 phthisiatrists' offices. The screening service is a Russian Federation-wide programme that is part of the general health service network; it is also used to diagnose lung cancer. In the prison system, which is managed by the Ministry of Justice, 2 of the 19 detention institutions provide treatment services.

Financing and resource allocation

Financing of the health system is based on historic budgets rather than on true need. Funds allocated to TB control increased steadily between 1998 and 2000, but despite a worsening epidemic they declined in 2001 as a result in a fall in contributions from federal authorities (Fig. 2). Consequently, the money available per patient with TB declined from 1542 Russian roubles in 2000 to 1291 Russian roubles in 2001. (During 2000–01, US\$ 1.00 = 29 Russian roubles.)

Resource allocation and budgeting are driven by retrospective data. These data do not take into account the rapidly changing case-mix and the burden of multidrug resistance, which is likely to increase, nor do they take account of the rapid increase

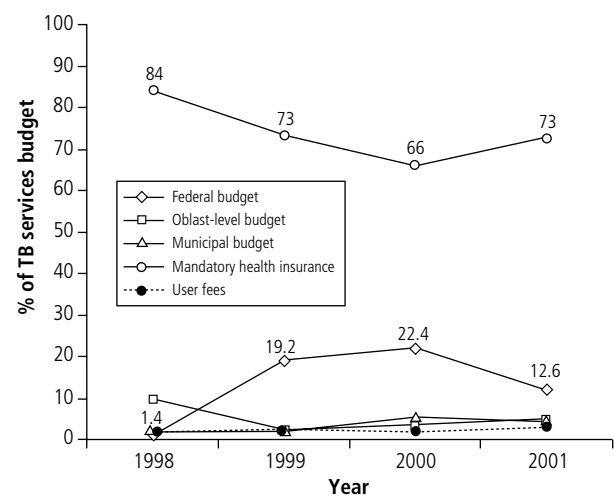
in the incidence of human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) (10).

Financing for the TB system comes from federal, oblast and municipal budgets, from the Territorial Health Insurance Fund through insurance companies, and from user fees for services provided to private patients (Fig. 3). Details of how the health system in Samara is financed are given in Box 1.

Payment systems for providers

Insurance companies pay for the care of five groups of TB patients. These are: patients seen by the outpatient phthisiatry service, which is a community-based service provided to patients registered with a TB dispensary; patients who have completed their inpatient treatment; patients who are suspected of having complicated cases of TB and who require tests while inpatients to establish a diagnosis; patients receiving certain health services that are commissioned by a primary

Fig. 2. Sources of financing for tuberculosis (TB) services in Samara oblast, Russian Federation, 1998–2001



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Box 1. Funding for the health system in Samara oblast, Russia

The budget for the oblast is composed of two elements: the oblast-level budget and the local budgets for the districts and city municipalities that are under the oblast's jurisdiction (19). Health financing comes from two main sources: a payroll tax levied on the working population under the regulations governing mandatory health insurance and the oblast's budget. These resources are pooled in the Territorial Health Insurance Fund (Fig. 3).

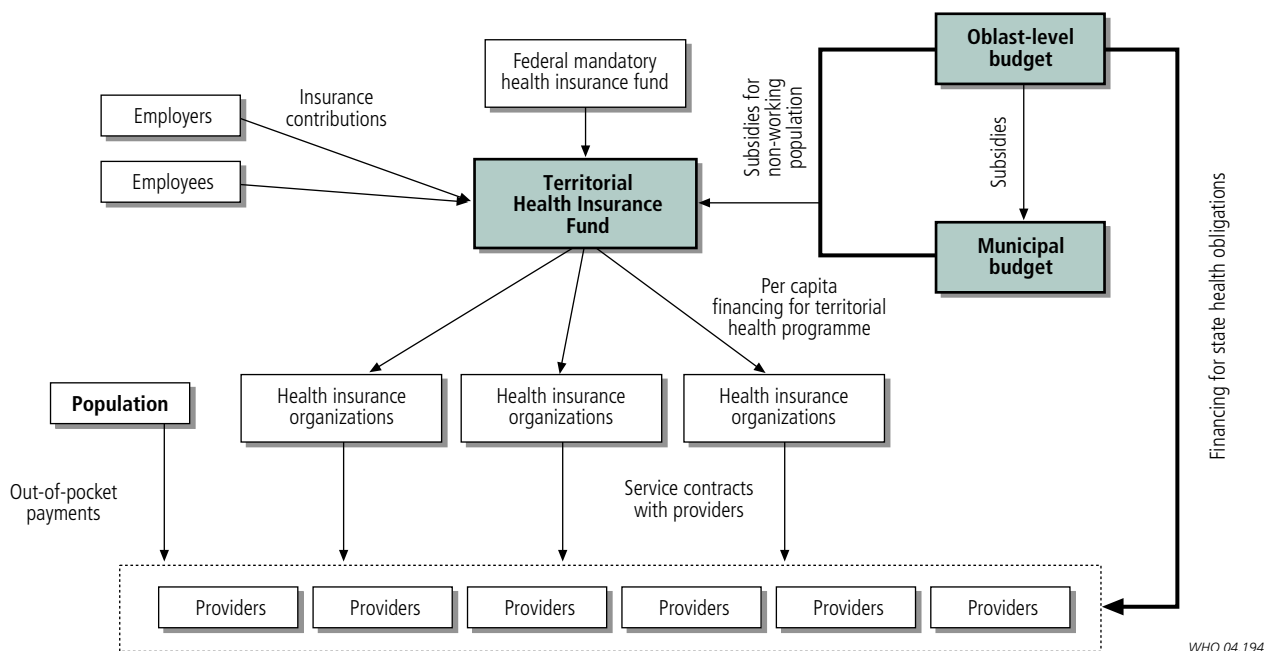
The oblast's health department is responsible for organizing health services and implementing the package of health services specified in the State Guarantees for Health. These guarantees specify the diseases, treatments, volume of services, conditions of provision of services, and pharmaceutical benefits that will be financed by the Territorial Health Insurance Fund. These services are free at the point of delivery (20–22). The State Guarantees for Health are used by the regions to define a free Regional Benefits Package, which may be more inclusive than the state guarantees (23).

The mandatory health insurance system has three components. The first is a Federal Health Insurance Fund. The second is the Territorial branch of the Federal Health Insurance Fund (discussed above). The third is composed of private insurance companies. The Territorial Health Insurance Fund allocates finances to a number of health insurance companies according to a formula that is risk-adjusted per capita (24, 25). (These insurance companies provide health insurance cover to all people regardless of whether they are employed. See Fig. 3 for more information.)

Guidelines and tariffs are regulated by federal law and defined in the Clinical Service Groups, under which a number of diagnoses of similar complexity, intensity of resource use, and average length of hospital stay are pooled. For tuberculosis, these guidelines are based on the Russian national classification system, which differs from WHO's system and other internationally adopted classification systems. The Clinical Service Groups stipulate the length of time a patient should stay in hospital and how cases should be managed; they also define what constitutes a completed case for episodes of care as well as reimbursement levels for care (26). The guidelines are refined regionally within federal regulatory boundaries (27).

Hospital admissions are costed according to the average length of stay and the average daily cost of stay by clinical speciality. Rates are set not according to the real costs to the institutions but according to set costs based on norms specified by regulations and by available regional health-care resources (28).

Fig. 3. Financing of the tuberculosis control system in Samara oblast, Russian Federation



health-care professional (such as consultation or examination); and patients cared for in sanatoria.

Primary care providers treating TB patients receive a risk-adjusted per capita payment for each registered patient who is seen at regular intervals (which is known as dynamic supervision); they are also paid for the estimated amount of resources used for each Clinical Service Group. We found that 40 100 patients were considered to be cared for under dynamic supervision in 2002. Of these, nearly 80% (32 080/40 100) were either contacts of people who had been diagnosed with TB (42%; 16 842/40 100) or people who had been clinically cured (37%; 14 837/40 100). However, only 12% (4 812/40 100) of those receiving care regularly were classified as new cases of active pulmonary TB. A further 4% (1 604/40 100) of these patients had extrapulmonary TB. The average duration of supervision per person was 4 years, but for some patients it lasted as long as 20 years (Fig. 4, web version only, available at: <http://www.who.int/bulletin>). The per capita payment system for primary care-based providers of TB care does not have a performance-related element. It thus creates perverse incentives to retain patients since the provider is paid for each patient who remains under dynamic supervision. This system prevents the primary care provider from acting as a gatekeeper because the provider benefits not only by maximizing the number of patients registered but also by increasing the number of patients referred to hospital and minimizing the scope of services delivered.

Reimbursement for hospitals

TB hospitals are paid a fee-for-service for completed cases; these are classified according to 17 Clinical Service Groups that define the complexity of the case and the clinical guidelines for care and length of stay that need to be adhered to for case management. Each Clinical Service Group attracts a different payment rate. This payment system can lead to cost inflation in the secondary care sector for three reasons.

First, payment-per-case creates perverse incentives for providers that encourage them to increase the number of admissions and investigations to maximize funding (11). Our analysis of hospitalizations occurring during the period 1999–2002 showed that of the 2657 patients registered in 1999 with pulmonary TB 19.5% (505/2657) had been hospitalized twice; 7.6% (202/2657) had been hospitalized three times; 2.7% (72/2657) had been hospitalized four times; and 5% (133/2657) had been hospitalized five times or more (Fig. 5, web version only, available at: <http://www.who.int/bulletin>).

Second, because some types of cases attract more payment than others there is an incentive for providers to change the coding on diagnoses to those that will be reimbursed at higher rates. Interviews with key informants confirm that this practice exists but the scale on which it occurs is not known.

Third, interventions that attract higher daily payment rates, such as surgery, are encouraged at the expense of other more cost-effective options. Between 1999 and 2001 more than 7% of all TB-related episodes of hospitalization were associated with complex investigations and surgery that were reimbursed at higher rates; this is a high proportion when compared with other international practices.

A further problem with the hospital payment system is that the method used for calculating the reimbursement rate for the Clinical Service Group is weighted according to what category of hospital is providing the service. Hospitals with a greater proportion of qualified staff, with expensive equipment on site, with a larger number of beds and more space per bed are reimbursed at a higher rate for each completed case. This encourages retention of staff, the use of a large number of beds, the preservation of sizeable space per bed and investment in equipment. However, it discourages downsizing to improve efficiency because a downsized hospital is paid less per case and it also discourages shifts from inpatient care to community care because this results in a net loss of revenue. Consequently, over the period 1997–2001 the number of inpatient beds remained

at 1300–1350 beds with no downsizing, and overall expenditure on TB hospitals increased from 32 million Russian roubles in 1999 to 35 million Russian roubles in 2000. Overall expenditure for primary care-based TB services in 1999 and 2000 was 31 million Russian roubles, increasing to 41.5 million roubles in 2001. Spending on hospitals accounted for 50% of the total expenditure on TB services (excluding fluorography); this cost per case successfully treated is broadly similar to that in other Russian oblasts but is higher than any of the 22 countries designated as having a high burden of TB (12).

Providers should be paid according to guidelines that stipulate the length of hospital stay and the reimbursement rate per case treated according to guidelines. However, this is not what happens and instead providers are paid an average daily rate adjusted according to the patient's length of stay in hospital even when treatment is not completed. This discourages providers from complying with guidelines because they are reimbursed regardless of whether the patient is treated successfully. Our analysis identified many episodes that fell short of the specified period of admission or far exceeded it (Fig. 6 web version only, available at: <http://www.who.int/bulletin>). In 2001, more than 19% of all admissions (916/4821) were of patients who did not complete treatment. Obviously, this is an undesirable practice that is likely to increase the spread of drug-resistant TB. This practice, combined with inadequate community-based social support systems for vulnerable and homeless populations, encourages hospitals to function as shelters for many patients during the winter and to be remunerated for performing this social function.

Discussion

We have shown how the organizational structure, financing and payment systems create perverse incentives for providers and affect the delivery of health care. The simple per capita payment system for community-based providers encourages them to keep patients under their care for unnecessarily long periods. Likewise, the fee-for-service payments to hospitals encourage them to increase their activity by repeatedly admitting the same patients. The method used to calculate payments for Clinical Service Groups encourages the development of large hospitals with large numbers of inpatient beds and high staffing levels. It discourages rationalization of services in the hospital sector while encouraging investment in hospital equipment. Furthermore, the use of differential payment rates for Clinical Service Groups encourages practitioners to code cases as more severe and to order unnecessary investigations and procedures. Additionally, the use of a payment system in which hospitals are paid for each day a patient remains in hospital rather than per completed episode of hospitalization means that clinical guidelines are not followed and a large number of patients do not complete treatment, thus increasing the risk of multi-drug-resistant TB. Hospitals are also reimbursed for admitting patients for non-clinical reasons and acting as social care institutions. Finally, separating the financing streams for primary care and secondary care fractures the gatekeeping function of community-based providers since referring patients to hospital reduces their workload but does not affect their revenue.

There is growing recognition that in many settings delivering effective health care requires a major strengthening of the health system (13, 14). WHO considers strong health

systems to be a prerequisite for delivering and sustaining vertical programmes for controlling TB, HIV and malaria (15). WHO Director-General, LEE Jong-wook, identified comprehensive engagement with and strengthening of health systems as necessary starting points for scaling-up HIV/AIDS interventions and achieving the objectives of the 3 by 5 initiative (to get 3 million people living with HIV/AIDS in low- and middle-income countries on antiretroviral treatment by 2005) (16, 17). Furthermore, effectively addressing major public health problems often requires action outside the health sector, given the dependence of the health sector on the effective functioning of, for example, revenue raising systems (18). Hence, it is necessary to analyse the functioning of infectious disease programmes within the context of the health system and beyond in order to identify barriers to implementation and resource constraints prior to planning and implementing scaled-up intervention strategies. However, instruments for making a detailed analysis of the wider context in which the health system operates and its relation to infectious disease-control systems are lacking. Our understanding of the challenges involved remains fragmented. This is surprising given that the success of vertical programmes is often determined by the constraints of the health system in which they operate. Using the toolkit helped us to expand our understanding of the complex and dynamic interactions within the health system, within the vertical programme, and between the two of these. This knowledge has contributed to a better understanding of the drivers and barriers to change in the area. Our findings have been used to design context-sensitive interventions.

Our findings show that there are inherent disincentives in the Russian health system; this means that even if WHO-approved methods of TB control are implemented successfully in demonstration sites at oblast level, changes in service provision and institutionalization of these changes will not be realized and sustained. The findings for Samara hold for the rest of the Russian Federation, where financing of TB services is based on the size of the infrastructure, specifically the number of hospital beds and doctors in the TB control network.

Following discussions with regional policy-makers, options have been identified that will allow the system to move to a financing model that links provider payments to quality and outcomes and that will also address perverse incentives in the system. One option being considered is to transfer some of the funds for inpatient care to community-based providers who can act as purchasers; this option would also address linkage issues, strengthen the gatekeeping role of the primary care provider, reduce the number and length of hospitalizations and reduce the incidence of incomplete treatment. Contracts for hospitals may be based not just on initiating courses of treatment but also on outcomes, such as completion of treatment. A second option being discussed is to introduce a more sophisticated per capita payment system for community-based units; this would incorporate performance-related elements and targets (for instance for fewer hospital referrals) and bonus payments for adherence to guidelines and meeting specified quality criteria. These policies are politically feasible, and plans are being made to introduce these changes, given that they do not require additional resources but will improve the efficiency of resource use and outcomes.

Conclusions

The research findings presented here highlight the need for a systemic as well as a programmatic approach to analysing the implementation of TB control programmes. Our findings have implications for the Russian Federation and post-Soviet transition countries in eastern Europe and Central Asia that are introducing DOT for TB control. Changes in service delivery may be achieved but without changes to financing and systems for paying providers the benefits are unlikely to be sustained.

Whether the DOT method of TB control in the Russian Federation is introduced successfully and sustainably depends

on whether changes are made to the health-financing system and the system for paying providers. Implementation strategies that focus on service delivery must be reoriented to embrace systemic approaches to TB control that take into account organizational structures, financing and resource allocation. ■

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Résumé

Obstacles dans le système de santé de la Fédération de Russie s'opposant à une lutte durable contre la tuberculose

À l'échelle mondiale, la Fédération de Russie supporte la onzième plus forte charge de tuberculose si l'on exprime celle-ci par le nombre total estimé de nouveaux cas survenant chaque année. En 2003, 26 % de la population était couverte par la stratégie de lutte antituberculeuse internationalement recommandée, connue sous le nom de traitement sous supervision directe (DOT), chiffre à comparer à la valeur moyenne globale de 61 % pour les 22 pays présentant la plus forte charge de tuberculose.

Le Directeur général de l'OMS a identifié deux points de départ nécessaires pour étendre la portée des interventions visant à combattre les maladies infectieuses émergentes : un engagement total en faveur du système de santé et un renforcement de ce système. Le succès des programmes de lutte contre les maladies infectieuses est souvent déterminé par des contraintes pesant sur le système de santé. Les auteurs analysent et évaluent l'impact des dispositions prises pour assurer la délivrance des services liés à la tuberculose dans la Fédération de Russie, en dressant des analyses détaillées des obstacles et des incitations

créés par les structures organisationnelles et par les systèmes de financement et de paiement des dispensateurs. Ils démontrent que ces systèmes offrent peu d'incitations à l'amélioration de l'efficacité des services ou de la lutte antituberculeuse. Au lieu de cela, le système encourage un suivi prolongé par les services de consultation externe spécialisés des hôpitaux (connus sous le nom de dispensaires), ainsi que des hospitalisations multiples ou trop longues.

Il est peu probable que la mise en place, le développement et l'application durable des méthodes de lutte antituberculeuse approuvées par l'OMS puissent s'opérer dans le cadre du système actuel de prestation de services. Cela est dû à l'absence de prise en compte du contexte plus large du système de santé. Pour que le programme de lutte antituberculeuse puisse être mis en œuvre de façon durable, il est nécessaire de modifier le système de santé en reconfigurant les services, de manière à créer des incitations récompensant les améliorations en matière d'efficacité et de résultats.

Resumen

Obstáculos para un control sostenible de la tuberculosis en el sistema de salud de la Federación de Rusia

La Federación de Rusia ocupa el undécimo lugar entre los países con mayor carga de tuberculosis, entendida ésta como el total estimado de nuevos casos surgidos cada año. En 2003, el 26% de la población estaba cubierta por la estrategia de control internacionalmente recomendada conocida como tratamiento breve bajo observación directa (DOTS), frente a una media general del 61% entre los 22 países con mayor carga de tuberculosis.

El Director General de la OMS ha identificado dos puntos de partida necesarios para la expansión de las intervenciones de control de las enfermedades infecciosas emergentes; a saber, una implicación amplia con el sistema de salud, y el fortalecimiento de dicho sistema. El éxito de los programas encaminados a controlar las enfermedades infecciosas viene determinado a menudo por las limitaciones que impone el sistema de salud. Analizamos y evaluamos aquí el impacto de las medidas adoptadas para ofrecer servicios contra la tuberculosis en la Federación de Rusia, partiendo de análisis detallados de los obstáculos y los

incentivos creados por las estructuras orgánicas y la financiación y los sistemas de pago a los proveedores. Demostramos que los sistemas ofrecen pocos incentivos para mejorar la eficiencia de los servicios o la eficacia del control de la tuberculosis. En cambio, el sistema fomenta la supervisión prolongada a través de los departamentos ambulatorios especializados de los hospitales (conocidos como dispensarios), los ingresos hospitalarios repetidos y las hospitalizaciones prolongadas.

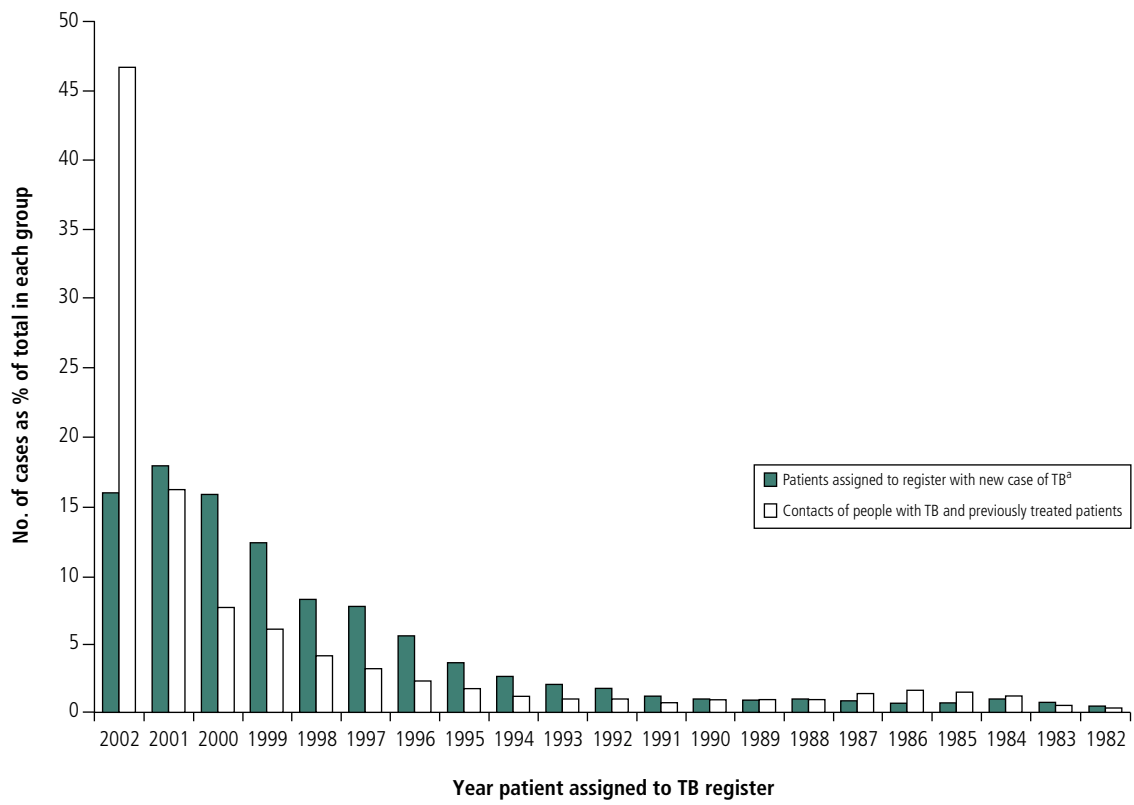
En la Federación de Rusia, la ejecución y la ampliación y sostenibilidad de los métodos de control de la tuberculosis aprobados por la OMS tienen pocas probabilidades de materializarse en el marco del sistema vigente de prestación de servicios. Ello es así porque en la ejecución no se tiene en cuenta el contexto general del sistema de salud. Para que el programa de control sea sostenible, habrá que reformar el sistema de salud a fin de poder reorganizar los servicios de modo que se creen incentivos que recompensen las mejoras de la eficiencia y los resultados.

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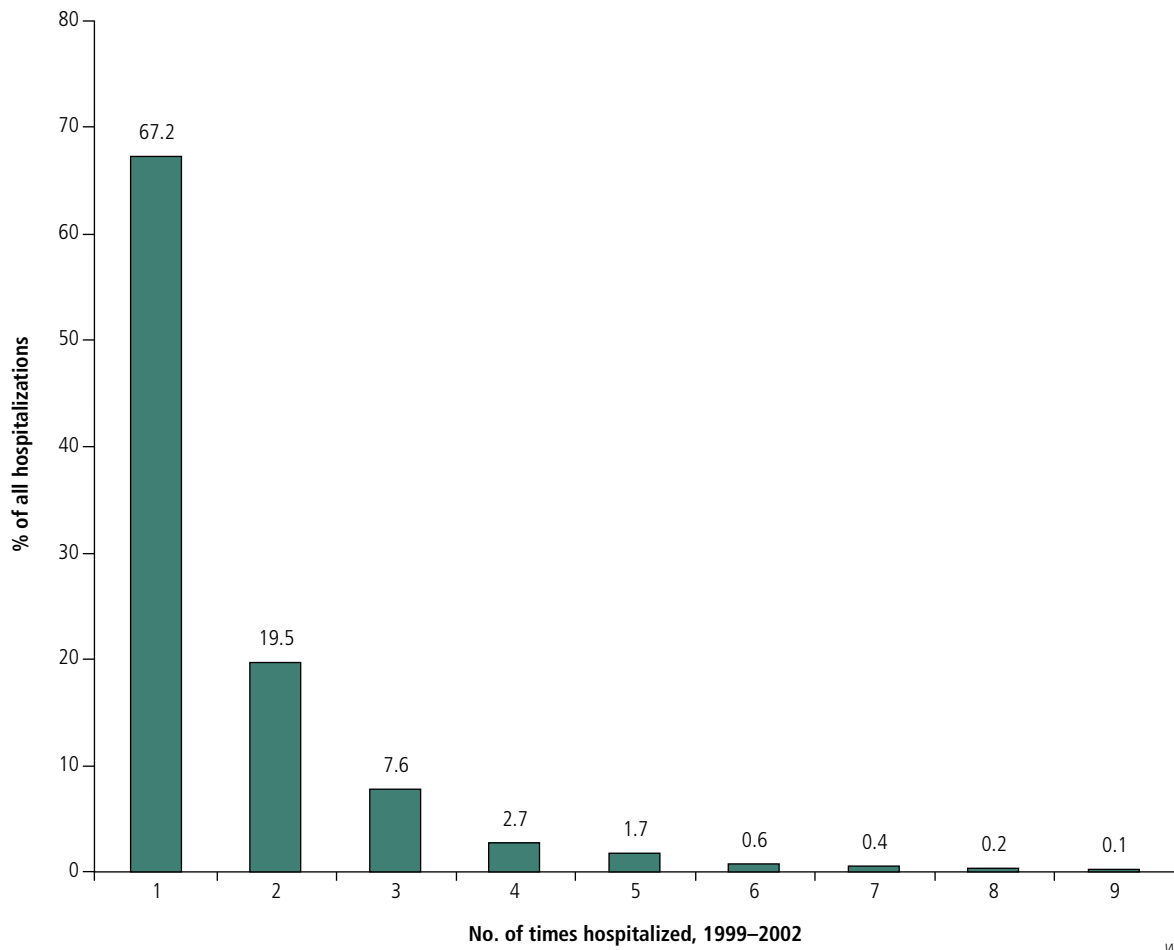
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Fig. 4. Length of time patients remained on the register, Samara oblast, Russian Federation, 2002



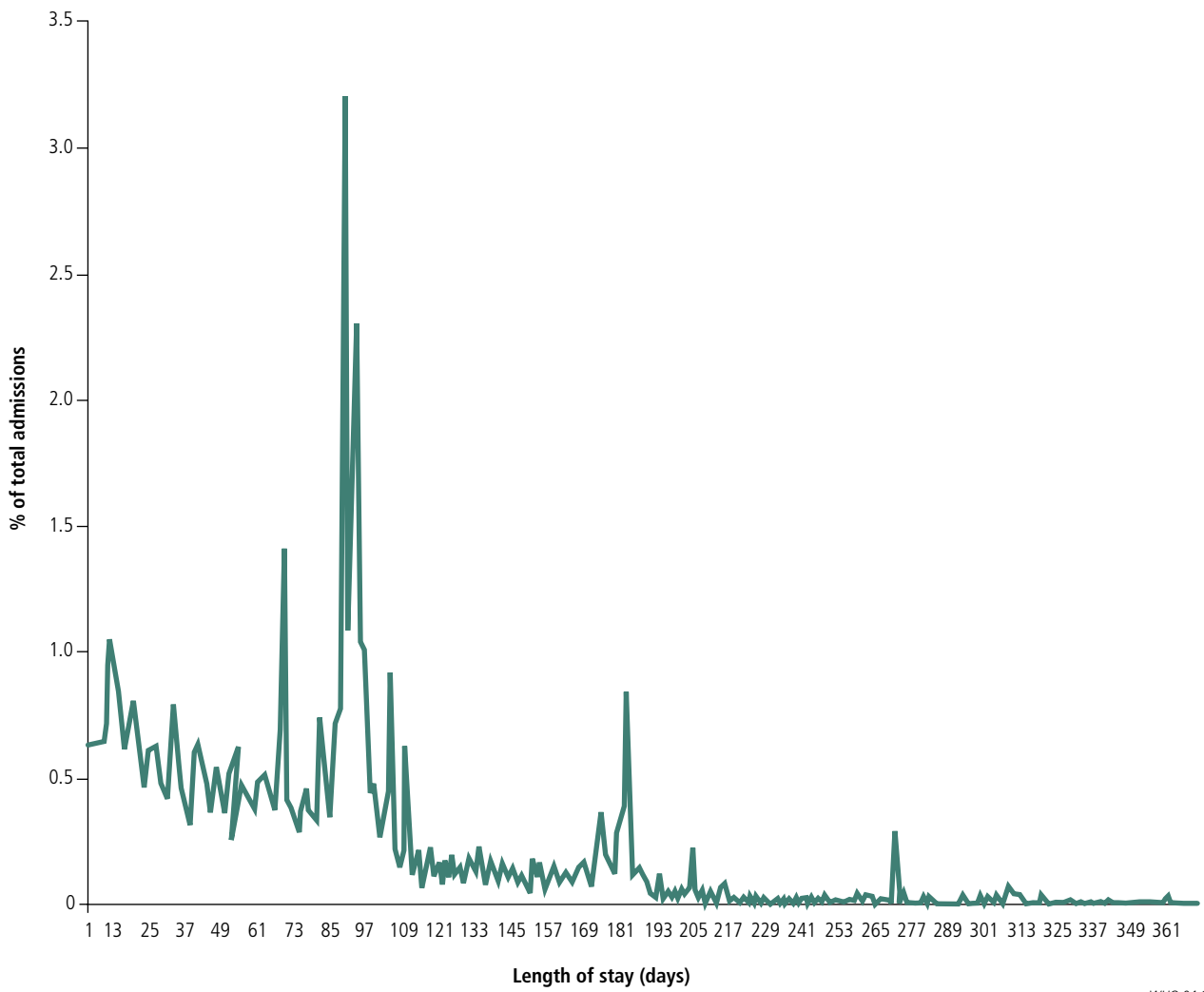
^a TB = tuberculosis.

Fig. 5. Frequency of hospitalization for tuberculosis patients registered in Samara oblast, Russian Federation, between 1999 and 2002



WHO 04.196

Fig. 6. Length of time spent in hospital per episode of admission for tuberculosis in Samara oblast, Russian Federation, 1999–2002



WHO 04.197