

**EUROPE AND EURASIA REGIONAL
TUBERCULOSIS EVALUATION
REGIONAL REPORT**

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ACRONYMS AND ABBREVIATIONS

| | |
|--------|--|
| BCG | Bacillus of Calmette and Guerin vaccine |
| CDC | (U.S.) Centers for Disease Control and Prevention |
| CMS | Central Medical Stores |
| DMIS | Drug Management Information System |
| DOTS | World Health Organization's-recommended Directly Observed Therapy Short-course (DOTS) strategy |
| DOW | Doctors of the World |
| DST | Drug Susceptibility Testing |
| E&E | Europe and Eurasia (region) |
| FAP | Feldsher Acoucherski Punct |
| FDC | Fixed-Dose Combinations |
| FSU | Former Soviet Union |
| GFATM | Global Fund to Fight AIDS, Tuberculosis and Malaria |
| GLC | Green Light Committee |
| HLWG | High-level Working Group |
| HSR | Health Sector Reform |
| IDU | Injecting Drug User |
| IEC | Information, Education and Communication |
| IUATLD | International Union Against Tuberculosis and Lung Diseases |
| KfW | Kreditanstalt fuer Wiederaufbau (German Development Bank) |
| MDR-TB | Multidrug-resistant tuberculosis |
| MMR | Mass Miniature Radiography |
| NGO | Nongovernmental Organization |
| NIS | Newly Independent States |
| NRL | National Reference Laboratory |
| NTP | National Tuberculosis Control Program |
| PCR | Polymerase Chain Reaction |
| PVO | Private Voluntary Organization |
| RF | Russian Federation |
| SES | Sanitary and Epidemiological Surveillance |
| SVA | Semeino Vrachbnyi Ambulatoria |
| SVP | Semeino Vrachbnyi Punct |
| TB | Tuberculosis |
| USAID | United States Agency for International Development |
| USSR | Union of Soviet Socialist Republics |
| WB | World Bank |
| WHO | World Health Organization |

EXECUTIVE SUMMARY

USAID, over the past five years, has invested considerable resources into TB programs in the Europe and Eurasia (E&E) Region. The primary objective of these programs has been to assist host governments to effectively and efficiently control and prevent tuberculosis through implementation of the World Health Organization's (WHO)-recommended Directly Observed Therapy Short-course (DOTS) strategy. Another objective is to demonstrate that the WHO-approved DOTS approach, with possible adaptations, is appropriate and successful in the E&E Region. USAID funds TB control programs in Russia, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Ukraine, Kosovo, Latvia, and Estonia. Additional activities are being initiated in Tajikistan, Moldova, Romania, and Georgia.

USAID wanted to assess the impact of its support to tuberculosis control in the E&E Region and requested an evaluation of the USAID-supported tuberculosis programs in Europe and Eurasia. The evaluation sought to identify regional and subregional issues in order to provide leadership in tackling the complex problems related to TB control and to identify the conditions and interventions of USAID's programs that lead to successful DOTS and modified DOTS implementation in the region. The Royal Netherlands Tuberculosis Association (KNCV) conducted the evaluation in 2002. KNCV was asked specifically to evaluate a select group of the USAID-supported programs in Europe and Eurasia.

A multidisciplinary team carried out the evaluation. Each country team consisted of five persons, but the team members were interchangeable. KNCV provided the overall coordinator, Jaap Veen (tuberculosis specialist); the field team leader, Peter Metzger (tuberculosis specialist); and Marija Joncevska (laboratory specialist). Management Sciences in Health, through its program Rational Pharmaceutical Management Plus (RPM Plus), provided Olya Duzey, Andrew Marsden, and Andrey Zagorskiy (drug management specialists). The USAID Global Bureau for Health and the USAID E&E Bureau, both in Washington, D.C., participated with Cheri Vincent (public health advisor), Tim Clary (public health specialist), Marni Sommer (pharmaceutical management advisor), and Emily Wainwright (infectious diseases specialist).

The team visited USAID field sites in the Baltic countries of Latvia and Estonia, the Russian Federation (Ivanovo and Orel oblasts), Kazakhstan and Uzbekistan in Central Asia, Kosovo in the Balkans, and Ukraine (Donetsk oblast). Below is a summary of the overarching lessons learned and recommendations resulting from this evaluation.

ACHIEVEMENTS IN TB CONTROL IN THE E&E REGION

Overall, USAID's support has contributed to successes in TB control in the E&E Region. Increases in TB case notifications, improvements in treatment success rates, and decreases in acquired multidrug-resistant tuberculosis (MDR-TB) rates have been documented within USAID demonstration sites to date.

Political commitment for TB control has increased in all countries in the region where USAID is intervening in TB control, with the exception of the Baltic countries where high-level political commitment already existed at the inception of project activity. Some governments have demonstrated more commitment than others. For example, not only has the introduction of a High-level Working Group on TB in the Russian Federation contributed to increased acceptance of the DOTS strategy by senior specialists and politicians, but it is also a model for other countries of how involvement of the country's own specialists can lead to ownership and thus sustainability. In Ukraine, where the TB pilot is still in its initial stages, political commitment remains weak, but there are encouraging signs of a possibility of further government commitment.

USAID has helped increase the role of sputum smear microscopy in the diagnosis of TB by providing necessary equipment to laboratories in the region, and by supporting the essential training of laboratory technicians in standard microscopy techniques. Increases in proficiency have been documented in USAID demonstration sites.

USAID's support has also contributed to the standardization of anti-tuberculosis treatment regimens within countries, most notably evident in Kosovo. In addition, USAID support has led to improvements in TB control program monitoring. For example, in Kazakhstan an electronic case-based surveillance and monitoring system has been introduced.

USAID's support has made an important contribution in the Baltic countries where capacity has been built in MDR-TB diagnosis, treatment, and prevention through the creation of a Center of Excellence in Latvia and training for nurses in Estonia. This growth in capacity can potentially have a wider impact on the surrounding countries.

USAID support has helped increase awareness among national TB programs in the E&E region about the importance of effective drug management for successful TB control. USAID's leadership and technical support have contributed to strengthened drug management systems as well as stimulated leaders within the international TB community to recognize the role strong drug management systems in effective TB control.

Finally, USAID's support has created a greater awareness within programs for TB and MDR-TB hot spots: prisons. In Kazakhstan, the Russian Federation, and Ukraine, prison tuberculosis control has been included as an area addressed among USAID-supported TB control activities.

IMPORTANT LESSONS LEARNED

1. Strict application of the World Health Organization's recommended Directly Observed Therapy short-course (DOTS) strategy in the region results in resistance to change; adapting DOTS with the help of national specialists creates an atmosphere conducive to change that helps in implementing sound, technical interventions.

The DOTS strategy was not intended to be implemented in situations that lacked any form of tuberculosis control. A strategy for tuberculosis control already existed in all countries visited. In fact, complex systems for TB control were found to be in place, including population-based screening activities, lengthy hospitalization, individualized treatment regimens, and in some cases lifetime follow-up. Aspects of existing strategies often were included or adapted in the new DOTS strategy within the region, further facilitating acceptance. For example, to address technical issues, the High-level Working Group (HLWG) in Russia created task forces comprised of Russian and international experts that developed policy documents containing elements of both DOTS as well as the strategy of the Former Soviet Union (FSU). In addition, the national TB strategy includes population-based screening through fluorography as well as sputum smear microscopy as a patient management tool. This approach can also be seen in the new recording and reporting system, where the DOTS treatment card has been retained, but an attempt was made to include the previous system's parameters on the card.

The HLWG is committed to adapting the FSU strategy to make tuberculosis control more consistent with the WHO DOTS strategy. The Russians speak about the 'basic package'.¹ This hybridization of the strategy results in good and needed support by the government and its major institutions (political commitment). This approach is also technically sound as it includes bacteriologic diagnosis and bi-phasic treatment, but it may be complicated in its reporting and therefore operational analysis. There is no doubt that it is more costly than can be supported in the long-term. In summary, to be effective, technical consultants need to understand that DOTS is not a dogma.

2. The creation of pilot and demonstration sites has helped overcome initial resistance to the DOTS strategy and clearly improved political commitment at the oblast level and gradually also at the central level.

A major incentive for strong collaboration for implementation of DOTS in pilot sites has been material support. The upgrading of laboratories, rehabilitation of buildings and equipment for training, production of training materials, and provision of consumables in situations where underfunding, or even no funding at all was common, all have helped build a sympathetic attitude among politicians and professional staff. Staff motivation has also improved as a result of training. DOTS and non-DOTS strategies, however, still exist in the same demonstration site, which needs to be changed. Although there is no doubt that USAID support has been important in building political commitment leading to the embrace of DOTS implementation, the question remains whether pilot site success can stimulate leadership within the government to roll out DOTS countrywide.

3. Management of MDR-TB (multidrug-resistant TB) patients requires specific knowledge and skills, not only second-line drugs. The creation of a Center of Excellence helps to create expertise that may be expanded to the wider region.

¹ The Russian resistance to the acronym D.O.T.S. has caused WHO to give up the use of the dots in the acronym. The terminology now is DOTS as a brand name and not anymore as an acronym.

The recognition that the diagnosis and treatment of MDR-TB needs specific expertise has led USAID, through its partner the U.S. Centers for Disease Control and Prevention (CDC), to create a Center of Excellence in the National Tuberculosis Institute in Riga (Latvia), which serves a wider region than Latvia. Specialists from neighboring Estonia and Lithuania, as well as from Belarus and Ukraine have been trained there. The involvement of the center in the development of an international MDR-TB surveillance system ensures that relevant country-specific details are not overlooked in the recording. The decrease of acquired MDR-TB in Latvia from 54 percent to 28 percent is an early indicator of success of DOTS implementation.

4. Effective treatment of TB patients requires a stable, uninterrupted supply of quality TB drugs. Building and strengthening TB drug management systems is critical to controlling TB in the region.

Shortages of TB drugs in the E&E region over the last decade have led to the growth in MDR-TB, demonstrating the danger of weak drug management systems. Utilization of poor quality TB drugs, presence of stock outs, or misuse of drugs all contribute to development of drug resistance as has been seen in the region. In addition, poor quality and/or an unreliable supply of drugs can diminish people's trust in the health system, which can hurt TB control. Reports from the region suggest that interventions aimed at building systems for effective drug management have made progress to date, such as increasing understanding among TB specialists of the role that drug management plays in effective TB control and increasing the capacity of TB programs to ensure an uninterrupted supply of quality TB drugs. However, further technical assistance and support to strengthen drug management capacity is needed throughout the region.

KEY OBSERVATIONS

1. USAID should support the development of a plan for dealing with the challenges arising from health sector reform, such as the shrinking number of tuberculosis facilities and its implications for human resources development and the difficulties of integrating the vertical TB structure into the general health services.

Under the DOTS strategy, inpatient treatment on average will be shortened from 9–12 months to 2–3 months, a decrease of bed-days by a factor of 4. This has several implications. Fewer bed-days mean less funding for the institution and less work for the staff. This translates into less money available for maintenance, heating, food, and salaries, and the need to reduce staffing. Naturally, staff will object to these changes.

The shortened inpatient treatment also means that buildings will have become too large for the need, resulting in departments being closed to save on heating and maintenance. This, in turn, will lead to a gradual dilapidation of parts of the building. The buildings are already in poor condition, as is the furniture and equipment inside. If the epidemic declines, this situation will become even more pressing. Such a downgrading scenario is bad for staff morale. Tuberculosis has associated stigma, not only for patients but also for staff. Salaries were

invariably low in all countries visited, and the staff were often advanced in age but unable to retire because they cannot afford to live on a low pension.

Integration of skills and facilities may be the answer in such a situation. By centralizing hospital-based care, not necessarily in separate institutions but as part of general hospitals, it will be easier to provide the necessary funds for food and other patient utilities, and for maintenance and equipment. In addition, health care staff must work with a minimum number of patients to retain their expertise and skills. A training plan with a career development perspective needs to be developed to motivate doctors to remain in or come to the tuberculosis services.

All countries face similar problems in embedding the vertical tuberculosis structure in general health services. Progress depends in part on how advanced health sector reform is in each country, including the expansion of roles and responsibilities of primary health care providers. It is clear that early diagnosis and treatment adherence are related in part to access to health services, and that integrating TB control into strengthened primary health care systems is essential to extending access to the DOTS strategy to all, especially those in rural settings.

2. The funding mechanisms for tuberculosis care services needs to change. Tuberculosis services should receive adequate funding within health system financing mechanisms, ensuring an adequate budget for TB control, such as for inpatient care (bed-days), screening, and medications. USAID could help governments develop new financial structures.

Financing of tuberculosis services remains a critical area demanding attention. Funding in some countries is based on bed-days, in some demonstration sites on per case funding, and in the Baltics TB services are funded through an insurance scheme, but with all countries providing tuberculosis care free of charge to patients. It is difficult to determine the budget needed to adequately fund tuberculosis control. Most countries do not have a separate budget uniquely developed for the support of TB control activities. For example, salaries for tuberculosis staff are part of the local administration's health salary budget and drug funding is partly hidden in the national budget with drugs often procured at the national level. Inpatient care is often funded through bed occupancy in the hospital. Further, aspects of the tuberculosis control program such as population-based screening with mobile x-ray units or Mantoux skin testing are considered a social service and provided through the Sanitary and Epidemiological Surveillance (SES) program budget. The same goes for BCG (anti-TB) vaccinations. Savings in these interventions, therefore, do not lead to increases in overall resources available for tuberculosis control programming within the health system budget. Thus, there is a clear disincentive to undertaking activities directed at making tuberculosis services cost-effective.

However, if tuberculosis control is seen as a coherent set of interventions for which an adequate budget is available, savings from one intervention must then be available for increased investments in other interventions. USAID could help national or local governments look for ways to strengthen the tuberculosis component within health sector reform and develop a proper financing structure for tuberculosis facilities and services. A proper funding structure both for the TB control program and its staff is a condition sine qua non.

3. Donor coordination is often lacking. USAID should play an active role in initiating this coordination.

Donors have their own objectives, and implementing partners are driven by their individual objectives. This often results in territorial competition. In Uzbekistan, Kreditanstalt fuer Wiederaufbau (KfW) has its own approach to tuberculosis control and exerts influence on the National Tuberculosis Control Program (NTP) manager that may result in a strategic or tactical implementation of DOTS that is different from USAID/Project HOPE. A similar situation may occur in Russia or Ukraine, where different donors through their partners may have diverging objectives. Another threat is duplication of effort or investment. For instance, each organization is inclined to develop its own training materials or translate existing materials. Uncoordinated efforts may confuse program staff: for example, drugs come in different dosages or fixed combinations, which may lead to errors in patient management making drug management cumbersome for the country. This could be avoided if donors would emphasize improving coordination of efforts. USAID may be well positioned in the countries of the region to take the lead in donor coordination.

4. USAID can support improved case finding through creating public awareness (communication campaigns), better access to care (education), and a decrease of social stigma (information) where basic elements of TB programs have been strengthened adequately. Technical assistance for Information, Education and Communication (IEC) is needed.

The goal of information, education and communication (IEC) strategies is to inform the general public about tuberculosis, prevention, symptoms, diagnosis and treatment, the fact that it is curable, and how and where to find help.

Information works to decrease fear and contribute to the decrease of social stigma, although stigma cannot be expected to completely disappear. Information will increase awareness among the general population that tuberculosis is an infectious but also curable disease that affects everyone, not only disadvantaged or marginalized people.

Education acts to improve the health-seeking behavior of potential patients, bringing them in at an earlier stage of disease, which will contribute to a decrease in mortality and a decrease in transmission.

Communication is more difficult. Use of radio, television, and newspapers will go a long way toward reaching the general population. However, a large proportion of potential tuberculosis patients come from the homeless and substance abusers, individuals who will not be reached by the media. Even if brochures were disseminated among these groups, it is doubtful the people can or will read them. Other forms of communication have to be tried, such as a peer-to-peer approach, or street theater.

Where TB systems are adequately developed, IEC needs among the population must be addressed and developed as a separate discipline. In the E&E region, this area of focus is gradually evolving, but technical assistance is needed. USAID could play a role in this area.

5. USAID could advocate for sufficient material support (vehicles) and technical support (why and how to do supervision) to the region.

The DOTS strategy relies on a cascading system of supervision in program management, laboratory management, data management, and drug management. In most countries, a tuberculosis coordinator visits and checks on facilities and programs from the national level to the oblast level. Supervisory visits from the oblast level to the raion level are mostly sporadic, and visits by teams of specialists are rare. This is due in part to lack of transportation and lack of understanding of the concept and value of supervision.

In its programs, USAID could help solve the transportation problem by advocating within the government as well as seeking to leverage the work of other donors. USAID could provide training to help improve supervisory skills and change the perception of supervision from a tool grounded in control and punishment to one offering opportunities for communicating program successes and obstacles, and recommendations for improvement. Use of checklists as done by Project HOPE in Kazakhstan and Uzbekistan is a start, but it is not enough. Checklists alone can lead to an emphasis on filling out forms instead of on evaluating the quality of the system. By changing the perception of what it means to supervise and improving supervisory skills, supervision can become an effective tool of support and an opportunity for transferring knowledge meant to improve conditions through constructive means.

RECOMMENDATIONS

Training

USAID could support or initiate a variety of training modules.

1. USAID could support operational research activities to develop training modules on Evidence-Based Decision Making for TB control.

The ongoing use of the ineffective and costly intervention, Mass Miniature Radiography (MMR), illustrates the importance of ensuring that decision makers understand the true value of population-based screening. MMR has been proven to be ineffective and costly, but it is difficult to convince doctors of this because they lack the epidemiological training needed to evaluate the true contribution of MMR to the control of tuberculosis. Another obstacle to discontinuation of this intervention is the lack of incentive. Because the funds are allocated centrally, not performing the task means losing the money altogether.

Cohort analysis is not yet used routinely as a management tool to improve tuberculosis control programs. Since indicators always have been activity based and outcome was never evaluated as a means to make changes in existing activities, cohort analysis is neither recognized nor understood as a management tool. Program managers must learn to use the results of

notification, cohort analysis, and operational research for decision-making. Regular reporting and cohort analysis are available as continuous instruments, while operational research will answer important incidental questions. Managers must learn what questions to ask and what measures to take and how to use data for programmatic decision-making.

The use of an electronic database does not mean that the process of data collection and analysis is understood. It is often better to start implementation with a manual recording system to gain an understanding of what data are needed. Cohort evaluation and how to use it should be part of a broader public health training program. For example, a module could be developed that can be part of existing TB manager training courses, like those in Warsaw, Poland and Almaty, Kazakhstan. However, training must be perceived as an ongoing activity where support is provided to TB program managers at routine intervals, such as during regular supervision visits to continuously build and reinforce skills.

2. USAID could collaborate with existing schools of public health and promote the establishment of these schools where they do not already exist, and they could become responsible for all aspects of program staff training. This may go beyond tuberculosis control.

Schools of public health that can provide training in program management, epidemiology, and health financing, as well as marketing, information systems, and health promotion are needed in the region. Public health training needs to be strengthened. In addition, collaboration with schools of pharmacy is an important avenue to strengthen TB drug management capacity. This could be done either through support of an existing school, such as the public health school in Almaty, Kazakhstan, which could be strengthened to provide a regional role, or a school could be built around existing initiatives such as the Regional Training in Program Management and the Tartu Nurses training.

The creation of a Nursing Training Center in Tartu (Estonia), although not yet institutionalized, has strengthened the role of Baltic nurses in treatment delivery, enhancing compliance, and thereby preventing new cases of MDR-TB. Materials have been adapted for regional use and trainers have been trained, but further implementation is slowed for lack of organizational capacity. Once institutionalized, it could become a nucleus for a nursing school in public health.

3. USAID should support further training and capacity building in drug management, the development of a Drug Management Information Systems, and the creation of drug quality assurance schemes.

Drug management capacity is weak in the E&E region. Few people have received formal training in drug management and key aspects are in need of strengthening: how to procure, how to draft tender requirements, how to deal with import problems, aspects of GMP, where and how to store and distribute, and how to calculate needs. Through the RPM Plus project, USAID contributes to the improvement of this important program element, but there is a demand for wider implementation. For example, introduction of Drug Management Information Systems (DMIS) plays an important role by helping to track drug stocks, keeping

an eye on expiry dates and calculation of drug needs. An electronic system may be the final target, but for now even a proper manual paper systems would suffice in most areas.

Another type of drug information is needed as well. Information on medication side effects and drug interactions should be made available to doctors and patients. A drug information center, as was established in Ferghana City, could serve as a model. Organizations such as MSH can help develop such a plan.

Drug quality assurance needs improvement in the region. There is extensive anecdotal information on poor quality drugs or drugs with too many adverse effects. In some cases poor quality drugs are blamed for the enormous MDR-TB problem. This should be verified. Laboratory capacity for drug quality assessment needs to be developed. It may be too much of an effort to establish these laboratories in all countries of the region, but the creation of a regional laboratory that is trusted by the respective governments should be considered. USAID could play an important role in this.

Infection Control

4. USAID could advocate for the creation of a position and training for infection control nurses.

In Latvia in the Center of Excellence, much attention was given to the prevention of nosocomial transmission of tuberculosis. Yet despite the existing protocol, no one had responsibility for its implementation and supervision. In Estonia in the MDR-TB hospital, a visitor was allowed to enter without a facemask, although staff were wearing masks. No one felt responsible. In a hospital in Kosovo, management refused to separate infectious patients from other pulmonology patients and even allowed children to be admitted to the same ward. Economic motives overruled infection control. In the other countries visited, cotton facemasks are worn and ample disinfection takes place, but modern understanding of nosocomial transmission and how to prevent it does not exist, or if it does, at the least is not put into a protocol.

Technical support for the creation of a position with responsibility for development of broad infection control guidelines and with the authority to implement them is needed. Infection control goes beyond tuberculosis. The whole set of hygienic measures should be part of the training. In Western Europe, nurses hold such positions. It should be explored whether a nurse in Eastern Europe and Eurasia, where nurses often have not yet achieved professional status, can fill this position.

It was observed that laboratory technicians have demonstrated that infection control can be successfully implemented. Invariably during site visits, infection control measures were found in place. Apparently laboratory personnel have a better understanding of the biohazard risks of being in the vicinity of a tubercle bacillus.

Diagnosis

5. USAID, through CDC or the WHO/International Union against Tuberculosis and Lung Diseases (IUATLD) network of Supranational Reference Laboratories, could organize a workshop for laboratory consultants working in different projects or programs to harmonize training strategies and materials; develop a protocol for cascade-wise quality assurance in the network, with a proper sampling methodology; and develop criteria for the number of peripheral laboratories needed in a network.

Through its partners CDC, Project HOPE, and Doctors of the World (DOW), USAID has played a major role in the improvement of laboratory working conditions by providing new equipment and upgrading professional skills of laboratory staff, resulting in improved diagnostic procedures. However, since several organizations are involved in laboratory proficiency training in the region, both inside and outside the USAID-supported programs, there may be great benefit in coordinating training procedures and laboratory strengthening activities. Bringing professionals together could provide an important opportunity to share best practices across programs.

Consultants providing technical assistance also advise on quality assurance and proficiency testing, but some of the procedures are neither practical nor sustainable in a given setting and need to be adapted.

Furthermore, WHO has developed criteria for the optimal number of level III laboratories, but these criteria are based on the size of the catchment population. In the E&E region, these criteria are not sufficient. Attention must also be paid to the epidemiological and geographical situations within countries. USAID could take the initiative to organize or support a workshop where these topics will be discussed and consensus established.

Treatment

6. Patronage nurses may be an alternative for patients who prefer self-administered therapy. USAID could support a cost-effectiveness study into this aspect of treatment adherence.

Direct observation of treatment is part of the DOTS strategy. But some patients see it as paternalistic and many educated patients will not accept it. Furthermore, in peripheral areas it is difficult to operationalize. No doubt it is needed for marginalized populations who lack routines, but for others an experiment with patronage nurses may be an answer.

Kosovo has revived the system of patronage nurses. Drug taking is self-administered by patients in the ambulatory phase (often already starting a few weeks after the initiation of treatment). On a regular basis, a patronage nurse, who will pay attention to medical, social, and financial problems, visits these patients at home. This approach was successful in the Former Republic of Yugoslavia and has been successfully used for many years in countries like the Netherlands with benefits beyond improving treatment adherence such as improving case detection among contacts.

This approach may also help with follow-up of ex-prisoners. Ex-prisoners must register with the police before going to a health facility. Many prisoners have no registered domicile. For these reasons ex-prisoners often prefer to disappear, which results in the interruption of treatment. Patronage nurses could visit the prisoner prior to his release, build trust, and after release take care of his continued treatment intake without having to observe his dosages every day. It may not work for all, but probably at least for some and is worth exploring the evidence-base further.

TB/HIV

7. USAID could help develop coordination between the tuberculosis and HIV/AIDS programs by creating a mechanism that induces regular exchange of information and may initiate training.

From a tuberculosis perspective, reduction of HIV transmission is imperative. This means tuberculosis doctors need to develop knowledge about the prevention of HIV transmission, either by sexual or drug-injection route. This goes beyond the usual tuberculosis skills or knowledge. Society also must change its attitude toward HIV+ persons and injecting drug users. Only by seeing users as patients in need of help can they be reached with prevention and treatment services. Inside prisons, attention needs to be given to information and services that make transmission of the bacteria less likely.

A coordinating task force on TB/HIV could be established to exchange information on the incidence, prevention, and treatment of both diseases, especially in risk groups where the dual infections are likely to occur. Additional training for health care personnel from both programs will be needed. Furthermore, integrating pharmaceutical and commodity management systems for TB and HIV where appropriate could further strengthen these systems. A task force could help initiate this. Through its missions USAID could contribute to this process.

8. USAID could support a network for expanding the MDR-TB management expertise in the Baltics to the wider region.

USAID has recognized that diagnosis and treatment of MDR-TB needs specific expertise and has realized success in building this expertise in the National Tuberculosis Institute in Riga (Latvia), through its partner CDC. USAID should invest in further building the capacity of the TB Institute in Riga to serve as a technical resource center for programs throughout the region that are struggling with the case management of MDR-TB. The expertise currently housed in this center, if shared with programs confronted with high or growing rates of MDR throughout the region, has the potential to help halt growing rates of acquired MDR-TB. Furthermore, USAID could continue to invest in building drug management capacity for MDR-TB throughout the region.

I. INTRODUCTION

The transformation of the Union of Soviet Socialist Republics (USSR) into a Russian Federation (RF) and a number of Newly Independent States (NIS) resulted in the disintegration of a complex societal infrastructure that, among other things, provided extensive social services including health care to the whole population. As the health care system deteriorated, beginning before the breakup, infectious diseases rapidly spread throughout the region. Tuberculosis (TB), in particular, increased at an alarming rate, along with its more deadly and costly drug-resistant strains. The states of the Former Soviet Union (FSU) could no longer financially support the previous TB infrastructure. New effective and efficient solutions were needed.

The burden of tuberculosis in the E&E Region can be summarized as follows: all countries of the FSU have a high case notification rate, poor treatment outcomes, a high burden of MDR-TB, and an increasing HIV problem. However, the notification rate is strongly influenced by data collection systems, which differ in DOTS and non-DOTS areas and the length of time DOTS has been implemented. Kosovo is not a FSU country, but as part of the Former (socialist) Republic of Yugoslavia (FRY) it shares characteristics with the other countries in their traditional tuberculosis control programs.

USAID, over the past five years, has invested considerable resources into TB programs in the E&E Region. The primary objective of these programs has been to help host governments to effectively and efficiently control and prevent tuberculosis through implementation of the World Health Organization's (WHO)-recommended Directly Observed Therapy Short-course (DOTS) strategy. Another objective is to demonstrate that the WHO-approved DOTS approach, with possible adaptations, is appropriate and successful in the E&E Region. USAID funds TB-control programs in Russia, Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan, Ukraine, Kosovo, Latvia, and Estonia. Additional activities are being initiated in Tajikistan, Moldova, Romania, and Georgia.

USAID provides its support through partners including international public and governmental organizations such as WHO and CDC, nongovernmental organizations (NGOs) such as Project HOPE, Doctors of the World (DOW), and Program for Appropriate Technology in Health (PATH). Many challenges have been encountered in implementing TB programs based on the DOTS approach in the region.

USAID wanted to assess the impact of its support to tuberculosis control in the E&E Region and requested an evaluation of the USAID-supported tuberculosis programs there. The evaluation sought to identify regional and subregional issues to provide leadership in tackling the complex problems related to TB control and to identify the conditions and interventions of USAID's programs that lead to successful DOTS and modified DOTS implementation in the E&E Region.

USAID wanted to know: *Did USAID and partners do the right things? Did USAID and partners do the things right?* Related questions include: What were the obstacles, what lessons were learned, how sustainable were efforts, and what outside influences interfered? The common denominators of these questions were the key elements in the WHO-DOTS protocols: Political commitment, laboratory-based diagnosis, adequate treatment, uninterrupted supplies through proper logistics and pharmaceutical management, and reporting and recording. These factors were all reviewed in the context of a country's existing health systems environment.

The Royal Netherlands Tuberculosis Association (KNCV) was asked in 2002 to evaluate a select group of the USAID-supported programs in Eastern Europe and Central Asia.

METHODOLOGY

A multidisciplinary team carried out the evaluation. Each country team consisted of five persons, but the team members were interchangeable. The Royal Netherlands Tuberculosis Association (KNCV) provided the overall coordinator, Jaap Veen (tuberculosis specialist); the field team leader, Peter Metzger (tuberculosis specialist); and Marija Joncevska (laboratory specialist). Management Sciences in Health, through its program Improved Rational Pharmaceutical Management (RPM+), provided Olya Duzey, Andrew Marsden, and Andrey Zagorskiy (drug management specialists). The USAID Global Bureau for Health in Washington, D.C., and the USAID E&E Bureau participated with Cheri Vincent (public health advisor), Tim Clary (public health specialist), Marni Sommer (pharmaceutical management advisor), and Emily Wainwright (infectious diseases specialist)².

The team visited the Baltic countries of Latvia and Estonia, Ivanovo oblast and Orel oblast in the Russian Federation, Kazakhstan and Uzbekistan in Central Asia, Kosovo in the Balkans, and Donetsk oblast in Ukraine. A thorough description of the USAID-evaluated projects is provided in Annex A.

USAID prepared a scope of work for each country and collected background documents. Additional documents often were obtained in the field. Meetings were held with major stakeholders in tuberculosis control, such as governmental institutions, nongovernmental organizations and donors, as well as patients. Visits were paid to a variety of institutions or organizations in the countries, but especially to project sites. At the end of the visit the findings were discussed with the program or project staff in a debriefing session. An executive summary was prepared and delivered to the USAID mission in country at the team's departure. A draft report on each project was prepared for discussion with USAID staff in Washington.³ All team members contributed to the resulting reports. KNCV assumed responsibility for this

² Jaap Veen, Peter Metzger, and Marija Joncevska visited all seven countries. Cheri Vincent joined in Latvia, Estonia, and Uzbekistan; Tim Clary and Andrew Marsden in Russia; Olya Duzey in Latvia, Estonia, Kosovo, and Ukraine; Marni Sommers in Kazakhstan; Emily Wainwright in Kosovo and Ukraine; and Andrey Zagorskiy in Kazakhstan and Uzbekistan.

³ A schematic SWOT analysis of the countries visited can be found in Annex B

overarching regional report, which was entirely based on the completed individual country assessments and reports.

LIMITATIONS

Several limitations to the evaluation were identified. First, the time spent in the countries was necessarily limited. It is therefore possible that important documents were not identified, or that key persons were not interviewed. The team attempted to minimize this risk by dividing tasks and splitting up the team in smaller units when possible.

Second, although the E&E Region may be viewed as a single region with many common characteristics based mainly on their shared history of socialist government, it is important to note that there are enormous cultural differences that will undoubtedly affect the progress countries are making in all aspects of society, including in their health and health services.

II. USAID SUPPORT FOR THE DOTS STRATEGY IN THE E&E REGION

Over the past five years, the control and prevention of TB in the Europe and Eurasia Region has been a USAID priority and USAID has invested considerable resources there on tuberculosis control programs. The main objective of USAID's TB efforts has been to help host governments effectively and efficiently control and prevent tuberculosis through implementation of the World Health Organization's (WHO)-recommended Directly Observed Therapy Short-course (DOTS) strategy. Another objective has been to demonstrate that the WHO-approved DOTS approach, with possible adaptations, is appropriate for and successful in the E&E region. The DOTS strategy has been introduced as the recommended alternative to the traditional Soviet TB Control Strategy. In some cases, elements of this historic strategy have been fused with the DOTS strategy.

The emphasis has varied across the region. For example, in the Russian Federation, Ukraine, Kazakhstan, and Uzbekistan, pilot projects were initiated to demonstrate the effectiveness of the DOTS strategy. In Kosovo, aspects of the DOTS strategy needed strengthening and USAID, through its partners, assisted in this. In Latvia and Estonia, where DOTS has been implemented countrywide, the looming threat of MDR-TB was addressed.

THE DOTS STRATEGY

According to the WHO DOTS strategy, a strong tuberculosis control program has five core elements:

1. Political commitment
2. Laboratory-based diagnosis
3. Adequate treatment
4. Uninterrupted supplies of drugs
5. A proper recording and reporting system

In addition, other elements important for an adequately functioning program include training, health promotion, supervision, and infection control. Because a sound strategy starts with accurate and timely information, it is helpful to examine these five elements in reverse order.

To recognize the success of any TB program, measurable outcomes need to be demonstrated. To monitor a TB program, No. 5, *a proper recording and reporting system* is essential. The program requires data that are easy to collect, understandable in their definitions, and recorded in a way that aggregation for reporting or analysis is relatively simple. The DOTS monitoring system is based on a few indicators to be recorded on a Treatment Card (Form TB01) and in a TB Register (Form TB03) that are easily accessible to produce Quarterly Reports (Form TB07). The DOTS strategy produces data on case finding and treatment outcomes that can easily be used for management decisions.

Insufficient funding and lack of (drug) management capabilities in the last decade in the countries of the FSU have led to No. 4, *interruptions of drug supplies*, resulting in stock-outs. This has contributed to the increase of tuberculosis in the FSU.

Without drugs, No. 3, *adequate treatment*, cannot be provided. To share the limited available drugs among all identified patients, doctors often provided monotherapy with different drugs subsequently given. This is perhaps the major contributing factor for the rise in multidrug-resistant tuberculosis (MDR-TB) in Eastern Europe and Eurasia. Even if sufficient drugs were available, doctors used non-standardized regimens. This contributes to therapeutic inconsistencies and to the rise of MDR-TB. Although it was understandable that doctors wanted to prevent their patients from dying, from a public health perspective they probably did more harm than good.

In the absence of adequate treatment, case finding is necessarily restricted to patients that are a threat to the community. These are the patients that excrete bacilli, which can be detected through sputum smear microscopy. It is for this reason that the WHO strategy emphasizes No. 2, *laboratory-based bacteriologic diagnosis*, but this does not exclude altogether other diagnostic methods such as radiology.

To secure sufficient supplies for diagnosis and treatment, an adequate budget is required. Funds are primarily provided by or through the government and so the first key element in any health strategy is No. 1, *government (political) commitment*. In addition, political commitment to controlling and preventing TB is requisite to a successful program.

The tuberculosis control program is not an isolated activity; the health systems environment in which it must function is an important determinant. Conditions to be met include adequate training for health professionals, supervision to support the strategy, health education and promotion to raise awareness among the general population, and infection control to prevent transmission in institutions that deal with tuberculosis patients.

THE SOVIET STRATEGY

In the FSU, a well-functioning vertical system of public health interventions for tuberculosis control existed. Early diagnosis was secured by annual mass screening of the adult population by fluorography and of children and adolescents by the tuberculin skin test. Gradually, in many countries, screening shifted from targeting the total population to targeting tuberculosis risk groups. Risk groups were not defined by epidemiological factors, but rather by social criteria. In addition to general risk groups, several professions (i.e., medical, teachers, food-handlers) were subject to mandatory annual screening by chest x-ray.

Reliance on this population-based screening was so focused that awareness for symptomatic patients was neglected. Until today, the Russian Federation claims that screening identifies more than half of the patients detected.

Patient management was based on an elaborate system of diagnostic procedures and follow-up that relied heavily on radiography and cultures. Treatment regimens were individualized with much attention to side effects of the drugs used. The duration of treatment was at least 9 months in a tuberculosis hospital ('sanatorium'). Progress toward "healing" was measured by radiological criteria.

Surveillance was and still is extensive. A large number of parameters need to be reported monthly to the Ministry of Health (MoH) and the statistical department, known as the Department of Sanitary Epidemiological Surveillance, or SES.

Preventive measures included vaccination schemes with BCG vaccination at birth, school entry, school departure, and at age 18. Many countries have now do vaccination only twice, once at birth and once at school entry. Annually and after an established contact, children are screened by a tuberculin skin test. If found skin-test positive, children up to the age of 6 years receive isoniazid chemoprophylaxis for 3–6 months. Adults who had tuberculosis and still have fibrotic lesions are requested to come for annual seasonal therapy, i.e., 2 months of isoniazid treatment in spring and autumn.

Furthermore, infection control followed a strict regimen, with elaborate disinfection of patients' homes, clothes, and utensils. In institutions staff wore protective clothing, high hats, and cotton masks. However, little attention was paid to separation of patients by infectious and non-infectious categories or maintaining visiting rules. The current constraints of health care resources don't allow for all preventive measures to be implemented presently, but the belief of their necessity and value is still held by many clinicians and the public alike.

DOTS VERSUS NON-DOTS

The initial implementation of the DOTS strategy in the FSU was problematic. The relatively simple nature of the DOTS strategy made Russian-trained TB specialists suspicious. The argument was that the strategy had been developed in Africa and maybe it could work in a developing country, but such a complicated disease as tuberculosis in the FSU context required a more refined approach.

When compared, the differences between both strategies are more of management philosophy than of diagnosis and treatment (see Table 1). The FSU strategy focuses on individual patients. Early diagnosis makes treatment easier and progress is measured based on '*restitutio ad integritatem*' (healing) of the affected tissues. Patient management decisions are clinical decisions, looking at cavity closure on chest x-rays. In contrast, the DOTS strategy targets the infectious patient as a source of transmission in the society. Treatment aims at killing the infecting organism (*M. tuberculosis*) and patient management decisions are public health decisions, looking at the disappearance of the mycobacteria from the sputum and therefore the reduction in transmission capacity.

However, both strategies diagnose and treat patients in almost the same way, and both measure a number of parameters, even though FSU surveillance is process oriented and the DOTS

surveillance is more outcome oriented. The most striking differences between the two approaches are the non-DOTS use of ineffective and costly population-based screening, a long treatment protocol with costly and hospital-based clinical interventions, and frequent BCG vaccinations.

Table 1. Comparison of Interventions in the FSU and DOTS Strategy

| | FSU System | DOTS |
|------------------------------|----------------------------------|---|
| Case finding | Screening | Symptoms |
| Diagnosis | X-ray Culture | Microscopy (X-ray)* (Culture used in advanced programs, but not part of official DOTS)* |
| Treatment | Individual (3-5 drugs) | Standardized (3-5 drugs) |
| Classification | 7 categories | 3 (+ 1) categories |
| Reporting | Case finding Monthly/annually | Case finding Treatment outcome Quarterly |
| Vaccinations | 2-4 times | Not officially included (At birth)* |
| Isolation | Hospital Sanatorium | (Hospital)* Ambulatory |
| Surgery | Routine | (Rare)* |
| Contact Investigation | Routine | (Routine)* |

* Information in parentheses is not considered part of the official DOTS strategy, but x-ray, for example, is often performed in many countries around the world where DOTS is implemented as an additional clinical tool for patient management. However, diagnosis according to DOTS is based on bacteriology.

DOTS IMPLEMENTATION IN THE REGION

Role of USAID in Implementing DOTS

Overall, USAID's support has contributed to successes in TB control in the E&E region. Increases in TB case notifications, improvements in treatment success rates, and decreases in acquired MDR-TB rates have been documented within USAID demonstration sites to date.

Political commitment for TB control has increased in all countries in the region where USAID is intervening in TB control, with the exception of the Baltic countries where high-level political commitment already existed at the inception of project activity. Some governments have demonstrated more commitment than others. For example, the introduction of a High-level Working Group on TB in the Russian Federation not only has contributed to increased acceptance of the DOTS strategy by senior specialists and politicians, but it is also an example for other countries of how, through the involvement of the country's own specialists, ownership and thus sustainability can be achieved. In Ukraine, where the TB pilot is still in its

initial stages, political commitment remains weak, but there have been encouraging signs of a possibility of further government commitment.

USAID has helped increase the role of sputum smear microscopy in the diagnosis of TB by providing necessary equipment to laboratories in the region, and by supporting the essential training of laboratory technicians in standard microscopy techniques. Increases in proficiency have been documented in USAID demonstration sites.

USAID's support has also contributed to the standardization of anti-tuberculosis treatment regimens within countries, most notably evident in Kosovo. USAID support has also led to improvements in TB control program monitoring. For example, in Kazakhstan an electronic case-based surveillance and monitoring system has been introduced.

Finally, USAID's support has created a greater awareness within programs for TB and MDR-TB hot spots: prisons. In Kazakhstan, the Russian Federation, and Ukraine, prison tuberculosis control has been included as an area addressed among USAID-supported TB control activities.

Role of USAID in Implementing DOTS Plus

The initial finding that the Baltic countries had a major drug resistance problem was followed by information from other countries in Eastern Europe and Eurasia that reported similar high levels of MDR-TB. In patients that had been treated before, resistance was found in 35–50 percent of cases, while in new patients this percentage was 10–15 percent. The conclusions are that previous treatment has been erratic, creating drug resistance, but also that these resistant strains are continuously transmitted in the society.

To deal with this problem, first an effective DOTS-based TB control program needs to be in place. Then the mechanisms for intervening are similar to addressing sensitive tuberculosis with standard DOTS. The same five key elements apply; however, the strategy is more costly and several additional considerations are needed. First, for diagnosis, extra laboratory facilities and capacity are needed to test for drug resistance. Second, for treatment, drugs other than the usual first-line drugs must be used and monitoring is significantly more complicated as the duration of treatment is 18–24 months with the drugs having a greater potential for causing toxicity. This strategy has been named DOTS Plus, and is still considered to be under development.

The traditional diagnosis of drug resistance requires culturing of the strain and subsequent inoculation on media containing the anti-tuberculosis drugs. This process easily takes 2–4 months. During that period it is impossible to choose the proper drugs for patient treatment. Faster methods to determine drug resistance are needed. The use of liquid media with anti-tuberculosis drugs speeds the process, but a disadvantage is the high cost of the media and in the older machines the use of radioactive-labeled substances. Molecular techniques are being developed to get a more rapid answer on whether the strain is sensitive to what drugs. With USAID support, the Center of Excellence in Latvia is researching these new rapid techniques.

First-line drugs are not effective against MDR-TB. In new patients the use of four drugs, of which the two most important (isoniazid and rifampicin) are not effective, easily leads to treatment failure. According to the present WHO strategy, one drug (streptomycin) is then added to a failing regimen. It is known that resistance to streptomycin is widespread, so the rationale of this strategy is questionable. But the alternative is the use of expensive drugs that were used in the past and were discarded because of their lack of effectiveness and high toxicity.

WHO advises the use of second-line drugs only in countries that have successfully implemented DOTS. MDR-TB exists as a result of erratic treatment protocols in the past. If the same erratic approach would prevail with the use of second-line drugs, the country will soon face the situation that no drugs are effective any longer. The WHO has found an effective mechanism to deal with this: because second-line drugs are costly on the open market (it is approximately 100–500 times more expensive to treat an MDR-TB patient than a patient with a drug-susceptible strain), the WHO has created a closed market where second-line drugs are available for about 90 percent of the original price. But access to these cheaper drugs is only provided if WHO's Green Light Committee (GLC) is satisfied that DOTS has successfully been implemented. In the E&E region, only Latvia and Estonia have received Green Light assistance and USAID supported the development of expertise by supporting the training of their tuberculosis specialists. Kazakhstan has procured second-line drugs on the open market, although the DOTS strategy is not yet working satisfactorily. USAID, WHO, and Project HOPE have warned the government that it is too early to introduce second-line drugs, but the country's decision-makers went ahead nevertheless.

Monitoring the results of MDR-TB treatment has its own difficulties. The treatment timeframes, the interventions and information for patient management decisions, and outcomes may all be slightly different. This monitoring system is still in its developmental stage. CDC with USAID support has taken the lead in this process and leans on the experience gained in Latvia and Estonia. Trainings directed at building capacity to manage MDR-TB have targeted a wide range of public health workers including physicians, nurses, and laboratory technicians throughout the Baltic States.

In summary, USAID's support has made an important contribution in the Baltic countries where capacity has been built in MDR-TB diagnosis, treatment, and prevention through the creation of a Center of Excellence in Latvia and training for nurses in Estonia. Both these efforts have the potential to have wider implications for the surrounding countries. Support has been provided for important endeavors such as the development of the MDR-TB electronic registry as well as the rapid molecular sensitivity testing techniques mentioned above.

SIGNIFICANT USAID ACCOMPLISHMENTS

Although not enough time has elapsed to realize major regional epidemiological impacts of USAID's E&E TB control and prevention efforts, significant results have been achieved. These include:

Progress in building political commitment:

- In Russia, a major achievement of the USAID/WHO collaboration has been the creation of a High-level Working Group (HLWG), consisting mainly of Russian TB specialists, committed to making adaptations of the FSU strategy to make TB control more consistent with the WHO DOTS strategy.
- USAID support has led to strong political commitment for the DOTS strategy. In Orel oblast, Russia, TB is now seen as the second health priority. In Latvia, Estonia, and Kosovo, the national governments support the DOTS strategy. In Kazakhstan, the strategy has gained support of the president.

Progress in monitoring and surveillance:

- With USAID assistance, monitoring has been improved, most notably in Kazakhstan where an electronic case-based surveillance and monitoring system has been introduced.
- In Latvia, USAID and its partner CDC have established a Center of Excellence in the National Tuberculosis Institute in Riga. This center serves a wider regional audience with specialists from Estonia, Lithuania, Belarus, and Ukraine also receiving training. The center has helped develop an international MDR-TB surveillance system. The decrease of acquired MDR-TB in Latvia from 54–28 percent is an early indicator of success.

Progress in case detection and treatment:

- USAID has contributed to an increase in case detection and treatment success rates in demonstration sites across the region.
- Orel oblast, Uzbekistan, Kosovo, and Kazakhstan are now over or near the WHO treatment success target rate of 85 percent.
- Under the DOTS strategy, inpatient treatment on average has been shortened from 9–12 months to 2–3 months.
- In Kazakhstan, TB-related mortality has decreased by approximately 30 percent, from 38 per 100,000 in 1998 to 26 per 100,000 in 2000.
- USAID-supported efforts have contributed to the increase of DOTS coverage in the region. For example, there is 100 percent coverage in Kosovo.

Progress in laboratory strengthening:

- USAID has help expand the role of sputum smear microscopy diagnosis by providing the necessary equipment and training to laboratories in the region.
- USAID has been instrumental in establishing a TB laboratory network. In Kazakhstan, Ukraine, Latvia, and Estonia, a well-functioning National Reference Laboratory has been established in each country.

- USAID contributes to the development of new tools in several ways. For example, the Latvian National Reference Laboratory is investigating the application of rapid molecular techniques for the diagnosis of tuberculosis and detection of rifampicin resistance.

Additional noteworthy progress:

- USAID support has begun to integrate TB treatment into the Primary Health Care Systems of countries in the region.
- With the emphasis on case detection and effective treatment, USAID-supported activities have brought attention to the importance of infection control in the prevention of TB throughout the region.

INDICATORS OF SUCCESS

The global indicators of success for the DOTS strategy are a case detection rate of $\geq 70\%$ and a treatment success rate of $\geq 85\%$ in new smear positive pulmonary cases, which if achieved will ultimately lead to a decrease in incidence and thus transmission. Ultimately the desired outcome is to document that new smear positive pulmonary cases are cured at the end of TB treatment; however, data often do not allow for separating treatment completion from treatment success in many countries, and thus treatment success is used as a proxy for cure rates internationally.

It is impossible to measure the actual case detection rate. However, estimates are that in non-DOTS areas worldwide, less than 60 percent of cases are diagnosed. It is also impossible to estimate what percentage of patients is detected in the USAID-supported pilot regions. The increasing trust of the population in a strengthened system contributes to more frequent and earlier self-reporting by patients. Case detection is approximated by looking at notification rates. DOTS implementation causes notifications initially to go up by about 30 percent, as was seen in Moldova in 2001 and in Kazakhstan after 1999. In Kazakhstan, after the implementation of DOTS, notification rates went up from a little over 100 per 100,000 in 1998 to 151 per 100,000 in 2001.

At first glance this could suggest that DOTS is a failing strategy; critics are sure to use this in their arguments. However, increase of notification is a consequence of better surveillance, and more importantly, of greater trust of patients in the system. An initial increase in the first years after implementation is not an argument against, but an argument in favor of DOTS. Evidence to demonstrate that interventions are successful can be shown in Kazakhstan, where mortality in the same period decreased by approximately 30 percent, from 38 per 100,000 in 1998 to 26 per 100,000 in 2000. The 'crossing lines' of the increasing incidence and decreasing mortality are an early indicator of successful DOTS implementation.

As mentioned above, an important TB indicator is the cure rate in new smear-positive pulmonary tuberculosis. The reporting system in most countries does not yet allow for separating the cure rate from treatment completion rates, but when treatment success is taken as a proxy for cure rate, in the USAID project sites the treatment success rate reported is between 75 percent (Latvia and Estonia) to 90 percent (Orel oblast). One caveat: Cohorts cannot always be compared as different denominators may have been used.

The conclusion is that in the USAID-supported projects, the epidemiological indicators point to successful interventions. Decrease of incidence can only be expected after a longer period of implementation, a period of at least five years.

LESSONS LEARNED

1. Strict application of the DOTS strategy in the region results in resistance to change; adapting DOTS with the help of national specialists creates an atmosphere conducive to change that helps in implementing sound, technical interventions.

The DOTS strategy was not intended to be implemented in situations that lacked any form of tuberculosis control. A strategy for tuberculosis control already existed in all countries visited. In fact, complex systems for TB control were found to be in place, including population-based screening activities, lengthy hospitalization, individualized treatment regimens, and in some cases life-time follow-up. Aspects of the existing strategy often were included or adapted in the new DOTS strategy within the region, further facilitating acceptance.

In Latvia and Estonia, DOTS was implemented without much controversy. In Kazakhstan, although DOTS was introduced by presidential decree, significant resistance to embracing the strategy exists. In Kosovo, DOTS was introduced by the United Nations Interim Administration Mission in Kosovo (UNMIK) government. In the Russian Federation, Uzbekistan, and Ukraine, there was and still is substantial resistance from senior TB specialists. In these countries, and also in several pilot projects (Russian Federation — Ivanovo and Orel oblasts; and Uzbekistan) DOTS has only been partially introduced.

Doctors see DOTS as too simplistic a clinical intervention and often only put patients who are not severely ill on the DOTS strategy. Lacking confidence that DOTS can cure their sickest TB patients, they are reluctant to introduce DOTS for all patients. The result is two kinds of patients in the same administrative area: DOTS patients and non-DOTS patients. Theoretically the non-DOTS patients are also treated adequately (perhaps less efficiently, but not necessarily less effectively except where donors are the sole supply of drugs and reserve them for patients registered for DOTS), but this is difficult to judge since these patients are not entered into the DOTS registers.

Two Systems, Not So Different

In Tashkent (Uzbekistan), one floor of the TB hospital was for DOTS patients (smear positive and smear negative) and another one for non-DOTS patients. Each floor had its own doctor, both were middle-aged female, both had undergone the same DOTS training, and both were equally skeptical about DOTS. The doctor on the DOTS ward, however, performed her tasks as required by the DOTS strategy. She asked for sputum smears, gave Directly Observed Treatment (DOT), and mostly discharged her patients at the end of 2 months' intensive phase. It turned out that the doctor in the other ward also introduced DOT, but did not rely on sputum smears and standardized treatment. Patients were admitted longer. In essence the two strategies were not so different.

A major achievement of USAID/WHO in Russia is the creation of a High-level Working Group (HLWG) consisting mainly of Russian specialists. To address technical issues, task forces comprised of Russian and international experts have developed policy documents that contained elements of both the DOTS' as well as the Former Soviet Union (FSU) strategies. For example, the national TB strategy includes population-based screening through fluorography as well as sputum smear microscopy as a patient management tool. This approach can also be seen in the new recording and reporting system, where the DOTS treatment card has been retained, but an attempt was made to include on the card most of the parameters of

the previous system. The HLWG is committed to making adaptations to the FSU strategy to make tuberculosis control more consistent with the WHO DOTS strategy. The Russians speak about the 'basic package'.⁴

This hybridization of the strategy results in good support by the government and its major institutions (political commitment). This approach is technically sound as it includes bacteriologic diagnosis and bi-phasic treatment, but may be unnecessarily more complicated in its reporting and therefore operational analysis. There is no doubt that it is more costly than can be supported long-term. In summary, to be effective, technical consultants need to understand that DOTS is not a dogma.

2. The creation of pilot and demonstration sites has helped overcome initial resistance to the DOTS strategy and clearly improved political commitment at the oblast level and gradually also at the central level.

A major incentive for strong collaboration for implementation of DOTS in pilot sites has been material support. The upgrading of laboratories, rehabilitation of buildings and equipment for training, production of training materials, and provision of consumables in situations where underfunding, or even no funding at all was common, all have helped build a sympathetic attitude among politicians and professional staff. Staff motivation has also improved as a result of training. DOTS and non-DOTS strategies, however, still exist in the same demonstration site, which needs to change. Although there is no doubt that USAID support has been important in this process of building political commitment leading to embracing the implementation of DOTS, the question remains whether success in demonstration site activities can stimulate leadership within the government to roll out DOTS countrywide.

3. Management of MDR-TB (multidrug-resistant TB) patients requires specific knowledge and skills, not only second-line drugs. The creation of a Center of Excellence helps to create expertise that may be expanded to the wider region.

The recognition that the diagnosis and treatment of MDR-TB needs specific expertise has stimulated USAID, through its partner the U.S. Centers for Disease Control and Prevention (CDC), to create a Center of Excellence in the National Tuberculosis Institute in Riga (Latvia), which serves a wider region than Latvia. Specialists from neighboring Estonia and Lithuania, as well as from Belarus and Ukraine, have been trained there. The involvement of the Center in the development of an international MDR-TB surveillance system ensures that relevant country-specific details are not overlooked in the recording. The decrease of acquired MDR-TB in Latvia from 54 percent to 28 percent is an early indicator of success of DOTS implementation.

OPPORTUNITIES FOR EXPANDING AND STRENGTHENING EFFORTS

⁴ The Russian resistance to the acronym D.O.T.S. has caused WHO to give up the use of the dots in the acronym. The terminology now is DOTS as a brand name and not anymore as an acronym.

Improved *donor coordination* is needed for TB control efforts in the region. A significant number of donors are active across the region, and without intentional collaboration and coordination there is a potential for duplication of effort and inability to maximize the use of resources. Further, programmatically challenges can arise within countries if donors do not coordinate; for example, when different donors bring in drugs in different dosages or fixed combinations, confusion at the least, and inappropriately prescribed treatment regimens at worst, can result.

It will be important to ensure that a *comprehensive strategy* for TB control activities based on DOTS is in place when intervening. In some cases, aspects of DOTS implementation have been supported without an overall comprehensive strategy. Although technically the support provided has been correct, the availability of strategic guidance would have facilitated implementation and potentially a greater level of impact.

In future years a number of activities may be undertaken:

- It is important to *expand DOTS implementation* beyond the present demonstration sites. Now that success has been shown, the speed of implementation must increase.
- *Training* will remain an important objective for the tuberculosis program. Tuberculosis managers and coordinators need training in management, evidence-based decision making, and understanding of public health. Drug management is weak in all programs and needs to be strengthened. Training and systems building in this area is warranted. Training in outreach services for nurses and fieldshers could be expanded.
- There is opportunity to improve *infection control* across the region. Support for the development of guidelines and engineering is in need. Support for the creation of a new infection control nurse position could have benefits throughout the region.
- A wider development and expansion of *MDR-TB and TB/HIV co-infection* case management capacity is in demand, both in the civilian and penitentiary sector across the region as well as drug management capacity for TB, MDR-TB, and TB/HIV.
- *Health promotion activities* (IEC) are weak in almost all pilot sites to date. Technical assistance for the development of a sound IEC strategy in the countries of the region is a potential future area of focus.
- To make sure that appropriate efforts are made in response to these issues, capacity for *operational research*; knowledge, attitude, and practices studies; and cost-effectiveness studies must be increased. In addition, representative DST surveys are urgently needed in most countries in the region.

III. TECHNICAL SUMMARY

HEALTH SYSTEMS ENVIRONMENT

Health Sector Reform

Health sector reform is underway in several countries in the E&E region with the objective of optimizing the overall structure and financing of health care, with each country at different stages of reform. One aspect of reform is the strengthening of primary health care (PHC), which has an impact on the vertical structure of tuberculosis control. In some areas of the region reform has helped to stimulate integration of PHC and tuberculosis services. Primary health care providers are often thought of as a person's first contact with the health system. However, at present, even where reform is underway, a person suspecting that they may have tuberculosis can choose to bypass the PHC system and seek care directly from a TB specialist. There is a possibility in the future that as the role of PHC providers expands, they may become gatekeepers to specialty care for their patients.

Primary health care structures are found in all countries visited and include polyclinics, doctor's posts (SVAs and SVPs), and feldsher posts (FAPs). Polyclinics in urban areas are not PHC structures as such, because the doctors working there are mostly specialists, but patients have unlimited access and for them a polyclinic is a first-line facility.

In all countries visited, tuberculosis cabinets are present in some of the polyclinics, often with laboratory services for smear microscopy. In doctor and feldsher posts, theoretically access to care is easy since these posts are near the patients' homes. For diagnosis, an individual must be referred. In some situations, sputum is collected in the peripheral health facility and sent to the nearest laboratory. Treatment under observation during the continuation phase is relatively easy, just like defaulter tracing, but peripheral health staff must be trained to take part in tuberculosis control.

Hospital-based Care

Often, because of the complexity of their condition, many tuberculosis patients need to begin treatment in a specialized facility. This facility does not need to be a hospital focused solely on tuberculosis care, but may be part of a general hospital. The latter has implications for infection control to avoid nosocomial transmission. The traditional sanatoria facilities have become less important, particularly since the DOTS strategy has been introduced as adequate and effective standardized treatment regimens prevent the emergence of chronic (drug-resistant) cases.

At present across the region, tuberculosis hospitals face a decreasing demand for beds. Under the DOTS strategy, inpatient treatment on average has been shortened from 9–12 months to 2–

3 months, a decrease of bed-days by a factor of 4. However this may be less in the first years after DOTS implementation, as case notifications are likely to increase initially.

Finances

The flow of money for health care has also changed in some countries. In the Former Soviet Union health care system, all treatment was free and the central government through local governments was responsible for salaries, supplies, investments, transport, and maintenance.

In the Baltic countries the state has now earmarked “sick” funds, or state-owned insurance companies that, based on a contract with a service provider, will either remunerate for medical interventions (activity-based funding) or pay a lump sum relative to the size of the population in the catchment area (per case funding). It is often combined with cost recovery via a small patient fee for services.

In cases where tuberculosis services are officially supposed to be free, unnecessary costs may arise for a patient who visits a primary health care facility for a complaint like a cough, for which he must pay for evaluation (since it may turn out to be flu or pneumonia) and then is later diagnosed as having tuberculosis. There is no system at present for an individual once confirmed to have TB to receive a refund on the out-of-pocket expenses paid for care prior to diagnosis.

Recommendations

USAID should support the development of a plan for dealing with the shrinking number of tuberculosis facilities during health sector reform and its implications for human resources development.

Under the DOTS strategy, inpatient treatment on average will be shortened from 9–12 months to 2–3 months, a decrease of bed-days by a factor of 4. This has several implications. Fewer bed-days mean less funding for the institution and less work for the staff. This may translate into less money for maintenance, heating, food, and salaries, and the need to reduce staffing. Naturally, staff will object to these changes.

The shortened inpatient treatment also means that buildings will have become too large for the need, resulting in departments being closed to save on heating and maintenance. This, in turn, will lead to a gradual dilapidation of parts of the building. The buildings are already in poor condition, as is the furniture and equipment inside. If the epidemic declines, this situation will become even more pressing. Such a downgrading scenario is bad for staff morale. Tuberculosis has associated stigma, not only for patients but also for staff. Salaries were invariably low in all countries visited, and the staff were often advanced in age but unable to retire because they could not afford to live on a low pension.

Integration of skills and facilities may be the answer in such a situation. By centralizing hospital-based care, not necessarily in separate institutions but as part of general hospitals, it will be easier to provide the necessary funds for food and other patient utilities, and for maintenance and equipment. In addition, health care staff must work with a minimum number of patients to retain their expertise and skills. A training plan with a career development perspective needs to be developed to motivate doctors to remain in or come to the tuberculosis services.

All countries face similar problems in embedding the vertical tuberculosis structure in the general health services. Progress in addressing this depends in part on how far advanced health sector reform is within each country, including the expansion of roles and responsibilities of primary health care providers. It is clear that early diagnosis and treatment adherence are related in part to access to health services, and that integrating TB control into strengthened primary health care systems is essential to extend access to the DOTS strategy to all, especially those living in rural settings.

POLITICAL COMMITMENT

Technical Aspects

Where the DOTS strategy has been implemented, there is high political commitment to support the tuberculosis program. In Orel oblast, Russia, tuberculosis was seen as the second health priority. In Latvia, Estonia, and Kosovo, the national government is in favor of DOTS and supports the NTP. In Kazakhstan, although tuberculosis control has been officially supported by the president, political commitment needs to increase significantly as the increasing case notification rates are scaring authorities, and senior specialists are openly doubtful about the effectiveness of the DOTS strategy. In Uzbekistan, the government recently decided to introduce DOTS. In Ukraine a new law on tuberculosis control is presently being debated by parliament, but it is still uncertain how much of the traditional and how much of the DOTS strategy will be included. In the Russian Federation DOTS has been implemented in 22 demonstration sites and the government is becoming convinced that elements of the strategy should be adopted. A Prekaz was signed by the MoH on March 21, 2003 on TB detection and treatment that includes DOTS elements, adapted to Russian needs. The acceptance of this document means the official high-level recognition of the DOTS strategy in Russia. The question that remains unanswered is whether over time this will result in a hybrid strategy.

When implementing a strategy, much depends on the individual doctors. Although they will follow orders, many are still reluctant to fully introduce the DOTS strategy. Modifications of treatment regimens because of perceived adverse effects from the drugs, and prolongation of the intensive and continuation phase based on radiological criteria are not uncommon. This reluctance can only be overcome through training and demonstration by treatment outcome data that the strategy works.

A Prevailing Skepticism

Specialists, who have been working all their lives in tuberculosis control, with an emphasis on the clinical management of patients, see the WHO-supported DOTS strategy as too simplistic. It can work in Africa, where it had been developed, but can never work in technically advanced countries, they feel.

The strongest examples of resistance are seen in the Russian Federation and Ukraine. In Uzbekistan the director of the Tuberculosis Institute is still reluctant, but has declared his support. In Kazakhstan the Tuberculosis Institute's commitment appears to depend on the current political situation.

Funding

Political commitment is demonstrated in part by adequate funding, but none of the countries in the region at present can do without external financial support. Kazakhstan has negotiated a World Bank Loan for funding its tuberculosis program. Despite the countrywide introduction of the DOTS strategy, the cost per patient in Kazakhstan remains high (\$400-\$500, according to the World Bank). This may be due in part to the inclusion of components of the former TB strategy, such as mass x-ray screening, within the TB control program. Uzbekistan relies heavily on outside donors, but it has established a National DOTS Center and provided a budget for which the program manager is directly accountable to the deputy minister. The MoH of the Russian Federation negotiated a \$100 million loan with the World Bank, but initially rejected it because it did not like the technical (DOTS) requirements. Negotiations were reopened and both parties have compromised on the technical issues with the loan having been officially signed on March 17, 2003. In Ukraine, funds for tuberculosis control have increased in the last few years, but still are inadequate and late in coming. Kosovo, Latvia, and Estonia receive government funds, but none can operate without outside help.

In the pilot areas local governments have recognized the importance of the tuberculosis problem and have increased the funding for tuberculosis activities in their region. One problem with the funding mechanism is that it is bed-day based. In a strategy where the emphasis is on ambulatory treatment, this mechanism is inadequate. In Ivanovo oblast, the local government has converted to a more direct activity-based funding, which is independent from the bed-days. In the Baltic countries, an insurance system with a per-patient payment structure has been introduced, but this has not yet solved the problem of payment by bed-days. All countries visited have made tuberculosis services officially free of charge for patients.

PARTNERS

USAID has supported tuberculosis control in the E&E region through various partners. WHO is a public international partner that plays a role at the political strategy level. WHO headquarters has put tuberculosis control on the international political agenda, WHO/EURO has created impetus for DOTS implementation in the European Region, and regional WHO offices (Russia, Central Asia, Balkans) have contributed to political awareness and program implementation.

WHO also is closely involved in the implementation of tuberculosis control programs in oblasts in the Russian Federation and in Ukraine. However, there is a potential inherent danger in doing this. Technical assistance must be hands-on and made operational without undue emphasis on political aspects. If implementation fails for whatever reason, the organization

providing the technical assistance will be blamed. If this organization is WHO, its credibility may be lost, potentially resulting in any further advocacy for DOTS implementation by WHO being difficult. Fortunately, despite this observation, the WHO's presence in both countries has been successful and the support of USAID to WHO/EURO has been well founded.

The U.S. Centers for Disease Control and Prevention (CDC) is a U.S. governmental organization. It has been an important contributor to the implementation of aspects of the tuberculosis control program in several countries (laboratory upgrading, training, and/or surveillance strengthening in Latvia, Estonia, Russia, Kazakhstan, and Uzbekistan), but it carries an organizational approach that is more epidemiological and evidence-based than operationally oriented. CDC provides technical assistance to well-defined components of the tuberculosis control program, but it does this without contributing to an overall country master TB program plan. For example, in Ivanovo and Orel oblast, weaknesses in tuberculosis control were addressed, but at the time there was no comprehensive strategy developed or advanced. However, this does not imply that CDC has not done its work properly. Instead, it is recommended to USAID that in the future all partners be asked how their proposed activities fit into the overall TB control plan for the country.

Project HOPE is a nongovernmental partner of USAID and is involved in tuberculosis control in Central Asia. Its role has primarily been in training, some equipment provision, quality assurance, health promotion, and advocacy. Project HOPE's training approach aims at strengthening local capacity, using adult learning methods, and doing follow-up on training activities. The development of checklists for supervision to improve the quality of the daily work is a good and practical contribution to tuberculosis control. This suitability of using this approach in the wider region should be analyzed.

DOW, also a nongovernmental organization with a long track record in Kosovo, wanted to expand its activities in tuberculosis control after the civil war. It found financial support from USAID after initial donors had decreased or completely withdrawn their support. As was shown in Kosovo, an NGO is perfectly capable of implementing a DOTS program. DOW, however, like CDC, emphasized certain aspects of tuberculosis control without actively embedding them into the national tuberculosis control program. For instance, starting a publicity campaign to mobilize the general population to seek health care before the system was ready to absorb the increased demand demonstrated a lack of coordination.

The Role of USAID

USAID, through its implementing partners, has influenced the implementation of the DOTS strategy in countries or pilot sites in the E&E region. The best example is probably in Russia. With USAID support and the involvement of CDC and Russian specialists, and in direct collaboration with the WHO, a technically sound strategy has been developed. A similar approach is expected to be successful in Ukraine. In Uzbekistan USAID/Project HOPE influenced the development of a 5-year tuberculosis plan and in Kazakhstan direct interference has helped to prevent the adoption of a Prekaz that was technically unsound.

The influence of USAID on political commitment has been indirect in countries like Latvia, Estonia, and Kosovo, where DOTS implementation started before USAID became involved. USAID is not the only donor in the area of TB control in the region. Important organizations such as the World Bank and KfW also are playing important roles in strengthening the DOTS strategy. Donor coordination has not been formally established in several countries, which has the potential to cause diverging strategic approaches or duplication of efforts and investments.

Recommendations

The funding mechanisms for tuberculosis care services needs to change. Tuberculosis services should receive adequate funding within health system financing mechanisms, ensuring an adequate budget for TB control, such as inpatient care (bed-days), screening, and medications. USAID could help governments develop new financial structures.

Financing of tuberculosis services remains an important, and incompletely addressed issue, with funding in some countries based on bed-days, in some demonstration sites on per-case funding, and in the Baltics TB services are funded through an insurance scheme, but with all countries providing tuberculosis care free of charge to patients. It is not easy to determine the budget needed for tuberculosis control to be adequately funded. Tuberculosis does not have a separate budget unique for the support of TB control activities in most countries. For example, salaries for tuberculosis staff are part of the local administration's health salary budget and drug funding is partly hidden in the national budget with drugs often procured at the national level. Inpatient care is often funded through bed occupancy in the hospital. Furthermore, some aspects of the tuberculosis control program such as population-based screening with mobile x-ray units or Mantoux skin testing is considered a social service and is provided through the Sanitary and Epidemiological Surveillance (SES) program budget. The same goes for BCG (anti-TB) vaccinations. Savings in these interventions, therefore, do not lead to increases in the overall resources available for tuberculosis control programming within the health system budget. Thus, there is a clear disincentive to undertaking activities directed at making tuberculosis services cost-effective.

However, if tuberculosis control is seen as a coherent set of interventions, for which an adequate budget is available, savings in one intervention can then be used for increased investments in other interventions. Financing of tuberculosis services remains a critical area demanding attention. USAID could look for ways to strengthen the tuberculosis component within health sector reform and develop a proper financing structure for tuberculosis facilities and services. USAID could assist national or local governments in addressing these issues. A proper funding structure both for the TB control program and its staff is a condition sine qua non.

Donor coordination is often lacking. USAID should play an active role in initiating this coordination.

Donors have their own objectives, and implementing partners are driven by their individual objectives. This often results in territorial competition. In Uzbekistan, Kreditanstalt fuer

Wiederaufbau (KfW) has its own approach to tuberculosis control and exerts influence on the NTP manager that may result in a strategic or tactical implementation of DOTS that is different from USAID/Project HOPE. A similar situation may occur in Russia or Ukraine, where different donors through their partners may have diverging objectives. Another threat is duplication of effort or investment. For instance, each organization is inclined to develop its own training materials or translate existing materials. Uncoordinated efforts may confuse program staff; for example, drugs come in different dosages or fixed combinations, which may lead

| Radiography Recommendation |
|--|
| <p>WHO Expert Committee on Tuberculosis in Ninth Report (1974):</p> <p>....mass miniature radiography is a very expensive screening procedure for tuberculosis, even when the prevalence is high. Other disadvantages [...] are:</p> <ul style="list-style-type: none"> • it contributes only to a small proportion of the total number of cases found • it has no significant effect on the occurrence of subsequent smear positive cases [...] • it requires the services of highly qualified technicians and medical staff who could be better used in other health activities • the apparatus or vehicles to transport it are often out of service [...] <p>The Committee concluded that the policy of indiscriminate tuberculosis case finding by mobile mass radiography should now be</p> |

to errors in patient management making drug management cumbersome for the country. This could be avoided if donors would emphasize improving the coordination of their efforts. USAID may be well positioned in the countries of the region to take the lead in donor coordination.

CASE FINDING

Active Case Finding

The adage of the DOTS strategy is to detect cases as early as possible. In the FSU it is argued that the extensive system of population-based x-ray screening that existed (fluorography) did just that. Undoubtedly a number of cases are detected in an early stage of disease, but epidemiological studies have shown this to be of no significance to tuberculosis control. This is perhaps best demonstrated in the Kolin study that took place in Czechoslovakia from 1961–1969. In a population of about 100,000, three quarters of new infectious cases developed in persons who had a normal chest x-ray at the previous survey.⁵ Even if the interval were shortened to a survey every 4 months, 21 percent of the cases detected already had moderate to far-advanced disease.⁶

Population-based screening is costly. Lack of drivable roads, the high breakdown rate of vehicles and x-ray machinery, and the shortage of spare parts and repair facilities are additional obstacles to the effective operation of periodic mass radiography.⁷

⁵ Krivinka R. et al. Bull WHO 1974; 51: 54.

⁶ Pinne M. Pulmonary Tuberculosis in the adult. Springfield, IL, Thomas 1946.

⁷ Toman K. Tuberculosis Case finding and Chemotherapy. WHO, Geneva 1979.

In Ukraine in 2001, 18 million radiographs were made for a total cost of US\$25 million. Per every 1,000 adults, 482 persons were examined; to find one sputum smear positive patient, more than 3,000 persons had to be examined at a cost of US\$4,000 per patient detected.⁸ In Kiyv City it has been calculated that to find an infectious case of tuberculosis, mass radiography is about 70 times more expensive than microscopy.⁹

The use of mobile units around the countryside has been halted in most countries in the region due to lack of funds, but Kazakhstan and the Russian Federation are considering reintroduction of this screening method, the latter even with mobile digital x-ray cameras.

Passive Case Finding

In line with the reliance on mass screening has been the neglect of patients with symptoms. Within the framework of the DOTS strategy, emphasis is on symptomatic patients, but this means that case finding may only be significantly improved through public awareness, better access to care, and decrease of stigmatization.

Case Notification

Before 1990, TB case notifications declined by approximately 5 percent per year. In all countries in the region, case notifications have risen sharply since 1995. However, it is difficult to compare data from the years previous to 1990 with present day data, as previously only proportional figures were provided. Absolute data on infectious diseases were a state secret, which is why only percentages were published. The state expected an annual decrease. Data from the FSU prior to 1990 therefore should be interpreted with care.

Notifications from areas where DOTS has not been implemented must also be treated with care as some definitions and cohorts differ from the WHO-supported methodology. For instance, an “active” case in non-DOTS is a patient who either still is on treatment or in the two years of observation after completion of treatment. A recurrent case or “rezidiv” is often called a “relapse” without taking into consideration the WHO’s precise case definition for this term. A cohort to be studied in the non-DOTS system includes transfer in and excludes death from other causes than tuberculosis and transfer out cases, while the DOTS system does just the opposite.

The data collected by the team (see Figure 1 on next page) showed case notifications lower than 60 per 100,000 in Estonia, Orel oblast, and Ukraine. In the Russian Federation, Ivanovo oblast, Uzbekistan, and Kosovo rates are between 70 and 90, while Kazakhstan has a staggering 176 per 100,000 in 2001. In Kazakhstan, notification rates have risen following the introduction of the DOTS strategy, leading to concern among responsible officials. However, mortality declined, indicating that treatment was effective. Probably the high rate in

⁸ Department of Medical Statistics of the Research Institute of Phthysiatry and Pulmonology at the Academy Of Medical Sciences in Kiyv, Ukraine.

⁹ L Turchenko, Personal Communication.

Kazakhstan is a mixture of more trust in the system so more patients are coming forward, a mix-up of prevalence data from the previous data collection system combined with the DOTS data collection, as well as the result of a better way of recording and reporting brought by the DOTS strategy. Remarkable is the difference in notification between Latvia and Estonia, given that these countries have so much in common geographically, socially, and economically. The reasons for this difference are unknown.

Obstacles

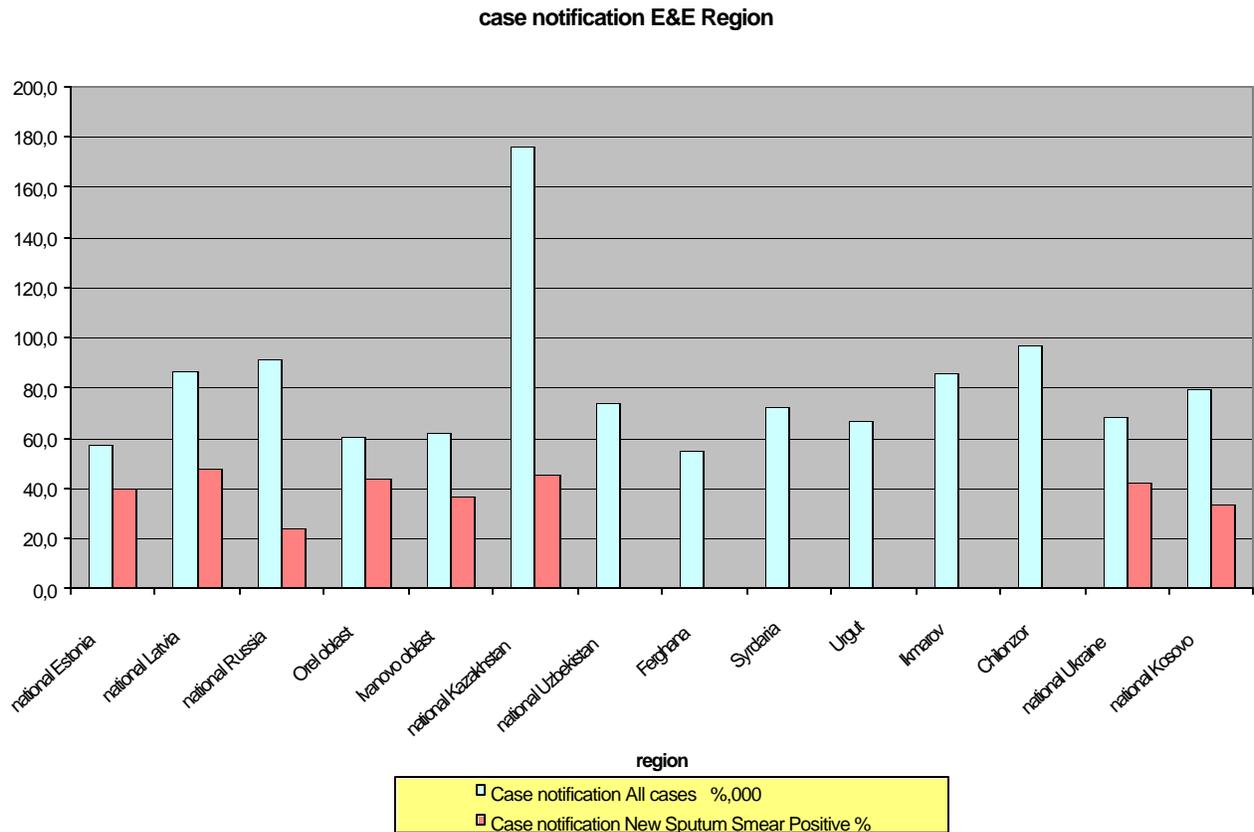
The discontinuation of population-based screening is hindered by the method of funding. Screening is paid from a different budget. Money is allocated, but if not used, does not have to be returned. It becomes part of the institutional budget. Thus, to agree that screening is not needed immediately means loss of income for the institution. Another obstacle to discontinuation of this intervention is the lack of incentive. The funds are allocated centrally; therefore, not performing the task means losing the money altogether.

Recommendations

USAID could support training in basic epidemiology that can be used for evidenced-based decision-making.

For example, using Mass Miniature Radiography (MMR) as an example, it is important that decision makers understand the value of population-based screening. MMR has proven to be

Figure 1. Case Notification Rates per 100,000 in 2001 in USAID-Supported Pilot Sites



ineffective and costly. But it is difficult to convince doctors of this because they have insufficient epidemiological training to evaluate the true contribution of MMR to the control of tuberculosis.

Beyond support for training in epidemiology, USAID could support activities that build operational research capacity among the TB leadership for planning and undertaking studies such as exploring the cost-effectiveness of approaches that can have an impact on changing policy.

DIAGNOSIS

Diagnosis

Providing laboratories in the pilot regions with equipment and supplies has contributed to the quality of smear microscopy as a diagnostic tool. At all sites, laboratory staff training has followed the introduction of new microscopes.

One obstacle is obtaining the cooperation of the TB clinicians, who are slow to recognize the value of the sputum smear as a diagnostic and patient management tool. For example, in

Kosovo this was found to be a weak aspect of the program. In Orel and Ivanovo oblasts, as in Donetsk oblast, clinicians still relied heavily on x-ray findings for their treatment decisions. Clinicians often forget to indicate on the laboratory request form if the patient is a new or previously treated patient. It is another example of the patient orientation of these clinicians without understanding the public health aspects of the aggregated results. Furthermore, another obstacle is the limited trust in the laboratory technicians that was observed among some TB doctors. There may be an unaddressed reluctance among TB specialists to rely on the result obtained in the laboratory by the technicians.

Laboratory Network

A start has been made with the creation of a laboratory network within countries. In Kazakhstan, Ukraine, Latvia, and Estonia, a well-functioning National Reference Laboratory (NRL) has been established in each country. (Although in Estonia 2 laboratories may be considered reference laboratories). The Kazakhstan laboratory, if housed in a better building, could easily act as a Supranational Laboratory for Central Asia. In the Russian Federation there are two national laboratories that can act as reference laboratories, but so far they have not been included in the routine TB laboratory network. In Uzbekistan, the laboratory in the National Tuberculosis Institute has been equipped and the staff trained, but lack of managerial capacity prevents the network from functioning effectively to date. In Kosovo the NRL is in the Institute of Public Health, but this laboratory is not functioning inside the TB laboratory network.

Criteria for the number of peripheral laboratories have not been developed. There are international criteria based on population size, but these do not pay sufficient attention to the unique epidemiological and geographical situation of individual countries.

Methodology

Overall in the pilot regions smearing and staining techniques were adequate. The training clearly has been effective. In the past, culture had always been a routine procedure, but had stopped in some areas because of lack of funds to buy (ingredients for) culture media and to maintain the equipment. A number of laboratories have been provided with new equipment and media. Some laboratories have the new automated liquid media culture techniques, which are costly to run and thus sustain long-term.

In general, far too many cultures are performed at present in the region. In the traditional strategy, two cultures per patient were done monthly. This is not needed for patient management, and it contributes to unnecessarily high cost and has the potential to overburden the laboratory staff. What is indicated is two cultures at the start of treatment, in the case of smear-positive sputum at the end of the continuation phase and at the fifth month, and in all cases at the end of treatment which adds up to a maximum of eight cultures, and in many patients only four, instead of the 18 or more that are done under the FSU strategy. The savings

that could be achieved on these costs could be used by the laboratory for other priorities, such as to improve quality.

Drug Susceptibility Testing

Latvia and Estonia are the only countries where drug susceptibility testing (DST) has become standardized and a routine practice. DST is performed in all other countries, but with different techniques and in non-representative patient samples. A common practice in countries where the technique is not standardized is the use of crushed tablets to replace the pure substance of antibiotics, which is not routinely available. This practice provides unreliable results. The WHO/IUATLD drug resistance network has accepted several methods for DST. In most FSU laboratories, the absolute concentration method is used. Training by donors often uses another method. It does not make sense if training is done using a method that is unfamiliar to the microbiologists or technicians, even if that method is the more accepted one in the West.

Quality Assurance

To assure the quality of the laboratory examinations a network of QA must be set up. In most programs this means that sputum smears found to be positive in peripheral laboratories must be checked by the reference laboratory. A proper protocol for this is lacking in several project sites, and even if it exists it is often not realistic in its approach. To expect the NRL to supervise the quality of thousands of smears made in the periphery is not realistic. A more realistic protocol such as one based on an approach that checks a percentage of positive smears is needed. Internal quality assurance of cultures or DST is not performed anywhere. Some laboratories have had access to QA by a Supranational Reference Laboratory, but only in Latvia and Estonia has a routine link been established.

Monitoring

In the traditional system laboratory records were specimen-based. Under the DOTS strategy the register is patient-based. Many laboratories still struggle with this change. The result is that a multitude of cultures is reported, which reflect activities of the laboratory but has no relation to the number of patients that have been examined. On this multitude of cultures, DST results are reported, which may or may not reflect a number of strains from the same patient. This clearly needs improvement. In addition, often laboratories do not know if the examination is for a new patient or a follow up patient. Clinicians do not completely fill in the laboratory request forms, which makes it difficult for the laboratories to provide the proper reports.

Infection Control

In the majority of pilot sites attention to some extent was paid to safety measures in the laboratories. Guidelines were in place and in many cases routinely followed. In many NRLs biosafety cabinets were in place.

Supervision

Supervision of the laboratory network varied across the region. Supervision by the Level III to Level II laboratories is sometimes done in Kazakhstan. It is non-existent in Uzbekistan. Level II laboratories supervising Level I laboratories is missing in all pilots or is done only irregularly. Misunderstanding of what is meant by supervision, and lack of funds to adequately perform supervision activities appear to be the main reasons.

New Tools

USAID contributes to the development of new tools. The Latvian National Reference Laboratory is investigating the application of rapid molecular techniques for the diagnosis of tuberculosis and detection of rifampicin resistance. The outcome of this study is expected to have an impact on improved and earlier diagnosis in the whole E&E region.

Recommendations

USAID, through CDC or the WHO/IUATLD network of Supranational Reference Laboratories, could organize a workshop for laboratory consultants working in different projects or programs to harmonize training strategies and materials; develop a protocol for cascade wise quality assurance in the network, with a proper sampling methodology; and develop criteria for the number of peripheral laboratories needed in a network.

Through its partners CDC, Project HOPE and DOW, USAID has played a major role in the improvement of laboratory working conditions by providing new equipment and upgrading professional skills of laboratory staff, resulting in improved diagnostic procedures. However, since several organizations are involved in laboratory proficiency training in the region, both inside and outside the USAID supported programs, there may be great benefit in coordinating training procedures and laboratory strengthening activities. Bringing professionals together could provide an important opportunity to share best practices across programs.

Consultants providing technical assistance also advise on quality assurance and proficiency testing, but some of the procedures are neither practical nor sustainable in a given setting and need to be adapted.

Furthermore, WHO has developed criteria for the optimal number of level III laboratories, but these criteria are based on the size of the catchment population. In the E&E region, these criteria are not sufficient. Attention must also be paid to the epidemiological and geographical situations within countries. USAID could take the initiative to organize or support a workshop where these topics will be discussed and consensus established.

TREATMENT

Access to Care

A common feature in all programs visited is poor access to care, resulting in patients reporting an advanced stage of the disease. Reasons for this are geographical, financial, social, and managerial constraints. For example, in Russia and Kazakhstan, administrative regions are large and patients living in their periphery may be far away from diagnostic and treatment centers. Although public transport is available, it is often time consuming and too expensive for most people. An added cost aspect is the loss of one or more working days.

Another obstacle is the social stigma related to tuberculosis. This is prevalent all over the region. Patients are ashamed to confess that they suffer or have suffered from tuberculosis (see box). Added to that is the negative attitude of medical staff toward socially marginalized people or ex-prisoners.

Tuberculosis facilities have not been designed to be easily accessible. Often they are found outside city boundaries, connected by ill-maintained roads. In winter the hospitals often are insufficiently heated or not heated at all, and/or have insufficient funds for proper food for patients.

“I am here because I had white spots on my lungs. Yes, I coughed for a long time. The name of my disease? I do not know. A common cold. OK, it is pneumonia. Yes, I know a bacillus causes it. I know this bacillus is called tubercle bacillus. Yes, I know the disease is called tuberculosis.”

— *Young lady (18 years), English speaking*

Decentralization of service delivery may overcome some of the managerial obstacles and offer better access for diagnosis and the ambulatory phase of treatment. The integration of Tuberculosis Cabinets in polyclinics in the entire region is a good example of this.

Patient Categories

Classification of patients was observed to be done appropriately for DOTS patients, but non-DOTS patients were still included in the traditional system. Nevertheless, in both cases there is a lack of understanding of the roles of sputum smear and culture in this classification process. Smear examination is meant to classify patients for standardized treatment and culture confirms that the diagnosis is correct, however it was apparent that this was not widely understood.

Regimens

Standardized regimens were observed in use, often with two Fixed-Dose Combinations (FDCs) and sometimes three FDCs available; four FDCs were not seen. In the majority of pilot regions the choice of the regimen depended on the presence of a previous treatment episode, resulting in Regimen I or II. Smear negative patients are also treated with Regimen I instead of Regimen III as international guidelines recommend, which is slightly more costly than necessary, but in itself is an acceptable adaptation.

Patient Management

Under former Soviet TB strategy doctors had been trained to consider tuberculosis as a difficult-to-handle disease. This training focuses on a clinical approach toward the individual patient. This means that the full spectrum of diagnostic and therapeutic interventions should be utilized. For diagnosis this includes fluoroscopy, radiology (standard chest x-rays + 3 tomograms), bacteriology (culture with or without sputum smears), and bronchoscopy.

For treatment this includes restricting antituberculosis treatment to preferably three drugs because of expected adverse effects, a change to two drugs after the initial phase based on

radiological criteria (cavity closure), and a total duration of a minimum of nine months to avoid relapses. From that perspective DOTS is a simplistic approach, with emphasis on bacterioscopy, standardized treatment regimens, and standard duration.

The DOTS strategy has a few indicators for patient management, based on the results of smear microscopy. Basically it relies on sputum smear results at the end of two months for new patients and three months for recurrent cases to shift from the intensive phase to the continuation phase, at the end of five months to determine possible failure to treatment, and at the end of treatment to determine if the patient was cured.

Again, for clinicians coming from the former strategy perspective this is too simplistic. The strategy does not deal with the 50 percent of patients who were not bacteriologically confirmed, i.e., approximately 40 percent of pulmonary tuberculosis, most extrapulmonary tuberculosis, and pediatric cases. From the clinician's perspective, this may be justified in situations where other means of diagnosis are not present, but in industrially advanced countries a multitude of diagnostic interventions are available and most doctors in the FSU know about it or even have been trained in a number of them (bronchoscopy, tomography, PCR).

Radiography plays an important role in the decisions of phtysiaters (pulmonary specialists). Cavity closure is still an important indicator for therapeutic changes and the remaining visible lesions determine the length of treatment and the duration of follow-up at the end of treatment. Chest x-rays are requested monthly in the traditional system.

Doctors realize the difference in bacteriological and host response to treatment, and therefore in their decisions, culture results are also important. Cultures are also requested every month in the traditional system, but results come in with a delay of four to eight weeks, and thus cannot play an important decisive role in patient management.

In summary, the traditional system for patient management has several disadvantages. Hospitalization is longer than necessary. Frequent radiography attempts to indirectly assess the bacterial response to treatment by evaluating the host response, while frequent cultures produce information that is rather useless due to its delay. Therefore, the strategy is not practical, and as mentioned previously, too costly. To change attitudes and protocols it must be proven that the standardized DOTS strategy is effective. This must be demonstrated through evidence: reliable, successful TB patient outcomes in E&E region countries where DOTS is being implemented.

Treatment Delivery

Treatment for tuberculosis is a long-term process (even if the 'S' in the original acronym D.O.T.S. means 'Short Course'). The shortest possible duration with the present day antituberculosis medications is six months. For MDR-TB the duration may easily be 24 months or even longer. For any patient, such treatment duration is difficult to complete without

missing a daily dose. Clinically, for patients on daily continuous treatment, to miss a daily dose is not a serious problem; treatment can also be effective when given in an intermittent, three times weekly scheme. However, an intermittent treatment interruption is more serious.

Interruption of treatment may lead to the development of drug resistance. Providers are therefore asked to observe the patient swallowing their medication (DOT). During hospital stays this is relatively easy to organize, but during the ambulatory phase this becomes more cumbersome. To overcome barriers for patients to come daily for DOT, services have to be provided as near to the patient's home as possible. Integration of tuberculosis services in the primary health care system can help resolve this. In all countries in the region the reform of the health sector toward integration into PHC is underway. In the DOTS pilot projects integration of PHC has become part of the TB strategy, including training for GPs and feldshers. GPs and feldshers, because of their proximity to the patients, are in an excellent position to observe daily intake of drugs.

In Kosovo, the system of Patronage Nurses has been revived. Drug taking is self-administered by patients in the ambulatory phase (often already starting a few weeks after the initiation of treatment). A Patronage Nurse, who will pay attention to medical, social, and financial problems, visits these patients regularly at home. It is too early to evaluate if this approach is successful, but it existed in the Former Republic of Yugoslavia and has been successfully used for many years in countries like the Netherlands. In Estonia social workers have been added to the tuberculosis team to further support and address patients' needs throughout their course of treatment.

Patient Adherence

Under the FSU approach, responsibility for successful treatment lies with the patient. He is told to return for services, and when he does not show up, a letter may be sent, a phone call made, or social services informed, which could result in a house call. But the doctor only feels responsibility to the individual and not to the community. However, health care providers should feel a responsibility towards the general public for the interruption of disease transmission, i.e. the public health perspective. That is, the tuberculosis program must assume responsibility for treatment completion and prevention of default by patients. For this to occur, more effective tools are needed.

Respect for Patients Leads to Greater Compliance

In Tartu (Estonia) a nurse was administering drugs to a homeless alcoholic patient. She approached the patient in a friendly way. When interviewed the patient stated that he would complete his treatment out of respect for the nurse. She was the first person in a long time who had treated him as a human being, showing respect.

For example, incentives and enablers are tools that can be used to combat poor adherence. Incentives and enablers are meant to stimulate and ease access for symptomatic patients to seek care and for patients on treatment to complete treatment. They can also be used to stimulate and motivate staff to provide proper care and adhere to the chosen strategy. By providing free fares or bus tickets, the geographical and direct financial obstacles may be resolved. But incentives need not always be financial. A friendly atmosphere also increases adherence.

Training can change the attitude of the staff, as was seen in the Baltics, where nurses learned to respect their patients, for which they were rewarded by compliance in treatment.

For patients, enablers include bus tickets, patient-friendly opening hours, and a caring attitude. Incentives may be food coupons (Latvia) or food packages (Uzbekistan, Orel oblast). Food packages have often been provided through the national Red Cross and Red Crescent Societies. For staff, better working conditions or training may be an incentive. Rehabilitation or heating of buildings, but also provision of sufficient drugs or new instruments (microscopes) can be seen as enablers. In some projects the staff is paid for the “extra” work, but in the long run this is not sustainable. Donors rarely consider rehabilitation of buildings as an enabler. It is expected that the government itself takes care of infrastructure maintenance. Yet, rehabilitation is much more of a sustainable activity than is assisting in the supplementation of staff salaries.

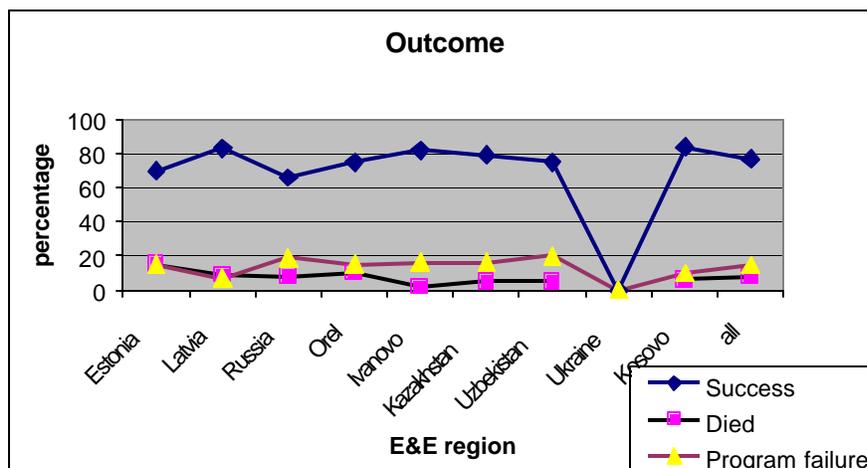
The continuation of treatment of released prisoners poses a different challenge. Especially with regard to amnesties, assuring that ex-prison patients visit health facilities regularly is difficult. In various countries, programs have been started in which nurses contact prisoners weeks before release to begin to build a trusting relationship with them and to impress upon them the necessity to come regularly to the dispensary for continuation of treatment.

Treatment Outcome

Cohort analysis is a technique to evaluate the success of the TB program. Unfortunately, the term treatment outcome is seen as an indicator for the effectiveness of the treatment process rather than for program performance as was originally intended. In the traditional system, some outcome data were routinely recorded and reported, but the cohort for reporting differed from the DOTS cohort, which makes comparison difficult.

Treatment outcome data have been collected from project sites and from official national publications. Clearly project site data are more reliable than national data if the country has not implemented DOTS nationwide. It is important to look at treatment outcome, especially the reported success rates, as this will give an indication of how much new MDR-TB cases may be expected. Treatment success probably is a more reliable indicator than failure, especially if non-DOTS patients are included. Apart from the Russian Federation as a whole, where successful treatment is reported in 68 percent of cases, all programs report acceptable results in newly detected smear positive pulmonary tuberculosis cases. Orel oblast, Uzbekistan, Kosovo, and Kazakhstan are over or near to the WHO target rate of 85 percent. For Ukraine, no data were available yet, as the project is too young. These good success rates indicate that the development of new MDR-TB cases is probably small.

Figure 2. Success Rates in New Smear Positive Ptb Cases in 2000 in the E&E Region



*Program failure = treatment failures + defaults + transfer outs

Recommendations

Patronage nurses may be an alternative for patients who prefer self-administered therapy. USAID could support a cost-effectiveness study into this aspect of treatment adherence.

Direct observation of treatment is part of the DOTS strategy. But some patients see it as paternalistic and many educated patients will not accept it. Furthermore, in peripheral areas it is difficult to operationalize. No doubt it is needed for marginalized populations who lack routines, but for others an experiment with patronage nurses may be an answer.

Kosovo has revived the system of patronage nurses. Drug taking is self-administered by patients in the ambulatory phase (often already starting a few weeks after the initiation of treatment). On a regular basis, a patronage nurse, who will pay attention to medical, social, and financial problems, visits these patients at home. This approach was successful in the Former Republic of Yugoslavia and has been successfully used for many years in countries like the Netherlands with benefits beyond improving treatment adherence such as improving case detection among contacts.

This approach may also help with follow-up of ex-prisoners. Ex-prisoners must report to the police before going to a health facility. Many prisoners have no registered domicile. For these reasons ex-prisoners often prefer to disappear, which results in the interruption of treatment. Patronage nurses could visit the prisoner prior to his release, build trust, and after release take care of his continued treatment intake without having to observe his dosages every day. It may not work for all, but probably at least for some and is worth exploring the evidence-base further.

DRUG MANAGEMENT

A cornerstone of effective tuberculosis drug management is consistent, adequate availability of good quality antituberculosis medicines. Several aspects of tuberculosis drug management were examined during this assessment. These included current availability of first-line tuberculosis drugs, the procurement process, donor involvement in providing funding for tuberculosis drugs and drug management technical assistance, drug quality assurance, and the drug distribution system.

Availability

In general, no shortages of first-line antitubercular drugs were found in the pilot regions. It was evident that an important role of the USAID partner(s) within the pilot sites was to assure adequate drug supply. However, differences showed up in more general ways among countries. For example, Kazakhstan is the only country in the Central Asia Region that since 1998 has had an uninterrupted supply of first-line drugs for all patients at all levels of care. This is due to the centrally managed supply system. In Kosovo all drugs were available as long as they were provided through Doctors of the World (DOW). Since the MoH took over the responsibility in 2001, shortages have occurred. In Ukraine, Latvia, and Estonia, no shortages were uncovered. For the Russian Federation as a whole, this could not be ascertained, but in the pilot regions no stock-outs were reported.

Political Commitment, Funding, and Sustainability

Kazakhstan has achieved sustainability in funding the growing needs of the program. Funds are centrally allocated. In Orel and Ivanovo oblast, sustainability of funding by local government seems assured. However, it is unknown what the central government plans, although it is expected that the World Bank Loan and the possible contribution of the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) in the future will contribute to the availability of drugs in the whole Russian Federation. In Latvia and Estonia, the governments fully fund drug requirements.

Uzbekistan has the commitment, but lacks a long-term strategy or system. Drug supplies are donor dependent, and parallel systems for donor drug management and MoH drug management exist. Needs in the pilot sites are donor-driven. The raion-size pilots do not provide a replicable model for a nationwide drug management roll out. Kosovo is committed but has no consolidated budget. It is preparing an application to the Global Drug Facility. In Ukraine the government decided to centralize drug procurement in 2000, but the Ministry of Finance did not release all funds available. Stock-outs, however, were not reported.

Drug Quality Assurance

Legislation can form a solid basis for the development of tuberculosis drug quality assurance mechanisms. But a registration system in itself does not guarantee quality. Latvia and Estonia have regulations that are in line with EU requirements. Uzbekistan has a well-equipped Drug Quality Assurance Laboratory that has the potential to perform QA for the NTP. In Ukraine a Drug Regulatory Body has been installed, with a GMP Inspectorate. Laws dealing with GMP

are currently being discussed in the parliament. It is also possible to include quality assurance provisions in tender documents, but this is rarely done.

Drug Information

Rarely do countries have a mechanism to report problems with drugs (side effects, poor quality). Latvia recently initiated such a system. No information on drugs is available in all countries.

Selection, Market, and Competition

If sufficient drugs have been registered on the local market, it is easier to induce competition and select the proper (quality, price) product. This is the case in Kazakhstan, but the rapid growth of domestic products that are not manufactured under GMP is a cause for concern. Uzbekistan lacks coordination on selecting which products need to be bought. Each donor and the MoH make their own selections.

Quantification

The need for future consumption is estimated based on historic data, adjusted for buffer stock. But these decisions are sometimes driven by interest instead of need, as is evident in Kazakhstan. In Ukraine quantities were determined to be based on oblast needs.

Procurement

In most countries drugs are procured centrally. This is not so for pilot sites, where donors do procurement, or in the Russian Federation, where Orel and Ivanovo oblast use local funds to do their own procurement. Most countries do not have guidelines on procurement and bidding procedures. In Kazakhstan the procedure is not transparent. In Kosovo there is no Essential Drug List. Estonia has a centralized tender procedure that is open to domestic and foreign suppliers.

Prices

Prices drop when procurement is centralized as was seen in Kazakhstan. But for Fixed-Dose-Combinations, prices were high due to inconsistent selection. This was the case also for second-line drugs, which were not procured through the Green Light Committee (GLC). In Latvia and Estonia, GLC involvement resulted in a considerable lowering of drug costs.

Storage and Inventory Control

After procurement, the bulk drugs must be stored. In Estonia all drugs are stored in the Tartu University Hospital. In Latvia, the National Tuberculosis Institute acts as a warehouse. In most other countries the supplier is asked to distribute the drugs (and other consumables) to the oblast level. But oblasts have limited capacity in space, manpower, and skills.

Inventory control appears to be done manually in most cases and inevitably when large bulk quantities are present, the risk for waste increases. In Ukraine an inefficient paper-based, non-standardized inventory system exists in the periphery, while the central warehouse uses a computerized database.

Distribution Mechanisms

The FSU drug distribution system can be described as a 'push' system: decisions on quantities to and where to distribute are determined centrally, without routinely soliciting feedback. Although the unit known as Central Medical Stores is responsible for distributing the drugs, in reality this unit lacks sufficient transport, which means oblasts in many countries in the region have to find ways to collect the drugs on their own. Only in Latvia and Estonia was this found to be different.

Drug Management Information Systems (DMIS)

One advantage of a centralized system for tuberculosis drug supply is its simple vertical structure and clear chain of command and division of responsibilities. A disadvantage is the one-way flow of information. Feedback mechanisms are missing to allow lower levels to participate or contribute to decision-making. For example, in Kazakhstan, information on consumption is computerized but available only to selected persons at the central level. In Uzbekistan, information is fragmented and not based on indicators. In Kosovo the system is paper based, but not standardized.

Recommendations

USAID should support further training and capacity building in drug management, the development of a Drug Management Information Systems (DMIS), and the creation of Drug Quality Assurance schemes.

Drug management capacity is weak in the E&E region. Few people have received formal training in drug management and key aspects are in need of strengthening: how to procure, how to draft tender requirements, how to deal with import problems, aspects of GMP, where and how to store and distribute, and how to calculate needs. Through the RPM Plus project, USAID contributes to the improvement of this important program element, but there is a demand for wider implementation. For example, introduction of Drug Management Information Systems (DMIS) play an important role by helping to track drug stocks, keeping an eye on expiry dates and calculation of drug needs. An electronic system may be the final target, but for now even a proper manual paper systems would suffice in most areas.

Another type of drug information is needed as well. Information on medication side effects and drug interactions should be made available to doctors and patients. A drug information center, as was established in Ferghana City, could serve as a model. Organizations such as MSH can help in the further development of such a plan.

Drug quality assurance needs improvement in the region. There is extensive anecdotal information on poor quality drugs or drugs with too many adverse effects. In some cases poor quality drugs are blamed for the enormous MDR-TB problem. This should be verified. Laboratory capacity for drug quality assessment needs to be developed. It may be too much of an effort to establish these laboratories in all countries of the region, but the creation of a regional laboratory that is trusted by the respective governments should be considered. USAID could play an important role in this.

MONITORING

Database

The DOTS recording and reporting system has been introduced in all pilot projects. But it exists in parallel with the traditional data collection as required by law in most FSU countries. Only in Latvia, Estonia, and Kosovo has the DOTS monitoring system become national policy. Naturally, the pilots have requested computers for their data management and in all projects computers are available at some level. Only in Latvia and Estonia is a network developing, where the periphery enters data directly into an electronic database and forwards this to the central level. In other areas, aggregate forms are produced, sent to a centralized level and then entered into an electronic database.

USAID, through CDC, has promoted the use of computers, but it missed an opportunity to harmonize the databases. In Kazakhstan, a new electronic data case management system is being introduced that allows for better management of information. The parameters chosen are

more numerous than the basic DOTS parameters, which will allow a more precise analysis of outcomes in the near future. Based on the “EPI Info” software developed by CDC, an electronic database is implemented throughout the country. In Latvia, initially an Excel database and later an Access database has been used. In Estonia, SQL.BASE software was introduced. In Orel, the situation is even more complicated: for data entry, like in Latvia, initially Excel and later Access was used. The need for parallel data entry made the system complicated. In Ivanovo, a FoxPro database was introduced that could handle both systems, but was found not to produce the right kind of reports. In Orel and Ivanovo, oblast data therefore are entered several times, to be able to use both software systems. This is wasteful and a potential source for mistakes.

Notification

Proper notification depends on proper use of definitions. Definitions have been adapted in several countries. For instance, in Orel and Ivanovo oblast, but also in Uzbekistan, sputum smear-negative relapses are reported. According to international TB definitions, relapses can only be sputum smear positive. It is understandable that doctors want to report on smear-negative patients who have been treated in the past. But to be consistent, either the international definitions need to be adapted or doctors need better training in understanding and application of definitions.

Another area of confusion that is also unnecessarily labor intensive and time consuming is the parallel systems of recording and reporting that persist. Since by law it has been decreed what must be reported to the national authorities, in the pilot sites this reporting has to continue. But as the DOTS strategy requires a different recording and reporting system, doctors dealing with the registry face the problem of double recording and reporting. No doubt this is cumbersome and likely to result in mistakes. In addition, the difference in definitions in the two reporting systems produces tables that show different results.

Treatment Outcome

Historically in the region, data have always been collected because it was demanded. The emphasis was on producing data describing the process in a quantitative way. The data were rarely used as management information to change processes; at most they were used to support budget requests.

The DOTS cohort analysis allows collection of quantifiable data that describe the quality of the strategy. In Estonia, the program manager used the data for adaptation of the strategy and to request a rational budget. In Latvia, the data are also used for budget purposes. But so far, none of the other regions view or use cohort analysis as a management tool.

Recommendations

USAID could support operational research activities to develop training modules on Evidence-Based Decision Making for TB control.

As mentioned previously, using Mass Miniature Radiography (MMR) as an example, it is important that decision makers understand the true value of population-based screening. In addition, cohort analysis is not yet used routinely as a management tool to improve tuberculosis control programs. Since indicators always have been activity based and outcome never was evaluated as a means to make changes in existing activities, cohort analysis is not recognized nor understood as a management tool. Program managers must learn to use the results of notification, cohort analysis, and operational research for decision-making. Regular reporting and cohort analysis are available as continuous instruments, while operational research will answer important incidental questions. Managers must learn what questions to ask and what measures to take and how to use data for programmatic decision-making.

Furthermore, the use of an electronic database does not mean that the process of data collection and analysis is understood. It is often better to start implementation with a manual recording system so as to gain an understanding of what data is needed. Cohort evaluation and how to use it should be part of a broader public health training program. For example, a module could be developed that can be part of existing TB managers training courses, like those in Warsaw, Poland and Almaty, Kazakhstan. As mentioned previously although development of training modules and implementation of training workshops are critical, the concept of training can not be perceived as one-time, individual events, but instead as an on-going process where support is provided to TB program managers at routine intervals, such as during regular supervision visits to continuously build and reinforce their skills in this area.

MDR-TB

Multidrug-resistant tuberculosis, or MDR-TB, (*M. tuberculosis* resistant to at least the two major drugs, isoniazid and rifampicin) is a major problem in the region. MDR-TB is difficult and expensive to treat and has a high mortality rate. In Latvia and Estonia, this problem first became apparent as a result of susceptibility surveys.

In Latvia between 1996–1998, MDR-TB was found in 14 percent of patients who had not been previously treated and in 54 percent of patients who had had a previous episode of treated tuberculosis. These figures have since decreased to 9 percent and 28 percent, respectively, an indication of a successful DOTS program implementation. In Estonia these figures are 14 percent and 45 percent, respectively, for the year 2000. In a cohort of 211 patients in Karakalpakstan (Uzbekistan), MSF found 11 percent primary and 40 percent acquired MDR-TB.

Success in Battle against MDR-TB

In Latvia and Estonia DOTS has been successfully implemented and the number of new MDR-TB patients is decreasing. DOTS Plus is thus justified. The creation of a Center of Excellence in Latvia has contributed to the development of clinical expertise in MDR-TB with the tuberculosis specialists, not only from Latvia itself but also for neighboring countries.

This can be seen as a major USAID contribution to the improvement of the MDR-TB situation.

Latvia and Estonia have implemented the DOTS Plus strategy. Second-line drugs have become available through the Green Light Committee (GLC). Kazakhstan has applied to the GLC, but so far has no access to the cheaper drugs. Kosovo, Ukraine, and Uzbekistan first need to expand the DOTS strategy before treatment of MDR-TB becomes possible. In general, countries should prove that they have stopped creating new MDR-TB cases before engaging in DOTS Plus. The rationale for this is that the therapeutic anarchy that led to MDR-TB will lead to super multidrug resistance if proper measures are not taken.

In other countries data are scarce or nonexistent. It is, however, likely that the MDR-TB rate is high throughout the region as all countries suffered the same breakdown of services after 1990.

Some data are available, but not all are reliable or representative. The Russian Federation reported 7 percent in 1999, but data varied widely, from 1.3 percent in Ivanovo to 47 percent in North Ossetia. These data are not representative as laboratory methods and data collection systems differ across the Russian Federation. In Ivanovo oblast in 2000, MDR-TB was reported in 2.5 percent of previously untreated and 15 percent in previously treated patients.

The first surveys on drug susceptibility in the region appear to show similar results: 10–15 percent primary drug resistance and 35–50 percent acquired drug resistance. This comes as no surprise as all countries come from the same historic tuberculosis control program background and staff were trained in the same Soviet ways. Some differences can be accounted for by the size of the existing epidemic, the duration of the economic crisis, and cultural differences among populations.¹⁰ An intriguing issue remains: If countries have enough funds to buy second-line drugs for the treatment of MDR-TB, it is clearly difficult to encourage them to refrain from doing so. It is not feasible to prohibit this procurement. The carrot that the WHO uses is the low prices of these drugs through the GLC mechanism, but DOTS must be properly implemented to get Green Light support.

This leads to a number of questions. If MDR-TB was the result of treatment anarchy and treatment anarchy was the result of shortages, and if before 1990 the non-DOTS strategy had reportedly good results when there were ample drugs available and doctors knew how to use them, why not flood the market with second-line drugs? If shortage is the underlying cause for resistance, wouldn't it be true then that one should not be afraid of super resistance developing if there are enough drugs? Or is it more complicated than this, is there an element of limited control over the availability of TB drugs, with anti-tuberculosis drugs readily available without a prescription throughout the region, or is it the lack of proper standardization of the second-line treatment regimens based on the resistance pattern in that particular country and the skills of doctors to monitor and manage side effects, that also contributes to this scenario? With

¹⁰ The Baltic States are oriented toward western Europe and will have access to the European Union in 2004; Russia and Ukraine still are proud of the socialist achievements; Kazakhstan and Uzbekistan are more Asian, with an open attitude in Kazakhstan and a very closed cultural society in Uzbekistan; Kosovo, with its Albanian population, has a hybrid culture partly based on the former Ottoman Empire, partly based on the Yugoslav Federation.

second line drugs widely available in Kazakhstan at present, the evolving situation there may in fact offer a case study to understand this further.

Recommendations

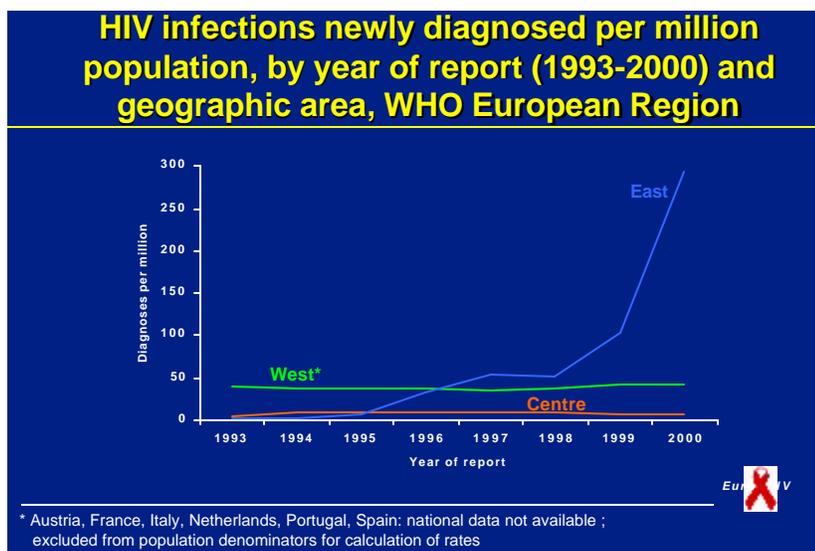
USAID could support a network for expanding the MDR-TB management expertise in the Baltics to the wider region.

USAID has recognized that diagnosis and treatment of MDR-TB needs specific expertise and has realized success in building this expertise in the National Tuberculosis Institute in Riga (Latvia), through its partner CDC. USAID should invest in further building the capacity of the TB Institute in Riga to serve as a technical resource center for programs throughout the region that are struggling with the case management of MDR-TB. The expertise currently housed in this center if shared with programs confronted with high or growing rates of MDR throughout the region has the potential to help halt growing rates of acquired MDR-TB.

TB/HIV

The tuberculosis epidemic will be complicated by an increasing HIV epidemic. HIV in Eastern Europe still is primarily an infection of Injecting Drug Users (IDUs), but it is likely to spread also through sexual transmission due to the rise in the number of prostitutes in many countries in the region. In all countries visited, with the exception of Kosovo, HIV infection prevalence is growing rapidly. A dual epidemic of tuberculosis- and HIV-infected persons is still small, as drug users are primarily young people, which so far have escaped evident tuberculosis infection. But as the prevalence of HIV infection will increase the number of TB/HIV dual cases, AIDS patients will also increase. This trend is illustrated in the graph below.

Figure 3. HIV Infections Newly Diagnosed Per Million Population (Source: EuroHIV)



In most countries in the region governments have created AIDS institutes or a department for HIV/STD prevention that develop strategies for prevention and control. These efforts are mostly donor funded. The young IDUs at risk are difficult to reach by the health care system, and their HIV sero-positivity is often discovered in prisons. Some HIV-infected persons are young; in Estonia the youngest was 11 years old. Risk behavior, much more than addiction in these young persons, is the cause for infection. More and intensive information and education is needed to prevent this risk behavior. Other forms of harm reduction also need to be introduced.

Recommendations

USAID could help develop coordination between the tuberculosis and HIV/AIDS programs by creating a mechanism that induces regular exchange of information and may initiate training.

From a tuberculosis perspective, reduction of HIV transmission is imperative. This means tuberculosis doctors need to develop knowledge about the prevention of HIV transmission, either by sexual or drug injection route. This goes beyond the usual tuberculosis skills or knowledge. Society also must change its attitude toward HIV+ persons and injecting drug users. Only by seeing users as patients in need of help can they be reached with prevention and treatment services. Inside prisons attention needs to be given to information and services that make transmission of the bacteria less likely.

A coordinating task force on TB/HIV could be established to exchange information on the incidence, prevention, and treatment of both diseases, especially in risk groups where the dual infections are likely to occur. Additional training for health care personnel from both programs will be needed. A task force could help initiate this. Through its missions USAID could contribute to this process.

TB IN PRISONS

In the Russian Federation, one-third of tuberculosis patients is said to have a history of imprisonment. In all countries of the FSU, 10 percent of prisoners suffer from tuberculosis. The Russian Federation alone has more than 1 million prisoners. Russia has 700 prisoners per 100,000 inhabitants. (cf Western Europe: 100). The FSU leads world statistics in incarcerated people. Only in Texas are similar numbers reported.

TB and MDR-TB is rampant in prisons due to overcrowding, malnutrition, and lack of sufficient drugs. In many prisons more prisoners are housed than the system can adequately handle. Prisoners have to take turns sleeping because there are insufficient beds. Windows often are kept closed to keep the wind, cold, or sand out. Prison cells are thus overcrowded and not ventilated. Walls and bed linens are often damp from the moisture. This is the perfect environment for transmission of the tubercle bacillus.

Prisons used to be part of Stalin's labor production network and were self-sufficient as income-generating entities. After the break-up of the FSU, this network disappeared and so did the

income. Prisons are underfunded, resulting in poor maintenance, poor hygienic conditions, insufficient food, and only few drugs. Prisoners are malnourished. The irregular availability and use of tuberculosis drugs has created an enormous drug-resistant tuberculosis problem.

Tuberculosis in prisons is a threat to the community. Prisons have been named the “tuberculosis pump.” Prisoners are often recidivists, moving in and out the penitentiary institutions, thereby increasing their risk of exposure. But when infected and ill they may expose prison staff, visitors, or after release, the general public to this risk. To illustrate the size of this problem, an estimated 130,000 prisoners move in and out prison annually in the Russian Federation.

TB projects within prisons by various agencies in Tomsk, Mariinsk (both Russian Federation), Baku (Azerbaijan), Tblisi (Georgia), and Pavlodar (Kazakhstan) have shown that case notifications are a factor 20–50 times higher in the prison population than in the general population. Since the prison system is severely overcrowded in almost every country, transmission of tuberculosis is high. Prisons have always been the last to be funded for health services; thus, treatment has been inadequate for years, leading to high rates of drug resistance and MDR-TB. Add to this the increased number of drug addicts with HIV infection who are incarcerated, and it is clear that prisons will suffer an increase of difficult to treat HIV/MDR-TB cases.

The involvement of USAID and its partners in prison tuberculosis control is fairly recent and limited. In Ivanovo through the CDC, and in Karaganda oblast (Kazakhstan) through Project HOPE, the DOTS strategy has been introduced and training and equipment provided. It is too early to evaluate success of treatment or reduction of incidence. What is lacking is recognition that tuberculosis control in prisons is more than implementing a technical strategy, but that issues such as overcrowding merit action for successful control of TB, necessitating a change in the legal system and a change toward a more human rights approach. There are examples of programs where these elements have been recognized. For instance, the cooperation in Karaganda between Project HOPE and a consortium of KNCV and Penal Reform International, which has been involved in prisons in Kazakhstan since 1998, is one such example.

USAID’s decision to take on tuberculosis control in prisons is a positive one as it will greatly contribute to easing the burden of the disease. Long-term success in controlling TB in prisons may depend upon an approach that goes beyond the technical aspects of DOTS.

TRAINING

An important feature of the DOTS strategy is training. Phtysiaters, nurses, GPs, feldshers, laboratory technicians — all need to be retrained in the DOTS strategy. To meet this training need, the WHO has developed training modules that have been translated and adapted for local use.

Large numbers of staff in all pilot areas throughout the region receive good, baseline training. But a new approach to training is needed that considers more targeted needs. For example, as mentioned before physicians in leadership positions need program management training (financial, human resources, planning) as well as in public health issues, including epidemiology, medical statistics, cost/benefit analysis, etc. Physicians, nurses, and feldshers also need training in a more humanistic approach to care, such as customer-friendly services and respect for individual rights, and in communal protection, such as recognizing that patients that default are a risk for the community, and that it is the responsibility of the care provider to minimize that risk.

Clearly, more emphasis needs to be placed on aspects of training that go beyond tuberculosis control programs. Management, public health, and professional accountability need to be dealt with sector-wide. Further, training methodology has to change. Adult learning methods should be introduced where they haven't yet. Training is a science and should have academic support. Nurses' training, as was developed in Estonia, is a good example of how, with input of the local staff, existing methodology and materials can be adapted to the local situation. Institutionalization is the next step, where after academia should support wider implementation of the methodology into other fields.

Regional training in tuberculosis control management as initiated by Project HOPE in Kazakhstan is a good example of an adult learning method in management issues. This training is an adaptation of the WHO/KNCV Regional Training in Tuberculosis Control Program Management in Warsaw, Poland. Annually, both trainings process 70–80 physicians from Central and Eastern Europe. The demand, especially in Russia, is greater than can be handled, and a separate training for the Russian Federation might be considered in the future. This training also should be institutionalized, preferably in a school of public health.

Recommendations

USAID could collaborate with existing schools of public health and promote the establishment of these schools where they do not already exist and they could become responsible for all aspects of program staff training. This may go beyond tuberculosis control.

Schools of public health that can provide training in the fields of program management, epidemiology, and health financing, but also marketing, information systems, and health promotion are needed in the region. Public health training needs to be strengthened. This could either be done through support of an existing school, such as exists in Almaty, Kazakhstan, that could be strengthened to provide a regional role, or a school could be built around existing initiatives such as the Regional Training in Program Management and the Tartu Nurses training.

The creation of a Nursing Training Center in Tartu (Estonia), although not yet institutionalized, has strengthened the role of Baltic nurses in treatment delivery, enhancing compliance, and thereby preventing new cases of MDR-TB. Materials have been adapted for

regional use and trainers have been trained, but further implementation is slowed for lack of organizational capacity. Once institutionalized it could become a nucleus for a nursing school in public health.

INFORMATION, EDUCATION, AND COMMUNICATION

USAID can support improved case finding through creating public awareness (communication campaigns), better access to care (education), and decrease of social stigma (information) where basic elements of TB programs have been strengthened adequately.

The goal of information, education, and communication (IEC) is to inform the general public about tuberculosis, prevention, symptoms, diagnosis and treatment, the fact that it is curable, and how and where to find help.

Information will decrease fear and contribute to the decrease of social stigma, although stigma cannot be expected to completely disappear. Information will increase awareness among the general population that tuberculosis is an infectious but also curable disease that affects everybody, not only disadvantaged or marginalized people.

Education will improve the health-seeking behavior of potential patients, bringing them in at an earlier stage of disease, which will contribute to a decrease in mortality and a decrease in transmission.

Communication is more difficult. Use of radio and television, as well as newspapers, will go a long way toward reaching the general population. However, a large proportion of potential tuberculosis patients come from among the homeless and substance abusers, individuals who will not be reached by the media. Even if brochures were disseminated among these groups, it is doubtful the people can or will read them. Other forms of communication have to be tried, such as a peer-to-peer approach, or street theater.

In areas where TB systems are adequately developed, IEC needs among the population must be addressed and developed as a separate discipline. In the E&E region, this area of focus is gradually evolving, but there still is a great need for technical assistance in this area.

SUPERVISION

USAID could advocate for sufficient material support (vehicles) and technical support (why and how to do supervision) to the region.

The DOTS strategy relies on a cascading system of supervision in program management, laboratory management, data management, and drug management. In most countries, a tuberculosis coordinator visits and checks on facilities and programs from the national level to the oblast level. Supervision visits from the oblast level to the raion level are sporadic in many areas, with visits by teams of specialists being rare. This is in part because of lack of transportation and lack of understanding of the concept and value of supervision.

In its programs, USAID could help solve the transportation problem by advocating within the government as well as leveraging other donors. USAID could also provide training to help improve supervisory skills. Changing the perception of supervision from one that is grounded in control, where a supervisor makes visits to check if everything is going well and punishes if it is not, to one that sees supervision as an opportunity for communicating program successes and obstacles with the intent to make recommendations for improvement where possible. The use of checklists as done by Project HOPE in Kazakhstan and Uzbekistan is a start, but it is not enough. By relying on checklists alone, there is risk that emphasis will be on filling out forms instead of on evaluating the quality of the system. Supervision must be taught as a tool of support and a skill for transferring knowledge, meant to improve conditions through constructive means, and not by punishment.

INFECTION CONTROL

USAID could advocate for the creation of a position and training for infection control nurses.

In Latvia in the Center of Excellence, much attention was given to the prevention of nosocomial transmission of tuberculosis. Yet despite the existing protocol, no one had responsibility for its implementation and supervision. In Estonia in the MDR-TB hospital, a visitor was allowed to enter without a facemask, although staff were wearing masks. No one felt responsible. In a hospital in Kosovo, management refused to separate infectious patients from other pulmonology patients and even allowed children to be admitted to the same ward. Economic motives overruled infection control. In the other countries visited, cotton facemasks are worn and ample disinfection takes place, but modern understanding of nosocomial transmission and how to prevent it does not exist, or at least is not put into a protocol.

Technical support for the creation of a position with responsibility for development of broad infection control guidelines and with the authority to implement them is needed. Infection control goes beyond just tuberculosis. The whole set of hygienic measures should be part of the training. In Western Europe, nurses hold such positions. It should be explored whether a nurse in Eastern Europe and Eurasia, where nurses often have not yet achieved professional status, can fill this position.

It was observed that laboratory technicians have demonstrated that infection control can be successfully implemented. Invariably during site visits, it was found that infection control measures were in place. Apparently laboratory personnel have a better understanding of the biohazard risks of being in the vicinity of a tubercle bacillus.

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6. KNCV E&E Evaluation VI. Kosovo
7. KNCV E&E Evaluation VII. Ukraine

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ANNEX A

USAID ACTIVITIES IN THE E&E REGION

ANNEX A. USAID ACTIVITIES IN THE E&E REGION

| PROJECTS | PARTNERS | OBJECTIVE | OVERALL OUTCOME |
|--|--|---|---|
| Russian Federation (1997) | | | |
| DOTS implementation in Orel, Ivanovo, Wladimir, Chuvash WHO coordinating office | CDC, MoH, CTRI, WHO/EURO | <ul style="list-style-type: none"> • Demonstrate high cure rates and low mortality • Connect tuberculosis control in prisons with tuberculosis control in civil society • Use lessons learned to influence the MoH | WHO has played strong coordinating role in program development and political advocacy. MoH has accepted the key elements of the DOTS strategy and is developing its own strategy based on this. |
| Kazakhstan (1998) | | | |
| Upgrade NRL TA to MoH Training in DOTS strategy Strengthen surveillance system Supervision | MoH, Project HOPE, Chevron, CDC, USAID/CAR, Abt Associates, Min Jus | <ul style="list-style-type: none"> • Support DOTS implementation nationwide • Support DOTS implementation in prisons | Laboratory equipment for NRL. Presidential Prekaz leading to DOTS implementation nationwide. Ministerial Prekaz on DOTS implementation including the penitentiary system. > 2500 doctors trained. Electronic surveillance system implemented. |
| Uzbekistan (1998) | | | |
| DOTS implementation in 5 pilot sites Upgrading skills Monitoring | MoH, Project HOPE, CDC, National DOTS Center, Zdrav Plus | <ul style="list-style-type: none"> • Demonstrate that DOTS is an effective strategy | DOTS expansion to 1/3 of population. Training of all staff involved. Upgrading laboratories. Successful advocacy with MoH. Creation of National DOTS Center. |
| Ukraine (2000) | | | |

| PROJECTS | PARTNERS | OBJECTIVE | OVERALL OUTCOME |
|---|---|--|--|
| DOTS implementation in Donetsk oblast TA for surveillance, QA of MDR-TB | MoH, WHO/EURO, PATH | <ul style="list-style-type: none"> • Improve professional training • Promote IEC • Improve quality of Tb services • Establish a tuberculosis specific MIS • Reallocate health resources • Create a DOTS friendly atmosphere within MoH • Obtain evidence based recommendations for effective treatment | <p>DOTS implementation has started successfully, but it is too early to evaluate outcome.</p> <p>Manual has been prepared.</p> <p>Training has started.</p> <p>Monitoring system has been introduced.</p> |
| Latvia (1999) | | | |
| Creation of a Center of Excellence for the treatment of MDR-TB | MoH, NTP, CDC, NIOSH, Dep of State | <ul style="list-style-type: none"> • Create a Center of Excellence for MDR-TB management | <p>Upgraded laboratory for rapid diagnosis of tuberculosis.</p> <p>Clinical expertise (also for specialists from the region).</p> <p>Infection control (air cleaning equipment, upgraded ventilation systems).</p> <p>Electronic PIS.</p> <p>Study into risk factors for MDR-TB.</p> |
| Estonia (1998) | | | |
| Improvement of tuberculosis control, especially targeting MDR-TB | MoH, NTP, CDC, FILHA | <ul style="list-style-type: none"> • Improve MDR-TB management • Develop a comprehensive training program for nurses | <p>Training of experts in Latvia.</p> <p>Creation of nurse's training course.</p> |
| Kosovo | | | |
| 5-year plan of tuberculosis control | UNMIK/WHO, PSIG MoH, NTP, DOW, SIDA, ECHO | <ul style="list-style-type: none"> • Support the NTP manager to implement the Kosovo Tb Action Plan • Introduce effective monitoring system • Assist the MoH in re-establishing the Patronage Nurse system • Strengthen laboratories and their network • Provide international TA • Increase tb activities in minority areas | <p>Extensive training.</p> <p>Upgrading laboratories, but no proper network or QA.</p> <p>Re-establishment of PN.</p> <p>Tuberculosis control in minority areas.</p> |

ANNEX B

SWOT ANALYSIS SUMMARY OF ALL PROJECTS

ANNEX B. SWOT ANALYSIS SUMMARY OF ALL PROJECTS

| POLITICAL COMMITMENT | | | | |
|-----------------------------|---|--|--|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | The NTP system does not overly rely on donor funding. Nurses receive credit toward their level of accreditation, which improves their salary. Uninsured have direct access to treatment, even if they've exhausted their benefits. NTP is a strong organization and has political influence. Government has agreed to pay for second-line drugs in 2002. Social support (travel and food incentives) improves adherence. | 25% of population has no insurance coverage. Lack of incentives for working with TB patients has resulted in a shortage of nurses. | Government funding of TB incentives would attract more nurses into care for TB patients. | Estonia anticipated support for five years; uncertain donor support may threaten the transition to full governmental support for a comprehensive DOTS strategy. Lack of support has created a funding gap, which may affect capacity building. Official policy doesn't address access by uninsured. |
| Latvia | Demonstrated amply at central level (priority disease; relatively high budget). Supported at local level in addition to the central level. | Frequent change of ministers needs constant lobbying. Physicians have little interest in health reform and the bacillary approach of treatment. | Director of Institute has good relationship with the director of the department of health, and works well with the insurance agency; there is interest to cooperate. | Possibility of sick funds to allocate funds according to their own priorities, rather than government priorities. Therefore, may need to compete with funds with other health priorities, such as HIV. |
| Orel | Tuberculosis ranks 2 nd among health priorities in Orel oblast. Inclusion of prison and HIV system. High level of commitment of all involved personnel. | Insufficient funding. Dependence on personalities in cooperation. | More efficient use of funds. Demonstration site. | Too much attention on demonstration site at the present state. |
| Ivanovo | Highest political leaders are involved (government). Inclusion of prison system. High level of commitment of all involved personnel. Longstanding involvement of the former Health Commissioner. Extra budget for nutrition. Declared non-availability of tuberculosis drugs in the private pharmacies. | Insufficient funding. Insufficient understanding of what DOTS means. | More efficient use of funds. Demonstration site. Dedicated chief doctors are able to achieve results despite the shortage of funds. | MOH decision to integrate oblast and federal budgets. |
| Kazakhstan | Tuberculosis control is a priority issue for the government. Tuberculosis control in prisons has become integrated part of the government control efforts. Good cooperation at operational level between the 2 departments. | Overnight implementation in the whole country. Assistance to prison sector. Funding at oblast level through bed-days. Prisoners on treatment are lost for follow up upon release. | Comprehensive 5-year NTP is in the making. | Opposition to DOTS strategy has political influence. |
| Uzbekistan | MoH showed ownership by the establishment of the NDC that is answerable to the Dept. Minister. Development of a 5-year plan. | Weak management of NDC, lines of responsibility need to be defined. Fragmented implementation at raion level by various donors. Poor coordination by various stakeholders. No involvement of the penitentiary system. | USAID should consider strengthening the NDC by appointing an external experienced advisor. Integration in the PHC structures may create synergy. | Prekaz 591 from 1994 obstructs the implementation of DOTS. |

| POLITICAL COMMITMENT | | | | |
|-----------------------------|---|--|---|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| Ukraine | Strong commitment at Donetsk oblast level. Pilot has already reached other phtysiaters in other oblasts. | Weak commitment at central level Unstructured donor coordination at central level. Medical community lacks information. | Develop a strategy for how to convince political decision makers to accept changes in terms of health financing, reallocation of resources from inpatient to out-patient care. Promote ambulatory care. Organize “pro DOTS” physicians. Increase access to information. DOTS pilots preconditions for the WB loan. Incentives to retire would open positions for younger physicians. | Defined to lower ranks within the NTP and to only some officials I within the MOH. Many phtysiaters are near or beyond retirement age. DOTS is a threat to medical workers because of possible reductions of beds through the introduction of the DOTS strategy. |
| Kosovo | Availability of resources from international aid organizations. Salaries are being paid regularly. Diagnosis and treatment are free. The government has authorized an increase in salaries for regional coordinators and NTP managers. The TB Commission provides a structure for coordinating donor investments in TB treatment and control. | The status of the NTP and other MOH structures is ambiguous, since the final form of the government is unclear. The dual structure of the UNMIK and PISG fragments decision-making. Decentralization of decision-making and expenditures to the municipality level may be premature, since funding level of the NTP at national level is uncertain. Salaries are sufficiently low that many NTP staff seek additional work to supplement their incomes. | There is a comprehensive strategic plan for TB treatment and control. The DOW has facilitated the development of a linkage between the NTP and the minority population. DOW may be able to advocate more strongly for creative mechanisms for improving care to minority populations. | The is no full-time staff in place to manage the NTP. Seeking additional income by NTP staff creates a conflict of interest that may threaten proper performance of the NTP. There is a conflict of interest where the NTP manager supervises public sector staff, who may be in a parallel or higher position in the private (NGO) sector. The lack of an official government hinders the development of sustainable support for the NTP. Governmental revenues are marginal; it's questionable if revenues will grow to a sustainable level before the pull out of international aid organizations. |

| DIAGNOSIS | | | | |
|------------------|---|---|--|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | Access to follow up (smear and culture) by identified patients appears good. A well-organized and well-functioning laboratory network. | Payment system provides a disincentive to use the of smear microscopy in the periphery. Multitude of cultures is expensive and may be excessive. | Good transportation system. Training of GPs in TB patient management would strengthen implementation of DOTS strategy (smear microscopy). | DST methods are expensive and susceptible to changes in funding Disposal of radioactive waste with regular waste is a health hazard. |
| Latvia | Sputum smear based. Laboratories well organized and coordinated and working on three levels. Laboratories well equipped, | Insufficient funds for supervision. Not yet a protocol for proficiency testing; the current method is on quantification rather than quality | Potential regular and refresher training for laboratory staff. NRL will soon start with molecular biology | Insufficient funding for supervision lowers quality of program. Relative expensive investments and expensive consumables may |

| DIAGNOSIS | | | | |
|-------------------|--|---|---|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| | well maintained. Large contribution in equipment by CDC and NO-TB BALTIC. | of methods. | techniques to improve rapid diagnosis. | not be sustainable. Not sustainable donor support. |
| Orel | Sputum smears have been introduced as routine procedure. Organized network. Quality control system. | Still heavy reliance on x-ray screening. Too many microscopy centers. Too many cultures during the course of treatment. No need for duplicate DST. Too many culture sites. | More effective use of funds by reorganization of services. | Loss of quality by doing too many tests that come up negative. Insufficient sputum containers; re-use of slides. |
| Ivanovo | Sputum smears have been introduced as routine procedure. Organized network. Quality control system. Well-trained staff. Sputum collection at FAP with good transport facilities. Centralized DST. Financing of services. | Still heavy reliance on x-ray screening. Too many microscopy centers. Too many cultures during the course of treatment. No need for replicate DST. Too many culture sites. | More effective use of funds by reorganization of services. | Loss of quality by doing too many tests that come up negative. Insufficient sputum containers; re-use of slides. |
| Kazakhstan | Smear microscopy has been adopted as the basic tool for diagnosis. Well-organized laboratory network. NRL has good technical standard. | Screening with fluorography still seen as a major tool in case finding. Too many laboratories perform cultures and DST. Not all laboratories are included in the QA network. | NRL has the technical capacity to become the SNRL for the CAR. | Suspects have to pay for chest x-ray, which could be an obstacle for early diagnosis. QA system may break down because of overloading the higher level services. |
| Uzbekistan | In pilot sites microscopy has been accepted with all necessary precautions. At raion-level laboratory networks are carefully implemented. The NRL has been adequately equipped by Project HOPE. | Screening is still required by the Prekaz 591; by lack of films it is done by fluoroscopy (high radiation exposure). Smear microscopy only detects 38% of infectious cases. The NRL is not working within the network, the network still has to be developed. Training in DST has been done using unfamiliar methodology Parallel R&R system. | | An increasing notification is not yet accompanied by a decreasing mortality, indicating that control efforts are still insufficient. |
| Ukraine | Good strategy for establishing the laboratory network in the oblast. Good technical skills of laboratory staff. WHO-recommended recording and reporting system successfully introduced in the pilot laboratories. | Fluorography screening for general population. x-ray results more important for diagnosis and follow up than the laboratory results. There is no program for quality assurance in place. Too many culture examinations. Parallel recording in laboratories for DOTS and non-DOTS patients. Poor quality of DST. | Reducing active screening will make resources available for care. Training for oblast laboratory staff in DST Establishing a link with SRL. Including non-DOTS patients in the laboratory registers. | Maintenance of the expensive equipment in the laboratories. Loss of qualified and trained laboratory staff because of low salaries. |
| Kosovo | The laboratories are sufficiently equipped with microscopes and supplies. Sputum microscopy has become a regular part of diagnostic procedures. The quality of smear microscopy is very good. | SSM is not requested by all physicians. There is no system nor protocols for regular quality control of SSM. There is no laboratory checklist Equipment and supplies for culture and the methodology for DST are expensive to maintain or replace. There is no external quality control for DST. Overreliance on a single supplier. | The existence of two equally equipped culture and DST laboratories provides an opportunity for internal quality control by exchanging specimens. | There is no recognized reference laboratory to provide training, quality control, and supervision to the laboratory network. |

DIAGNOSIS

| | Strengths | Weaknesses | Opportunities | Threats |
|--|-----------|--|---------------|---------|
| | | <p>A microbiologist is not included in the lab monitoring team.</p> <p>There is an inconsistency between the stated level of drug resistance and actual treatment outcomes.</p> <p>There is a selection bias for follow-up diagnostic procedures by clinician and patient financial resources.</p> | | |

TREATMENT

| | Strengths | Weaknesses | Opportunities | Threats |
|-------------------|--|--|--|---|
| Estonia | <p>Good provider-patient communication.</p> <p>Effective use of social worker.</p> <p>Standard treatment regimens since 1996.</p> <p>Decentralized ambulatory DOTS results in:</p> <ul style="list-style-type: none"> • Strict practice of DOTS • Better access by patients in their communities • Better defaulter tracing | | <p>Decreased hospitalization costs result in the ability to redirect funds to other areas.</p> <p>The nurse training program will result in improved adherence to treatment.</p> | |
| Latvia | <p>Ambulatory care is impressive: every dose is given under direct supervision 6 times a week.</p> <p>In Riga, conditions were excellent.</p> <p>Social condition of patient is taken into account and incentives for transport and food in the city as well as in Daugavpils works well.</p> <p>120 beds were closed throughout the country since 1999 (but NTP cannot close beds, since this responsibility falls on the MOH).</p> | <p>Half of population in Riga and other cities, rest of the population is rural.</p> <p>Patients report late in advanced stages of disease.</p> <p>Patients from rural area: not much opportunity for ambulatory treatment (Jegavpils), resistance from older physician(s).</p> <p>Even patients in Daugavpils stay in the hospital too long (100 days), since rural distances are considerable.</p> <p>Money does follow the patient, so incentive is to hospitalize.</p> | <p>Director of institute met with health insurance agency to talk about this; they agree conceptually, but this needs to be worked out.</p> | <p>Distances are far in the rural areas, and a potential barrier for access to hospitals and clinics.</p> <p>Ambulatory care for hospitals acts as a disincentive, since this cuts their budget for the following year.</p> |
| Orel | <p>DOTS has been introduced and is supported by senior staff.</p> <p>Treatment delivery well decentralized.</p> <p>Cooperation with Red Cross in Incentives program.</p> | <p>Regimens often are not standard.</p> <p>Still preventive treatment in cored cases.</p> <p>Still relative long hospital stay.</p> <p>Red Cross also is insufficiently funded.</p> | <p>Orel may become pilot area for the new Reg II.</p> <p>Orel is considered for DOTS Plus.</p> <p>Created preconditions for a reduced hospital stay.</p> | <p>Non-standardized regimens can increase the MDR-TB problem.</p> <p>Too early introduction of DOTS Plus.</p> <p>Bed-based funding rationale remains unchanged.</p> |
| Ivanovo | <p>DOTS has been introduced and is supported by senior staff.</p> <p>DOT is strongly supported.</p> <p>Treatment delivery well decentralized.</p> <p>Red Cross interlinks penitentiary civil services.</p> | <p>Still relatively long hospital stay.</p> <p>Red Cross is insufficiently staffed.</p> | <p>Ivanovo is considered for DOTS Plus.</p> | <p>Erratic supplies of second-line drugs.</p> <p>Too early introduction of DOTS Plus.</p> <p>Bed-based funding rationale remains unchanged.</p> |
| Kazakhstan | <p>Standardized regimens have been introduced.</p> | <p>Too many standardized regimens without criteria when to use</p> | <p>Cooperation between Chemizators and PHC</p> | <p>Erratic treatment of MDR-TB cases.</p> |

| TREATMENT | | | | |
|-------------------|--|--|---|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| | Creation of the position of Chemizator for case management. | what. Too long inpatient treatment. High failure rates. Rapid expansion of MDR-TB treatment without training and quality assurance. | structures to ensure adequate treatment delivery and patient adherence. NTBC can become the Center of Excellence for the CAR. | |
| Uzbekistan | Good results in DOTS patients. | Only selection of patients put on DOTS. Often DOTS and non-DOTS exist in the same facility. | Develop patient management module for DOTS approach. | |
| Ukraine | A DOTS manual has been developed and approved for the pilot oblast. Standardized short course treatment regimens are in use. | Non-DOTS patients occupy the bulk of beds. Length of hospital stay often exceeds recommendations. | All patients should be included into DOTS. Decentralization of treatment and promotion of ambulatory care. | Hospitals are financed by bed and not per capita. Reduction of beds is a threat to the medical community working in TB control. |
| Kosovo | DOTS is 100% implemented. Lots of attention to training and patient. There is alternative system of treatment, which appears to have excellent treatment outcomes. | Treatment is overly focused on a partially supervised or unsupervised treatment. There are limited individualized approaches to facilitate more frequent supervision of patients. Not sufficient focus in the training on treatment and outcomes. The current climate of uncertainty. | Incentives for health providers are lacking; they could encourage improved performance. Assess the need for incentives (food, transportation, or other) in special populations. Identify possible defaulters and utilize creative mechanisms for encouraging completion of outpatient treatment. Examine role of nurses for further delegation of responsibility in DOT. Identify patient-specific barriers to completion of treatment and means to overcome them (check the NTP plan). | Low salaries encourage health providers to work in the private sector. This makes work in the public sector of secondary importance; this may affect all levels of program performance. |

| SUPPLIES | | | | |
|-----------------|---|--|--|--|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | Assured supply of first-line drugs, and second-line drugs for 2002. Prices of second-line drugs are affordable because they're purchased through the GLC. The EU-based drug registration system assures the quality of drug products. | Distribution system is based on a paper system. | A standardized system for tracking additional second-line drug information country wide. Computerized system would streamline processes and provide more aggregate and patient-specific data. | If funding by government is decreased it will threaten DOTS Plus. Continuous supply of second-line drugs through GLC; when drugs are unavailable through GLC. |
| Latvia | Availability of first-line and second-line drugs appear to be | The tender does not provide specifications of drug quality | Procurement of TB drugs is mixed; all | The drug registration process has been improved; Latvia has |

| SUPPLIES | | | | |
|-------------------|--|--|---|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| | in regular supply. TB drugs should no longer be available in retail pharmacies since the middle of 2001. | beyond required drug registration in the country. The MoF has directed tender committees to select drug products on the basis of lowest cost. The absence of drug quality criteria in the tender will not guarantee drug quality. GLC will help if NTP can demonstrate that no new MDR cases are being created; currently, can provide information for demonstration districts, but hard to come by data in non-pilot districts. | first-line drugs are procured by tender. Second-line drugs are procured through tender and the Green Light Committee. Procurement of second-line drugs through Green light saves considerable funds and should be further encouraged. | implemented drug registration procedures consistent with the EU. However, there are drugs that were registered before this change that may not meet the current drug quality requirements. |
| Orel | Consistent declared availability of all first-line drugs at all levels. Shortages in laboratory consumables addressed by informal mechanisms (such as credit and borrowing). All laboratory supplies available through local procurement. | Registration/approval of all second-line drugs not currently forthcoming. Lack of funds to complete local procurement. Absence of meaningful and consistent stock recording system at all visited sites. Lack of formally trained personnel in supply disciplines. WHO quarterly reporting considered onerous, which provides pretext for sourcing drugs elsewhere. Lack of forecasting capacity, data or procedures. | Establishment of replicable, transparent and accountable drug supply systems. Sustainable supply solutions are achievable. Ready market for human resources capacity building. | Second-line drug usage cannot be rolled out under prevailing scenario. Lack of management information. Fundamental revision of working practices at all levels required to achieve measurable improvements. Prevailing supply arrangements unsustainable without WHO support. 'Wish list' masks real equipment needs. |
| Ivanovo | Consistent declared availability of all first-line drugs at all levels. Flexibility to address supply shortfalls in laboratory and drug supply through local procurement. All laboratory supplies available through local procurement. | Inconsistent standards of stock recordings of drugs and laboratory supplies. Lack of formally trained personnel in supply disciplines. Lack of forecasting capacity, data or procedures. | Establishment of replicable, transparent and accountable drug supply systems. Sustainable supply solutions are achievable. Ready market for human resources capacity building. | Second-line drug usage cannot be rolled out under prevailing scenario. Lack of communication capacity. Fundamental revision of working practices at all levels required to achieve measurable improvements. |
| Kazakhstan | Consistent availability of all first-line drugs because of central procurement. Availability of second-line drugs. Antituberculosis drugs cannot be sold in private pharmacies. | Lack of feedback mechanism. No quality requirements in tender documents. Procurement process is not transparent. Second-line drugs are not bought through GLC mechanism. No adequate storage facilities at oblast level. Lack of skills in drug management. | Creation of National Drug Information Center. | Poor quality drugs may increase MDR-TB problem. |
| Uzbekistan | Commitment to provide drugs for non-DOTS patients. All tuberculosis drugs including FDCs are registered in the country. | No institutional capacity for drug management. No long-term strategy to take over drug procurement from donors. Selection, quantification and distribution is donor driven. | Development of a DMIS. Pharmaceutical Committee has good laboratory equipment for QA. | Present drug supply not sustainable without donor support. Lack of strategy. Availability of drugs in retail pharmacies. |
| Ukraine | The GOU is financing the drug supply. All first-line drugs have been available since January 2001. | Recording and reporting are not standardized. Second-line drugs are being prescribed according to clinical | Development of standardized drug management systems could bring savings of | Funding levels are increasing, but not always released; maintaining sufficient funding will require continued advocacy. |

| SUPPLIES | | | | |
|-----------------|--|--|---|--|
| | Strengths | Weaknesses | Opportunities | Threats |
| | First-line drugs are also available in the prison system. Donetsk oblast substantially supplements the drug budget. | findings, rather than DST. Drug needs estimation is inconsistent between oblast and national levels. Unavailability of information about the tender process raises questions about its effectiveness and transparency. | time and increased information for use in managing the NTP. Implementation of drug formularies for non-TB drugs could extend the effectiveness of scarce resources. | Lack of familiarity with DOTS, or fear of loss of jobs, fuels resistance to DOTS implementation, and may threaten approval of the World Bank loan. |
| Kosovo | There is a regular supply of anti-TB drugs in most ambulatory and inpatient health facilities. The government has taken over responsibility for the drug supply. | Drugs are unavailable in the Serbian enclaves. There was no assessment of the general drug ordering and distribution system to identify potential challenges in making the transition to MOH drug distribution. The overall drug ordering and distribution system is cumbersome and not standardized. Salaries for pharmacists are low, prompting them to work short hours in the public sector and supplement their salaries in the private sector. | The NTP is preparing an application to the GDF for anti-TB drugs. A creative mechanism for the minority health facilities to obtain drugs would facilitate continued treatment by minority populations. | The ambiguous budget situation may threaten procurement of a regular supply of anti-TB drugs. The donor community is not addressing the need for a the development of a sustainable, efficient drug management system, including drugs for TB treatment. There are no controls over the dispensing of TB drugs, nor any mechanism for reporting such treatment to the NTP. |

| MONITORING | | | | |
|-------------------|--|---|---|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | Well-implemented recording and reporting of information using standardized forms. The centralized computerized register is well-thought out and works well. Communication between the register and the laboratories is good. | | | |
| Latvia | National electronic TB register has been set up. Good verification system, so results appear reliable. Excellent bookkeeping and registration. | Peripheral data are sent as aggregate data in treatment outcome. CDC could have provided a data base (EPIINFO) ready made for the DOTS strategy. Laboratory register is specimen rather than patient based; this makes supervision difficult. | With little investment an electronic data exchange with the periphery can be achieved. | |
| Orel | Great dedication in collecting data. | Multiple data entry. Not well understood recording system. Treatment outcome monitoring inadequate. Do not make use of the data Still use of 2 different systems of data collection. | Capacity building for use of data analysis for policymaking and resource allocation. Government Prekaz forthcoming. | Major mistakes leading to wrong conclusions. Fundamental lack of understanding at all levels. |
| Ivanovo | Great dedication in collecting data. | Multiple data entry. Treatment outcome monitoring inadequate. Not proper use of data collected. Still use of 2 different systems of data collection. | Capacity building for use of data analysis for policymaking and resource allocation. Government Prekaz forthcoming. | |
| Kazakhstan | ECSM has facilitated data collection. | Definitions still differ from DOTS definitions. Check lists of project HOPE are too complicated. No standardized treatment outcome of MDR-TB yet. | Inclusion of prison sector in electronic data collection. | Improper outcomes due to misunderstanding may lead to wrong management decisions. |
| Uzbekistan | DOTS system in place in pilot raions. Existent monthly reporting requirements reduced to once yearly requirements. | Old definitions still in use. | Training in surveillance. | Double recording system DOTS and non-DOTS. |
| Ukraine | Excellent recording and reporting system is introduced in the pilot. A system of monitoring is being implemented. | Introduction of DOTS has resulted in dual recording and reporting systems, creating an additional burden for TB staff. | Computerize the monitoring system. Abolish double recording and reporting system. Train an adequate number of monitoring teams. | Restricted to the pilot. |
| Kosovo | The WHO recording system has been implemented. Training has been completed and supervision takes place. Excessive paperwork has been eliminated. An ACCESS database has been introduced and all regional | The lab request form isn't being filled in appropriately; this negatively affects the quality of the data entered into the TB register. Physicians may not perceive the value of recording the information correctly; this needs | Effective supervision will enhance recording and reporting systems. | Lack of appreciation for the value of accurate recording and reporting systems will undermine effective monitoring of the TB program GIGO. The irregular power supply hinders access to data, which may |

| MONITORING | | | | |
|-------------------|-----------------------------------|---|----------------------|-----------------------------|
| | Strengths | Weaknesses | Opportunities | Threats |
| | coordinators are using computers. | to be reinforced by more effective supervision and feedback. The definitions of outcomes have been adapted to deficiencies in the system. The only record of patient treatment is the patient treatment card; there is no mechanism for safeguarding patient medical information. Computers may have been introduced prematurely without sufficient emphasis on the quality of the data entered. | | be only in electronic form. |

| TRAINING | | | | |
|-------------------|--|---|--|--|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | Responsibility increases for nurses. Nurses had input into development or adaptation of materials and the process. | Follow up to training; there may not be a plan for monitoring and supervision of the master trainers. Language of materials in Russian is suboptimal; it is less well understood and precision of content is uncertain. | Availability of appropriate language materials and a comprehensive plan for developing and maintaining new skills will provide for a long-term training program for nurses. Training provides opportunities for nurses to advance in their careers. | Training development and implementation is donor dependent. |
| Latvia | | | | |
| Orel | Many sorts of training have taken place. | No testing of knowledge retention. Not known strategy. | Infrastructure for training. | Uncoordinated development of materials. |
| Ivanovo | Many sorts of training have taken place. | No testing of knowledge retention. Not known strategy. | Infrastructure for training. | Uncoordinated development of materials. |
| Kazakhstan | Extensive training of health staff and ToT. Adult learning methods. | Not all levels of health staff (PHC, prisons) have been adequately trained. No drug management module in training. | NTBC could nominate a coordinator to draw up a comprehensive long-term training plan. | |
| Uzbekistan | Establishment of training centers Creation of ToT. Exchange of trainers between NDC and HOPE. | Poor translation of WHO modules. | Integration in PHC. | |
| Ukraine | | | | |
| Kosovo | The first round of DOW training has been completed for TB health workers (physicians, nurses and lab technicians). 55 pulmonologists have been trained by WHO and DOW. Approximately 300 physicians have been trained within the FP specialty. | NTP does not have a overall training plan. The outcomes of the training haven't been evaluated. There is an inadequate supply trainers. | A TB component has been developed for inclusion in the family practice curriculum for physicians. Create an adequate pool of trainers trained in modern adult learning methodology. | Once DOW completes its program, there is no sustainable training system in place (trainers or resources). Training is not generally a top funding priority; vigorous advocacy by DOW and then NTP will be required to sustain training efforts. |

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|--|--|--|---|--|
| | DOW is providing follow up on nurse training. Patronage nurses have been trained to provide health education to patients. | | Supervision can reinforce concepts learned in training for more effective implementation. | |
|--|--|--|---|--|

| SUPERVISION | | | | |
|--------------------|---|--|------------------------------|--|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | The program provides funding for transport to allow regular, effective supervision. | Laboratory supervision depends on the presence of the head of the National Reference Laboratory. | | Additional travel costs have been dependent on donor funding. |
| Latvia | | | | |
| Orel | Many sorts of training have taken place. | No testing of knowledge retention. Not known strategy. | Infrastructure for training. | Uncoordinated development of materials. |
| Ivanovo | Oblast level committed and operative. | Peripheral insufficient means. | Infrastructure in place. | Without external intervention the current system will endure. Charging for service in a system that is not based on this. |
| Kazakhstan | NTBC supervises oblast level. | Insufficient funds for supervision at raion level. | | |
| Uzbekistan | 6 weekly. Use of checklists. | | 3 monthly. | Not sustainable for lack of funds. |
| Ukraine | | | | |
| Kosovo | | | | |

| IEC | | | | |
|-------------------|---|--|--|--|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | | | | |
| Latvia | | | | |
| Orel | Seems to be well done. | No strategy in place. | Media access. | Misinformation. |
| Ivanovo | Seems to be well done. | No strategy in place. | Media access. | Misinformation. |
| Kazakhstan | KAP survey was conducted. | No adequate IEC materials have been developed yet. | Findings of KAP survey to better target risk groups. | Groups at risk are not reached by general HE. |
| Uzbekistan | KAP study done and more planned. IEC gets more attention in near future. | Frequent turnover of HOPE's IEC staff. | HOPE and Zdrav Plus can pool efforts and findings. Ideas about mobilizing volunteers for peer-education. | Few local staff qualified in IEC. |
| Ukraine | KAP survey is an insightful step in developing educational materials. | Most affected groups have been left out. | Include these groups. PATH could be approached (funded) to reach and provide services to marginalized groups. | |
| Kosovo | There is a comprehensive IEC program in place, including mass media, school and teacher education. Health education is introduced in the intensive phase of treatment. Patronage nurses reinforce information about continued treatment. The health education is based on the original KAP survey. | The IEC campaign for the general population was introduced before TB health services were appropriately strengthened. The attention to IEC may not have been the best use of resources. | Materials developed by DOW can be disseminated to a wider audience. A repeat KAP survey is being used to evaluate past efforts and create more effective education materials. | If service delivery is inconsistent with expectations raised by the IEC campaign, it will discourage patients from seeking care in the public sector |

| INFECTION CONTROL | | | | |
|--------------------------|---|---|---|---|
| | Strengths | Weaknesses | Opportunities | Threats |
| Estonia | | | | |
| Latvia | Good new equipment. UV lamps and HEPA filters provide some reduction in bacilli. Proper waste disposal techniques are practiced. High-risk procedures are done in safety cabinets. Lab staff were trained in rapid diagnosis and molecular biology. | Patients mix when they go out in corridors. Not understood by everyone. Doors between wards open: possibility for transmission. UV lamps and HEPA filters are less effective than a ventilation system. Expensive system to maintain (requires proper disposal). Lack of proper sputum collection rooms. Adherence to accepted administrative procedures is not enforced. | With little input, the administrative procedures could be easily implemented. Recommendation: An infection control nurse should be introduced. Recommendation: staff training is needed. Lab tests contribute to rapid diagnosis for isolation of patients in the proper wards. | Rapid diagnosis tests are expensive. Infection control nurse may not have sufficient authority to introduce/IC measures. Lack of funding will threaten rapid diagnosis. |
| Orel | Sensitized. Protocol for sputum collection graded to infectiousity. | Non observed. | Dissemination of the protocol beyond the oblast. | |
| Ivanovo | Sensitized. Protocol for sputum collection graded to infectiousity. | Some masks are unpleasant to wear. | Dissemination of the protocol beyond the oblast. | |
| Kazakhstan | Guidelines exist. | Guidelines are not followed everywhere. | New position of infection control nurse to be established; training by the SPH with help of CDC. | Insufficient funding. |
| Uzbekistan | | | | |
| Ukraine | | | | |
| Kosovo | Infection control has been implemented within the laboratories. | In the clinical setting, there is no strategy for infection control. | There is much renovation of facilities taking place; infection control measures could relatively easily be incorporated into infrastructure renovation. | Management issues override health issues relative to infection control. |