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STRENGTHENING TUBERCULOSIS CONTROL IN MOLDOVA

FINAL REPORT

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ACRONYMS AND ABBREVIATIONS

AID	Acquired Immune Deficiency Syndrome
AIHA	American International Health Alliance
CCM	Country Coordination Mechanism
CPHM	National Scientific and Practical Center of Public Health and Sanitary
DOT	Directly Observed Therapy
DOTS	Directly Observed Therapy, Short Course
DOTS-Plus	Strategy for drug-resistant tuberculosis
DRS	Drug Resistance Surveillance
DST	Drug Susceptibility Testing
EU	European Union
GDF	Global Drug Facility
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GLC	Green Light Committee
HIV	Human Immunodeficiency Virus
IDU	Injecting Drug User
IPP	Institute of Phthisiopneumology
KAP	Knowledge, Attitude, and Practice
KNCV	KNCV Tuberculosis Foundation, Netherlands
LQAS	Lot of Quality Assurance System
MDHS	Moldova Demographic and Health Survey
MDR-TB	Multi-drug Resistant Tuberculosis
MGIT	Mycobacteria Growth Indicator Tube
MoH	Ministry of Health
MoJ	Ministry of Justice
MSH	Management Sciences for Health
MTB	Mycobacterium Tuberculosis
NGO	Non-governmental Organization
NRL	National Reference Laboratory
NTP	National Tuberculosis Program
PAC	Public Awareness Campaign
PHC	Primary Health Care
PIMU	Project Management and Implementation Unit of Global Fund's TB/AIDS Project
PLWHA	People Living with HIV/AIDS
PMEP	Performance Monitoring and Evaluation Plan
PPD	Purified Protein Derivative
RRL	Regional Reference Laboratory
SCTLD	State Center for Tuberculosis and Lung Disease, Latvia
SIDA	Swedish International Development Agency
SMPU	State Medical and Pharmaceutical University "Nicolae Testimianu"
SNRL	Supranational Reference Laboratory
SSM	Sputum Smear Microscopy
SYMETA	System for Monitoring and Evaluation of TB/AIDS
TB	Tuberculosis
ToT	Training of Trainers
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

The *Strengthening Tuberculosis Control in Moldova* project began in December 2003 and concluded in September 2007. USAID funded the project and the American International Health Alliance implemented it. Moldovan health practitioners, educators, students, policymakers, journalists, broadcasters, NGOs, TB patients, and the general population contributed to its success. Collaboration with other international efforts, especially the Global Fund, was instrumental in achieving proposed targets. During the four-year project period, the four planned components were carried out comprehensively and complemented one another. The national TB laboratory network was strengthened, the PHC capacity for TB control was strengthened, surveillance and monitoring of TB was improved, and public awareness of TB was increased.

The project completed the establishment of the Moldovan national TB laboratory network by renovating 4 reference laboratories, revising guidelines on methods, and instituting quality control and feedback procedures. TB laboratories became capable of performing the series of tests for diagnosis and treatment management of drug-susceptible and drug-resistant tuberculosis. The Ministry of Health's policy of placing greater responsibility at the primary health care level for diagnosis and follow-up of TB patients was realized through coordination with ongoing retraining programs and revision of protocols. Surveillance of TB was completely revamped. A fragmented system was replaced with a single system that verifies completeness of data from lab tests to treatment outcomes and flags localized outbreaks and high default rates to TB managers. In line with improvements in the TB control infrastructure, accurate information about symptoms, diagnosis, and treatment was widely distributed. With concerted public awareness campaigns through mass media and direct contact, the Moldovan population received reinforcing information on recognizing TB symptoms, where to present for diagnosis, how TB is treated, and the DOTS strategy.

Output and outcome targets established for the project were largely accomplished. All of the 18 output targets were met or surpassed. More laboratory space, more trainees, and more materials than anticipated were completed under intensive monitoring by a small project staff. All but one outcome indicator was achieved and two of the outcome indicators could not be measured directly. The remaining 11 outcome indicators surpassed the set target value. More patients had advanced lab tests with fewer false results, more suspect cases were referred for diagnosis, more released prisoners continued treatment, and the default rate was reduced further. These factors helped to propel TB case detection, which increased rapidly during the project period. The effects of the project in controlling TB in Moldova will become more apparent over the next 3-4 years.

Noteworthy results and developments related to the project are:

- For all four components, the project surpassed its stated output targets within the four-year period. There were more extensive renovation of laboratories, more PHC and laboratory practitioners trained, a surveillance system designed with greater analytical and patient management functionality, and larger numbers of informational materials distributed.

- Moldova advanced towards the global target of case detection of 70% of infectious pulmonary TB. The case detection rate increased rapidly, from 46% in 2003 to 65% in 2005. Moldova has a substantial distance to cover to reach the 85% global target of treatment success, but the foundation for this has been built.
- The project developed the existing TB control structure, identifying and engaging those with authority and responsibility to make decisions, reach target populations, and sustain local commitment to the changes being introduced. Due to the expertise and cooperativeness of the entirely Moldovan staff, the project advanced TB control towards international standards.
- Because of responsive and expert advice on TB given to the Ministry of Health, the project staff was consulted regularly on directives and began to have a decisive role in TB policies. The project used seminars of high-level decision makers to address and resolve difficult topics, such as indicators for the redesigned surveillance, the algorithm for diagnosis and treatment of all TB suspects, infection control regulations, and patient management protocols for MDR-TB.
- A grassroots organization, *Speranta Terrei*, grew out of the enthusiasm and combined commitment of practitioners, students, and TB patients in Balti and is supporting vulnerable patients to complete treatment. Cured patients are serving as peer educators for patients undergoing treatment.
- Following a presentation by *Speranta Terrei* to the Country Coordination Mechanism, the Ministry of Health and the State Medical and Pharmaceutical University added the TB informational team concept to the medical student practicum requirement so that students practice health promotion along with clinical practice.
- The special needs of vulnerable populations were addressed through existing NGOs, who were already reaching these groups with other activities. Caritas Luxembourg and KNCV Tuberculosis Foundation helped to formulate the policy on post-release continued treatment of prisoners and distributed TB information to prisoner patients. NGOs served as the link to HIV/AIDS patients and migrants.
- Political obstacles were overcome to bring Transnistria into the national TB control system.
- The project helped to realize the stated policies of integrating PHC and TB services and civilian and penitentiary health services for the purposes of TB diagnosis and treatment.

I. INTRODUCTION

The *Strengthening Tuberculosis Control in Moldova* project occurred during a critical period in tuberculosis and health system reform in Moldova and reinforced the shift towards international standards. Moldova adopted the WHO-recommended DOTS (Directly Observed Therapy, Short Course) strategy in 2001 and committed itself to reaching the global TB targets of 70% case detection and 85% treatment success. At the same time, policies with respect to primary health care (PHC) and obligatory national medical insurance supported TB control. The chronology of the principal activities and milestones in TB control overall and in the project are given in the Appendix (Table 1.1). Along with other funds, the project allowed Moldova to put into practice the *National Programme for Tuberculosis Control in the Republic of Moldova for 2001-2005*.

The main purpose of the four-year (2003-2007) project funded by USAID and implemented by the American International Health Alliance (AIHA) was to assist the Government of Moldova in strengthening DOTS and controlling the TB epidemic in line with the *National Programme*. In all respects, the project was a cooperative effort with Moldovan officials and the Moldovan population. The Project Director and the other staff set a tone of working towards common goals and with a coordinated approach.

The project comprised four components: strengthened national TB laboratory network, strengthened PHC capacity in TB, improved TB surveillance, and increased public awareness of TB symptoms and treatment. These interventions were targeted at improving detection, diagnosis, and surveillance of TB and MDR-TB. Treatment was covered by the project only tangentially and is the focus of follow-on programs under the Global Fund Round 6 grant, which begins just as this project ends.

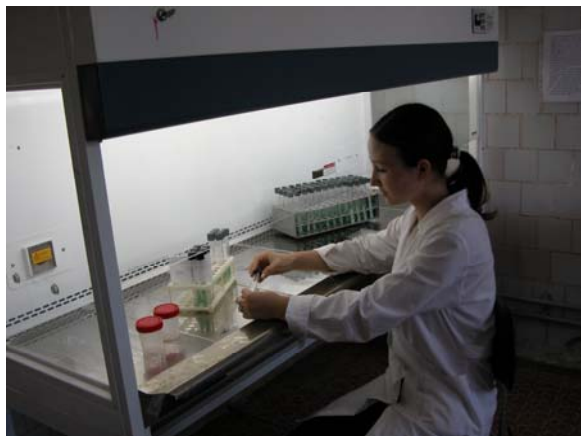
This final report of the *Strengthening Tuberculosis Control in Moldova* project presents the principal results in each component, reviews the progress in Performance Monitoring and Evaluation Plan (PMEP) indicators, and offers lessons and recommendations. An account of step-by-step activities was presented in the quarterly reports and is not repeated in this report, which gives an overview of how the activities fit into the TB control context and contributed to the remarkable progress in TB services in Moldova. More information on the project and tuberculosis trends and policies is presented in the Appendix, which contains the referenced tables and figures.

II. STRENGTHENED NATIONAL LABORATORY NETWORK FOR TUBERCULOSIS CONTROL

II.1 Activities and Results

Building on the establishment of the microscopy lab network in Moldova during 2001-2003, the project undertook to complete the reference lab network. The National Reference Laboratory (NRL) and three Regional Reference Laboratories (RRLs) were reconstructed and reequipped, training of laboratory personnel was conducted, quality control systems were instituted, and revised guidelines were adopted. The NRL and two of the RRLs were redesigned and reconstructed simultaneously and reopened in March 2005, a mere 16 months after the project began. Constant monitoring and intensive engagement in the daily decisions related to the renovation made this feat possible.

The national TB laboratory network became capable of conducting sputum smear microscopy (SSM), culture, and drug susceptibility testing (DST) and assuring the quality of these lab tests. As a result of the project, there was a substantial improvement in work and biosafety conditions. The



Extensive renovations done at four Reference Laboratories in Moldova through the USAID-funded project vastly improved national capacity to diagnose and monitor TB. The renovations also greatly improved safety conditions for technicians and clinicians working in these labs.

upgraded facilities have been instrumental in meeting the increased demand for laboratory tests generated by improved diagnostic skills among practitioners and heightened public awareness. There was a fourfold increase in the number of patients for whom TB diagnostic investigations were conducted, from 12,625 in 2003 to 53,936 in 2006. Moldova came close to the global target of 70% for case detection of infectious, pulmonary TB. According to WHO data, case detection increased from 46% in 2003 to 65% in 2005, the latest year for which data is available. Improved diagnostics have led to more cases being detected and started on treatment, leading to reduced transmission of infection.

One of the most significant outcomes of improved laboratory capability was the approval by WHO's Green Light Committee (February 2005) of DOTS-Plus for MDR-TB treatment in Moldova. Quality-assured culture and DST results were a prerequisite for approval, which permits access to technical expertise in MDR-TB treatment and second-line drugs at concessionary prices. Moldova is now able to proceed with combating this growing threat to TB control.

II.1.1 Renovation and equipment

Nearly 2,500 square meters of laboratory facilities were renovated, covering design, construction, materials, interior furnishing, and ventilation. New ventilation systems were installed in all of the labs and in the MDR-TB ward of the Institute of Phthisiopneumology (IPP) and in the entire building of the IPP. The design and reconstruction were carried out in accordance with prevailing environmental, building, and biosafety standards. The final inspection of the labs was conducted in early 2006. In mid-2007, the labs were formally turned over to the IPP, which operates the facilities for the Government of Moldova. The renovated area in square meters is as follows:

National TB Reference Laboratory	1040
Balti Regional Reference Laboratory	315
Vorniceni Regional Reference Laboratory	650
<u>Bender Regional Reference Laboratory</u>	<u>450</u>
Total	2455 sq. m.

Because the renovation was far more extensive and costly than anticipated, the laboratory equipment was purchased with funds available under the Global Fund Round 1 grant. This was agreed through the Country Coordination Mechanism (CCM), which oversees the National TB and HIV control programs in Moldova. Staff of the *Strengthening Tuberculosis Control in Moldova* and Global Fund projects decided on how to distribute their respective activities in the interest of comprehensive TB control. They placed all of the planned activities for TB in a table and adjusted the responsibility for particular activities in order for all of the measures envisioned in the *National Programme* to be realized. In the case of laboratory improvements, AIHA agreed to be responsible for renovation, guidelines, and training; and the Global Fund agreed to be responsible for equipment. These adjustments allowed each organization to concentrate on the parts more suitable for it, with AIHA using its expertise in training and the Global Fund using its expertise in procuring equipment.

Laboratory equipment and supplies costing \$500,000 were purchased by the Global Fund and installed in the NRL and RRLs. In addition, the Global Fund project provided \$250,000

in reagents and other supplies for the microscopy centers. This substantial and coordinated action has created a functioning TB laboratory network in Moldova.

Because of AIHA's expertise in overseeing design and renovation contracting for TB facilities, the Ministry of Health (MoH) requested technical assistance on the MDR-TB ward at Vorniceni TB Hospital. This project was included in the Global Fund Round 6 grant and the preliminary design required revision with respect to infection control measures. AIHA negotiated a contract with Archiconi-Grup, the firm which reconstructed the reference labs, and the MoH has committed to revising the design accordingly.

II.1.2 Guidelines and quality assurance

The *Strengthening Tuberculosis Control in Moldova* project raised operational standards along with the upgraded physical infrastructure of TB laboratories. Revised guidelines for microscopy, culture, and DST were formulated in accordance with the DOTS strategy and in consultation with the MoH and IPP. The Laboratory and Surveillance Specialist assisted in drafting guidelines on the structure and procedures for microscopy centers and reference labs. AIHA's staff gained a reputation as experts in international TB standards and MoH officials consulted them regularly on designing official policies. This cooperative relationship contributed to advancing the project's objectives and acceptance of international practices in Moldova. The titles of policies and guidelines issued during the project period are listed in the Appendix (section 3).

An internal and external quality assurance system was established, linking the microscopy centers, the RRLs, and the NRL; and linking the NRL to a Supranational Reference Laboratory (SNRL) in Borstel, Germany. The tasks of the microscopy centers are receipt of specimens; smear preparation; Ziehl-Nielsen staining; and microscopy investigation of TB suspects and of TB patients during the continuation phase of treatment. The tasks of the RRLs are microscopy investigation; isolation and identification of *M. tuberculosis complex* (*MTB*) by culture investigation; DST on *MTB* culture for first-line drugs; and quality control of microscopy centers. The NRL, located at the IPP, functions as the coordinating body for TB microbiological services in Moldova. Its tasks are microscopy investigation; isolation and identification of *MTB*; DST for first- and second-line drugs; training of laboratory network staff; standardization of lab methods; elaboration of regulations; epidemiological survey of anti-TB drug resistance; internal quality control of microscopy, culture, and DST; and external quality control of DST.

Quality control of smear microscopy is carried out quarterly using the Lot of Quality Assurance System (LQAS) method. The NRL sends lab specialists to conduct supervisory visits according to checklists and visit protocols. They send the marked checklists and collected smears for verification to the NRL. The results are sent back to the microscopy centers along with conclusions and recommendations.

Internal quality control of culture media is carried out on each batch of media. For internal quality control of DST, a reference strain (*H₃₇R₂*) susceptible to all drugs to be tested is used. The serial drug concentration method is used to determine variations in minimal inhibitory concentration.

In December 2005, the NRL established an official relationship with the Reference Center for Mycobacteria, Forschungszentrum, to serve as the SNRL and conduct external quality control of DST. The NRL and SNRL exchanged a panel of 20 *MTB* strains. Each quarter, the NRL sends a panel of 20 strains to the SNRL for quality control. The panel sent for rechecking includes 100% of resistant strains and 10-20% of susceptible strains. Tables 3.1-3.3 present the results of DST quality control for the National Reference Lab for December 2005, March 2006 and September 2006. Sensitivity ranged from 91.7% to 100% and specificity ranged from 75% to 100% for the first-line drugs streptomycin, isoniazid, rifampicin, and ethambutol.

II.1.3 Training

Because of the considerable changes in laboratory facilities and guidelines, the project undertook an extensive training program on lab diagnostics and drug resistance surveillance. Practitioners were thus able to apply the large investment in laboratories in directly improving TB diagnostics. AIHA conducted training with project funds and under a contract with the WHO's European Regional Office, which allowed an increased number of lab personnel to be trained. The State Medical and Pharmaceutical University "Nicolae Testimitanu" (SMPU), Caritas Luxembourg, KNCV Tuberculosis Foundation, and Management Sciences for Health (MSH) supported the training in laboratory and surveillance methods. The purpose of the training was to improve skills in smear microscopy, culture, and DST; to teach about the lab network, quality control, and Drug Resistance Surveillance (DRS) protocols; to explain surveillance functions in TB control; to explain procedures and steps in data flows in TB case management; to teach TB doctors and lab personnel to complete TB lab forms (TB-05 and TB-06); and to motivate TB personnel.

Training of trainers (ToT) was conducted at the State Center for Tuberculosis and Lung Diseases (SCTLD) in Riga, Latvia, for selected laboratory doctors from the NRL and the RRLs. This training covered new microbiological methods for TB diagnosis, quality control and quality assurance procedures, laboratory management, and DRS. The trainers then conducted training at the NRL for TB doctors from municipal and rayon TB cabinets; for lab doctors and technicians from reference labs; and for lab technicians from microscopy centers. As indicated in Table 2.1, 364 laboratory doctors and technicians were trained during 2003-2007. Training of TB doctors (phthisiopneumologists) in lab diagnostics furthered their understanding of the lab network's functions and the effective use of tests for diagnosis, case management, and surveillance.

Five courses were designed and conducted for the WHO European Regional Office. All of the courses covered the principles of TB control consistent with WHO recommendations. The first course, "Laboratory TB Diagnostics and Drug Resistance Surveillance," was presented to TB doctors and covered the structure and goals of the lab network; and the reasons for, and prevention of, the development of drug resistance. The second course, "Culture Methods and TB Resistance Surveillance," was presented to doctors, residents, and lab technicians from reference labs and covered microscopy, culture, DST, and drug resistance surveillance. The third course, "Sputum Smear Microscopy in TB Lab Diagnostics," was presented to lab technicians from microscopy centers and covered TB epidemiology; lab network; quality control; DRS protocols; lab methods; and safety procedures. The fourth course, "Drug Sensitivity Testing Method in TB Microbiological Laboratories," was presented to doctors and lab technicians from reference labs and covered

modern methods of DST; monitoring and supervision of DST; and compilation, validation, and analysis of drug resistance surveillance data. The fifth course, “Quality Assurance and Quality Control in Microscopy Method,” was presented to doctors and lab technicians from reference labs and covered quality assurance and quality control methods for microscopy; and monitoring and supervision of microscopy.

II.2 Lessons and Recommendations

Laboratory renovation was the largest expenditure in the *Strengthening Tuberculosis Control in Moldova* project. Because of the dilapidated condition of TB reference labs and the importance of diagnostic accuracy, the lab network required early and concentrated attention. AIHA’s Laboratory and Surveillance Specialist had a long association with the TB microbiological services in Moldova and continues to work in TB control in Moldova. His thorough understanding of what was required to bring the network up to international standards and his hands-on participation in the myriad decisions related to labs was critical. He helped AIHA transform the lab network from within and leave it with sustainable results. The project benefited enormously from local knowledge and commitment, lessening the time for implementation and yielding appropriate interventions.

The improvements in physical infrastructure were matched by revision of guidelines and training of personnel in new methods. Lab personnel and TB specialists learned to apply the improved diagnostic capability to increase case detection. Close coordination with donors and partners allowed joint decisions on using available TB funds and consistency between policy decisions and TB control investments. AIHA participated in the CCM and cooperated with the MoH and the Global Fund to implement national plans.

There are three important recommendations for further development of the lab network. The first is continuing training of laboratory personnel; the second is ensuring further sustainable development of the renovated facilities; and the third is improving quality control and quality assurance methods, especially with respect to external quality control by the SNRL. The new equipment and new methods require greater skill and the turnover of personnel means that new staff has to be trained regularly. The quality control procedures are only beginning to be instituted and need more strengthening to ensure that accurate results are underpinning diagnostic and treatment decisions. Finally, laboratory equipment maintenance costs need to be appropriately budgeted by the beneficiary to insure that equipment investment is fully realized.

III. STRENGTHENED PRIMARY HEALTH CARE CAPACITY FOR TUBERCULOSIS SERVICES

III.1 Activities and Results

Under the *2001-2005 National Programme*, PHC was given responsibility for TB detection and continuation phase treatment. The policy stipulated that PHC specialists were to refer suspected tuberculosis cases to TB doctors for diagnosis and initiation of treatment. TB doctors were to oversee intensive phase treatment and patients were to return to PHC for DOT (Directly Observed Therapy) during the continuation phase. PHC was also made responsible for treating released prisoners who had not completed TB treatment when they left prison.

The *Strengthening Tuberculosis Control in Moldova* project assisted in implementing these policy changes through training and revised protocols. Several entities were involved in this significant reshaping of TB control, including the MoH, Ministry of Justice (MoJ), IPP, SMPU, the World Bank, Caritas Luxembourg, and KNCV Tuberculosis Foundation. Training in PHC/TB was set up in collaboration with the World Bank's PHC retraining program and the Departments of Phthisiopneumology and Family Medicine at SMPU. A three-day TB module was added to an ongoing four-week training and the same PHC trainees continued with the TB module. This collaborative effort yielded consistency with the overall direction of PHC/TB responsibilities and low training costs for the project, of about \$40 per trainee. By mid-2007, a total of 898 doctors and 1204 nurses had been trained, exceeding by four times the planned number for the project. The trained personnel represent about one-third of the active PHC workforce in Moldova (Table 2.1).

Training and definition of protocols for PHC/TB integration and for prisoner follow-up have brought PHC practitioners into the TB control system. Integration is at an early stage and the concomitant changes in practices and perceptions will come about gradually. PHC offers accessibility, easing timely referral for diagnosis and lab confirmation and supervision of treatment completion. Since 2004, the state medical insurance company has recorded PHC visits on the basis of payments made to practitioners. PHC patient visits for all causes (including TB) increased overall from 8,826,323 in 2004 to 9,724,745 in 2006, though there was a decrease between 2005 and 2006. Ambulatory visit data (for all causes) indicate, however, that PHC is not seeing more ambulatory patients and the rate remained at about 50% of all ambulatory visits from 2003 to 2006. At the same time, there was an upsurge in ambulatory visits to TB doctors (phthisiopneumologists) and infectious disease doctors. In 2006, nearly 20% of ambulatory visits were to TB doctors and nearly 17% of ambulatory visits were to infectious disease doctors. In 2003, these doctors saw only 1-2% of ambulatory patients. The increase was particularly sharp between 2004 and 2005, suggesting that the population has become more informed about TB symptoms and diagnostics and that larger numbers of symptomatic cases are seeking care and doing so directly at TB services.

III.1.1 Training

Two groups of trainers were selected from SMPU and the Medical College of Nurses to conduct PHC/TB training. Each group consisted of a PHC doctor, a PHC nurse, and a TB doctor. ToT training was conducted for the trainers in 2004 at the SCTLD in Latvia, which has relevant regional expertise in integrated PHC/TB patient management. Prodidactica Center in Chisinau trained the trainers in interactive methods of teaching.



Curricula and related professional education materials developed through the project were used to train 898 physicians and 1,204 nurses working in primary care how to better diagnose, treat, and prevent tuberculosis.

AIHA's staff and the trainers jointly prepared the curriculum, with guidance from SCTLD, and revised it during the course of the project. They also adapted and reprinted WHO's "Pocket Guide on PHC-TB," published originally under the Moldova-Romania Cross-border Initiative, and distributed it to trainees and TB and PHC institutions. Three editions of the curriculum prepared by the *Strengthening Tuberculosis Control in Moldova* project were published,

each revision taking account of updated information and feedback from trainers, trainees, MoH, IPP, and SMPU. The first edition covered the basic principles of TB and the subsequent 2 editions expanded the curriculum on infection control, MDR-TB, and DOT and the role of the practitioner in treatment compliance of patients. In total, about 3,000 copies of WHO's "Pocket Guide" and 2,000 copies of the "Curriculum on TB Control for PHC Specialists" were distributed by the project (Table 2.2).

Doctors were taught in one group and nurses were taught in a separate group, using the same curriculum. Training segments for each topic consisted of a short lecture and clinical case presentation, followed by questions and answers related to the clinical case. The training emphasized practical and clinical skills development. The topics covered: TB epidemiology, DOTS, PHC role in TB control, infection control, detection and diagnosis, treatment regimes, and contact investigation. The contents of the curriculum are given in the Appendix (section 2).

Pre- and post-tests of trainees indicated an increase in the level of knowledge of 18% for nurses and 23% for doctors. Trainees participated actively and raised many questions related to clinical situations from their own experience. After returning to their practices, trainees telephoned trainers to ask advice on specific clinical manifestations they were encountering. Based on problems identified by trainees, a retraining series was prepared to cover MDR-TB, TB/HIV co-infection, and TB in pregnancy. This retraining was presented via videoconference to PHC practitioners and the chief TB doctor and the chief doctor in each district. They keenly discussed the epidemiological situation in their districts and its relationship to the training topics.

Trainers participated in public awareness campaigns (PACs) with students and spoke to journalists about coordination of patient management between PHC and TB. They helped to demonstrate the community outreach functions of practitioners and played their part in encouraging presentation of symptomatic cases and increasing detection.

III.1.2 Protocols on PHC/TB integration

AIHA assisted the MoH to design protocols for integrating TB control between the separate TB and PHC services. These protocols were based on WHO standards and the responsibilities spelled out in *Order 180* which accompanied the *2001-2005 National Programme*. The procedures were defined for referring patients after detection at the PHC level to diagnosis and intensive phase treatment at TB services and referring patients back to PHC for continuation phase treatment. The PHC/TB protocols were officially discussed and accepted at a national conference in March 2005.

TB and PHC practitioners have been learning each other's roles and their joint responsibilities in the referral of TB suspects and patients, the algorithm for symptomatic cases, laboratory diagnostics, treatment regimens, and infection control. The division of responsibility between PHC and TB services is still being formed and adjusted. Training is serving to define roles as well as to develop skills. In February 2006, AIHA helped to sponsor a combined conference of the Moldovan Republican Society of Phthisiopneumologists and the Moldovan Republican Society of Family Medicine. This was an opportunity for the 200 participants to discuss the integration of TB and PHC services,

among other agenda items. The project used the occasion to distribute TB informational materials to practitioners, as it has done at other conferences and meetings.

PHC practitioners have reported experiencing difficulties in overseeing the continuation phase of treatment. They have requested more practical guidance on patient education and counseling for treatment, on DOT, and on community support for patients. There are many new concepts that have been introduced with the integration and the DOTS strategy. Practitioners are learning that default depends not only on the patient and that practitioners have an important function in managing patients and helping them adhere to treatment. Contact investigation and controlling transmission are being introduced in the new *National Programme of Tuberculosis Control and Prevention for 2006-2010*. This will cover identification of close contacts, isolation, prophylactic treatment, hygiene, and addressing the needs of family members.

III.1.3 Treatment continuation for released prisoners

Because penitentiaries account for about 10% of total TB cases registered annually in Moldova (including Transnistria), follow-up treatment of prisoners after release is important to controlling transmission and increasing treatment success. While incarcerated, prisoners receive regular diagnostic and treatment services provided by penitentiary health services. Released prisoners are expected to continue treatment at the PHC clinic near their place of residence. PHC was given the responsibility for the follow-up treatment, but referral procedures and protocols for locating and addressing the needs of this vulnerable group were missing.

In cooperation with Caritas Luxembourg and KNCV Tuberculosis Foundation, AIHA helped the Government of Moldova to develop a policy on coordinated TB services between penitentiary and civilian health services. The two NGOs have a longstanding involvement in TB care for prisoners and have been distributing TB public awareness materials in prisons. They identified impediments faced by released prisoner patients and procedures that would help prisoners to complete treatment. These were formalized into protocols and accepted by the MoH and MoJ in July 2004. According to the protocols, the MoJ informs the MoH about every case of a released prisoner who is a TB patient. The MoH then follows up the case through PHC clinics which are to provide continuing treatment. KNCV Tuberculosis Foundation gives financial incentives to released prisoners to complete the continuation phase and remain under DOT. They receive a small sum for every instance of supervised drug intake and another small sum as a bonus at the end of the month. From 2003 to 2006, the number of released prisoners served by outreach on TB treatment increased from 0 to 72 (Table 1.2).

III.2 Lessons and Recommendations

Integration of PHC and TB services is being accomplished with the close collaboration of donors, ministries, and NGOs. International standards of referral and follow-up are being introduced along with the revised responsibilities.

The project offered inexpensive and coordinated training by combining efforts with ongoing programs and selecting trainers from SMPU faculty. A regional center, the SCTLD, provided practical expertise on curriculum and ToT for PHC/TB integration. Local entities were the principal drivers in shaping the protocols for a strengthened role for PHC in TB, with the

project helping them to reach agreement. The advice of local practitioners, officials, and NGO workers was critical for making the changes relevant and for continuing the adjustment in functions and necessary skills for TB and PHC personnel.

The recommendations for PHC/TB concern the need for continued training and a greater role in treatment adherence. Training conducted by the project was an important start. Regular and more extensive training is recommended to make the significant policy changes operational and to reap the benefits of improved labs, surveillance, and public awareness. As lab diagnostic capability increases and presentation of suspect cases increases, PHC doctors and nurses require more training on diagnosis and treatment algorithms and treatment regimens.

Moldova has received support from the Round 6 of the Global Fund to continue training in DOTS, MDR-TB and related areas. There is a need for continuous monitoring of the effectiveness of the training provided. In this regard, the NTP needs to be strengthened in terms of monitoring and evaluation of the quality of training and practices implemented. Current estimates are that 65% of TB patients in Moldova receive DOT. More involvement of PHC in DOT during the continuation phase and more patient counseling on treatment adherence is recommended. High default rates are a factor in low treatment success rates in Moldova. Practitioners have indicated that they would like to learn what and how to discuss transmission and treatment with patients and families. Patient-centered care is one of the stipulations of the International Standards of Tuberculosis Care. PHC and TB personnel have to help patients see the value in completing treatment and provide education and encouragement. Additional services and incentives for patients, who tend to be largely from marginal groups, could have a role. Social services for TB patients are lacking in Moldova, with only a limited number of social workers located in rayon centers.

Taking into consideration the prominent contribution of prisons to Moldova's TB burden it is imperative that the program initiated for follow-up treatment of prisoners after release be continued. It is also critical that the program be expanded with the support of the Transnistrian regional authorities to include Transnistrian prisons as well.

IV. IMPROVED TUBERCULOSIS MONITORING AND SURVEILLANCE

IV.1 Activities and Results

In designing the surveillance system for TB, AIHA initiated discussions with the CCM and UNAIDS on combining infectious disease surveillance on a common platform. Agreement was reached on the System for Monitoring and Evaluation of TB/AIDS (SYMETA), with AIHA taking responsibility for SYME TB and UNAIDS, and the World Bank taking responsibility for SYME AIDS. Based on the agreed platform, AIHA undertook wide collaboration with TB specialists, epidemiologists, and international and local organizations, including the Global Fund, World Bank, UNAIDS, Management Sciences for Health (MSH), MoH, IPP, the National Scientific and Practical Center of Public Health and Sanitary Management (CPHM), and the National Center for Preventive Medicine. CPHM served as the principal agency in the effort and now oversees the operations of SYME TB. Overhauling TB surveillance entailed identifying data requirements and indicators, designing software, installing hardware, and testing and refining the system. AIHA managed this

process, bringing together disparate views on which indicators and which reporting forms were to be included. A high-level workshop was held in March 2006 to forge agreement on the indicators (Appendix, section 6). Reporting forms for newly registered TB cases, lab results, and treatment were revised in consultation with the MoH and IPP.

Once the system parameters were agreed, AIHA engaged a local contractor, QSystems, to develop the software for SYME TB and acted as the intermediary between the contractor and CPHM as the software was being developed and tested. After QSystems had conducted initial testing, CPHM requested additional features to improve functions. QSystems agreed to introduce these modifications into the system and proceeded with final testing of the software. Several roundtables were held to discuss the results of the final testing with the end-users of the system.



AIHA worked with key stakeholders to design an effective TB surveillance system, which also integrated monitoring and surveillance of all infectious diseases on a common platform. The new system provides linked information, making it much easier to analyze trends and adjust strategies for stemming the spread of TB and other infections.

The previous TB surveillance system and reporting forms had yielded fragmentary data and weak capability in analyzing trends and signaling problems. The current system provides linked information and makes it available instantly to users of the system. The data generated is included in a quarterly report on infectious diseases produced by the MoH. SYME TB operated in parallel with the previous system for one year, from September 2006 until September 2007. It has completely replaced the previous surveillance system as of September 2007, which also marks the end of the *Strengthening Tuberculosis Control in Moldova* project.

IV.1.1 Description of system

SYME TB produces data by district (*rayon*) on case notifications, treatment results, laboratory tests, and drug resistance. A list of its 58 indicators, which are consistent with international standards, is given in Table 4.2. The largest number of indicators (42) pertains to case notifications. Examples of these indicators are the number of TB cases notified from prison, the rate of smear- and culture-positive relapse and re-treatment pulmonary cases, the distribution of new cases by age and sex, and the prevalence of all TB cases. Indicators pertaining to treatment results (4) allow users to see treatment outcomes for new and relapse cases by smear status at treatment initiation. Laboratory indicators (7) give the results of microscopy and culture examinations, rates of pulmonary cases with discordant smear and culture results, and the rate of smear-positive cases at treatment completion. Indicators pertaining to drug resistance (5) give rates of primary and secondary resistance and data on resistance by previous treatment.

Altogether, AIHA and the Global Fund provided 4 servers and 100 computers for the system's hardware (Table 4.1). The two main servers for SYME TB and 11 computers are housed at IPP and CPHM. The NRL and the 3 RRLs each have 1-2 computers. There is at

least one computer located at each of the 32 rayon centers in Moldova. Other computers are located at TB hospitals and rayon, municipal, and penitentiary medical institutions in Moldova and Transnistria. The remaining servers and computers provided by the Global Fund are being used for joint surveillance of TB and HIV/AIDS.

A new reporting and recording document, #089-1/(e), was designed to compile information from the standard TB reporting forms, TB-01 through TB-08. It consists of three parts, labeled A, B, and C. Part A is related to notifications and laboratory data; part B is related to treatment results and laboratory data monitoring; and part C is related to re-treatment and chronic cases. TB and PHC doctors and laboratory personnel complete the required information in the TB reporting forms. Data from these forms are entered into the system by data operators located at rayon centers, hospitals, and laboratories where the forms are collected. Altogether, 190 surveillance data operators were trained to extract and enter information. CPHM verifies the completeness and accuracy of the data. When patient information is missing, CPHM contacts the doctor or lab technician and requests the required information. The system signals, for example, if data in parts B and C, which is entered later, is not sent within the specified period.

SYME TB is available on the web (www.monitoring.mednet.md), allowing universal access to aggregate data on TB trends in Moldova and password-protected access to individual data records. Designated personnel have been assigned passwords that allow them to use all functions of the system. Personnel at rayon centers can view individual records for any TB patient in Moldova and can revise records for patients within their own district. This is a considerable achievement for TB control in a country in which different paper reports to two separate agencies and lab results not linked to case notification were the norm for TB surveillance.

IV.1.2 Analysis and management capability

A draft manual has been prepared for the users of the system. It lists the indicators, including definition, description, frequency of reporting, and formulas for calculating the indicator. SYME TB has much broader functionality than producing statistical reports. TB managers can use the system on a daily basis for analyzing results and the TB situation in particular districts. The information can be used to respond to problems and to base policy revisions. The MoH, IPP, and TB doctors can use it to improve patient management and TB control. A TB doctor can check in SYME TB whether a new patient had been treated previously, had a prior DST result, and the treatment regimen administered at the hospital. This information improves significantly the doctor's ability to order appropriate diagnostic tests and treatment regimens.

Training in analyzing SYME TB reports has been provided to 30 managers at NTP. SYME TB allows the MoH and NTP to know rapidly when TB incidence or default becomes especially high in a particular district. National NTP managers can respond by contacting the regional NTP coordinator, the rayon center for sanitary management, and the director of the TB hospital to discuss how to address specific problems in the district. If data reporting is incomplete from a district, the NTP can act quickly to pinpoint gaps in personnel or training. The immediacy of the action is critical in interrupting transmission and containing outbreaks.

Drug resistance is a significant impediment to controlling TB and improving treatment outcomes in Moldova. In consultation with WHO, a TB resistance survey is underway. SYME TB is making possible surveillance of drug-resistant TB. An MDR-TB module was added to the software and started to function after finishing the industrial testing at the end of September 2007. Having drug-resistance surveillance data will allow NTP to authorize isolation in particular penitentiaries and hospitals and to follow MDR-TB cases. Infection control and patient management will be strengthened as a result of better surveillance.

More complete data on TB means more cases registered, more lab tests recorded, more deaths recorded, and more capability for tracking patient progress. SYME TB links all of the information for a patient, from initial diagnosis to treatment outcome and indicates if the patient was treated previously. It gives practitioners and policy makers the ability to use the information for making decisions.

IV.2 Lessons and Recommendations

For those involved in TB control in Moldova, SYME TB has given a significant boost to their ability to manage the epidemic. The system's features respond to the identified gaps in the previous system, such as duplicate reporting channels and the absence of complete information on a patient. SYME TB was the result of a collaborative effort and the expressed requirements of practitioners, epidemiologists, and TB managers. AIHA enabled local practitioners and officials to define the parameters while designing a system compatible with international norms. TB control personnel view the availability of data and the ability to enter and manipulate data via the web as a considerable advance.

Only a few officials in Moldova are versed sufficiently in this new, robust system. The principal recommendation with respect to surveillance is to offer the means for more practitioners and TB managers to learn how to use the information and the capability of the system. High-level managers at the NTP and MoH need to learn what the surveillance reports contain, what the data signals about gaps in TB control, and what types of data can be generated. TB doctors need to be trained in completing reporting forms and in using SYME TB for treatment management. They need to learn how to locate patients and gather data on their lab examinations in the system's records.

SYME TB has enormous potential in the amount and types of information available for surveying TB and MDR-TB. Training for personnel and more managerial personnel at NTP are needed for the information to be used for a more timely response to problems. Analysis of the data can serve in developing evidence, for example, of the benefits of additional personnel for DOT for specific groups of TB patients.

V. INCREASED PUBLIC AWARENESS OF TUBERCULOSIS

V.1 Activities and Results

AIHA undertook extensive public awareness campaigns (PACs) to reach the population of 4 million Moldovans, including inhabitants of Transnistria. Many different means were used to place information in the hands of the public, including television, radio, newspapers, events, clinics, schools, enterprises, district rural post offices, open-air markets, and urban minibuses. Informational teams, a Healthy Bus, and NGO peer educators provided

information through direct contact. Medical practitioners were included in the campaigns and in the distribution of materials. They were the first target audience, with a campaign to help dispel their mistrust of DOTS and to give them accurate information for their own use and for patient education.

On World TB Day (March 24) each year, AIHA coordinated events with other organizations, such as WHO's local office, Caritas Luxembourg, Global Fund's TB/AIDS Project, MoH, and NTP. The *Strengthening Tuberculosis Control in Moldova* project awakened interest in TB among NGOs and the general public. From the start of the campaigns, NGOs have requested additional materials and training. Medical practitioners, especially PHC doctors and nurses in rayons, noted that the informational materials were comprehensible for the public and addressed the project for many additional copies. Although 270,850 pieces of informational materials were distributed by the project, there continues to be an unmet demand in Moldova, where TB communications activity had been dormant for the previous 15 years.

The project staff conducted the activities themselves and monitored the steps carefully, developing a base of knowledge within AIHA and reaching a broad spectrum of the public at low cost. The Senior Health Communications Specialist designed the logo and key messages, with the input of focus groups, arranged campaign events, and verified the distribution of materials. She convinced radio and television stations to broadcast without charge the project's audio and video clips and engaged journalists, practitioners, medical college students, and NGO workers in explaining TB symptoms and treatment and distributing materials. The personal, hands-on role of the entire AIHA staff in imparting TB information resulted in a large amount of good quality communications that now has a strong local foundation. One of the most significant results of communications activity is the formation of the first Moldovan NGO, *Speranta Terrei*, dedicated to providing TB information and supporting TB patients.

V.1.1 Public awareness campaigns

In the initial assessment, AIHA found a dearth of accurate information on TB and DOTS for practitioners and patients. Doctors even lacked a basic schema to show patients how TB is transmitted. The tone of previous TB messages in Moldova had been somber and evoked hopelessness about the disease. AIHA staff compiled and reviewed materials, messages, and Knowledge, Attitude, and Practice (KAP) surveys from recent campaigns in regional countries. A KAP survey was undertaken by the project in June 2004 and the results were used to define the main goal and to formulate the key message of PACs. The executive summary of the KAP Survey is enclosed in the Appendix 5.

According to the KAP survey, television (79%) and radio (57%) were the principal means of receiving TB information in Moldova. General knowledge of TB was high, with 88% of respondents saying TB was contagious and 62% of respondents saying TB was transmitted through the air. Specific knowledge on symptoms and curability was lower. Only 12.9% of respondents clearly indicated that TB could be treated and only one symptom (cough) was identified by 48.8% of respondents. The messages were designed to address these gaps. Audio and video clips were produced to reach the broadest segments of the population. A logo was designed in bright yellow with a positive message that TB can be treated.

Altogether, 6 PACs were conducted in Moldova and Transnistria. The first campaign was targeted at practitioners with the key message “Tuberculosis can be cured! DOTS is the most effective strategy for TB control.” In the second through fifth campaigns, for which the audience was the general public in different districts, the dandelion flower logo and yellow color remained the same and the key message was modified to “Tuberculosis can be cured! See the doctor timely!” The sixth and last campaign was nationwide and introduced the subject of stigma with the key message “Tuberculosis can be cured! TB patients need your help.” A new public service announcement and poster-calendar (in blue) were added, with the original dandelion logo remaining in the corner on all informational materials. The timing, location, key message, and main events of the 6 campaigns are given in Table 5.1.

The first PAC addressed practitioners and gave them information on DOTS and TB diagnosis and treatment. These materials were distributed at medical meetings and gatherings. For the second PAC, the advice and feedback of doctors and TB specialists was sought to modify the materials to make these comprehensible, readable, and useable for a general audience. These materials formed the core of the print materials used in subsequent campaigns. The second PAC was targeted to the general public in Chisinau and the central districts of Moldova. The main goal of the campaign was to convince the public to seek care immediately from a doctor after the onset of TB symptoms. Video and audio clips were designed to show symptoms and a symptomatic person going to the doctor for treatment.

The third PAC centered on Balti, the principal city in the northern districts and burdened by a high prevalence of TB and HIV/AIDS. This campaign led to a much greater involvement of those affected by, and treating, TB and led to the development of informational teams who trained teams from other districts. *Speranta Terrei* grew out of the enthusiastic participation of medical students and practitioners in the Balti PAC. *Speranta Terrei*'s membership now includes cured patients who are helping current, vulnerable patients to complete treatment.

The fourth PAC was targeted at youth in Chisinau and the general public in Transnistria, a frozen conflict region in eastern Moldova. For most official matters, Transnistria has remained apart from the rest of Moldova. But, it has joined in efforts related to laboratories, PHC, surveillance, and public awareness, taking steps to overcome political obstacles in the interest of TB control. The PAC in Transnistria was adapted to the fewer mass media outlets and restrictions on public service announcements.

The fifth PAC was conducted in Cahul and the southern districts, where previous health promotion programs were incorporated into the TB campaign. A “Healthy Bus” from an EU project, “Health Promotion and Disease Prevention,” was made available for the PAC. During 36 field trips to 15 villages selected for low socioeconomic status, the “Healthy Bus” gave the message directly to rural inhabitants, making public address announcements and distributing materials. The direct contact was especially important because of the limited mass media in Cahul.

The sixth PAC was conducted nationally to address stigma. The KAP survey indicated moderate levels of stigma in Moldova. When asked if a person would try to hide having TB, 37.7% of respondents answered affirmatively; and when asked if having TB is considered a shame, 19.6% of respondents answered affirmatively. A new audio and video clip was

designed to elicit empathy with TB patients, showing that illness in one person cannot be separated from others. The key message, “Tuberculosis can be cured! TB patients need your help” focused attention on patients. The PAC comprised television and radio broadcasts and the actions of 5 NGOs which collaborated with AIHA. These NGOs organized charitable events to collect in-kind donations and children’s events for family members of TB patients. A television talk show, entitled, “Don’t avoid TB patients – help them” was presented on the program “Buna seara, Moldova!” (“Good evening, Moldova!”). TB specialists and activists from *Speranta Terrei* participated in the show, which led to offers of assistance for TB patients from owners of businesses and pharmacies.

V.1.2 Distribution and outreach

PACs consisted of a series of events, covering broadcast of clips, distribution of materials, and presentations to the public and particular groups by volunteer informational teams and NGO workers (see Table 5.1). Except for the longer campaign on stigma, the campaigns were conducted over 2-3 months. As the campaigns took place, the project adjusted the delivery of the message. Monitoring results after the first and second PACs indicated that greater community involvement would help to convey the message more effectively. Informational teams were formed and trained to address vulnerable populations and audiences in schools and enterprises. In total, these teams held 1506 meetings with the public, providing reliable information on TB symptoms, detection, and treatment directly to nearly 90,000 Moldovans. Considering that meeting participants conveyed some of the information to their family and friends, the reach of the information is likely to be wider.

Doctors told the project staff that more information should be targeted in rural areas, where most of the Moldovan population resides. AIHA arranged for the postal service, Posta Moldovei, to hand TB flyers to urban and rural residents when they came to pay utility bills at the post office. NGOs assisting HIV-infected persons and drug users became involved initially when the PAC was conducted in Balti, where the prevalence of these conditions is high.

Many channels were used to spread the key message. Information was distributed at practitioner meetings and training sessions, at events related to PACs, during radio and television broadcasts, and through NGOs by peer educators. AIHA trained the staff of 23 NGOs providing services to drug users, HIV-infected persons, and commercial sex workers on TB communications and gave them materials and guidance on the key messages (section 5 of Appendix). These NGOs became the means of reaching directly the vulnerable populations with whom they had ongoing contact. The trained NGO staff reached about 300 of their clients. Posters and stickers on public transport and brochures at the post office and social service agencies allowed TB messages to be disseminated in a convenient way and when interest was heightened by mass media. Practitioners continuously distributed material to their patients. Seminars for journalists were held to provide them accurate information on DOTS and TB and to spur coverage. In cooperation with, and financial support from, the Global Fund, journalist contests were held in Moldova and Transnistria to promote more stories on TB.

Video and audio clips on TB symptoms and treatment were broadcast on 19 television and 13 radio stations. A total of 26 hours of broadcast time was donated for TB messages. Given the importance of television and radio in communicating TB messages and the geographical

distribution of the stations, this large amount of time devoted to TB is likely to have reached the majority of the population. Seventeen types of informational materials, such as booklets, stickers, guides, flyers, posters, and calendars, were designed and printed (Table 5.2). All of the materials were in the two predominant languages, Romanian and Russian. In total, 270,850 pieces of information on TB were distributed.

AIHA staff regularly informed government officials and institutions about the project and about international TB standards. There were press conferences and press kits when PACs were launched and meetings held. The Project Director, the Laboratory and Surveillance Specialist, and the Senior Health Communications Specialist gave presentations and conducted workshops to impart information and to help resolve differences on important policy matters related to TB (Tables 6.1 and 6.2). They gave presentations on the *Strengthening Tuberculosis Control in Moldova* project in Latvia, Romania, Georgia, and Tajikistan to share regional experience and address common problems in reforming health care.

V.1.3 NGO development

Speranta Terrei began working in early 2005 and became officially registered as a Moldovan NGO in July 2006. Its functions have expanded to cover patient education and support. *Speranta Terrei* combines and coordinates efforts of the TB dispensary, TB and PHC doctors and nurses, medical students, former patients and their families, and volunteers, called moderators, to provide DOT at home to vulnerable patients. Trained moderators pick up medication from the TB dispensary and take it to the patients according to the specified schedule for the continuation phase. They offer social interaction and peer education along with medication and report back to *Speranta Terrei* and the doctors on these visits. Working collaboratively to identify patients requiring special attention and peers effective at communicating with them, the medical personnel, moderators, and *Speranta Terrei* are helping patients to complete treatment. Some of the moderators are from among former TB patients who have been cured.



Speranta Terrei volunteer Sergei Tinica (left) visits a TB patient at home to ensure he takes his medication. Located in Balti, Speranta Terrei is an NGO founded in 2006 by a small group of healthcare providers, social workers, and patients with AIHA's assistance.

Speranta Terrei is reaching the most vulnerable and giving hope to TB patients, acting out the meaning of its name. TB patients in Moldova are overwhelmingly from marginal populations. Moderators have expressed that the organization has given former TB patients a purpose in helping current patients. These moderators help to lessen the isolation of former patients and bring them into contact with those they can help. They are effective peer educators and know how to reach others with similar, comparable experiences, for example, being a former prisoner or drug user. The moderators guide patients through the maze of medical information,

helping them to understand combination therapy and which drugs have been prescribed. Because the moderators' effort is in concert with medical personnel, TB patients remain

under medical supervision while being helped by peers, to whom they respond more easily. Thus far, *Speranta Terrei's* moderators have served 97 adults and 52 children.

Alongside these functions, *Speranta Terrei* is continuing to send informational teams to schools and enterprises and sustaining TB communications. The MoH and CCM have recognized its excellent work. Following a presentation to the CCM in June 2007 by the head of the organization, the MoH and SMPU announced the addition of health information teams to the practicum of medical students. *Speranta Terrei* has been nominated as a member of the CCM, where it will represent the interests of TB patients. This is a critical step at a time when the Global Fund Round 6 grant is beginning.

V.2 Lessons and Recommendations

AIHA communicated about TB with a consistent message and logo, helping to reinforce the meaning to different audiences. The logo and background were in bright, hopeful tones signifying the positive message about TB as a treatable disease. Information teams reported that school children and workers were pleased to be able to take the colorful stickers, calendars, and posters with them. Many venues were used so that the message could reach Moldovans while they were commuting, shopping, gathering for meetings, studying, working, or watching, listening, and reading mass media.

The active and direct participation of staff in the design and conduct of campaigns was critical to the good results. They saw and heard for themselves, confronted at times with difficult questions and honest feedback which proved useful for planning upcoming events. AIHA staff monitored campaigns and the distribution of materials and spoke to participants two weeks after an event to ascertain the use of materials. They kept the project's progress in the public eye with press conferences, attendance at practitioner meetings, presentations to officials in Moldova, and international presentations. They met regularly with journalists and brought experts to speak to journalists to nurture their interest in TB and to give accurate information.

Community involvement was found to be an effective and inexpensive method of distributing TB information and providing social support to TB patients. The potential of NGOs, practitioners, and medical students can be used more fully. For the *Strengthening Tuberculosis Control in Moldova* project, the most enthusiastic information team members were students and faculty from Balti Medical College. The project recommends that groups be selected, trained in how to convey the message, be given the materials for distribution, and be monitored periodically. Community support for patients should be provided in concert with medical personnel who are overseeing treatment. AIHA recommends that the *Speranta Terrei* model be used more broadly in Moldova.

Practitioners are an important part of information delivery. The project recommends keeping them involved in communications, especially with respect to patient education. There continue to be misconceptions about the DOTS strategy and the doctors' and nurses' responsibilities towards patients. AIHA recommends that campaigns be conducted regularly for practitioners and the general public, modified to reflect changes in knowledge and behavior. Campaigns, for example, are recommended on TB curability and MDR-TB to explain timely diagnosis and treatment adherence and why some cases cannot be cured. We

recommend that KAP surveys be conducted every 2 years as it is crucial to continuously measure the effects of TB communications on behavior.

VI. PROJECT OUTPUTS AND OUTCOMES

For the four components, the *Strengthening Tuberculosis Control in Moldova* project met or exceeded all of the target outputs and most of the target outcomes by the end of 2006 (Table 1.2). When the data for 2007 becomes available, it is likely to show that all of the outcome indicators in the PMEP were met. In the case of the public awareness component, the change in the outcome indicator cannot be measured directly because the planned, follow-up TB KAP survey was not conducted. This was at the request of USAID, which advised that proxy measures of increased TB awareness as well as data from a separate, general health survey be used instead. Proxy measures, such as TB diagnostic investigations, case detection, and post-campaign interviews of patients and practitioners, are available. But, the timing and data reporting of the “Moldova Demographic and Health Survey 2005” (MDHS) make it inapplicable for measuring the effects of the project’s public awareness campaigns. The first campaign was conducted from September to November 2004; and the MDHS was conducted a few months later, from June to August 2005. There was intensive project activity to raise tuberculosis awareness during 2005-2007, with 5 additional campaigns and 270,850 copies of informational materials distributed. Methodological differences between the KAP and the MDHS are beyond the scope of this report, but one point should be noted. The MDHS gives TB data separately by gender and does not give a combined figure, which is how the KAP results were calculated. For these reasons, the discussion below on public awareness outcome indicators is on indirect measures.

VI.1 Tuberculosis trends

The project period coincided with other supportive changes when Moldovan health policies were being realigned along with nationwide implementation of DOTS (see Table 1.1). Policies and regulations related to PHC and national medical insurance were particularly important to TB control. The 2001-2005 *National Programme* stipulated that PHC and TB services were to be integrated and that TB detection would become the responsibility of PHC. This was promulgated by *Order 180*, issued by MoH in August 2001. The World Bank health reform project on PHC development began in June 2001 and has served to train PHC practitioners on TB for the *Strengthening Tuberculosis Control in Moldova* project. In January 2004, obligatory national medical insurance was introduced. Among the package of health services, TB diagnosis and treatment is financed through contracts with PHC practitioners and TB hospitals. These developments have contributed to increasing the accessibility of TB services for the Moldovan population, allowing them to act on information they receive on TB symptoms and where to present for diagnosis and treatment.

Figure 1 shows the national trends in tuberculosis cases and SSM confirmation along with the project’s interventions in laboratories, PHC, surveillance, and public awareness. The incidence of new cases increased from 3,619 to 4,567 from 2003 to 2005, and then declined to 4,395 in 2006. The incidence of total cases (new plus relapse) increased from 4,579 to 5,700 from 2003 to 2005, and then declined to 5,505 in 2006. Case rates per 100,000 increased at a slightly faster rate because the population of Moldova decreased slightly. From 2003 to 2006, the new case rate per 100,000 increased from 85.6 to 108.2 and the total case

rate per 100,000 increased from 108.0 to 135.5. From 2003 to 2006, new and total tuberculosis cases registered increased overall by about 20%; and the new and total case rate per 100,000 increased overall by about 25%. There has been a concerted effort by the project and the Government of Moldova to bring the underlying incidence of TB into the national TB control system.

Bacteriologic confirmation of a TB diagnosis is one of the principles of DOTS, which reached 100% coverage in Moldova in January 2004. The percent of pulmonary TB cases confirmed by a positive SSM reflects the recognition of SSM as the definitive, confirmatory diagnostic test and the quality of SSM and diagnostic skills. As indicated in Figure 1, SSM positive confirmation increased overall from 2003 (46.5%) to 2006 (51.1%), but declined between 2004 and 2005. This decline from 53.9% to 50.0% was due to the extensive renovation of reference labs under the project and consequent reduced monitoring of microscopy lab tests.

VI.2 PMEP

Table 1.2 presents the PMEP, with baseline, target, and actual figures for output and outcome indicators for 2005 and 2006. The outputs of each component were discussed in sections II-V above and the discussion here is on the outcome indicators. On the basis of the trends to date and ongoing efforts, outcome indicators encompassing 2007 data are expected to continue to show improvement.

VI.2.1 Laboratories

As a result of renovation, equipment, guidelines, training, and quality control measures undertaken, all of the target outcome indicators for laboratories were achieved or surpassed. Guidelines on environmental mitigation and infection control related to the engineering design of laboratories were approved in 2005. In 2006, the upgraded NRL and RRLs allowed Moldova to conduct culture examination for 87.8% and DST for 70.5% of pulmonary TB patients, surpassing the established targets of 65%. This outcome means tangible progress in TB control because culture confirmation is the gold standard in TB diagnosis and DST is the basis for devising treatment plans for drug-resistant tuberculosis. Culture and DST results add much to the diagnostic capability of microscopy alone and enable Moldova to begin to address drug-resistant TB.



Targets for improving sputum smear microscopy were exceeded during the first three years of the project, with false readings dropping from 6 percent in 2003 to 1.9 percent in 2006.

Sputum smear microscopy also improved. The percent of false-positive and false-negative SSM results declined from 6% in 2003 to 1.9% in 2006, again surpassing the target of 3%. Another important indicator related to SSM is the percent of SSM positive results out of the total SSM examinations performed. This figure has been established at 10% for all countries except high-incidence regions with high rates of TB/HIV co-infection, where it is higher. WHO estimates that ten suspect cases have to be tested by smear microscopy to find one case of TB. Therefore, 10% of SSM exams should

yield positive results if all symptomatic cases, not only TB cases, are being referred for diagnostic testing. For the project period, this indicator was set at 8%, with a baseline of 5%. In 2006, 9.0% of total SSM investigations yielded SSM-positive results.

VI.2.2 Primary Health Care

Among the three outcome indicators for PHC, one did not reach the target by 2006. The percent of TB cases detected in the destructive phase of pulmonary TB decreased by 14% whereas the target was up to 33% decrease. In 2003, 47.0% of such cases were in the destructive phase and this declined to 40.4% in 2006. There was substantial improvement in the default rate, which decreased by 50%, surpassing the target of up to 10%. The halving of the default rate from 20% of registered cases to 10% of registered cases will begin to be manifested in improved treatment success rates in 2-3 years. High default rates are a factor in stagnant treatment success rates in Moldova and the reduction will have significant consequences for TB transmission and cure.

In Moldova, by far the highest incidence of tuberculosis is among prisoners. In 2006, the total TB case rate for prisoners (excluding Transnistria) was a staggering 2451.4 per 100,000, nearly 18 times the national rate. This concentration of cases represents a threat to TB control because of the movement of released prisoners into the population at large and the breakdown in continuation phase treatment. Because of improved coordination between the penitentiary health services and PHC and outreach to prisoners, the percent of released prisoners continuing TB treatment increased to 81%, exceeding the PMEP target of 75%.



Skills-based practitioner training courses armed primary care providers with the knowledge they need to more effectively care for TB patients.

VI.2.3 Surveillance

Tracking and recording of tuberculosis cases advanced to such an extent that 100% of TB reports submitted by Moldova's MoH and NTP met international standards by 2006. This was a considerable advance from the 40% baseline figure in 2003. The comprehensive SYMETA has given managers and practitioners a more complete picture of the TB situation and captured the effects of TB control interventions. Accuracy of reporting has improved with standardized forms, electronic data submission, and verification mechanisms. Laboratory test results are recorded for registered patients and the progress of patients can be followed. There is no longer duplicate reporting to the NTP and to the MoH. These factors are important in reflecting more of the underlying incidence of TB in case notifications.

The MDR-TB module of SYMETA is being developed and will be completed by the end of 2007. It will allow Moldova to gather and analyze data on drug-resistant TB, a growing menace to controlling TB. Moldova began participating in WHO's drug resistance survey in 2005 and is gathering data on the prevalence of primary and acquired resistance. The availability of sound data on resistance patterns along with patient data on culture and DST

results are critical to treating drug-resistant TB under DOTS-Plus. In October 2006, GLC approved an expansion of the number of patients under DOTS-Plus pilot projects in Moldova to 600.

VI.2.4 Public awareness

Under the project, a TB KAP survey was conducted in June 2004. A stratified sample of 1194 persons answered 25 questions related only to TB. The results established the baseline for the indicators of the percent of the general population identifying TB as a curable disease and identifying correctly at least two TB symptoms. Only 12.9% of respondents clearly identified TB as treatable and 58.7% identified TB as treatable only if it is treated timely. When asked to identify symptoms of TB, 48.8% identified cough and less than 10% identified each of the other symptoms. Although nearly all respondents had heard of TB, the indicators of knowledge of curability and symptoms showed gaps.

As noted, the changes in these indicators cannot be measured directly. Proxy measures that can be considered are the growth in the number of cases notified and the number of patients for whom diagnostic investigations were conducted. Many factors contributed to the 20% increase in cases notified and the fourfold increase in diagnostic investigations, including improved labs and surveillance, more skilled practitioners, provision of medical insurance, and the full implementation of DOTS. Increased public awareness had a part in prompting symptomatic people to see the doctor and thereby increase the demand for TB services. The project has recorded instances of direct responses following broadcasts and informational meetings. For example, 5 new TB cases detected during the Balti PAC were among those presenting to PHC after a clip or television show was aired; and 3 new TB cases detected in Bender were among relatives of participants at 2 informational meetings. In 30 in-depth interviews of PHC and TB practitioners during and after PACs in Balti, Transnistria, and Cahul, the project found that all practitioners indicated that they registered a marked increase in patients who presented for TB tests following television shows, radio programs, and informational meetings. This was especially pronounced after informational meetings at large enterprises, such as factories.

Another proxy indicator for the effect of PACs is to consider the relative importance of the message of the PAC in the myriad other messages being given to the public. Following the second PAC conducted from January to March 2005, the media rating agency AGB Moldova/AGB Nielsen Media Research placed AIHA fourth among all advertisers, with 7.5% of total advertising time (*The Komsomolskaia pravda v Moldove*, 6 April 2005). Given that the ranking includes private commercial companies with large advertising budgets (Woxtell, Moldcell, and Proctor&Gamble), this is a striking placement for TB messages. The campaigns can be surmised to have been far-reaching.

Because of relationships formed during public awareness campaigns and local engagement, an NGO with the purpose of supporting TB patients was established in Balti. *Speranta Terrei* is the first officially registered NGO for combating tuberculosis in Moldova. Its grassroots origins, coordinated assistance among community and practitioners, and selection of vulnerable patients for support demonstrate the members' dedication and a patient-centered approach. The project has provided technical and financial assistance to *Speranta Terrei*, which has been nominated as a new member of the CCM, where it will represent the interests of TB patients. This outcome of the project will have lasting consequences in

increasing DOT in the continuation phase of treatment, reducing the default rate, and interrupting transmission of TB.

VI.3 Global targets for case detection and treatment success

Extensive public awareness, improved diagnostics, and better surveillance contributed to the rapid increase in TB case detection during the project period. The national health policy framework and other international donor assistance contributed substantially to this trend. From 2003 to 2005, the latest available data year, case detection of infectious, pulmonary TB



The USAID-funded TB project has resulted in improved capacity to diagnose, treat, and monitor TB in Moldova, as well as increased public awareness about TB and its symptoms.

increased from 46% to 65%, putting Moldova within reach of the global target of 70%. The activities of the *Strengthening Tuberculosis Control in Moldova* project were instrumental in this achievement because of the attention on timely presentation following symptoms, diagnostic skills, quality-assured confirmatory tests, and registration of patients and their progress.

At the same time, the global target for treatment success has yet to show significant movement in Moldova. Between 2003 and 2005, the treatment success rate declined from 65.2% to 62.0%. The

project's activities were focused on detection and diagnosis and not treatment. Only a limited amount of training was provided to TB specialists. Much more targeted training is needed in treatment regimens, management of TB patients, and drug management. This is to be provided in the impending Global Fund project, which also continues to fund anti-TB drugs through Global Drug Facility procurement mechanisms.

Drug resistance and the extent of DOT are important factors in the rates of treatment failure in Moldova. Estimates of MDR-TB in Moldova indicate that prevalence has been increasingly steadily, from 6.0% in 2003 to 13.0% in 2005 to 19.4% in 2006. The prevalence of drug-resistant forms of TB is due to the large numbers of MDR-TB patients without proper treatment in previous years, inappropriate or irregular treatment, and non-compliance in drug taking.

VII. CONCLUSIONS

AIHA assisted the Government of Moldova to implement the national tuberculosis control plan by strengthening existing structures and systems. There was a substantive involvement of local practitioners, officials, and entities in the definition of the changes and how the changes should be put into practice. The project staff consulted regularly with the MoH and CCM and assisted in preparing data and applications for international agencies. Local cooperation and commitment were instrumental in the project's achievements and remain instrumental for sustaining interventions.

A small AIHA staff managed the project intensively, engaging in the process and helping to mold disparate views to reach decisions. They remained abreast of relevant developments, responded quickly to concerns and requests, and worked together to do so. The activities were carried out and monitored directly by the staff, in Chisinau and in Washington, DC. Only a few items were contracted out, such as the reconstruction of labs, the conduct of the KAP survey, and the software program for surveillance. The all-Moldovan staff in Chisinau applied its intimate knowledge of the TB control system and how to prod it to adapt to international standards. The staff at AIHA's headquarters in Washington, DC kept in regular contact with the AIHA Moldova staff and USAID's regional staff.

In all four components, the project followed largely the proposed plan. Activities in labs, PHC, surveillance, and public awareness were coordinated closely. Funding amounts for each component were revised, but the improvements were made as proposed. Output targets were surpassed and outcome targets were nearly all reached before the conclusion of the project. The *Strengthening Tuberculosis Control in Moldova* project served as a start towards stemming the epidemic and continuing effort is required to raise the level of skills, quality control, patient education, and TB knowledge.

The project helped to bring in additional funding and expertise and built systems in cooperation with other agencies. The Global Fund, WHO, and the World Bank made possible much larger amounts of equipment, training, and technical assistance for TB control. Local NGOs and local branches of international NGOs used established channels to reach vulnerable populations, who comprise the majority of TB patients. Caritas Luxembourg, KNCV Tuberculosis Foundation, and *Speranta Terrei* helped to address special needs and reach many more people with TB information and services. The participation of many entities and individuals has been critical to the project and they share in the results that have been achieved.