World Health Organization

REGIONAL OFFICE FOR Europe

Models of care for multidrug-resistant tuberculosis

Report of a regional workshop
WHO Regional Office for Europe
Copenhagen, Denmark
17 October 2013

ABSTRACT

The *Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011-2015* sets out the activities for Member States, WHO and partners to achieve universal access to the prevention, diagnosis, treatment and care of multidrug-resistant and extensively drug-resistant tuberculosis. Since the publication of the Plan, innovative models of outpatient care, cost-effective and tailored to patients' needs, have been introduced in countries as an alternative to inpatient care. In order to promote them, the WHO Regional Office for Europe held a workshop in Copenhagen on 17 October 2013 with the participation of priority countries such as Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine. Representatives from the Republic of Moldova, Russian Federation and Uzbekistan presented their best practices as published in the *Best practices in prevention, control and care for drug-resistant tuberculosis.* At the end of the workshop, specific recommendations were made for introducing and/or expanding most appropriate best practices in outpatient care of multidrug-resistant and extensively drug-resistant tuberculosis in the participating countries.

Keywords

BEST PRACTICES
HEALTH SERVICES
INTEGRATED HEALTH CARE SYSTEMS
OUTPATIENT CARE
PUBLIC HEALTH
TUBERCULOSIS, MULTI-DRUG RESISTANT

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Acronyms and abbreviations

DOT	directly observed treatment
MDR-TB	multi-drug resistant tuberculosis
TB	tuberculosis
XDR-TB	extensively drug-resistant tuberculosis

This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the World Health Organization and do not necessarily reflect the views of USAID or the United States Government.

Background

The Consolidated Action Plan to Prevent and Combat Multidrug- and Extensively Drug-Resistant Tuberculosis in the WHO European Region, 2011-2015 *(1)* and its accompanying resolution EUR/R61/R7 *(2)* set out the activities for Member States, WHO and partners to achieve universal access to the prevention, diagnosis, treatment and care of multidrug-resistant (MDR) and extensively drug-resistant (XDR) tuberculosis (TB). Much progress has been made in the two years since the endorsement of the Plan but critical challenges remain. For example, the success rate of treatment of MDR-TB is still far below its target, it is mainly hospital-based in many countries and lacks adequate counselling and support in ambulatory treatment facilities. A better balance should be found between inpatient care, which favours diagnosis and initial treatment but also nosocomial infection, and outpatient care, which could be more cost-effective if it was tailored to patients' needs. Innovative and diverse models of care are necessary, including day-care centres, home-based treatment, treatment at primary health care service centres and strengthened peer support.

Introduction

In order to improve the transfer of knowledge between countries and partners, which is useful in the formulation of health strategies at national and regional levels, the WHO Regional Office for Europe held a workshop in Copenhagen on 17 October 2013. The objective was to share country good practices in providing patient-centred care of TB and MDR-TB patients by:

- improving awareness of innovative and diverse models of care;
- identifying strengths and weaknesses in current models of care adopted by countries;
- identifying opportunities for adopting innovative and diverse models of care as alternatives to hospital care.

Dr Masoud Dara and Dr Pierpaolo de Colombani welcomed the participants (see Annex 1 for the programme and Annex 2 for the list of participants). The workshop would focus on how to get the right approach and adapt services for the implementation of the Consolidated Action Plan. The participants also expressed an interest in comparing experience at country level and learning about the limitations and benefits of different models of care.

WHO is frequently asked to advise on how to expand TB care in countries. Ambulatory care[1] depends on how TB programme services are organized in the general system. The good practices proposed during the workshop should be adopted in each country, adapted to the national context and implemented according to plans of action.

Best practices and coordinated/integrated service delivery for MDR-TB

The Regional Office has recently published *Best practices in prevention, control and care for drug-resistant tuberculosis (3)* as part of its promotion of coordinated/integrated health service delivery. Forty best practices for M/XDR-TB care from 30 countries are described, as reported

[1] In this report, "ambulatory care" encompasses all types of outpatient service, both on and off hospital premises.

from May to August 2013 by ministries of health, national tuberculosis programmes and national and international partners. The publication aims to document progress in implementing the Consolidated Action Plan and the variety of practices between countries, and to propose effective models of care for adoption in other countries.

The 40 best practices cover the seven areas for interventions in the Consolidated Action Plan, as under:

(i) prevent the development of cases of M/XDR-TB (two practices);

(ii) scale up access to testing for resistance to first- and second-line anti-TB drugs and to HIV testing and counselling among TB patients (two);

(iii) scale up access to effective treatment for all forms of drug-resistant TB (14);

(iv) scale up TB infection control (three);

(v) strengthen surveillance, including recording and reporting, of drug-resistant TB, and monitor treatment outcomes (two);

(vi) expand countries' capacities to scale up the management of drug-resistant TB, including advocacy, partnership and policy guidance (eight);

(vii) address the needs of special populations (nine).

The 40 best practices were selected by an expert committee based on priority criteria such as relevance, effectiveness, efficiency and ethics and other criteria including equity, sustainability, possibility for scaling up, partnership, community involvement and political commitment.
The discussion of ambulatory care is part of a much broader discussion at the Regional Office concerning coordinated/integrated health services delivery, a framework for action which is considered essential for strengthening people-centred health systems in the WHO European Region *(4)*.

Best practices in the Republic of Moldova, the Russian Federation and Uzbekistan

The workshop continued with four presentations of best practices from the Republic of Moldova, the Russian Federation and Uzbekistan, all of which are described in *Best practices in prevention, control and care for drug-resistant tuberculosis (3)*.

Improving TB treatment adherence and awareness (Republic of Moldova)

Speranta Terrei is a nongovernmental organization working in Baltsy, the third largest municipality in the Republic of Moldova with a population of over 120 000. It has set up a small centre for meetings, training sessions and consultations with a psychologist. The organization works through 20 treatment moderators, all former TB patients, and 30 other volunteers (including health workers, housewives, students, teachers and drivers) who provide contact screening, directly observed treatment (DOT) at patients' homes, liaison with the treating physician, patient support (psychological, social, legal advice) and TB information/awareness activities among the population. All types of TB patient are considered, from children aged six years to elderly people and patients in vulnerable social groups.

Since 2006, 430 patients have been assisted (132 patients are still receiving assistance) and no cases have been lost to treatment follow-up. The cost per patient follow-up is US$ 40□180 when

provided by a nongovernmental organization moderator (each moderator receives US$ 10 per month for meals and transport and cares for four to five TB patients) and US$ 225 when provided by a nurse (each nurse receives a six-month salary of US$ 450 and cares for two TB patients).

The volunteers come from different backgrounds but are motivated to help as a result of their experience with friends or family members who also suffered from TB. Some are recruited from medical college. Four times a year they participate in training. Although they do not have a medical background they are allowed to dispense drugs, and they work in close collaboration with and report to health care staff.

Ambulatory TB care from day one (Uzbekistan)

The Ministry of Health, jointly with Médecins Sans Frontières, has gained experience in 10 of the 16 districts in the Karakalpakstan Region. The treatment success rate among MDR-TB patients in Karakalpakstan exceeded 60% in 2010, against 48% globally. This was possible through a programme of comprehensive TB care which included rapid molecular diagnosis and culture and treatment for all patients, ambulatory treatment from the first day, psychological support to patients and improved infection control. The decentralization of services was based on rapid diagnosis of M/XDR-TB, increased capacity of the TB consilium[2] that decides on the treatment for individual cases, a simplified clinical protocol with only nine treatment regimens and standardized management of adverse drug reactions, the involvement of primary health care staff (doctors, nurses and "adherence support nurses") and improved infection control in ambulatory settings.

The proportion of drug-resistant TB patients who started treatment in an ambulatory rose from 3.6% in the first quarter of 2011 to 60.7% in the fourth quarter of 2012. This allowed for an exponential increase in the number of MDR-TB patients enrolled for treatment and improved administrative infection control measures in hospitals. The latest interim outcome results among the cohort of MDR-TB patients who started treatment in ambulatories and hospitals between March 2011 and October 2012 show an increased sputum conversion in culture after four months of treatment (87.5% vs. 80.5%), a similar case fatality rate (4.7% vs. 5.2%) but an increased loss to follow-up after six months of treatment (12.3% vs. 6.8%). These results underline the need to keep patients in treatment during ambulatory care.

The patients in the Médecins Sans Frontières programme come to "DOT corners" in ambulatory facilities where drug-susceptible and drug-resistant patients are treated separately, and some patients even receive treatment outside the premises. Additional measures for infection control include the use of masks by patients and ad hoc education for primary health care doctors.

Discussion

In both countries, political support had been essential in overcoming the widespread and strong belief that hospitalization is necessary to contain the spread of TB in the community. In Uzbekistan, before involving primary health care doctors, Médecins Sans Frontières had first to convince political leaders, using published evidence from international studies. In the Republic of Moldova, it was important to document the work and prove its effectiveness.

[2] A specialized team or panel of experts with medical professionals covering complementary aspects of care (clinical (for adults and children), surgical, radiological, public health, psychological and nursing).

Ambulatory care of TB patients, including MDR-TB patients, is cost-effective, but hospitals are needed for the treatment of other co-existing conditions and of patients who require surgery. Involuntary isolation in hospitals may be needed for a few selected patients, but hospitals must be made more efficient and provide the best standards of care.

Home-based TB care in Orel Region (Russian Federation)

The Orel region is located in the south-west of the Russian Federation and includes 24 districts with around 776 000 inhabitants living in a territory stretching 150 km from north to south and more than 200 km from west to east.

In the Orel TB dispensary, DOT started in 1999. In 2002 a social support component was added, which included food and sanitary packages given to TB patients and vouchers for transport to reach the outpatient facilities. Home-based treatment was introduced in 2004.

There are around 350 new cases of TB annually in the region, of which around 20 also have HIV infection. MDR-TB is present in about 10% of the new TB cases and in 47% of the previously-treated TB cases; XDR-TB is present in 10%. The Orel region has both inpatient and outpatient TB services: the TB dispensary has 255 beds for inpatient care, 40 beds for mental care and two outpatient departments for adults and children. The central district hospitals have TB physicians' offices and rural *feldsher* units.

Home-based TB treatment is provided to 15□20 patients from the Orel TB dispensary. The selection criteria for treatment at home are the presence of co-morbidities that limit patients' mobility, low motivation for treatment or refusal to attend a clinic for drug administration, and co-existence of alcohol abuse. TB drugs are administered to these patients by a mobile medical team consisting of a nurse and a driver. The drugs are given to the TB dispensary and packed there in special containers, and a nurse is present while the patient takes the drugs. In addition to drugs, the mobile team delivers food packages and sanitary packages which can also be picked up at the dispensary. A physician visits the patients once a week or as needed. All patients are transported to the TB dispensary for regular medical examinations.

Home-based treatment has been provided to 356 TB patients with encouraging results: 87.9% of the patients were successfully treated, 2.9% were lost to follow-up and 7.8% failed treatment. Fifty-six patients on home-based treatment had MDR-TB (only 57.1% of them showed resistance limited to isoniazid and rifampicin). Of these, 73.2% were successfully treated, 23.2% had treatment failure and 3.6% died.

The cost of using home-based treatment is calculated to be 3.5 times lower than hospitalization for drug-susceptible patients and 1.6 times lower for MDR-TB patients. The TB situation in the Orel region is, however, much better than in the overall Russian Federation. In 2012, new TB cases were notified at the rate of 41.1 per 100 000 population in the Orel region as against 73 per 100 000 in the country as a whole, and TB deaths were 2.9 per 100 000 population as against 14.7 per 100 000 population in the country as a whole. It can, therefore, be concluded that home-based TB treatment is a successful practice, which is both convenient for the patients and for the health care services.

Almost half of the patients in the region have been treated in outpatient facilities, which they can also attend during holidays. The mobile teams work seven days a week, visiting each patient at least once every day.

DOT in the rural districts of Tomsk Region (Russian Federation)

The Tomsk region is about the size of Poland, but with a population of only a little over one million. The climate can be harsh (as low as -45 °C in winter but with very hot summers), making it difficult at times for people to travel to TB treatment facilities in rural areas. Despite these difficulties the TB programme has been successful, thanks to the support of the Red Cross since 2000. In 2010, the overall treatment success rate in Tomsk was 59.1%, with 8.2% loss to follow-up, 9.1% death and 16.4% treatment failure. The TB notification and mortality rates have fallen more than in the entire Russian Federation and in Siberia: in 2012, the TB mortality rates were 6.1 per 100 000 population in Tomsk, 14.2 in Siberia and 26.2 in the Russian Federation.

The success of TB treatment depends on the percentage of drugs taken, which it is very important to ensure even for those patients living in rural areas where treatment facilities may be far away from their homes. The requirements for successful implementation of DOT are: a patient-centred approach, good working conditions for the staff (designated transport, extended time for home visits, financial compensation) and quality monitoring and reporting.

The main objectives of the Red Cross programme are to support DOT in rural areas and increase patients' motivation to enter TB treatment. The Red Cross team is composed of a central office (with medical and financial coordinators, a logistician, two social workers and a driver), 21 regional coordinators and 145 volunteers ensuring DOT, delivery of food packages and social support. There are very few health care professionals in the rural areas, so well-educated people are used instead. The Red Cross coordinator (a TB specialist) cooperates with the TB dispensary on patient enrolment, reporting on the number of doses taken by each patient and information about patients discharged from the hospital and in carrying out joint monitoring visits to the rural areas.

The Red Cross programme uses volunteers to reach remote rural areas. As an incentive, these volunteers receive the equivalent of US$ 4 per patient per month. They are preferably medical workers so as to ensure that any side effects are properly recognized and managed, but this is not always possible.

The TB patients are given food packages[3] (equivalent to US$ 2.2 and US$ 3.1 for drug-susceptible and drug-resistant TB patients, respectively) after the daily administration as a reward for showing up. This has turned out to be very effective. To make access easier, additional DOT points have been established, the patients receive vouchers for public transport and home visits are organized. The keys to success are the creation of a trusting relationship between staff and patients (with a genuine interest in patients' problems), provision of psychological support and information to patients, and continuing training for staff and volunteers. The provision of comprehensive support to enhance TB patients' motivation to enter treatment is the final condition to ensure the success of any model of TB treatment.

Some 4390 patients with drug-susceptible TB have been enrolled in the programme: 3609 (82%) patients have been successfully treated, 615 have been transferred to inpatient facilities, 45 have died, 6 have been lost to follow-up and 115 are still under treatment.

Of patients with MDR-TB, 761 have been enrolled in the programme: 551 (72%) have been successfully treated, 86 have been transferred to inpatient facilities, 26 have died, 22 have been lost to follow-up and 76 are still under treatment.

[3] A food package contains natural juice (to take 4-aminosalicylic acid medication) and food rich in proteins (canned beef, canned fish, condensed milk).

Of patients with XDR-TB, 85 have been enrolled in the programme: 48 (56%) have been successfully treated, 14 have been transferred to inpatient facilities, 2 have died, none have been lost to follow-up yet and 21 are still under treatment.

Discussion

The main challenges in scaling up the practices described above are to increase the motivation of the health care workers and to raise the necessary funds, including for the staff so as to reduce the dependence on volunteers for these interventions, and for psychological and social support. Other challenges are to establish a legal framework and to organize transport in rural areas.

Presentations by working groups

The representatives from Armenia, Georgia and the Republic of Moldova were assigned to one working group and those from Armenia, Belarus and Ukraine to a second working group. Both working groups were asked to answer the questions: “What can you do in your country to improve care?” and “What steps do you need to take when you are back home?”.

Armenia

One of the main challenges in promoting ambulatory care is the funding model, which is based on the number of hospital beds even though the trend is towards treatment being administered in ambulatory facilities. It is planned to introduce best practices for home-based DOT involving other members of households. A proposal has been put forward to change the funding model, which the Ministry of Finance has received positively. In future, a bonus will be paid to primary health care staff when they refer a patient, to increase their motivation. The same will apply to TB doctors, who will receive a financial bonus based on successful treatment. If this proves to be effective, the next step will be to introduce psychiatric care for TB patients. Some patients will still be treated in hospitals, but a greater proportion of patients will be in ambulatory care.

Azerbaijan

Three main steps should be taken to promote ambulatory care: the number of hospital beds should be optimized (either by decreasing or increasing them), incentives should be offered to health care workers and patients, and additional external funding should be obtained for expanding social support to patients and motivating staff.

Belarus

The review of the national TB programme recently organized by WHO has highlighted some priority steps such as changing the funding model, creating a legal framework and developing an action plan. Closer collaboration with the Ministry of Health is required to identify possible solutions and specific needs to scale up ambulatory care.

Georgia

A private-public mix could be a way to scale up ambulatory TB care. At the same time, government ownership and accountability should be increased so as to strengthen ambulatory treatment. An external review of the national TB programme is scheduled for 2014. This could be an opportunity to review public/private collaboration in delivering services, as well as to establish a national working group and develop a plan for ambulatory care with the involvement of municipalities, the government, private and international donors and the Global Fund.

Republic of Moldova

A plan of action for ambulatory care is ready and a national working group is being established to guide its implementation. All national and international partners, including WHO, are invited to be involved. The number of hospital beds needs to be optimized for short-, medium- and long-term interventions. For primary health care and TB services to be strengthened, health care workers need to be motivated and the practical approach to lung health should be incorporated into the curriculum of medical schools. To mobilize additional resources, more nongovernmental organizations working on TB care would be required, together with a supportive legislative framework. Patients need further education and training about TB.

Ukraine

The number of TB hospital beds has been reduced by 1000, but the funding for treatment has been preserved. Greater understanding and political commitment are required if ambulatory care is to be expanded, in turn requiring further evidence of effectiveness and cost-effectiveness.

General conclusions and recommendations

Most of the countries use extensive hospitalization of TB patients, even if outpatient and home-based care are available. All the countries are moving, albeit at a different pace, towards more outpatient treatment. The following are examples of positive changes.

- Certain criteria have been developed for hospital admissions (psychiatric condition, disability, social needs).
- Financial incentives have been introduced to motivate: (i) primary health care staff to refer cases with presumptive TB to TB doctors, and (ii) TB doctors, to ensure the success of TB treatment.
- Transport of sputum samples from remote areas is organized centrally.
- Palliative care is available for chronic cases.
- Supervision has been increased to reach remote places to ensure quality of care.
- There are fewer beds and a move towards increased ambulatory treatment.
- Sanatoria have been closed down.

New tools have become available to support the ambulatory management of MDR-TB but practices need to change consistently. The most important challenges for expanding TB ambulatory care include changing from a funding model based on the number of hospital beds to one based on the number of services/patients, and creating and enabling strong political will. International partners are valuable in piloting new approaches. Support from the Regional Office is necessary to produce further evidence. Sharing experience among countries can reduce the risk of any potential negative impacts from changes in public health practice.

Another meeting could be useful to review more best practices and lessons learned and move from pilot projects to universal access to effective TB treatment.

The participants in the workshop made the following recommendations.

1. *Armenia*. A first step in the process of changing the financing model should be the establishment of home-based TB treatment in Yerevan, with support from Médecins Sans Frontières.
2. *Azerbaijan*. A national working group should be established to work on the different steps necessary to optimize the number of TB beds and to create a supportive environment and effective ambulatory treatment of TB patients.
3. *Belarus*. With reference to the recommendations of the review of the national TB programme, WHO should be asked to write a supporting letter requesting the highest health authorities to modify the current funding model based on the number of hospital beds. Discussions on the national plan for ambulatory TB care could benefit from directly involving experienced partners from other countries, such as Speranta Terrei from the Republic of Moldova.
4. *Georgia*. The external review of the national TB programme in 2014 should be used as an opportunity to review public-private collaboration in delivering TB services and the establishment of a national working group for the development of a plan for ambulatory TB care.
5. *Republic of Moldova*. The recommendations of the national TB programme review for strengthening primary health care and TB services should be reinforced, including to create effective incentives to motivate health care workers, to create a legislative framework which would allow nongovernmental organizations to work on TB care, and to incorporate the practical approach to lung health into the curricula of medical schools.
6. *Ukraine*. It is important to strengthen ambulatory TB care but this should be carefully balanced by the development of an effective primary health care network. The future piloting of the health reform in six regions could be an opportunity for this to take place, with the support of WHO and the World Bank.

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Annex 1

PROGRAMME

09:00 – 09:15	Welcome and introduction	Masoud Dara, Programme Manager, Tuberculosis & M/XDR-TB, WHO Regional Office for Europe
09:15 – 09:30	A compendium of best practices for MDR-TB	Colleen Acosta, Temporary Adviser Pierpaolo de Colombani, Medical Officer, Tuberculosis & M/XDR-TB, WHO Regional Office for Europe
09:30 – 09:45	Republic of Moldova: improving TB treatment adherence and increasing awareness	Feodora Rodiucova, Speranta Terrei, Republic of Moldova
09:45 – 10:00	Uzbekistan: ambulatory TB care from day 1	Johanna Kuhlin, Medical Team Leader, Médecins Sans Frontières, United Kingdom
10:00 – 10:30	Discussion	Pierpaolo de Colombani Ernesto Jaramillo, Medical Officer, Global TB Programme, WHO headquarters
11:00 – 11:15	Russian Federation: home-based TB care in Orel Region	Elena V Kyryanova, Deputy Head TB Physician, Orel TB Dispensary
11:15 – 11:30	Russian Federation: DOT in the rural districts of Tomsk Region	Nina Polyakova, Project Coordinator, Tomsk, Partners in Health
11:30 – 12:00	Discussion	Pierpaolo de Colombani Ernesto Jaramillo
13:00 – 13:15	Introduction to the working groups	Pierpaolo de Colombani
13:15 – 15:00	Working groups: – Azerbaijan, Georgia, Republic of Moldova – Armenia, Belarus, Ukraine	Pierpaolo de Colombani Ernesto Jaramillo
15:30 – 16:00	Presentation by the working groups	
16:00 – 16:30	Discussion	Pierpaolo de Colombani Ernesto Jaramillo
16:30	Conclusions	Pierpaolo de Colombani Ernesto Jaramillo

Annex 2

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