

Improving payment mechanisms to support a new delivery model of TB care in Romania

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1 Introduction

Romania is listed among the 18 high-priority countries to fight tuberculosis (TB) in the WHO European Region. Last WHO estimates of TB incidence and mortality (2015) are respectively 84 (72-97) cases and 5.8 (5.3-6.4) deaths per 100 000 population.¹ These rates have been decreasing slowly but steadily during the last years. TB resistant to rifampicin (as proxy of multidrug resistant [MDR] TB) is estimated 3% (2.1-3.9%) and 12% (9.3-15%) respectively among the newly-diagnosed and previously-treated TB patients; these proportions lead to an estimated number of 940 (730-1100) total new MDR-TB patients in the year. HIV co-infection is estimated in 2.6% (2.4-2.8%) of the TB patients. In 2015, the National TB Programme (NTP) detected 14 225 new/relapse TB cases, equivalent to 89% (75-100%) of the estimated cases occurring. The treatment success was 85% among the newly treated TB cases but only 45% among the retreatment cases (2014 patient cohorts), of 68% among TB/HIV cases (2014 cohort) 41% among RR/MDR-TB cases (2013 cohort) and 7% among XDR-TB (2012 cohort).

WHO and ECDC jointly performed a review of the NTP in March 2014. Based on its recommendations, it was developed the National Strategic Plan to Prevent and Control M/XDR-TB 2015-2020 that was officially endorsed and budgeted in February 2015. Based on this plan, a TB Concept Note was successfully submitted to the Global Fund to fight AIDS, Tuberculosis and Malaria (Global Fund). The Global Fund approved a TB grant of US\$ 8.9 million (April 2015-March 2018) with the Romanian Angel Appeal (RAA) Foundation, local nongovernmental organization (NGO), as principal recipient. Under this grant, RAA and WHO Regional Office for Europe signed an agreement for technical assistance in a number of areas, including the development of a new delivery model of TB care that is financially sustainable and enhances people-centred integrated/coordinated services across the different health providers (pulmonologists in hospitals and dispensaries, family doctors, community health workers, etc.). This report tries to describe in details such new model of delivering and financing TB services as final outcome of three WHO missions conducted on 19-22 October 2015 13-15 April and 12-16 December 2016 along with a roadmap initially agreed (Annex 1).

The specific objectives met by the technical assistance of this report are:

- a) Analysis of the costs of hospital and ambulatory TB care (in order to prepare the introduction of bundled case payment integrating hospital and ambulatory care.
- b) Analysis of the payment of inpatient and outpatient pulmonary-dedicated services and recommendations to introduce bundled case payment integrating hospital and ambulatory TB care.
- c) Analysis of the income of the family doctors (FD) under the framework contract with the National Health Insurance House (NHIH) and development of performance-based financial incentives for inclusion of TB services in the basic package of services.
- d) Development of performance-based financial incentives for the provision of TB services by community health providers (community health workers, patronage nurses, Roma mediators, nongovernmental organization workers, etc.).

¹ WHO global tuberculosis database (<http://who.int/tb/country/data/download/en/>, accessed 31 January 2017).

2 Methods and limitations of the report

This report was prepared by the authors and using data partly collected by local experts, which work is acknowledged with thanks. The authors were provided with useful data on the hospital activities reimbursed by NHIH countrywide and on the hospital and dispensary activities in Constanta county.

Unfortunately, the countrywide hospital data retrieved from the NHIH reports were not differentiating drug-susceptible (DS) TB and MDR-TB cases through the use of International Classification of Diseases (ICD) codes, which introduction in future is recommended to NHIH. Therefore, the authors of this report had to guess-estimate the MDR-TB cases by selecting those TB cases with much higher average length of stay (ALOS) in hospital. Another limitation comes from the limited time given to discuss and agreed with the counterparts the final type and volume of services to be delivered at each level of care. Some resistance to changes was noticed during the WHO missions and have be overcome through more discussion, implementation of the proposed new model of care in a pilot area and its close monitoring for immediate corrections when necessary.

3 Delivery model of TB services

Since the Declaration of Alma-Ata on Primary Health Care in 1978, the delivery model of health services has been developing towards the coordination/integration of services across the different levels of care with focus on the patients' and their families' needs. Such people-centred care has been pursued in all countries of the world, while adjusted to their epidemiological profile, health system capacity and available resources. Same is to be applied to TB services, which are moving towards a more balanced delivery between hospital and ambulatory care, including community care.

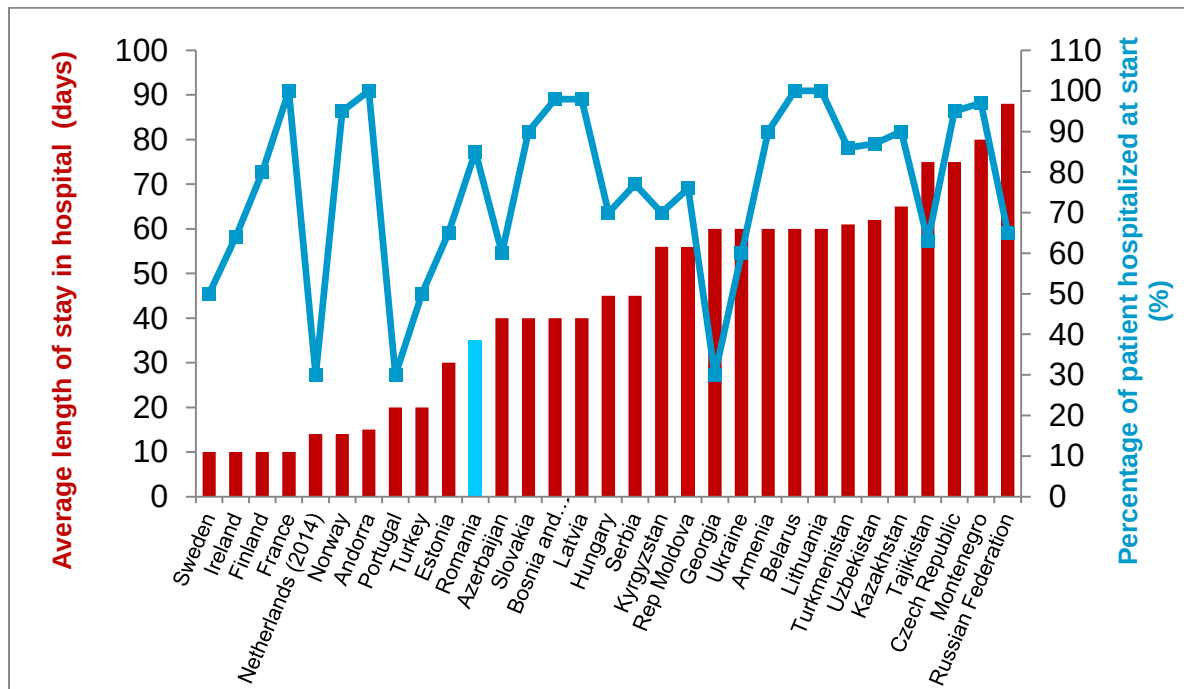
Sanatoria were built in the past to isolate TB patients from the community and to support their self-healing with good food and rest aimed at strengthening immune-defences in a time when anti-TB drugs were not available. At present, anti-TB drugs are available that can stop infectiousness and cure patients, standard operating procedures are made on rapid diagnosis and effective treatment with involvement also of non-TB specialists. Early diagnosis and uninterrupted treatment (otherwise developing drug resistance) are priority interventions that are proven to be more effective as lower is their level of access and higher is their responsiveness to the patients/their families' needs. Furthermore, many of the hospitals have poor TB infection control measures, nosocomial transmission is common and contributing to further TB and MDR-TB transmission in the community.

The data submitted to ECDC/WHO show a significant variation between countries both in average length of stay (ALOS) in hospital and rate of hospitalization of the DS-TB patients; compared with the other countries of Western Europe, Romania has a relatively high ALOS (35 days) and a high hospitalization rate (85%) (Figure 1). Meantime, Romania seems to be less successful in keeping patients on TB treatment, as indicated by the higher rate of lost-to-follow-up treatment (5.5%) (Figure 2).

The explanation is the underuse of the available outpatient care network (especially FD and community workers) sustained by financing mechanisms that incentivize hospital care and

discourage ambulatory care.² A new people-centred delivery model of TB care requires an optimal combination of services provided at different level of care (hospital, pulmonology dispensary, family medicine practice, and community) and the alignment of the payment methods of these services. The reconfiguration of the delivery model of TB care should comply with the overall healthcare delivery structure and its human resources, current and planned for future reform. Moreover, the NTP guidelines need to be revised and agreed, as well as the terms of reference of all relevant health providers. They should be trained accordingly and education/advocacy should be provided to the patients, their families and the population in general.

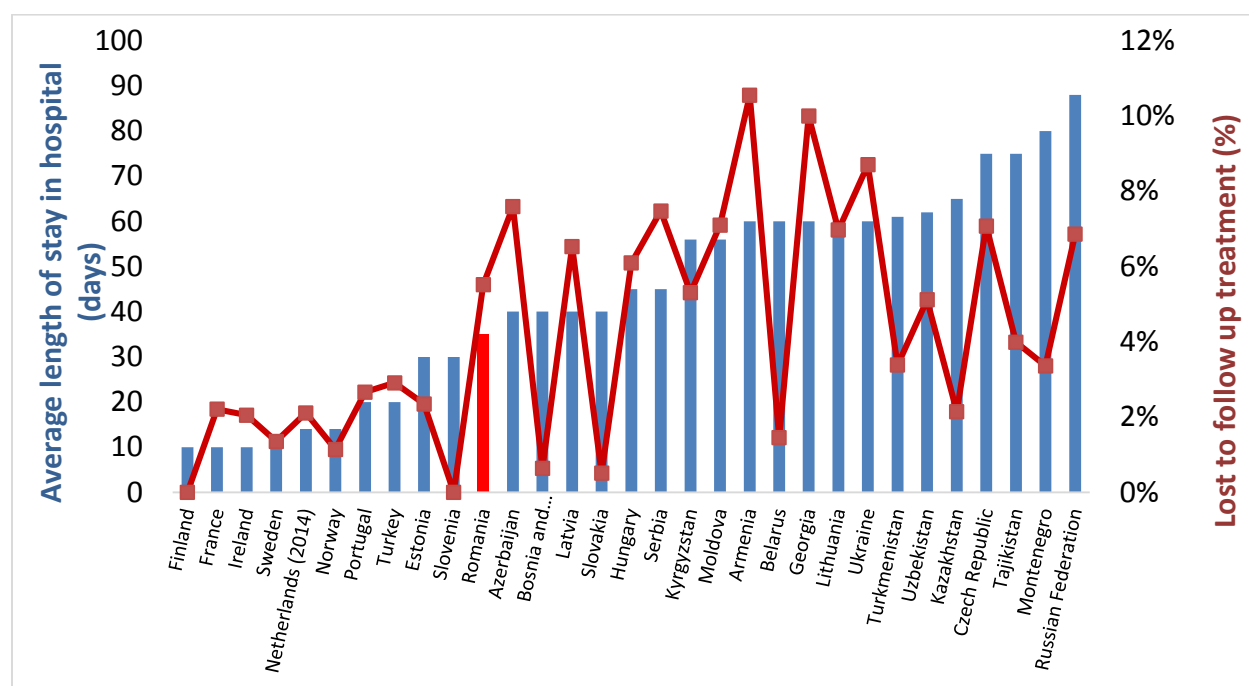
Figure 1. Average length of stay (ALOS) and hospitalization rate of new TB patients; WHO European countries, 2014.



Source: Authors based on the data collection of ECDC/WHO joint TB surveillance platform

² WHO. Review of the national tuberculosis programme in Romania, 10-21 March 2014. Copenhagen: WHO Regional Office for Europe, 2015 (http://www.euro.who.int/__data/assets/pdf_file/0007/269269/Review-of-the-national-tuberculosis-programme-in-Romania.pdf?ua=1).

Figure 2. Average length of stay (ALOS) and lost-to-follow-up treatment of new TB patients; WHO/Europe, 2014.



Source: Authors, based on the data collection of ECDC/WHO joint TB surveillance platform

The four WHO missions conducted in October 2015 and April, July and December 2016 had the possibility to discuss with NTP the new concept of delivering TB services and to agree on the model as shown in Table 1.

Table 1. Proposed new delivery model of TB services in Romania

Main TB task	Hospital (specialist)	Outpatient (dispensary specialist)	Outpatient (family doctor)	Community (community workers, others)
Early identification of presumptive TB	X	X	X	X
Diagnosis of TB disease	X	X		
Prescription of TB treatment regimen	X	X		
Administration of TB treatment	X	X	X	X
Monitoring TB treatment progress	X	X	X	X
Management of severe clinical conditions	X	X		
Management of adverse anti-TB drug reactions	X	X		
Management of co-pathologies	X	X	X	
Patient/family support	X	X	X	X
Education, social mobilization	X	X	X	X
Tracing lost to follow up TB patients		X	X	X
Screening for latent TB infection (LTBI)		X	X	X
Diagnosis of LTBI		X		
Prescription of LTBI treatment		X		
Administration of LTBI treatment		X	X	X
BCG vaccination		X		
Management of anti-TB drugs	X	X	X	X
TB recording and reporting	X	X	X	X

The above table shows how the main tasks essential for effective TB care can be delivered by the different levels of the health system through the coordination and integration of the different health providers and to ensure the necessary flexibility of the health system response to the needs of the TB patients and their families.

The roles and responsibilities for the various levels of staff must be clearly defined through more detailed job descriptions to be used for specific training and supervision. Job descriptions for specific providers in the settings listed above (hospital pulmonology specialist, outpatient

pulmonology specialist, family doctor, community health worker) are presented in Annex 2 and were developed from the review of a number of references^{3,4,5,6,7,8} and two WHO missions conducted in July and December 2016. However, there are additional providers and health care workers who also carry out TB-related tasks in these settings. They are nurses, laboratory staff, pharmacists, epidemiologists, county coordinators, and others. Additional job descriptions should be developed for them.

In order to quantify the costs required to implement the new delivery model of TB care in one pilot area (as agreed in the Roadmap of Annex 1), it is proposed the volume of services as described in Annex 3. The annex contains a spreadsheet with a number of proposed entries that can be changed and have the other fields updated automatically through pre-defined formulas. The spreadsheet in electronic format is available upon request to the Joint Tuberculosis, HIV and Hepatitis Programme (JTH) at the WHO Regional Office for Europe.

4 Current payment methods to TB-relevant providers

All health providers in Romania, whether workers in institutions or independent contractors (such as the FD), are paid by the National Health Insurance House (NHIH) based on a framework contract describing all the services to be provided as well as the co-payments that can be charged officially to patients. The only exception is represented by community health workers, which are employed by the local administration and paid by salary from the state budget, through the MoH. The payment methods and their impact on practices vary for each type of provider.

4.1 Community health workers

Community health workers, including the Roma health mediators, are working under a contract with the government local authorities or with nongovernmental organizations (NGO- exceptions). There are only around 1300 community health workers and Roma health mediators in the country, mainly distributed in the rural area and covering only part of the 3000 local administrative units of the country.⁹

The community health workers hired by the local health authorities are paid by salary through funds of the Ministry of Health; despite of their specific job description (including TB services), they are often diverted to different jobs, even not health-related, to compensate the shortage of local administrative staff.

³ Guidelines for implementing the national program for prevention, surveillance and control of tuberculosis. Bucharest: Ministry of Health, 21 September 2015.

⁴ Framework Contract which regulates medical assistance, medicines and medical devices in the health insurance system for the years 2016-2017. Government Decision no. 161/2016 of 22 June 2016.

⁵ Rules for Carrying out National Health Programs for 2015. Ministry of Health, 31 March 2015. and 2016 o. 31.03.2015: Consolidated Version on 16.08.2016.

⁶ Rules for Carrying out National Health Programs for 2016. Ministry of Health, 16 August 2016.

⁷ Community-based care for drug-resistant tuberculosis: a guide for implementers. USAID/TB CARE II, 2011.

⁸ Task analysis: the basis for development of training in management of tuberculosis. Geneva: World Health Organization, 2005.

⁹ There are almost 3200 local administrative units in Romania between cities, municipalities and communes (in rural area).

There are also a number of community health workers hired by NGOs through the funding of the Global Fund and other international donors. Usually, NGOs pay the community health workers through a lump sum not related to the volume of the activities performed. However, there are also some projects that are piloting the use of incentives to patients (“social vouchers” to increase their adherence to TB treatment) and to providers (“motivational vouchers” to promote early TB case detection and DOT). The pilot projects launched by RAA in September 2015 in five counties (Constanta, Neamt, Maramures, Arges and Bucharest) provide quarterly “motivational vouchers”, each worth 10 Lei (net from 16% income tax) to community health workers and Roma health mediators for:

1. Identification of TB cases in the general population: 3 motivational vouchers per each case referred for diagnosis (independently from the final confirmation of TB disease by a specialist).
2. DOT and distribution of social vouchers:
 - To <5 patients: 10 motivational vouchers/month
 - To 6-10 patients: 15 motivational vouchers/month
 - To >10 patients: 25 motivational vouchers/month

RAA completed these pilot projects at the end of December 2017 and now evaluating their effectiveness.

4.2 Family doctors

Primary health care (PHC) services in Romania are delivered by approximately 12 000 FDs. They are independent professionals very rarely organized in group practices and contracted by the local NHIF branch under the national framework contract. The ideal FD is expected to work 35 hours/week and to serve 1800 inhabitants (with an accepted minimum of 800 and a maximum of 2200 inhabitants). Each FD must employ at least one nurse. New FDs also receive some financial support for opening their practice. The NHIF contract includes the payment of the FD with age-weighted capitation fees (50%) and fees for service (50%) calculated through a system of points designed to discourage the enrolment of too many patients (which number is considered inversely related to the quality of care that can be provided) and to contain the fees for service.

Above the 2200 persons registered and the related threshold of 18 700 points per year, the NHIH payment of per capita fees is progressively reduced of 25% (between 18701 and 23000 points), 50% (between 23001 and 29000 points) and 75% (above 29000)

The fees for service are to provide a minimum package of promotion, prevention and curative services, e.g. immunizations, follow up of some chronic diseases,¹⁰ mother and child health. The fees for service are paid according to points assigned to each type of service multiplied by the number of patients served; then, the total number of points is adjusted to the professional seniority of the FD and the working conditions with the aim to promote professional development and attract

¹⁰ In 2014, the agreement was reached for five conditions of public health relevance such as hypertension, chronic bronchitis, renal failure, kidney diseases and asthma.

FD to unserved/difficult-to-reach areas. The services to be included in the minimum package, as well as the weight in points for each type of service, are negotiated every year under the framework contract between the Ministry of Health, the Family Doctors Association and the NHIH.

Normally a FD is expected to report a maximum number of services per day corresponding to an average of 20 visits in office (15 minutes duration each) + maximum 3 home visits. The average number of visits/day is calculated within a quarter. A maximum number of 40 visits per day could be accepted, but with the condition to maintain the average. Also no more than 42 home visits per month are reimbursed. Such scheme limits in practice the number of those that a FD can have reimbursed by the NHIH per working day. The additional patients may choose to be entered in a waiting list or to be visited in the same day but paying for the medical consultation. The final result is that many respiratory patients bypass their FD and go directly to the emergency department of the hospital.

Until 2009, the national framework contract with NHIH included the payment for the detection of a new TB case and for the completion of treatment. Since 2009, these fees were replaced by the payment of only 5.5 points (10.45 Romanian Lei or 1.9 Lei per point) for the detection of a new TB case confirmed by the specialist. All other TB services that may be needed from a FD are assumed to be part of the basic services paid through the capitation fees; in practice, only a few FD accept to provide DOT based on their good will and personal relation with the pulmonology referring the patient.

4.3 Specialists working in dedicated outpatient facilities

TB specialist outpatient care is provided through the pulmonology dispensaries, which are entities without judicial status, belonging to general or pneumology hospitals, owned by local communities. In the past, their budget was partly provided by the Ministry of Health (salaries and some prevention activities) and partly by the NHIH (consumable for diagnosis and drugs for treatment). In 2013, as consequence of the centralization of anti-TB drug procurement, all budget allocation moved back to Ministry of Health who is currently providing the salaries of staff through a separate budget line and all other expenses. Some financial support, mainly for utilities, but also for rehabilitation and medical equipment could be provided by the local authorities or through infrastructure EU or nationally financed projects. These changes in budgeting and administrative management caused service breakdowns, including the stock outs of some anti-TB drugs. In the near future, it is expected to move all budget under the NHIH national framework contract and consequently simplify administration and increase efficiencies.

4.4 Specialists working in dedicated inpatient facilities

All acute hospitals have an annual contract with the NHIH determining the number of inpatient admissions and the reimbursed tariff for each clinical case depending on the type of hospital and clinical complexity defined by the diagnosis-related group (DRG) classification system (see Annex 4). More complex the cases, larger are their costs of care, consequently the budget to be allocated to the hospital. The DRG system fixes the average number of hospital days for each medical specialty, but promotes the hospital admissions in order to have all hospital beds always occupied.

The chronic hospitals/departments, including TBcases, are excluded from the DRG system in Romania. All TB cases are considered requiring long-term hospital care which cost is reimbursed by NHIH through a flat-fee per diem which cannot exceed Lei 200.20 (or € 45) for the adult patients and Lei 258.01 (or € 57) for the children (2015). The maximum number of TB inpatient days that NHIH accepts to reimburse is theoretically negotiated, but in practice it cannot exceed the number of the previous year. The hospital budget for TB is calculated through the formula in the box below.

Formula for NHIH reimbursement of hospital TB care

Number of discharged cases* X average length of stay[†] X daily rate[‡]

**** Discharged cases***

The number of cases discharged by the hospital. It is negotiated with NHIH based on:

- *The average number of cases discharged by each hospital ward / department in the last five years (taking into account the structural changes approved by the Ministry of Health, as applicable) and the number of cases in the county;*
- *The number of cases discharged to be removed from the total because considered unnecessarily hospitalized (a right usually not implemented by the NHIH).*
- *The number of cases expected to be discharged by each hospital wards / departments in the coming year, considering the number of beds and the average bed occupancy rate and length of stay of the previous year;*
- *The estimated annual number of discharged cases is divided into four for the quarterly payment by the NHIH.*

† Length of stay

Number of inpatient days in the previous year.

‡ Daily rate

Base rate negotiated by each hospital wards / departments with the NHIH, given the justifying documents, depending on the type of hospital but not exceeding Lei 200.2 for adults and Lei 258.01 for children. Hospitals can apply up to 15% increase of the actual daily rate and many local NHIH county offices approved such increase in the past.

The non-DRG status of the TB cases opens the possibility to keep TB patients in hospital to the maximum length of stay, which is one of the few instruments available to the hospital manager to preserve the budget needed for salaries, procurement of goods and equipment and its maintenance/service.

It is also important to mention that all staff working in hospitals receives salary bonuses according to a national pay scale for occupational risk, which in the case of TB reaches 60–75% of the basic salary and it is only paid to the staff directly caring for TB patients. Understandably, such salary bonus is a major incentive for physicians to favour the hospitalization of the TB patients and their fragmented distribution across hospital wards/departments to ensure equal access to the bonus to

all staff. Eventually, it also limits the implementation of effective administrative measures for infection control, such as separating TB patients by drug-resistance profile and from other pulmonology patients.

The NHIH national database provided to the WHO mission allows the analysis of all TB cases admitted in hospital¹¹ by their acute or chronic condition¹² but without the possibility to differentiate between drug-susceptible (DS) TB and MDR-TB cases. However, these two types of cases can be guessed by considering their different need of treatment¹³ and then the average length of hospital stay (ALOS) pattern studied both by *patient* and *case*¹⁴ having the NHIH database an encrypted number for each patient that allows to trace his/her number of hospitalizations.

A total of 1,021 patients and 1,118 cases (due to hospital readmission) received acute care in hospital with an ALOS respectively of 6.8 days and 6.2 days (Table 2). 772 (76%) of them received also chronic care.¹⁵ 19 076 patients and 28 764 cases received treatment in chronic care hospital wards with an ALOS respectively of 59 days and 39.1 days.

Table 2. Main hospital statistics by type of TB care; Romania, 2015.

<i>TB patient</i>	<i>TB patients</i>			<i>TB cases</i>	
	<i>Number</i>	<i>Average age (years)</i>	<i>ALOS (days)</i>	<i>Number</i>	<i>ALOS (days)</i>
<i>On acute care</i>	1 021	50.1	6.8	1 118	6.2
<i>On chronic care</i>	19 076	45.2	59.0	28 764	39.1
<i>Total</i>	19 324	45.4	58.6	29 882	37.9

Source: data elaborated from the NHIH database

All TB patients admitted for chronic care can be distributed in intervals of 15 bed days ALOS (Figure 3). The majority of patients were treated up to a maximum of 75 days. The experts of Marius Nasta reported a practice of 30 day ALOS for DS-TB patients and 80 days ALOS for MDR patients, which population was estimated around 1400 in the country.

¹¹ All cases are coded under the International Classification of Diseases (ICD), with TB diagnosis indicated in the range from A15.0 to A19.9.

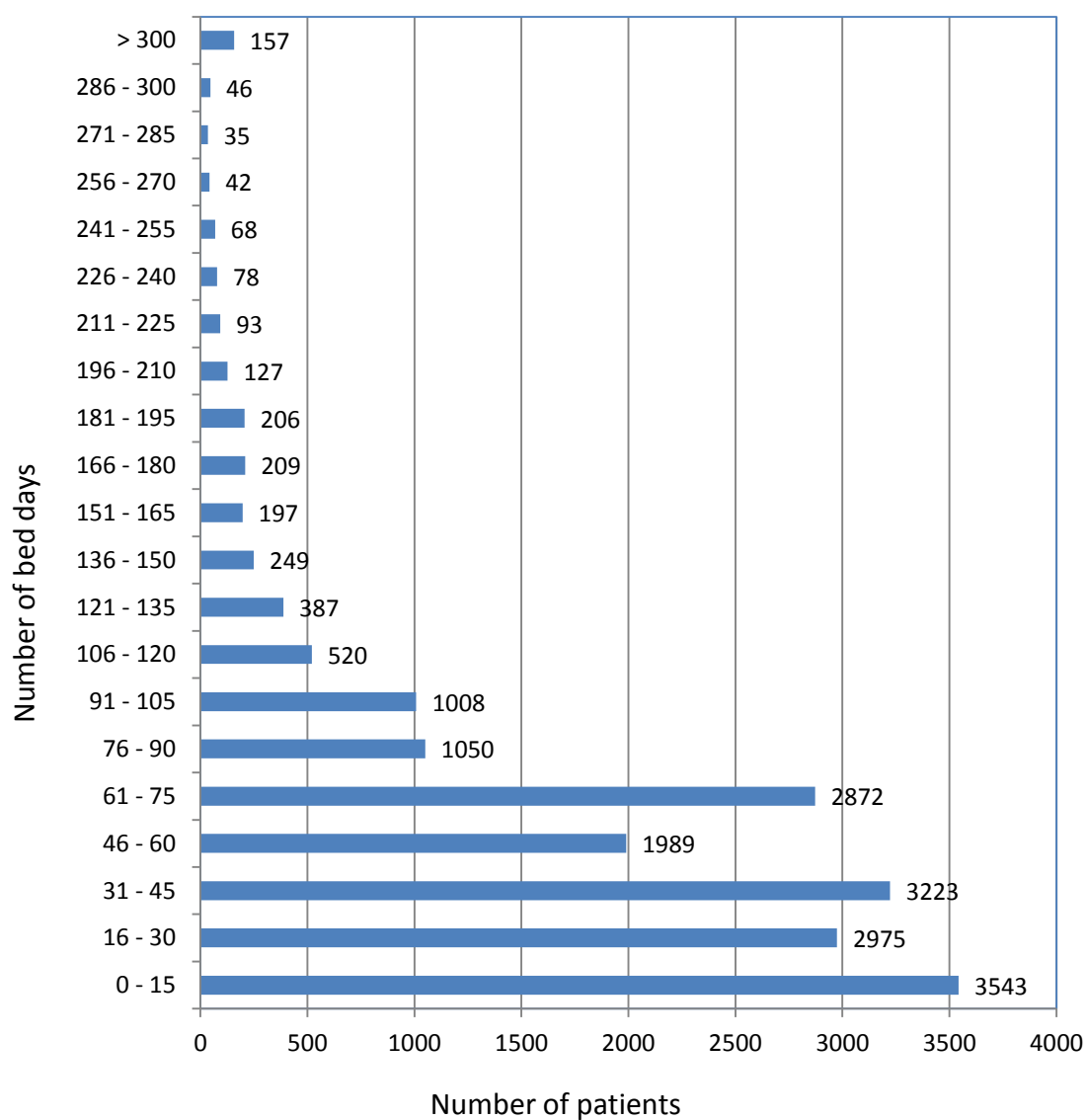
¹² Each hospital service has a code indicating the type of care provided, i.e. acute care (paid through DRG) or chronic care (paid through per diem).

¹³ The treatment of a DS-TB case is of at least six months while of a MDR-TB patient is at least 20 months.

¹⁴ A *hospital event* starts with the admission in hospital and ends with the discharge. A *patient* includes all hospital events of the same patient in the year. A *case* refers to each hospital event, even if of the same patient. It is important to distinguish between one or more hospital events (re-hospitalization) for a single patient.

¹⁵ This usually happens when a patient is initially diagnosed with pneumonia (acute condition) and then diagnosed with TB (chronic condition).

Figure 3. Number of hospitalized TB patients by group of bed days; Romania, 2015



Source: data elaborated from the NHIH database

As shown in Figure 3, in 2015 in Romania, 1507 TB patients spent in hospital more than 135 days, the majority of them evidently because of their MDR-TB status. The analysis of patients by their guess-estimated drug resistance status is shown in Table 3.

Table 3. Average length of stay (ALOS) in hospital by type of TB patient and case; Romania, 2015

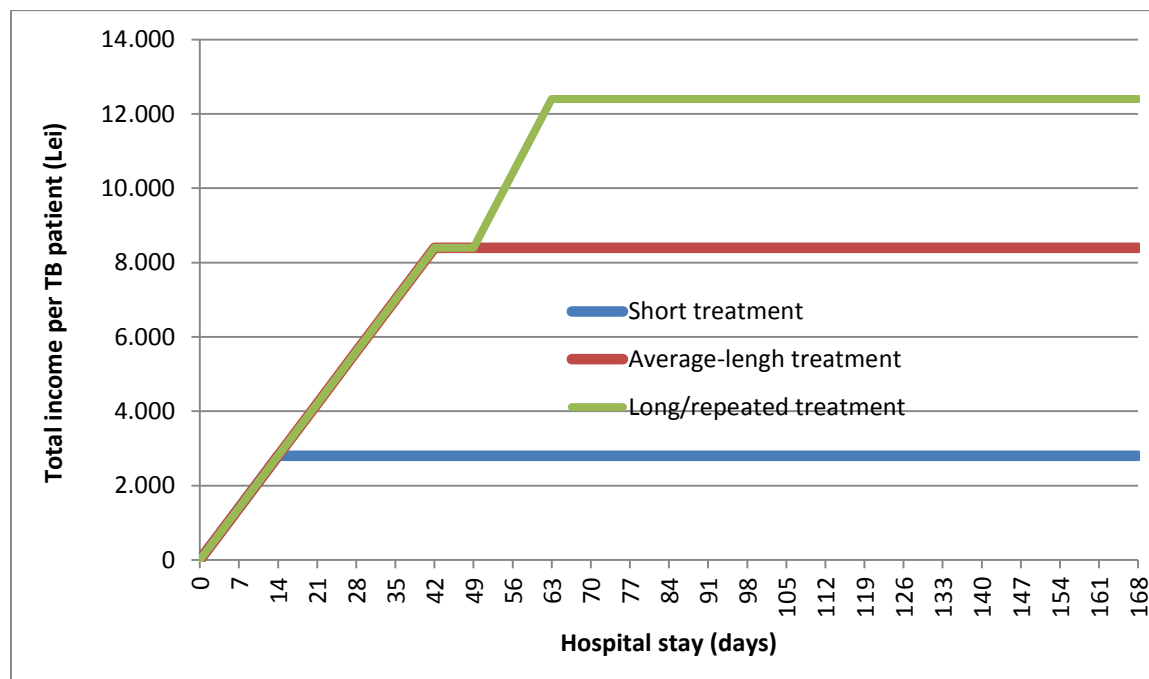
TB treatment	TB patients			TB cases	
	Number	Average age (years)	ALOS (days)	Number	ALOS (days)
<135 days (guessed to be for drug-susceptible patients)	17 567	44.5	46.1	23 650	34.3
>135 days (guessed to be for MDR-TB patients)	1 507	46	208.5	5 110	61.5
Total	19 704	45.2	59.0	28 670	39.1

Source: data elaborated from the NHIH database

The patients treated in hospital less than 135 days (and guess-estimated with DS-TB) had an ALOS of 46.1 days per patient and 34.3 days per case. The patients treated in hospital longer than 135 days (and guess-estimated with MDR-TB) had an ALOS of 208.5 days per patient and 61.5 days per case.

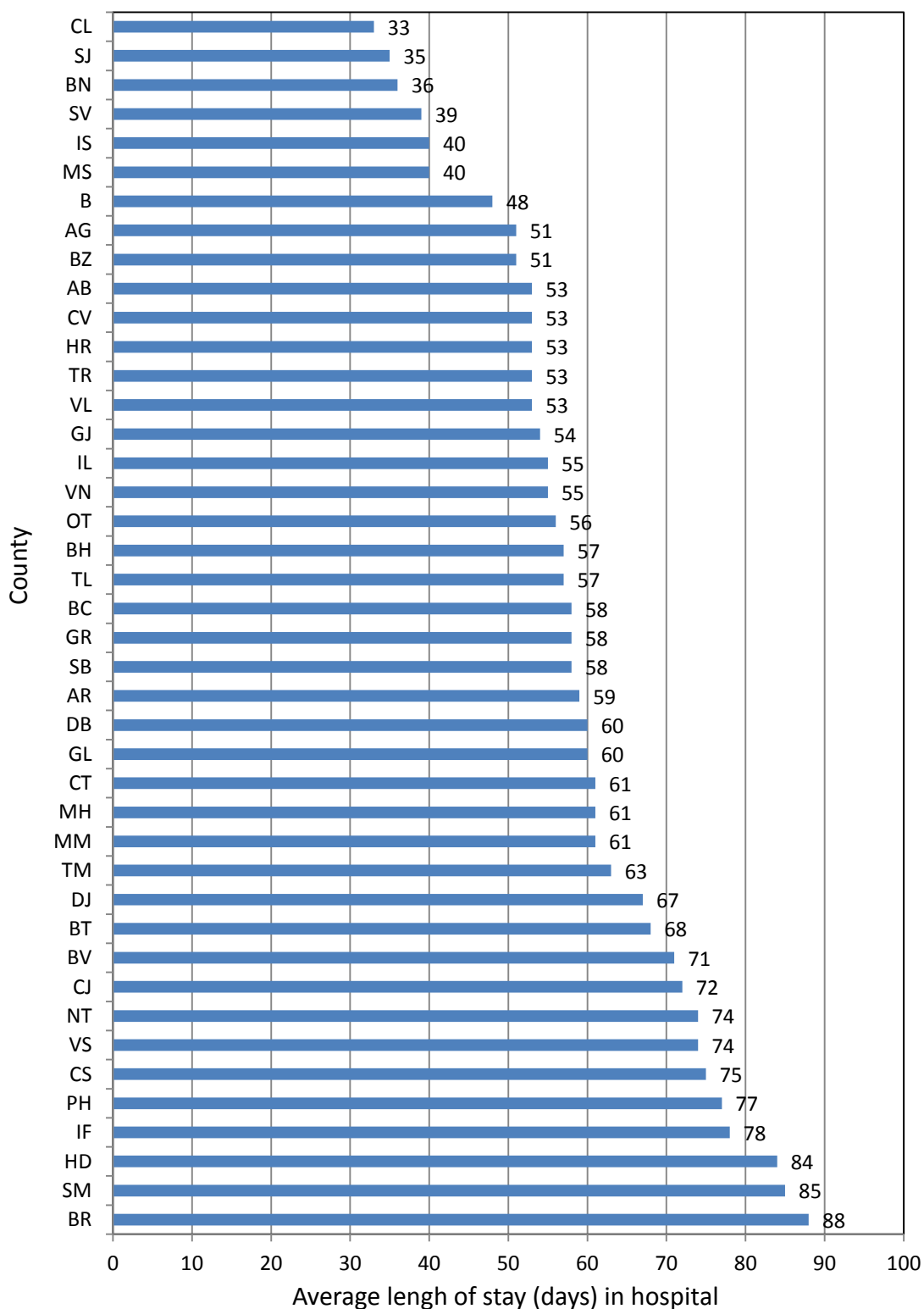
Figure 4 shows a model of hospital cumulative income from the NHIH reimbursement for the different treatment lengths. A "short treatment" is long 14 days and paid approximately 2800 Lei; an "average-length treatment" is long 42 days and paid 8400 Lei; a "long/repeated treatment" is long 62 days (without considering the interruptions between different admissions) and paid a maximum of 12400 Lei. It is evident how prolonging the treatment and hospital readmissions are financially advantageous only when the number of patients is limited and there is no other way to fulfil the bed occupancy rate and increase the hospital income.

Figure 4. Cumulative income (Leu) per patient by model of hospital TB treatment. Useful to provide data /table used for building the chart



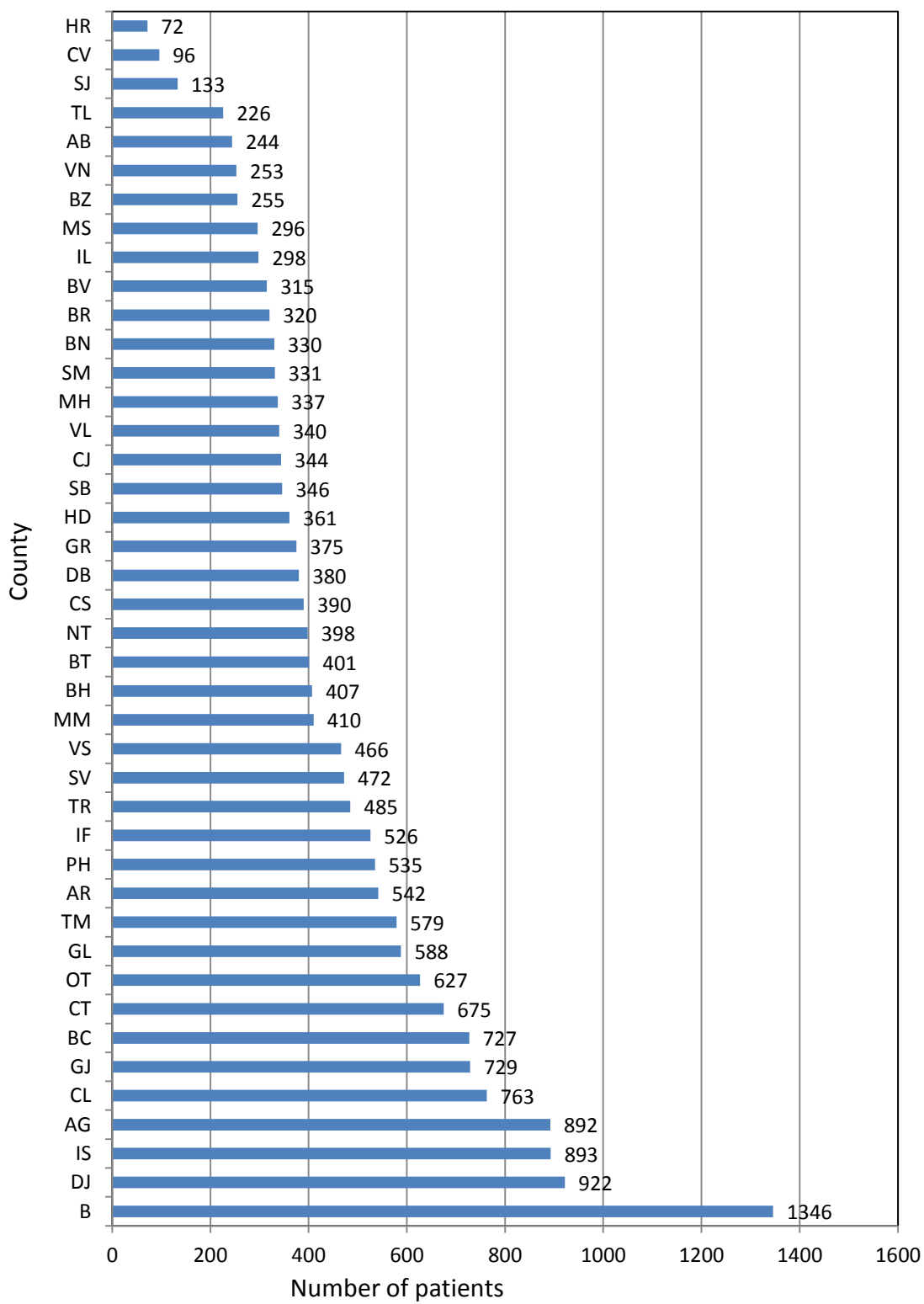
Substantial differences in ALOS (Figure 5) and number of TB patients treated in hospital (Figure 6) can also be observed across the counties of Romania.

Figure 5. Average length of stay (ALOS) in hospital by county; Romania, 2015



Source: data elaborated from the NHIH database

Figure 6. Number of TB patients treated in hospital by county; Romania, 2015



Source: data elaborated from the NHIH database

5 Proposed new payment methods for TB providers

5.1 Outcome-related fee-for-service to community workers

As per table 1, the community workers (health workers, Roma mediators, etc.) can provide the following services: early identification of presumptive TB cases, DOT, support to patients and their families, tracing of TB contacts and lost-to-follow up treatment TB patients, education and social mobilization. For these services, it is recommended to apply outcome-related fees for services (see Annex 5) proportionate to their delivery volumes. For example, to cover the two most important TB outcomes which are case detection and treatment success, fees could be considered to incentivize each TB diagnosis confirmed by a pulmonologist and each successful treatment (defined as cure or treatment completed). The tariffs should be seen attractive enough to the community workers and can be similar to those adopted under the pilot project implemented by RAA, i.e. motivational vouchers (worthy 10 Lei net from 16% income tax) given to community health workers and Roma Health Mediators for:

- Identification of TB cases in the general population: 3 motivational vouchers per each TB case detected after confirmation by the specialist
- DOT and distribution of social vouchers to patients upon the assumption of all doses of medicines prescribed for the month:
 - For <5 patients: 10 motivational vouchers/month
 - For 6-10 patients: 15 motivational vouchers/month
 - For 10 patients: 25 motivational vouchers/month

5.2 Outcome-related fee-for-service and capitation fee to family doctors

The National Health Strategic Plan considers revising the payment system under the NHIH to prevent unnecessary hospitalization of patients and provide TB outcome-based incentives to FDs under the package of minimum services.

The inclusion of TB in the package of minimum services reimbursable by NHIH to FD is an opportunity that cannot be missed to ensure coordinated/integrated people-centred TB control co-opting FDs for early identification and referral of presumptive TB cases for diagnosis and treatment, DOT, support to patients and their families, tracing of TB contacts and lost to treatment follow up TB patients, education and social mobilization (Table 1).

To engage FDs in TB care, it is recommended to apply a mix of payment methods composed by the current age-weighted capitation fee and fees for service under the NHIH point system. The number of points attributed to TB services should be similar to the points attributed to non-TB services in terms of time-consumption, cost, risk and complexity. The amount of points should be an attractive incentive for FD and suggested in Table 4.

Table 4. Outcome-related fees for service (comprehensive package of services) to family doctors.

Service	Unit		Points		Fee per case (Leu)
	Type	Number	/service	Total	
TB case detected and confirmed by a pulmonologist	Case	1	5,5	5,5	10,45
Directly observed treatment (6 months)	Week	26 weeks	5,5	143	271,7
Directly observed treatment (9 months)	Week	39 weeks	5,5	214	407,55
Directly observed treatment (12 months)	Week	52 weeks	5,5	286	543,4
TB case successfully treated (6 months)	Week	26 weeks	5,5	143	271,7
TB case successfully treated (9 months)	Week	39 weeks	5,5	214	406,6
TB case successfully treated (12 months)	Week	52 weeks	5,5	286	543,4

Points for NHIH reimbursement should be considered for each new TB case confirmed by a pulmonologist and for each week of directly observed treatment, with an additional bonus for each TB case successfully treated (cured or completed treatment). For the last two services the points given are according to the different duration of treatment for DR-TB patients (6 months or 26 weeks), severe patients but drug-susceptible (9 months or 39 weeks for treating meningitis and bone TB) and MDR-TB patients (12 months or 52 weeks outpatient treatment after hospitalization).

It is also recommended to implement non-financial rewards such as awards for the best performant FDs given during national health related events, publicizes data on FDs performances, etc.

Finally, the implementation of the new payment arrangement and TB management needs to be supported by the FDs Application Programming Interface (API), which is an electronic toll to report the utilization of services by the patients. It is recommended to develop a TB specific module that supports patients' follow up and clinical decisions. Additionally, business information tools with a monitoring and evaluation component can generate TB key performance indicators (KPIs) and alerts to the FDs.

5.3 Bundled payment for inpatient and outpatient TB facilities

To reduce the over-hospitalization of TB patients resulting from the current payment mechanism,

different models have to be developed. The DRG system applied to TB would force hospital managers to dramatically reduce the length of stay of TB hospital admissions but not their number. Alternative payment models should be considered and agreed with the hospital managers, then supported in their implementation through changes in clinical guidelines and practice and by an effective network for outpatient TB care.

The present "per diem" payment for inpatient TB care can lead to (unnecessarily) long hospitalization while the payment for outpatient TB care through fixed budget and partial reimbursement of operational costs are not motivating dispensaries for more activity. Such payment methods may explain the overuse of hospital services and underuse of outpatient services. A bundled payment, where the funding is not dependent from the length of stay, with the addition of a pay for performance (see Annex 4 for definitions) can be appropriate to support a change towards more outpatient TB care.

The bundled payment should be considered for the treatment of DS-TB patients as well as for the treatment of MDR-TB patients. In the latter, the cost of anti-TB drugs should be paid separately as it is now.

Cost data are needed for calculating the correct reimbursement for TB cases through the bundled payment mechanism.

The cost per bed day is one of the necessary factors to calculate the amount of the bundled payment. Using the step-down cost allocation method, the cost per bed-day was calculated in two different hospital departments of Constanta county treating TB patients (Table 5).

Table 5. Cost/bed-day calculation in two hospital departments of Constanta county treating TB patients, January-June 2016.

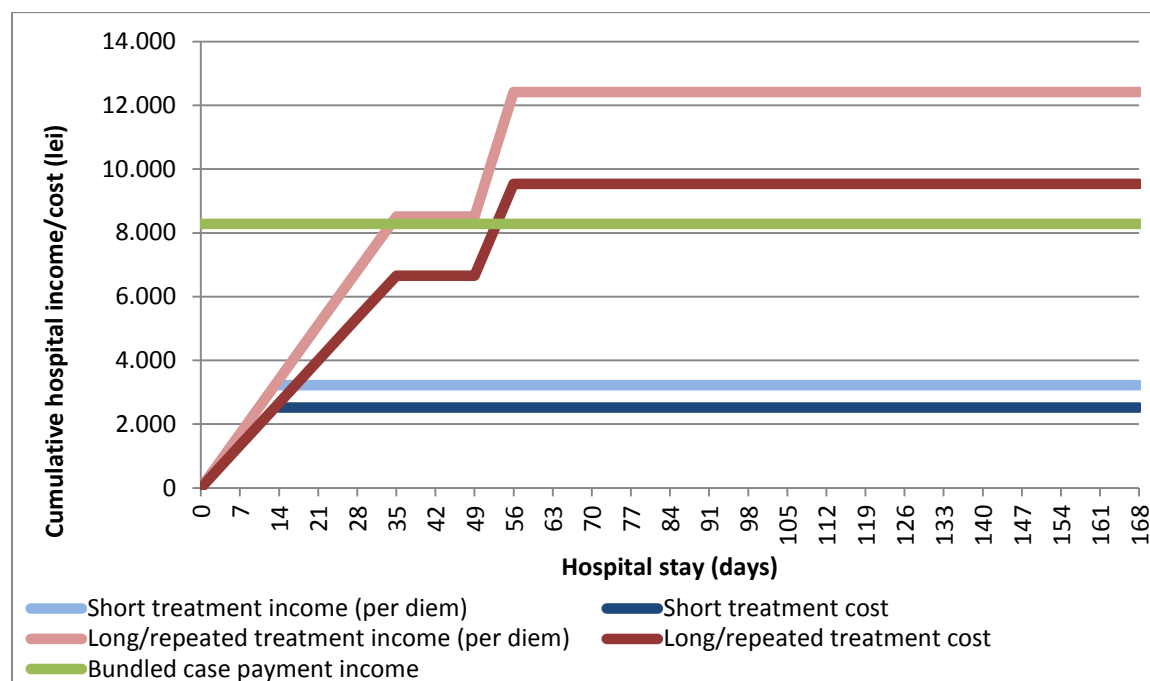
Unit	Total cost of the department/unit (Lei)	Bed/days	
		Number	Cost (Lei)
Clinical Pulmonology Hospital, Constanta	8 494 617	33 503,00	253,5
TB Department Agigea, General Hospital, Constanta	2 913 480	16 186,00	180,0

To study the relationships between inpatient cost and income, modelling can be made with different treatment lengths. Figure 7 shows such modelling based on the bed/day income (per diem payment) of 230 Lei and the bed/day cost of 180 Lei, data given by the Constanta County.¹⁶ It is evident that under the per diem payment method, the hospital management is benefitted by longer hospital stays and patients readmissions because the daily income is higher than the cost. In the case of a bundled payment method the hospital income is the same with shorter or longer

¹⁶ In Constanta County the NHIH reimbursed TB bed-days at 230 Lei/day having accepted the claim of the hospitals for 15% increase of the 200 Lei/day base rate.

hospitalization, while hospital costs increase with longer hospitalization. Less hospitalization on the other hand creates a need for more outpatient specialist service.

Figure 7. Modelling by different payment method and hospital stay.



Basically the bundled payment for drug susceptible TB patients can cover all TB specialist services needed to assure treatment success, consisting in a single payment for an episode of care involving both hospital and dispensary care. Potentially, the implementation of a bundled payment for drug-susceptible TB patients permits to follow the adequate clinical pathway by reducing the incentives for over-hospitalization and over-readmissions and prolonged length of stay.

In addition and independently from hospitalization, the pay-for-performance (P4P) payment should be also considered. It should be considered as reimbursement for taking care of a TB patient, calculated as 10% of the defined tariff and paid only for patients treated successfully (cure or treatment completion). Additionally, medical doctors working in dispensaries, similarly to the doctors working in the hospitals, should continue to receive a salary bonus for their occupational risk of TB.

The Romanian experts reported to the mission team an ALOS for the drug susceptible TB patients¹⁷ between 30 and 37 days. However, the ALOS claimed for reimbursement to NHIH (Table 2) for a "guessed drug-susceptible" TB patients was 46 days in 2015. The difference could be explained by the fact that NHIH was charged with an ALOS including the admissions and readmissions of single patients; therefore, the average of 46 days hospitalization multiplied by 200

¹⁷ Here ALOS is referred to patients and not to cases.

Lei, which is the hospital per diem, should be used as reference average cost of the hospital care for a DS-TB patient.

Defining different costing groups of TB patients based on their clinical conditions (i.e. with extrapulmonary TB, with complications, with different anti-TB drug resistance) could be too complicated. Instead, it is proposed two groups of patients only for bundled payment, i.e. those with drug susceptible (DS) TB and those with MDR-TB. In the case of the DS-TB patients, up to 9200 Lei (46 x 200 could be moved from inpatient care to outpatient care in dispensaries (hospital and dispensaries are under same administration), especially in case of those patients that require shorter length of stay and more limited volume of hospital services. Similar reasoning could be applied to the MDR-TB patients of which ALOS reimbursed by NHIH in 2015 was 209 days hospitalization per case (admission and readmissions merged).

We know that there are significant ALOS differences between hospitals of the different counties (see Figure 5.). Consequently, setting the bundled case payment to the national average could cause a loss of income for those hospitals with long ALOS; in these cases, both national and local ALOS could be considered in order to set a transitional compromise. This will necessarily result in higher case tariff in counties with historically higher ALOS, but still less than now. With time, there will be a gradual reduction of the county tariffs and a national convergence towards further lowering of ALOS and county inefficiencies and more people centred TB services.

6 Pilot project testing the new model of delivering and financing TB services

Coordination

The pilot should be steered by a technical working group of the Ministry of Health with participation of NHIH, NTP, the Family Doctors Association and other relevant stakeholders. Support should be ensured by international experts.

The overall coordination of implementation should stay at the local hospital, where the in/outpatient mix of TB care is decided and where there is the administrative capacity to manage financing matters.

A special Team composed by all key providers (pulmonologist in hospital, pulmonologist in dispensary, family doctor and social worker) should take the responsibility of the continuum of care of every patient enrolled in the pilot. In addition, a Payment Coordinator should take the responsibility of all financing arrangements.

Selection of the site

To easier the establishment, monitoring and evaluation of the pilot testing of the new model of delivering and financing TB services, it is recommended to consider the following criteria:

- Location in maximum only one-two administrative areas with involvement of one-one hospitals and their pulmonology dispensaries

- Hospital(s) and the dispensary/ies be directly linked administratively (to ensure an internal and easier reallocation of financial and human resources).
- Full understanding and strong commitment of all health providers to work together for the success of the pilot project, including in some adjustments which may be required during the process.
- Hospital administration without any financial debt. Capacity to present the costs of services using the template of Ministry of Health Order No. 1043/2010 on “Methodological standards for the elaboration of revenues and expenditures of public hospitals”.
- ALOS close to the national average.

Selection of the patients

To avoid any selection bias and ensure the testing of a new model of TB care that can be later roll out countrywide, all TB patients should be selected disregarding their drug susceptibility, their risk factors (HIV infection, use of injecting drugs, alcohol use disorders, etc.) and social determinants (poverty, imprisonment, migration, etc.)

Financing arrangements

There is no need for additional financial resources. The new model of TB care will be financed with reallocation of savings from the hospital budget. The bundled case-payment for DS-TB and MDR cases will be calculated by multiplying the local ALOS by the per diem. The procurement of anti-TB drugs, including for MDR-TB cases remains the same.

The bundled case payment financed by NHIH will be allocated by the Payment Coordinator based on the following formula:

Total bundled payment =	inpatient part +	outpatient part +	pay for performance
Equal to the current amount paid on average by the NHIH for the treatment of a TB inpatient (all episodes considered).	The reimbursement of the costs of hospitalization. It depends from the care model (planned treatment days) and the daily cost and payment data.	The reimbursement of the costs of outpatient care.	Financial incentive to providers (nurses, doctors) also for the management of TB cases who do not need inpatient care.

It is expected that in the new model of care the ALOS for DS-TB patients will be decreased from 46 days (in 2015) to 30 days and the ALOS for MDR-TB patients to 80-100 days. This would allow, for instance, in case of DS-TB cases to save and partly shift from hospital to ambulatory care the amount of 3200 Lei (16 days *200 Lei) or 800 US\$ per case that can sustain the

introduction of the pay-for-performance scheme for all providers (hospital and dispensary staff and also community health workers).

Preparation

Key for success of the pilot project is to ensure in advance a number of conditions:

- Legal framework agreed between national and local health authorities, NHIH and all health providers and officially endorsed through an order of the Ministry of Health.
- Availability of all diagnostic and treatment services (e.g. anti-TB drugs for DS-TB and MDR-TB).
- Standard operating procedures set and circulated among all stakeholders with clear description of: distribution of responsibilities, revised hospital admission/discharge criteria, revised terms of reference for all providers, schemes of payments, criteria for monitoring and evaluation.
- Updated training of the health managers and all health service providers.

The training should be developed to provide the knowledge and skills to carry out the tasks outlined in the Annex 2. More detailed task analysis could be needed to identify the gaps and needs for training in the specific settings of the pilot area chosen and to extend the training to other key staff, such as the nurses, laboratory staff and pharmacists. Depending on their number, their training could be organized on individual basis by an already trained physician or in group classes. Training should utilize active adult learning principles and should include lectures, plenary discussions with sharing of experiences, individual and group exercises and role plays. Particular emphasis should be placed on multidisciplinary team work and communication skills with patients and families. Existing curricula, exercises and certified trainers from current projects (e.g. communication training developed under Norwegian grant) can be adapted for these trainings. Trainings should be conducted by skilled facilitators performance should be monitored during the training and follow-up carried out at designated intervals after the training.

Monitoring and evaluation

To properly monitor and evaluate the financial aspects of the pilot project, additional data should be collected because not included in the routine recording and reporting system (see the forms proposed for the collection of additional financial data in Annex 5).

In hospital, there is the need to collect the total cost of the pulmonology department (including direct and indirect costs) and the number of bed days for the same period. These data are used to calculate the cost/bed day ratio and the cost/bed day ratio (if the cost of drugs is available).

In the pulmonology dispensaries, there is the need to collect the total costs (including direct and indirect costs) and the total number of outpatient visits for the same period. These data are used to calculate the cost/visit and the cost/patient.

The pilot project should be closely monitored jointly by the working group of the Ministry of Health and the local hospital administration. A number of indicators should be used to monitor the implementation of the project, allowing the early identification of problems to solve during the process and documenting the final outcomes (Table 5).

Table 6. Monitoring and evaluation framework

Level	Indicator	Source	Evaluation time
Output	▪ Hospitalization rate by type of patient ▪ ALOS ▪ Bed occupancy rate	Hospital records	Quarterly
	▪ Percentage of satisfaction among patients ▪ Percentage satisfaction among providers	Survey	
Intermediate outcome	▪ DOT compliance rate ▪ Percentage of patients lost in follow up	TB register	Quarterly
Final outcome	▪ Treatment outcomes ▪ Percentage of relapsed in need of retreatment	TB register	Annually
	▪ Cost per treatment completed ▪ Cost savings by patients	Hospital records	

In addition, the technical working group of the Ministry of Health should arrange supervisory visits of all health facilities/providers involved in supporting the local implementation of the pilot project and deciding together if and how to fine tune interventions.

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Annex 1. Roadmap for reforming TB service delivery in Romania

Activity	2015	2016				2017
	Q4	Q1	Q2	Q3	Q4	Q1
Set of working group and first meeting	X					
Monthly meeting of the working group	X	X	X	X	X	X
Revise TB patients' hospital admission/discharge criteria		X				
Revise family doctors' TOR		X				
Revise community health workers TOR		X				
Cost analysis and revision of payment methods of TB hospitals and dispensaries		X				
Cost analysis of the 2016 basic package of services for family doctors and development of performance-based financial incentives for TB services		X	X			
Revision of the legal framework to support the new model of TB care at hospital, ambulatory and community level		X	X			
Negotiation with the National Association of Family Doctors			X			
Negotiation with NHIH			X			
Consensus workshop with Ministry of Health and main national TB stakeholders			X			
Consensus workshop with health authorities and providers of the pilot county			X			
Order of the Ministry of Health for the implementation of the pilot project			X			
Develop the training plan and package for all levels TB providers in the pilot county			X			
Train NTP management on result-based management practices			X	X		
Train all levels TB providers in the pilot county				X		
Conduct and monitor the pilot projects				X	X	X

Mid-term evaluation of the pilot project (financial indicators)					X	
Final evaluation of the pilot project (TB treatment outcomes)						X
Final tune of the new model of TB care						X
Order of the Ministry of Health for the adoption of the new model of TB care countrywide						X

- Out of date

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Early identification of presumptive TB	• Identify all close contacts through interview of the TB patients. • Coordinate with pulmonary dispensary specialist, district epidemiologist, family doctors and others to trace the TB contacts.	• Coordinate with hospital specialist, district epidemiologist, family doctors and community workers to identify and trace all TB contacts. • Evaluate all TB contacts for active TB.	• Screen all respiratory patients for risk of TB (close contact, main signs/symptoms indicative of TB) and refer them to the dispensary. • Coordinate with dispensary specialist to identify all TB contacts. • Trace and refer all TB contacts to the dispensary. • Ensure that all contacts referred were seen in the dispensary.	• Investigate all respiratory patients for risk of TB (close contact, main signs/symptoms indicative of TB, social vulnerability) and refer them to the family doctor. • Coordinate with FD and TB dispensary specialist to identify all TB contacts. • Trace and refer all TB contacts to the dispensary. • Ensure that all contacts referred were seen by the family doctor or in the dispensary.
Diagnosis of TB disease	• Conduct physical examination and other investigations, according to the national guidelines. • Ensure appropriate communication with x-ray and laboratory services on tests and results. • Ensure appropriate documentation of all examination results and final diagnosis.	• Conduct physical examination and other investigations, as per national guidelines. • Ensure appropriate communication with x-ray and laboratory services on tests and results. • Ensure appropriate documentation of all examination results and final diagnosis.		

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Prescription of TB treatment regimen	• Select appropriate treatment regimen based on clinical, laboratory and epidemiologic findings according to the national guidelines. • Adjust treatment prescription according to the results of the follow-up.	• For patients with treatment prescribed in other facilities, ensure the consistency of the treatment prescribed with the national guidelines and for its continuation. • For patients not referred by other facilities, select appropriate treatment regimen based on clinical, laboratory and epidemiologic findings according to the national guidelines. • Adjust treatment prescription according to the results of the follow-up.		

Administration of TB treatment	• Ensure directly observed treatment (supervision of intake of oral and injectable anti-TB drugs). • Together with patient and family and considering their needs, identify the most appropriate plan for directly observed treatment to be followed outside the hospital. • Ensure that appropriate infection control measures are implemented, according to the national guidelines. • Prior to discharge of patient, coordinate with the pulmonary dispensary to arrange the continuation of treatment after hospital discharge.	• Together with hospital specialist, patient and family and considering their needs, identify the most appropriate plan for directly observed treatment to be followed in and outside the dispensary. • Ensure directly observed treatment (supervision of intake of oral and injectable anti-TB drugs) to the patients who decide to attend the dispensary. • Ensure that appropriate infection control measures are implemented, according to the national guidelines. • Coordinate with the family doctors and the community health workers to arrange the continuation of treatment outside the dispensary: - Provide initial or refresher training and educational material - Establish close communication with the patient and the family doctor (direct telephone line). - Ensure that all relevant information on patient is	• Together with patient and family and considering their needs, identify the most appropriate plan for directly observed treatment to be followed in the family doctor practice or by a community health worker. • Communicate plan to pulmonary dispensary. • Ensure directly observed treatment (supervision of intake of oral anti-TB drugs) to the patients who decide to attend the family doctor practice. • Ensure that appropriate infection control measures are implemented, according to the national guidelines. • Coordinate with the community health workers to arrange the treatment by them: – Provide initial or refresher training and educational material. – Establish close communication with the patient and the community health worker (direct	– Ensure directly observed treatment (supervision of intake of oral anti-TB drugs).
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Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
		available.	telephone line). – Ensure that all relevant information on patient is available.	
Monitoring TB treatment progress	• During hospitalization, monitor progress of treatment through medical follow-up according to the national guidelines. • Identify potential barriers to treatment adherence and work with the patient to overcome them.	• Monitor progress of treatment through monthly medical follow up of the patient according to the national guidelines. • Identify potential barriers to treatment adherence and work with the patient to overcome them. • Communicate changes to family doctor or community health worker as needed.	• Monitor progress of treatment through weekly medical follow up of patient and refer to pulmonary dispensary as needed for adverse reactions to anti-TB medication or other clinical concerns. • Remind patient about monthly follow-up at dispensary. • Ensure that all TB patients are seen monthly in the dispensary.	• Remind patient about weekly follow-up at family doctor and monthly follow-up at pulmonary dispensary. • Accompany the patient to the medical appointments as needed. • Ensure that patient reported for follow-up visits.
Management of severe clinical conditions	• Identify a severe clinical condition occurring at its earliest occurrence. • Promptly treat the patient for the severe condition occurring.	• Identify a severe clinical condition and refer the patient to hospital if necessary.		

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Management of adverse anti-TB drug reactions	• Monitor for adverse reactions according to the national guidelines. • Give appropriate advice and reassurance to the patient in case of minor adverse reactions. • Manage major adverse reactions according to the national guidelines. • Report adverse reactions according to national guidelines on active drug safety monitoring.	• Monitor for adverse reactions according to the national guidelines. • Give appropriate advice and reassurance to the patient in case of minor adverse reactions. • Manage major adverse reactions according to the national guidelines. Refer to hospital if necessary. • Communicate regularly with family doctor regarding adverse reactions. • Report adverse reactions according to national guidelines on active drug safety monitoring.		

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Management of co-pathologies	- Investigate the risk of co-pathologies (HIV counselling and testing, alcohol use disorders identification test [AUDIT], drug use, diabetes mellitus, other immunosuppressive conditions) - Coordinate with other specialized services for the diagnostic confirmation, treatment and continuous of care of the co-pathologies identified. - Ensure communication and coordination among all care providers.	- Investigate the risk of co-pathologies (HIV counselling and testing, alcohol use disorders identification test [AUDIT], drug use, diabetes mellitus, other immunosuppressive conditions). - Coordinate with other specialized services for the diagnostic confirmation, treatment and continuous of care of the co-pathologies identified. - Ensure communication and coordination among all care providers.	- Investigate the risk of co-pathologies (HIV counselling and testing, alcohol use disorders identification test [AUDIT], diabetes mellitus, other immunosuppressive conditions). - Coordinate with other specialized services for the diagnostic confirmation, treatment and continuous of care of the co-pathologies identified. - Ensure communication and coordination among all care providers.	

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Patient/family support	• Identify and assess social and psychological barriers or challenges that may impact treatment adherence • Arrange with available staff (multidisciplinary team) to provide necessary support including individual or group counselling, access to social welfare, enablers and incentives etc. • Communicate and coordinate with TB dispensary on the identification of the social and psychological needs prior to release from hospital. • Communicate effectively with patient and provide supportive, encouraging messages to patient throughout all treatment in hospital.	• Identify and assess social and psychological barriers or challenges that may impact treatment adherence. • Arrange with available staff (multidisciplinary team) to provide necessary support including individual or group counselling, access to social welfare, enablers and incentives, etc. • Communicate and coordinate with family doctors, community workers, others on the provision of all necessary social and psychological support. • Communicate effectively with patient and provide supportive, encouraging messages to patients throughout all treatment, including at all monitoring and DOT visits.	• Identify and assess social and psychological barriers or challenges that may impact treatment adherence. • Communicate and coordinate with the dispensary and others on the provision of all necessary social and psychological support including individual or group counselling, access to social welfare, enablers and incentives, etc. • Communicate effectively with patient and provide supportive, encouraging messages to patients throughout all treatment, including at all monitoring and DOT visits.	• Identify psychological barriers or challenges that may impact treatment adherence. • Communicate and coordinate with the family doctor and others on the provision of all necessary social and psychological support including individual or group counselling, access to social welfare, enablers and incentives, etc. • Communicate effectively with patient and provide supportive, encouraging messages to patients throughout all treatment, including at all DOT visits.

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Education, social mobilization	• Meet patient and family and educate them using clear non-technical language (verbally, educational material) on the following topics: - What is TB, how it spreads, how it can be prevented - Main TB signs and symptoms and where seeking for care - How TB can be cured; details of treatment regimen (drugs, duration, frequency); the importance of having complete and uninterrupted treatment, frequency and type of monitoring visits. - Which are the main signs/symptoms of adverse drug reactions - Which are the social and psychological support available and how to get it • Proactively ask for questions and respond clearly	• Meet patient and family and educate them using clear non-technical language (verbally, educational material) on the following topics: - What is TB, how it spreads, how it can be prevented - Main TB signs and symptoms and where seeking for care - How TB can be cured; details of treatment regimen (drugs, duration, frequency); the importance of having complete and uninterrupted treatment frequency and type of monitoring visits. - Which are the main signs/symptoms of adverse drug reactions - Which are the social and psychological support available and how to get it. • Proactively ask for questions and respond clearly. • Continue to provide educational messages throughout treatment	• Meet patient and family and educate them using clear non-technical language (verbally, educational material) on the following topics: - What is TB, how it spreads, how it can be prevented - Main TB signs and symptoms and where seeking for care - How TB can be cured; details of treatment regimen (drugs, duration, frequency); the importance of having complete and uninterrupted treatment, frequency and type of monitoring visits. - Which are the main signs/symptoms of adverse drug reactions - Which are the social and psychological support available and how to get it. • Proactively ask for questions and respond clearly. • Continue to provide educational messages throughout treatment	• Provide education on TB to high risk populations in the community • Provide reminders on main signs and symptoms of adverse drug reactions and frequency and schedule of monitoring visits to patients receiving treatment. • Motivate the patient about the importance of continuing treatment and the possibility of cure.

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Tracing lost to follow up TB patients		• Contact (or work with family doctor to contact) the patient when missing the directly observed treatment by more than 24 hours. • Administer the treatment • Reinforce message on importance of adherence to treatment. • Identify social and psychological barriers or challenges that may impact treatment adherence. • Communicate and coordinate with family doctors, community workers, others on the provision of all necessary social and psychological support.	• Contact (or work with community health worker to contact) the patient when missing the directly observed treatment by more than 24 hours. • Administer the treatment • Reinforce message on importance of adherence to treatment. • Identify and assess social and psychological barriers or challenges that may impact treatment adherence. • Communicate and coordinate with the dispensary, others on the provision of all necessary social and psychological support.	• Inform the family doctor as soon as the patient misses the treatment. • Locate the patient and return them to treatment as directed by family doctor or pulmonary specialist.
Screening for latent TB infection (LTBI)		• Coordinate with district epidemiologist, family doctors, community workers, and others to identify and screen all risk group populations indicated in the national guidelines.	• Coordinate with district epidemiologist, community workers, and others to identify and refer to the dispensary all risk group populations indicated in the national guidelines. • Ensure that all patients referred were seen in the dispensary.	• Coordinate with family doctor to identify and refer to the dispensary all risk group populations indicated in the national guidelines. • Ensure that all patients referred were seen by the family doctor or in the dispensary.

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Diagnosis of LTBI		• Perform and read the tuberculin skin test according to the national guidelines. • Ensure adequate supplies of tuberculin are available for tuberculin skin testing.		
Prescription of LTBI treatment		• Prescribe the TB preventive treatment as per national guidelines.		
Administration/monitoring of LTBI treatment		• Coordinate with family doctors and community workers to ensure that TB preventive therapy is regularly taken.	• Coordinate with community workers to ensure that TB preventive therapy is regularly taken.	• Ensure that TB preventive therapy is regularly taken.
BCG vaccination		• Provide BCG vaccination to all those infants not previously vaccinated in hospital as per national guidelines.		

Main TB task	Hospital (specialist)	Pulmonology dispensary (specialist)	Primary health care (family doctor)	Community (community workers, others)
Management of anti-TB drugs	• Calculate the needs of anti-TB medications annually and report for timely supply. • Coordinate with pharmacy as needed to ensure adequate supply of anti-TB drugs is in stock for patients in treatment and expected number of new patients to begin treatment.	• Calculate the needs of anti-TB medications quarterly and report for timely supply. • Ensure that an adequate supply of anti-TB drugs is in stock and stored appropriately for all patients in treatment and for the expected number of new patients to begin treatment during the quarter. • Coordinate for the monthly supply of anti-TB drugs to the family doctors.	• Collect monthly from the dispensary the needed quantity of anti-TB drugs • Store medications appropriately • Supply weekly the anti-TB drugs to the community health workers as relevant. • Provide weekly supply for TB preventive therapy to patient as prescribed by the dispensary. • Monitor and cross check the consumption of anti-TB drugs • Report any problems with medication to dispensary.	• Collect needed quantity of anti-TB drugs from the family doctor weekly. • Store medications appropriately.
TB recording and reporting	• Ensure that all recording and reporting is accurate and on time and completed according to the national guidelines. (patient registration, treatment regimen, DOT visits, monitoring, treatment outcome etc.)	• Ensure that all recording and reporting is accurate and on time and completed according to the national guidelines (patient registration, treatment regimen, DOT, monitoring, treatment outcome etc.)	• Ensure that recording and reporting of all DOT visits is accurate and on time and completed according to the national guidelines.	• Ensure that recording and reporting of all DOT visits is accurate and on time and completed according to the national guidelines.

Annex 3. Suggested volume of TB services by level of care and TB condition

	A	B	C	F	I	J
1	Patient	Length of treatment per patient				Home visits per patient (n)
2	Category	%	Total (weeks)	In hospital (weeks)	Outside hospital (weeks)	
3	New TB patients					
4	- Drug-susceptible pulmonary patient (85% of new)	60	26	2	24 (C4-D4)	0 (E4*2*0)
5	- Drug-susceptible pulmonary patient with severe condition** (10% of new)	5	26	4	22 (C5-D5)	4 (E5*2*0.1)
6	- Drug-susceptible extra-pulmonary patient (15% of new)	10	26	2	24 (C6-D6)	0 (E6*2*0)
7	- Drug-susceptible extra-pulmonary patient with severe condition** (10% of new)	1	39	9	30 (C7-D7)	12 (E7*2*0.2)
8	- MDR-TB patient (2% of new)	2	87	9	78 (C8-D8)	47 (E8*2*0.3)
9	Previously-treated TB patient/PDR-TB patient					
10	- Drug-susceptible TB patients (all forms)	8	26	2	24 (C10-D10)	10 (E10*2*0.2)
11	- PDR-TB patients	10	26	3	23 (C11-D11)	9 (E11*2*0.2)
12	- MDR-TB patient (18% of previously-treated)	3	87	9	78 (C12-D12)	78 (E12*2*0.5)
13	XDR-TB patient (21% of all MDR-TB)	1	156	52	104 (C13-D13)	62 (E13*2*0.3)
14	Total TB patients	100				

Notes:

Column B: proportions of patients as reported by the NTP or estimated from the main reported category

Columns C, D, F, G, K: columns with variables that change according to policy criteria for hospital admission and discharge

Columns E, H, I, J: columns with formulas that automatically change based on the inputs in the previous columns

* The number of days are indicated as best estimated average

** Severe condition is considered any diffuse TB (miliaris, meningitis, TB coinfection, hepatitis, adverse drug reaction, etc.)

Annex 4. Definition of the payment methods discussed in the report

Fee for service

Fee-for-service is a payment model where services are unbundled and paid for separately. It is a financial incentive to health providers to increase the number of their services but not necessarily their quality; the frequent impact on the health system is the raising of costs and the fragmentation of care. A variety of reform efforts have been suggested to counteract such negative impact, such as moving towards capitation and bundled payments.

Capitation fee

Capitation is a fix payment to the health provider per assigned covered person regardless of what that person may need clinically or receive as services. The calculation of the capitation amount derives from actuarial principles of insurance. In capitation, the health providers are discouraged from performing procedures, including necessary ones, because of no additional payment.

Diagnosis-related group (DRG)

The diagnostic-related group system is a standard system of measuring costs in an institution. It is based on aggregating hospital discharges in groups of patients with similar conditions (principal and secondary diagnosis, age and sex, presence of co-morbidities and complications) and similar costs (described as weight). All cases belonging to a particular DRG are characterized by a homogenous resource consumption pattern and have the same weight for costs reimbursement, with possible exceptions. By adding the weights of all discharges, it is possible to calculate the average for each hospital; the complexity (as a proxy of cost) can be also calculated and compared across hospitals using the same system.

The DRG payment system aims to contain inpatient care costs and to increase efficiency and accountability of the hospital services; it usually leads to shorter hospital stays but also to increased number of hospital cases (as a way to compensate the loss of income due to shorter hospital stay). The quality of services is also not ensured. In many countries, DRG is accompanied by some adjustment payments that contribute to the overall decrease of hospitalization and increase of the quality of services (see below).

Bundled payment

The bundled payment is the payment of multiple providers sharing the same financial risk pool. Payment may be bundled around a single service (e.g. hospital admission) or around different services across a continuum of care for a specific patient for a specific condition (e.g. hospital admission for acute myocardial infarction and outpatient cardiac rehabilitation). To establish the payment amount, boundaries in terms of time and the range of services to be included must be defined, usually through standard clinical pathways with an increasing attention to outcomes and with the possibility to allocate savings from hospital care into ambulatory care.

The bundled payment aims at improving coordination, efficiency and quality of the services delivered. However, bundled payments may expose to the financial risk of expensive medical follow-up in case of low quality treatment provided in hospital care. Therefore, bundled payments are often used to cover pre- and post-hospital care (paid by DRG) but ruled by evidence-based guidelines for pricing.

Annex 5. Additional information needed on activities and costs

Suggested presentation of costs and incomes of hospitals related to the treatment of TB patients (in our understanding this frame below is stipulated by Decree No 1043/2010)

	Total income	Expenditure				Balance
		Direct		Indirect	Total	
		Human resources	Other			
Department (TB patients)						
Department (MDR patients)						
TOTAL (Hospital)						

Suggested activity data to be collected from hospitals

Activity data	Unit
Staff of hospital	Number (FTE) or hours
Bed-days TB department or ward	number
Staff of TB department	Number (FTE) or hours
ALOS TB department	days
Number of TB patients	number
Number of TB cases	number

Suggested cost items to be collected from dispensaries*

Budget line items	Costs (Lei)
Total cost of the Dispensary (as a Hospital Unit) based on MoH Order No 1043/2010	
Administration (including staff and contribution costs, miscellaneous)	
Security	
Utilities	
Transport	
Clinical staff costs (including staff and contributions)	
X-ray	
Diagnostic tests, laboratories	
Supplies	

*The most important information is the total cost of the care at institutional level provided by the dispensary

Suggested activity items to be collected from dispensaries

Activity data per clinical fields (in case of more clinical fields working in the same dispensary)	Unit
Staff (FTE)	Number or in hours
Visit (including home visit)	number
Patient	number
Space used by clinical fields	share of total space
X-ray	number
Laboratory test	number
Transport	number
Supplies	number