Annex 1

Methods used to estimate costs, funding and funding gaps
Annex 1

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# Table of contents

Acknowledgements ................................................................. v
Abbreviations ........................................................................ vii
Introduction ........................................................................... 1

1. OVERVIEW OF ANALYTICAL FRAMEWORK ......................................................... 3
   1.1 Implementation Working Groups ................................................................. 3
   1.2 New Tools Working Groups ....................................................................... 4

2. GENERAL COSTING PRINCIPLES ..................................................................... 5

3. OVERVIEW OF SOURCES OF DATA .................................................................. 8
   3.1 Implementation Working Groups ................................................................... 8
      3.1.1 Quantity data ....................................................................................... 8
      3.1.2 Unit cost data ..................................................................................... 8
   3.2 New Tools Working Groups ....................................................................... 8

4. OVERVIEW OF COSTING METHODOLOGY FOR IMPLEMENTATION WORKING GROUPS ......................................................... 9

5. DOTS EXPANSION ....................................................................................... 10
   5.1 The cost of DOTS as implemented in 2005 (“existing” or “baseline” costs) .............. 10
      5.1.1 Unit costs for treatment ....................................................................... 10
      5.1.2 Unit costs for diagnosis ...................................................................... 11
      5.1.3 Total regional costs for existing or baseline DOTS services ......................... 11
   5.2 The cost of activities to increase geographical coverage of DOTS and to improve the quality of DOTS in settings where the strategy is already being implemented (Category 2 costs) ......................................................... 12
      5.2.1 EEUR and LAC regions ....................................................................... 12
      5.2.2 AFR high and AFR low ...................................................................... 12
   5.3 The cost of new initiatives to enhance DOTS (Category 3 costs) .............................. 12
      5.3.1 PPM DOTS ....................................................................................... 12
      5.3.2 Community-based TB care ................................................................... 14
      5.3.3 Practical Approach to Lung Health ......................................................... 15
      5.3.4 Introducing culture and DST services ....................................................... 15
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Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACSM</td>
<td>advocacy, communication and social mobilization</td>
</tr>
<tr>
<td>AFR high</td>
<td>Africa, high HIV prevalence countries (TB epidemiological region)</td>
</tr>
<tr>
<td>AFR low</td>
<td>Africa, low HIV prevalence countries (TB epidemiological region)</td>
</tr>
<tr>
<td>AIDS</td>
<td>acquired immunodeficiency syndrome</td>
</tr>
<tr>
<td>AMR</td>
<td>WHO Region of the Americas</td>
</tr>
<tr>
<td>ART</td>
<td>antiretroviral therapy</td>
</tr>
<tr>
<td>CBC</td>
<td>community-based TB care</td>
</tr>
<tr>
<td>CEUR</td>
<td>Central Europe (TB epidemiological region)</td>
</tr>
<tr>
<td>CPT</td>
<td>co-trimoxazole preventive therapy</td>
</tr>
<tr>
<td>DCPP</td>
<td>Disease Control Priorities in Developing Countries project</td>
</tr>
<tr>
<td>DOT</td>
<td>directly observed treatment</td>
</tr>
<tr>
<td>DOTS</td>
<td>the internationally recommended strategy for TB control until 2005, and the foundation of the new Stop TB Strategy introduced in 2006</td>
</tr>
<tr>
<td>DOTS-Plus</td>
<td>the strategy for control of MDR-TB developed by WHO and partner agencies in 1999</td>
</tr>
<tr>
<td>DST</td>
<td>drug susceptibility testing</td>
</tr>
<tr>
<td>EME</td>
<td>Established Market Economies (as defined by the World Bank)</td>
</tr>
<tr>
<td>EMR</td>
<td>WHO Eastern Mediterranean Region</td>
</tr>
<tr>
<td>EMRO</td>
<td>WHO Regional Office for the Eastern Mediterranean</td>
</tr>
<tr>
<td>EEUR</td>
<td>Eastern European Region (TB epidemiological region)</td>
</tr>
<tr>
<td>GFATM</td>
<td>Global Fund to Fight AIDS, Tuberculosis and Malaria</td>
</tr>
<tr>
<td>GNI</td>
<td>gross national income</td>
</tr>
<tr>
<td>GP2</td>
<td><em>The Global Plan to Stop TB, 2006–2015</em></td>
</tr>
<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
</tr>
<tr>
<td>HIV+</td>
<td>HIV-positive</td>
</tr>
<tr>
<td>IPT</td>
<td>isoniazid preventive therapy</td>
</tr>
<tr>
<td>ISAC</td>
<td>intensified support and action countries</td>
</tr>
<tr>
<td>LAC</td>
<td>Latin America and the Caribbean (TB epidemiological region and World Bank region)</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MDR-TB</td>
<td>multidrug-resistant tuberculosis</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
</tr>
<tr>
<td>NTP</td>
<td>national TB control programme</td>
</tr>
<tr>
<td>PAL</td>
<td>Practical Approach to Lung Health</td>
</tr>
<tr>
<td>PLWHA</td>
<td>people living with HIV/AIDS</td>
</tr>
<tr>
<td>PPM DOTS</td>
<td>public–private and public–public mix for DOTS</td>
</tr>
<tr>
<td>SEAR</td>
<td>WHO South-East Asia Region</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TST</td>
<td>tuberculin skin test</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>WG</td>
<td>working group</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WPR</td>
<td>Western Pacific (TB epidemiological region, equivalent to the WHO Western Pacific region excluding Established Market Economies)</td>
</tr>
</tbody>
</table>
Introduction

This document explains the methods used to produce the estimates of costs, funding and funding gaps included in The Global Plan to Stop TB, 2006–2015 (hereafter, GP2). It has 11 major sections, which are:

1. **Overview of analytical approach used for GP2.** The analysis that underpinned GP2 was based on demographic, epidemiological, planning and costing data. While the focus of this document is on the costing of the plan, the first section provides a brief explanation of the analytical framework within which this costing was done. More details about the epidemiological, demographic and planning data are provided elsewhere.

2. **General costing principles.** This explains the costing principles that underpinned the cost analysis for all of the seven working groups (WGs) of the Stop TB Partnership. The seven WGs include four “implementation” WGs – DOTS Expansion, DOTS-Plus, TB/HIV, Advocacy, Communication and Social Mobilization (ACSM) – and three “research and development” WGs – New Diagnostics, New Drugs and New Vaccines.

3. **Sources of data.** This explains the sources of data that were used to estimate costs.

4. **Overview of costing methodology for implementation working groups.** Before providing detailed explanations about the cost analysis for each WG, this section provides an overview of the interventions or activities considered by each of the implementation WGs and how their costs were estimated.

5. **DOTS expansion.** This explains how the costs for DOTS expansion were estimated. It is the longest section of the document, but is broken into subsections to enhance readability;

6. **DOTS-Plus.** This explains how the costs of treatment for patients with multidrug-resistant tuberculosis (MDR-TB) were estimated.

7. **TB/HIV.** This explains how the costs of implementing collaborative TB/HIV activities were estimated.

8. **Advocacy, communication and social mobilization.** This explains how the costs associated with ACSM were estimated.

9. **Research and development.** This explains how the costs of developing new diagnostics, new drugs and new vaccines were estimated.

10. **Funding and funding gaps.** This explains how estimates of the funding likely to be available in each year of the plan, and remaining funding gaps, were estimated.

11. **Regional explanation of costing methods.** For each of the seven geographical regions considered in GP2, this section explains in detail the costing assumptions and methods used. The focus is on DOTS expansion, DOTS-Plus and TB/HIV, since the regional details related to ACSM are adequately covered in section 8. Research and development is not included in this section, since needs were estimated at global rather than regional level. For those interested in a particular region, it is important to read this section of the document.

The main text of this document is 21 pages, with the remaining 18 pages providing regional details as well as an Appendix that lists the countries included in each region.
Methods used to estimate costs, funding and funding gaps

1. OVERVIEW OF ANALYTICAL FRAMEWORK

The analyses that were undertaken for GP2 had two major components: a) analyses related to implementation of interventions that are already available, which are the responsibility of the implementation WGs (i.e. DOTS Expansion, DOTS-Plus, TB/HIV and ACSM); and b) analyses related to research and development, which is the responsibility of the new tools WGs (i.e. diagnostics, drugs and vaccines).

1.1 Implementation working groups

The analysis that underpinned GP2 for the implementation WGs was based on a set of seven Excel spreadsheet models (one per geographical region considered) that linked planned activities with demographic, epidemiological and costing data. Each spreadsheet had three major components:

• A set of “input variables” for each year 2006–2015. These included demographic, epidemiological, planning and unit cost data. Examples included population estimates for the period 1985–2015, estimates of TB incidence, prevalence and mortality rates (per 100,000 population) for the period 1990–2005, the planned percentage of the population eligible for a particular intervention that would receive it each year 2006–2015 (e.g. the percentage of new cases of TB that would be detected and treated under DOTS, and the percentage of HIV-positive (HIV+) TB patients eligible for antiretroviral therapy (ART) who would receive such treatment), the cost per patient treated in a DOTS programme, the cost per HIV+ TB patient for six months of ART, and the cost to cover a population of 500,000 people with new initiatives such as PPM DOTS, PAL and community-based TB care.

• An epidemiological model of TB. This allowed estimates of the number of incident and prevalent TB cases and the number of TB deaths to be made for each year 2006–2015. These estimates of cases and deaths were based on the effectiveness of DOTS programmes expected during the period 2006–2015 (expressed as the percentage of new cases detected in DOTS programmes through existing and new initiatives for each year 2006–2015, and the treatment success rates achieved among these cases), assumptions about treatment outcomes outside DOTS programmes, a standard set of epidemiological parameters (e.g. the natural recovery rate for untreated cases, and the number of infectious contacts per person per year) and demographic projections. Prior to making projections for 2006 onwards, the model was fitted to estimates of TB incidence, prevalence and death rates for the period up to 2005.

• A set of “output” variables for each year 2006–2015. Examples included projected numbers of TB patients treated in DOTS or DOTS-Plus programmes, the number of TB patients tested for HIV, the number of HIV+ TB patients enrolled on ART, total costs for each major intervention and for all interventions combined, the total number of incident and prevalent TB cases, and the total number of TB deaths. These outputs were produced by combining the input variables with the epidemiological model.
Within this framework, GP2 was costed in each regional spreadsheet by multiplying the unit cost of each of the interventions considered by the total number of units of each intervention to be implemented in each year 2006–2015. Costs were assessed for each intervention, for each WG, and overall across all four implementation WGs. The total numbers of units of each intervention to be implemented were part of the set of output variables. Copies of these regional spreadsheets are available upon request.

1.2 New tools working groups

The secretariats of the new tools WGs assessed the budget needed for research and development in their respective areas of responsibility. Detailed budget breakdowns were provided to the core team responsible for the epidemiological and cost estimates, and appear in Part III of GP2. Since all the analyses provided to the core team appear in the plan itself, no further details are provided in this document. Those interested in further information should contact the secretariat of the relevant WG.
2. GENERAL COSTING PRINCIPLES

The cost analysis for GP2 was based on 17 general principles:

- **The cost analysis should be designed to be consistent with how working groups defined their planned activities, the epidemiological model developed for GP2 and available cost data.**

- **Costs should be assessed and presented at regional rather than country level.** Nine regions were defined according to epidemiological criteria: Africa – high HIV prevalence countries (AFR high), Africa – low HIV prevalence countries (AFR low), Eastern Europe (EEUR), Central Europe (CEUR), Established Market Economies (EME), Eastern Mediterranean (EMR), Latin America (LAC), South-East Asia (SEAR) and Western Pacific (WPR). Costs were presented at regional level because all epidemiological analyses were undertaken at a regional level. However, as explained below, in many instances regional costs were built up from country-specific data and assumptions. The appendix provides a list of the countries included in each region.

- **Detailed cost analysis is not necessary for the Established Market Economies region or the Central European region.** This was justified on the basis that the burden of TB is very low in the countries in these regions, and funding for TB control is already adequate.

- **Costs should be estimated for the whole plan period and also for each year 2006–2015.** It is important to know both the full cost of GP2 as well as how the cost varies by year – for example, whether and to what extent costs increase over time.

- **Costing should be based on existing country and regional plans and budgets wherever possible.** Many countries have provided budget data for 2005 through WHO’s Global Financial Monitoring project, and some regions have developed detailed budgets for the period 2006–2015 based on regional priorities (notably the European and LAC regions). These budgets provided a good basis for producing cost estimates for GP2.

- **Costs should be evaluated from a provider (health services) perspective, i.e. costs incurred by patients are not considered.** Exclusion of patient costs was justified on the basis that the GP2 is designed to show what funding needs to be mobilized by governments and other funding agencies for TB control. If it is believed that some of the costs currently incurred by patients should be financed by providers (e.g. vouchers to cover transport costs), these costs should be included as part of the GP2 provider costs.

- **Costs should be evaluated for DOTS providers only.** Costs for treatment that do not conform to DOTS principles were not considered. This was justified on the basis that GP2 is a plan to implement TB control according to internationally recommended strategies and policies.

- **The analysis should focus on financial (as opposed to economic) costs.** In other words, the focus was on costs that need to be paid for and for which funds need to be mobilized.

- **Costs should be presented in US$ in current prices.** This meant that costs were adjusted for inflation (an annual rate of 3% is assumed) and not presented at “constant” prices.

- **Cost analysis should be based on an “ingredients” approach.** This meant that quantities of inputs (e.g. number of staff, number of tests, number of patients treated) were estimated separately from their price in monetary terms (e.g. annual salary for a doctor, average cost of a sputum smear, average cost per patient treated). Total costs for any given intervention or activity were then calculated as the number of units of a service/intervention/activity provided multiplied by the unit regional price for that service/intervention/activity.

- **Unit costs should be defined on a per patient basis if costs are expected to vary with the number of patients treated.**

- **Unit costs should be defined for a population of 500,000 if they are costs that are incurred at sub-national level and they are not expected to vary with the number of patients treated** (i.e. they are relatively fixed costs). A population of 500,000 was chosen because this is a typical size used for planning purposes and corresponds to the basic administrative or planning unit in many countries.

- **Unit costs should be defined per country if they are costs that are incurred only at national level and are not expected to vary with the number of patients treated** (i.e. they are relatively fixed costs).

- **The quantities of services to be provided should be based on the plans developed by the working groups and the epidemiological model.** The most important quantities were the number of patients treated in DOTS programmes, the number of patients treated in DOTS-Plus programmes, the percentage of the regional population covered by new initiatives to improve DOTS and by collaborative TB/HIV activities, the number of countries implementing new initiatives and the number of people to whom TB/HIV interventions were provided. These quantities were estimated within the seven regional spreadsheet models described above, based on WG plans and WG estimates of the impact of their activities on case detection and treatment success rates.

- **Quantities of services to be provided at regional level should be built up from country-specific analyses.** This meant that case detection and treatment success rates, the number of people benefiting from collaborative TB/HIV activities and the percentage of the population covered by different initiatives were first estimated at country level. The regional figure is then a weighted average for the countries in the region, with the weight corresponding to the country’s share of regional TB cases (DOTS and DOTS-Plus), people to be reached (collaborative TB/HIV activities) or regional population (for some collaborative TB/HIV activities, initiatives to improve existing DOTS quality and new initiatives to enhance DOTS).

- **Unit prices at regional level should be built up from country-specific analyses, except where regional prices are already available.** It is well recognized that unit prices (e.g. the cost per patient treated in a DOTS programme) vary considerably among countries, related to variation in how treatment is delivered (e.g. the extent to which hospitalization is relied upon, the extent to which directly observed
### TABLE 1: COMPARISON OF METHODS USED TO ASSESS COSTS AND FUNDING GAPS IN THE GLOBAL PLAN TO STOP TB WITH THOSE USED TO PRODUCE RECENT ESTIMATES FOR HIV/AIDS AND MALARIA

<table>
<thead>
<tr>
<th>Variable</th>
<th>HIV</th>
<th>TB</th>
<th>Malaria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost perspective</td>
<td>Provider</td>
<td>Provider</td>
<td>Provider</td>
</tr>
<tr>
<td>Financial costs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ingredients approach</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Costs assessed at programme and patient level</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rates of scale-up/scenarios considered</td>
<td>Recent scale-up rates and scenarios that will achieve a &quot;comprehensive response&quot; to the epidemic by 2010 (including universal access to ART)</td>
<td>&quot;Realistic but optimistic&quot; scenarios developed by Stop TB Partnership working groups, and UNAIDS estimates of numbers to be enrolled on ART to achieve the target of universal access to treatment by 2010</td>
<td>Rates required to achieve Millennium Development Goal targets</td>
</tr>
<tr>
<td>Consistent use of epidemiological projections</td>
<td>Estimates used WHO projections of TB patients eligible for ART</td>
<td>UNAIDS HIV projections underpin TB modelling</td>
<td>NA</td>
</tr>
<tr>
<td>Total needs assessed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Funding availability and gaps assessed</td>
<td>Yes</td>
<td>Yes</td>
<td>Partially</td>
</tr>
<tr>
<td>Costs presented at regional or country level</td>
<td>Regional</td>
<td>Regional</td>
<td>Regional</td>
</tr>
<tr>
<td>Countries considered</td>
<td>135 low- and middle-income countries</td>
<td>172 countries, those additional to HIV mostly small islands. Countries in established market economies and central Europe excluded.</td>
<td>Africa, plus India and Brazil (high-burden countries)</td>
</tr>
<tr>
<td>Health worker production, adding to existing infrastructure</td>
<td>Yes (though these are stated to be preliminary)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Research and development costs included</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Inflation adjusted</td>
<td>No (though this is not so important for the next 3 years, the period covered by the estimates)</td>
<td>Yes (though estimates can also be presented at constant prices)</td>
<td>No (as of June 2005)</td>
</tr>
</tbody>
</table>
METHODS USED TO ESTIMATE COSTS, FUNDING AND FUNDING GAPS

Treatment (DOT) occurs in health facilities and the extent to which it is provided by community or family members and to variation in income levels (which mean that staff costs, for example, tend to be higher in middle-income than in low-income countries). Therefore, costs that vary with the number of patients treated were first estimated at country level. A regional weighted average was then calculated, with the weight being the proportion of TB cases accounted for by each country in the region in 2003\(^2\). Unit costs were calculated for each year of the plan (see section 5 for further details).

- For new initiatives to improve DOTS that are defined at national or sub-national level (per 500,000 population) and for which there is limited experience and/or cost data at the country level, a standard set of inputs and regional prices should be defined based on international experience to date. This applied to new initiatives to improve DOTS considered by the DOTS Expansion WG – namely PPM DOTS, PAL, introduction of culture and laboratory services for drug susceptibility testing (DST), and community-based TB care in all regions – and to general strengthening of the quality of existing DOTS services in Africa.

Based on these principles, the methods used to assess the cost of GP2 are similar to those used to produce recent estimates of the resources needed for HIV/AIDS and malaria (Table 1).

Answers to some frequently asked questions about cost estimates, including those related to consistency among estimates produced for TB, HIV/AIDS and malaria, are provided in Box 1.

**BOX 1: FREQUENTLY ASKED QUESTIONS**

1. Are human resource needs included?
Staff and training costs were included in unit costs wherever relevant. For example, staff costs were part of the unit cost of treating a patient in a DOTS programme (both the costs associated with full-time national TB control programme staff and the cost of staff time spent on providing care to TB patients in general health-care facilities, e.g. during hospital admissions or outpatient visits).

There are, however, two potentially important costs that were not included. These were a) the cost of training required to add to the existing health workforce and b) the costs associated with improved salaries/incentives. These cannot be estimated for TB control specifically, but would need to be estimated for the health system as a whole. The Commission for Africa estimated that an extra 1 million health workers are needed in Africa.

2. Are “health system strengthening” needs included?
Several components of GP2 include investment in human resources, infrastructure, health information systems and management capacity. While these investments have a TB focus, they can help to strengthen health systems as a whole. The full financial costs of building new infrastructure (for example with the purpose of improving geographical access to services) were not included because these cannot be estimated for TB control alone.

3. Are costs assumed to remain constant as the number of patients treated in DOTS programmes increases?
No, the cost per patient increases as new initiatives are implemented to enhance DOTS and reach more cases.

4. Are the methods consistent with those used to produce other cost estimates, e.g. for HIV and malaria?
Broadly, yes (see Table 1). Considerable efforts were made to ensure consistency, especially with the recent estimates produced for HIV/AIDS by UNAIDS and with the recent estimates produced for malaria, child health and immunizations by the Evidence and Information for Policy cluster in WHO.
3. OVERVIEW OF SOURCES OF DATA

3.1 Implementation working groups

The costing for the implementation component of GP2 (i.e. DOTS expansion, DOTS-Plus, TB/HIV and ACSM) required two types of data: the quantities of activities, services or interventions provided and the unit costs of these activities, services or interventions.

3.1.1 Quantity data

The quantities of services, activities or interventions to be delivered were based on the plans developed by the WGs, combined with demographic data and the epidemiological model developed for GP2, as described in section 1. The WG plans were based on consultations with regions and countries, which are described in detail elsewhere (for example, in parts II and III of GP2). For TB/HIV, there was particularly close collaboration with the Joint United Nations Programme on HIV/AIDS (UNAIDS), to ensure that planned levels of intervention implementation and rates of scale-up in GP2 were consistent with targets and related resource needs estimates produced by UNAIDS (especially regarding the number of people to be enrolled on ART and the number of people testing HIV+ in HIV testing and counselling services). The planned quantities of services to be provided in each region are defined in section 9.

3.1.2 Unit cost data

Unit costs for implementation of existing interventions were estimated using 10 main sources of data:

- The WHO Stop TB Department’s Global Financial Monitoring Project. Since 2002, WHO has collected and analysed financial data related to TB control on an annual basis using a two-page questionnaire that is sent to all countries. Full details are available in the WHO global tuberculosis control reports published since 2002. In 2005, 57 countries (including 19 of the 22 high-burden countries that collectively account for about 80% of global cases) provided complete financial data. The questionnaire was used to estimate the cost per patient treated in a DOTS programme in 2005.

- The Disease Control Priorities in Developing Countries project (DCPP). The DCPP was managed by the United States National Institutes of Health, and was used to produce a follow-up second edition of the book “Disease Control Priorities in Developing Countries” (launched in April 2006). The first edition was published in 1993 and formed the basis for the cost-effectiveness analyses included in the World Bank World Development Report 1993, “Investing in Health”. To assist in the production of cost-effectiveness analyses that are comparable across interventions, a standard set of regional prices for a range of inputs was produced for use by chapter authors of the second edition of the book. Many of these inputs were relevant to TB control and the cost analysis needed for GP2, e.g. the annual cost for different types of labour, the cost of a sputum smear, the cost of a day in hospital, the cost of a visit to a health clinic, and the cost of various types of equipment and transport.

- The cost of implementing initiatives to improve DOTS quality in Uganda. These initiatives have included strengthened supervision at the district level, establishment of partnerships at national and local levels with nongovernmental organizations (NGOs) to improve DOTS implementation at district level, and strengthening of capacity at national level through recruitment of additional staff. These costs were used to estimate the cost of strengthening DOTS quality in the two African regions.

- Regional budgets for DOTS expansion and improvements in DOTS quality for 2006 to 2015. A regional budget was available for the European and LAC regions.

- Cost studies of pilot ProTEST projects in Malawi, South Africa and Zambia. These provided evidence on the costs of various collaborative TB/HIV activities.

- A cost analysis undertaken by UNAIDS during 2005. Following discussions with the teams responsible for producing resource needs estimates for UNAIDS during 2005, data on unit costs relevant to TB/HIV were shared with the core team responsible for producing the GP2 cost estimates. These included the unit costs for six months of ART, care and support, HIV testing and counselling, and HIV prevention services.

- Economic evaluations of DOTS-Plus in Estonia, Peru, the Russian Federation and the Philippines. These evaluations provided detailed information on the costs of providing treatment for MDR-TB using the DOTS-Plus strategy.

- The Laboratory Subgroup of the DOTS Expansion WG. This subgroup provided an assessment of the start-up and running costs of laboratories that can provide culture and DST services.

- Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) proposals that have included an ACSM component and which are considered to conform with “best practices”. Proposals from five countries were used as the basis for estimating regional needs: Bangladesh, Indonesia, Kazakhstan, Kenya and Mexico.

- Gross national income (GNI) per capita. GNI was used as the basis for extrapolating costs from countries for which cost data were available to countries for which cost data were not available.

3.2 New tools working groups

As explained in section 1.2, the sources of data for the cost estimates for research and development were the secretariats of each WG.
4. OVERVIEW OF COSTING METHODOLOGY FOR IMPLEMENTATION WORKING GROUPS

An overview of the interventions or activities that were costed for DOTS expansion, TB/HIV and DOTS-Plus is provided in Table 2. This shows the way in which quantities and unit costs were defined, and the sources of data on quantities and unit price data. ACSM is not included in the table because the cost analysis was based on much less detailed information (see section 8).

<table>
<thead>
<tr>
<th>Variable</th>
<th>DOTS Expansion</th>
<th>MDR-TB</th>
<th>TB/HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventions/activities considered</td>
<td>DOTS as implemented in 2005. Improvements to the quality and geographical coverage of DOTS as implemented in 2005, if required (considered in SEUR, LAC, AFR high and AFR low regions). New initiatives, defined as PPM DOTS, PAL, community-based TB care, and introduction of DST and culture services.</td>
<td>DOTS-Plus</td>
<td>12 collaborative activities recommended in WHO interim TB/HIV policy 2004.</td>
</tr>
<tr>
<td>Quantities estimated</td>
<td>Number of patients treated in DOTS programmes (number of sm+ and sm-/extrapulmonary cases estimated separately) for each year 2006–2015. Number of units of 500,000 population to be covered by improvements in DOTS quality, PPM DOTS, community-based TB care and PAL each year 2006–2015. Number of new laboratories established to provide culture and DST services each year 2006–2015, and cumulative number of laboratories providing such services each year 2006–2015. Number of countries in each region implementing new initiatives.</td>
<td>Number of patients to be treated in DOTS-Plus programmes or projects for each year 2006–2015.</td>
<td>Number of HIV+ patients a) screened for TB and b) provided with IPT. Number of TB patients a) tested for HIV b) provided with ART c) provided with CPT d) receiving care and support if HIV+ e) provided with HIV prevention services. Percentage of regional population covered by full range of activities.</td>
</tr>
<tr>
<td>Unit costs estimated</td>
<td>Cost per new sm+ patient treated in a DOTS programme. Cost per new sm-/extrapulmonary patient treated in a DOTS programme. Cost per 500,000 population covered by efforts to improve DOTS quality. Cost per 500,000 population covered for each of PPM, PAL, and community-based TB care. Cost per laboratory established to provide DST and culture services (start-up and running costs estimated separately). Cost at national level for each of PPM, PAL and community-based TB care.</td>
<td>Cost per patient treated in a DOTS-Plus programme or project.</td>
<td>Cost per capita for mechanisms for collaboration (for areas covered by full range of interventions); cost per person screened for TB, cost for 6 months of a) IPT b) CPT and c) ART; cost per TB patient provided with HIV prevention services; cost per HIV+ TB patient provided with care and support services; cost per person tested and counselled.</td>
</tr>
<tr>
<td>Sources of quantity data</td>
<td>Working group estimates of how the planned activities will affect case detection and treatment success rates combined with spreadsheet epidemiological model (for numbers of patients treated under DOTS). Working group estimates of regional population coverage and demographic projections included in spreadsheet model (number of units of 500,000 population covered by different initiatives). Working group estimates of number of laboratories to be established.</td>
<td>Estimates provided by DOTS-Plus Working Group combined with spreadsheet epidemiological model.</td>
<td>TB/HIV Working Group estimates combined with spreadsheet epidemiological model.</td>
</tr>
<tr>
<td>Sources of unit cost data</td>
<td>Financial section of WHO questionnaire, completed by 57 countries for 2005 (for cost per patient treated in DOTS programmes in 2005). Regional prices used in Disease Control Priorities in Developing Countries project (for estimated inputs required for PPM, PAL, and community-based TB care). Experience in Uganda with strengthening DOTS quality (for DOTS quality in the two African regions). Regional budget for DOTS expansion and improvements in DOTS quality (European region). Laboratory subgroup (cost per laboratory established and running costs per laboratory for one year).</td>
<td>Economic evaluations of DOTS-Plus in Peru, Estonia, the Philippines and the Russian Federation; drug prices from DOTS-Plus WG secretariat.</td>
<td>Cost analyses of ProTEST pilot projects in Malawi, South Africa and Zambia. Cost analysis undertaken for UNAIDS assessment of resource needs for HIV/AIDS for the period up to 2010, undertaken during 2005.</td>
</tr>
</tbody>
</table>
5. DOTS EXPANSION

This section provides an overview of how the costs of DOTS expansion were estimated. Region-specific details are provided in section 11. The DOTS Expansion WG classified its planned activities in three categories:

1. DOTS implementation as it existed in 2005. This needs to be sustained or improved upon.
2. Improvements to the 2005 level of DOTS quality and geographical coverage, where these are required. This applied to the African regions where treatment success was still well below the treatment success target of 85% in 2003, the LAC region where 100% geographical coverage of DOTS has not yet been achieved, and the Eastern European region where treatment success rates are low and large parts of some countries are not yet implementing DOTS.
3. New initiatives to enhance existing DOTS provision. These were defined as PPM DOTS, community-based TB care, Practical Approach to Lung Health (PAL), and introduction of culture and DST services. Such initiatives are aimed at improving case detection rates within areas already covered by DOTS, and at ensuring that the additional cases detected are also successfully treated according to DOTS principles.

The costing analysis was based on the following logic for each region:

1. What is the estimated cost per patient treated under DOTS in 2005 in the high-burden countries in the region, how has this changed in the past 3–4 years, and what activities and initiatives are covered by this cost?
2. Does the cost per patient treated under DOTS in 2005, hereafter also called the “baseline cost”, reflect 100% geographical coverage of DOTS and the likely achievement of treatment success rates that meet the target of 85% within DOTS programmes?
   - If Yes, then activities in Category 2 (activities to improve existing DOTS quality and geographical coverage) were considered unnecessary, and no attempt was made to cost them. This applied to WPR and SEAR. The plans and budgets of all high-burden countries in WPR, which account for 96% of total regional cases, allowed for 100% geographical coverage and achievement of the 70/85% targets in 2005. Substantial increases in spending per patient were projected for 2005 compared to 2002. The high-burden countries in SEAR, which account for 92% of total regional cases, all expected 100% DOTS coverage in 2005, and treatment success rates were close to the 85% target in 2003.
   - If No, then activities in Category 2 were considered necessary, and they were costed. This applied to AFR high, AFR low, EEUR, EMR and LAC.
3. Does the cost per patient treated under DOTS in 2005 reflect any or all of the new initiatives that could be implemented to further enhance DOTS, and in particular increase the case detection rate?
   - If Yes, then activities in Category 3 (PPM, PAL, community-based TB care, introduction of DST and culture services) were considered unnecessary, and no attempt was made to cost them.

If No for some or all of the initiatives included in Category 3, these activities were considered necessary, and they were costed.

The costing of DOTS programmes as implemented in 2005 (“existing” or “baseline” DOTS), the costing of efforts to improve the geographical coverage of DOTS and the quality of DOTS where it is already being implemented, and the cost of new initiatives to enhance DOTS, are described in more detail in the following subsections.

5.1 The cost of DOTS as implemented in 2005 (“existing” or “baseline” costs)

5.1.1 Unit costs for treatment

The cost per patient treated under DOTS in 2005 was based primarily on data provided in the financial section of the annual WHO questionnaire in the 2004 round of data collection. The data provided on the annual WHO questionnaire were supplemented with estimates of the unit (average) cost of a day in hospital, a visit to a health clinic, and a sputum smear (all from DCPP), and assumptions about the number of sputum smears undertaken among TB suspects. Much of these data, and the methods used to collect and analyse them, are described in detail in the annual WHO report for 2005. In brief, the cost per patient treated was built up for each high-burden country in a given region, and for any other country in the region that submitted the necessary range of data in the 2004 round of data collection, as follows:

- The reported NTP budget per patient treated in 2005 was estimated by dividing the total budget for 2005 by the projected number of patients to be treated in 2005 (both figures are provided on the first page of the financial section of the WHO questionnaire). Two budget items were excluded from the calculation – collaborative TB/HIV activities and second-line anti-TB drugs – because these were costed as part of the TB/HIV and DOTS-Plus WG plans. All other budget line items, i.e. first-line drugs, dedicated NTP staff, new initiatives to increase case detection and cure rates, buildings/vehicles/equipment and “other” were included.
- The cost per TB patient of health system resources that are used during anti-TB treatment but that are not reflected in the NTP budget was added to the NTP budget per patient treated. The most important costs that are usually not included in NTP budgets (exceptions are when the TB control system is highly verticalized) are hospital admissions and outpatient visits to health facilities for DOT and monitoring. The costs of hospital admissions and outpatient visits per patient were estimated by multiplying the estimated average number of days per patient spent in hospital and the average number of outpatient visits to a health facility (as reported to WHO by countries in 2004) by their respective unit prices. This was done separately for new smear-positive patients on the one hand, and new smear-negative or extrapulmonary patients on the other. This is because it is recognized that the extent to which hospitalization and outpatient visits are required is often different for these two categories of patients.
Once the cost per patient treated in 2005 had been estimated for all countries that submitted complete financial data to WHO in 2004 or (in a few cases) for which a recent detailed costing study was available, estimates were produced for some or all of the other countries in the region for which data were not available (except for EMR, as explained below). The number of countries for which such estimates were produced varied by region, as follows:

- **SEAR, WPR and AFR high.** The high-burden countries in these regions account for 96%, 92% and 82% of the regional TB burden respectively. In addition, complete financial data were available for all high-burden countries in these three regions with the exception of South Africa, for which recent detailed costing studies were available. Therefore, it was not considered necessary to make estimates of the cost per patient treated in non high-burden countries in these three regions.

- **LAC and EEUR.** Complete financial data or a recent costing study were available for only a small number of countries in these two regions. At the same time, the regional WHO offices focus their efforts on 14 countries in LAC (which together account for 94% of cases in the region) and 15 countries in EEUR. In LAC, the cost per patient treated for the 10 priority countries that did not submit complete financial data to WHO or for which a recent detailed costing study was not available was estimated by extrapolating from Brazil. The assumption was that the cost in each country is (cost in Brazil) * (GNI per capita in country for which extrapolation is being done/GNI per capita in Brazil). The cost per patient treated in priority countries in EEUR that did not provide complete financial data to WHO was done in the same way, except that costs were extrapolated from the Russian Federation rather than Brazil.

- **AFR low.** Complete financial data were available for only nine countries in AFR low, which combined account for 44% of the total estimated cases in the region. Estimates were made for seven additional countries in AFR low, which combined with the nine countries for which data were available account for 96% of estimated cases in the region. For each country, the cost per patient treated was estimated by extrapolating from the most similar country in the region according to GNI per capita (as explained above for LAC and EEUR). The section that explains the costing on a regional basis provides further details.

For EMR, costs were estimated for nine priority countries (accounting for 89% of total estimated cases in the region) during a strategic planning workshop organized by the WHO regional office (EMRO). This workshop was organized in response to the development of GP2. The plans and budgets that were developed covered category 1, 2 and 3 costs. Costs for other countries in the region were extrapolated from the nine priority countries.

Since GP2 focuses on costs at regional level, it was necessary to use the country-specific cost estimates to estimate a regional average cost per patient treated. This was done by calculating a weighted average cost per patient treated among the selected group of countries described above. The weight used for each country was the proportion of estimated regional cases for which it accounted in 2003.

### 5.1.2 Unit costs for diagnosis

Diagnostic costs were estimated separately from treatment costs. They were estimated on the assumption that for each new smear-positive patient in whom TB was diagnosed, 30 smears and nine X-rays are needed (i.e. there are assumed to be 10 suspects screened for every new smear-positive patient diagnosed, each of whom have three smears done; for the nine suspects that are not diagnosed with TB on the basis of a positive smear, an X-ray will be done). The unit (average) costs of smears and X-rays were based on DCPP regional estimates.

### 5.1.3 Total regional costs for existing or baseline DOTS services

Based on the regional costs per patient treated and the diagnostic costs per new smear-positive patient explained in sections 5.1.1 and 5.1.2, the total annual cost of existing or baseline DOTS (Category 1 costs) was computed by multiplying the unit cost per patient diagnosed and treated with the corresponding estimated number of patients to be treated, as follows:

\[
\text{Regional unit cost of diagnostic tests among TB suspects per new sm+ patient} \times \text{estimated number of sm+ patients treated under DOTS} \\
+ \text{Regional unit cost per sm+ patient treated} \times \text{estimated number of sm+ patients treated under DOTS} \\
+ \text{Regional unit cost per sm- / extrapulmonary patient treated} \times \text{estimated number of sm- / extrapulmonary patients treated under DOTS}
\]

The number of patients to be treated was estimated using the Excel spreadsheet model for that region, as described in section 1. In the model, two of the “outputs” were 1) the number of new smear-positive patients treated in DOTS programmes and 2) new smear-negative extrapulmonary patients treated in DOTS programmes. These outputs were based on combining planning “inputs” from the DOTS Expansion WG with demographic and epidemiological data. The planning inputs provided by the DOTS Expansion WG included projected case detection and treatment success rates by region for each year 2006–2015, and the share of the population to be covered by initiatives to improve DOTS quality and new approaches to DOTS implementation.
5.2 The cost of activities to increase geographical coverage of DOTS and to improve the quality of DOTS in settings where the strategy is already being implemented (Category 2 costs)

As explained above, activities aimed at improving DOTS quality and expanding geographical coverage of DOTS are needed if a) geographical coverage is below 100% and/or if treatment success rates in areas already considered to be covered by DOTS are considerably below the target of 85%, and b) if increases in the NTP budget per patient treated up until 2005 are considered insufficient to close quality gaps within the existing programme. The DOTS Expansion WG view was that five regions would meet one or both of these criteria at the end of 2005: EEUR, EMR, LAC, AFR high and AFR low.

The way in which the unit and total costs of activities to improve coverage and quality were estimated varied by region, according to the data already available and what is known about likely solutions to existing coverage and quality problems.

5.2.1 EEUR and LAC regions

Prior to the development of GP2, the WHO regional offices that cover EEUR and LAC (EURO and AMRO) had assessed and costed the investments needed to improve the coverage and quality of DOTS in the priority countries in their respective regions. The cost analysis for GP2 therefore used these estimates and did not attempt to make any independent assessment of the investments that would be required. In EEUR, the cost estimates allow for reaching 100% geographical coverage of DOTS by 2010 at the latest (earlier in some countries), and improvements in quality based on additional funds for items such as laboratory equipment and supplies, training, salaries for new staff, incentives and enablers for patients, and renovation of buildings (full details are available in a spreadsheet developed by WHO regional office staff).

5.2.2 AFR high and AFR low

DOTS coverage in the African region was already 100% by 2005. However, a regional plan and related cost estimates for improvements in DOTS quality were not available. Therefore, a general framework describing the investments needed in the African region was developed by the DOTS Expansion WG in consultation with experts in TB control in the African region, drawing in particular on experience to date in Uganda. The framework is based on the observation that strengthening supervision at the national and sub-national levels, and establishing partnerships with NGOs that can then supplement existing government services (and help to overcome human resource and other constraints within the public sector), can translate into improvements in the quality of DOTS services. Table 3 describes the inputs that were considered to be needed at national and sub-national level. In line with the costing principles explained in section 2, sub-national needs and unit costs are per 500,000 population covered.

Costs for a) additional staff at national level and b) partnerships with NGOs at sub-national level in each country in the African regions were extrapolated from Uganda and adjusted according to their GNI per capita relative to that of Uganda. The regional average for additional staff at national level was then calculated as the total for all countries divided by the number of countries in the region. The regional average for contracts with NGOs was calculated as a weighted average, with the weight for each country being the proportion of the regional population for which it accounted in 2003. The cost of additional NTP staff at sub-national level, per 500,000 population, was estimated for both regions as 2 * 0.6 * regional annual salary for labour level 3 estimated by DCPP.6

The total regional cost in each year was then calculated as:

\[
\text{Total regional cost} = \left( \frac{\text{Regional unit cost at sub-national level} \times \text{proportion of the regional population covered in a given year} \times \text{population of the region}}{500,000} \right) + \frac{\text{Regional unit cost at national level} \times \text{number of countries implementing improvements in DOTS quality}}{500,000}
\]

The proportion of the regional population to be covered each year was based on the DOTS Expansion WG plan. The population of the region was based on United Nations Development Programme population projections, which were part of the regional spreadsheet models described in section 1.

5.2.3 EMR

Category 2 costs were estimated for nine priority countries during a strategic planning workshop (see also 5.1.1) and then extrapolated to other countries in the region.

5.3 The cost of new initiatives to enhance DOTS (Category 3 costs)

As explained above, new DOTS initiatives are activities or investments planned in addition to both existing DOTS services and to the activities needed in selected regions to improve the quality and geographical coverage of existing DOTS services. These new initiatives are aimed at further improvements in case detection and treatment success rates, beyond those expected to be achieved in 2005. They were defined by the DOTS Expansion WG as Public-Private and Public-Public Mix DOTS (PPM), community-based TB care, PAL and introduction of culture and DST laboratory services.

5.3.1 PPM DOTS

Costing studies in India suggest that the provider cost per patient treated when PPM DOTS is introduced is very similar to the cost per patient treated in existing public sector DOTS programmes.7 Therefore, the average cost per patient treated is assumed to remain the same when PPM is introduced, and the regional average costs per patient treated remain as described in 4.1 (nonetheless, the total costs increase as more patients are detected and treated in DOTS programmes as PPM is introduced and scaled-up).
### METHODS USED TO ESTIMATE COSTS, FUNDING AND FUNDING GAPS

**TABLE 3: INPUTS NEEDED TO STRENGTHEN DOTS QUALITY IN AFRICA AT SUB-NATIONAL AND NATIONAL LEVELS AND THEIR ESTIMATED COST, BASED ON EXPERIENCE IN UGANDA**

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Sub-national, per 500,000 population</th>
<th>National</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional national TB control staff at sub-national and national levels</td>
<td>Two more supervisors who spend 60% of their time on TB control</td>
<td>Recruitment of additional staff Estimated cost in Uganda US$ 300,000 per year</td>
<td>Strengthening at the central level in Uganda was achieved through the intensified support for action in countries initiative (ISAC)</td>
</tr>
<tr>
<td>Contracts with NGO partners</td>
<td>A nongovernmental organization is contracted to strengthen existing services. Estimated cost US$ 30,000 per year</td>
<td>Not applicable</td>
<td>Contracts in Uganda have been facilitated through the establishment of a Stop TB partnership</td>
</tr>
</tbody>
</table>

**TABLE 4: INPUTS NEEDED TO ESTABLISH AND SUSTAIN PUBLIC–PRIVATE AND PUBLIC-PUBLIC MIX FOR DOTS (PPM DOTS) AT SUB-NATIONAL AND NATIONAL LEVELS, BASED ON EXPERIENCE IN INDIA**

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Sub-national inputs, per 5 million population</th>
<th>National inputs</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up costs (year 1 of implementation)</td>
<td>1 senior focal point 1 consultant 2 assistants 4 computers</td>
<td>1 senior focal point 1 assistant</td>
<td>Team to prepare the launch of public-private mix for DOTS, including development of tools, operational guidelines and organization of a central level meeting</td>
</tr>
<tr>
<td></td>
<td>4 consultative meetings</td>
<td></td>
<td>1 week consultative meeting with stakeholders. Assumes about 20 attend, of whom about half travel from outside site where meeting is held</td>
</tr>
<tr>
<td>Recurrent costs</td>
<td>1 coordinator 1 assistant</td>
<td>1 senior focal point 1 assistant</td>
<td>The cost of all personnel at district and sub-district level is assumed to be included in the cost per patient treated (such personnel were included in the costing studies undertaken in India)</td>
</tr>
<tr>
<td>Capital costs</td>
<td>1 motorcycle</td>
<td></td>
<td>Estimated useful life assumed to be seven years, in line with assumptions of Disease Control Priorities in Developing Countries project</td>
</tr>
</tbody>
</table>

However, some additional costs for PPM were considered in GP2, to reflect the new management and organizational activities that are needed at national and sub-national levels when PPM is implemented (as opposed to costs at patient level, which are assumed to remain as in existing public sector DOTS programmes).

Given limited country-based costing of PPM to date or implementation of PPM on a large scale, the DOTS Expansion WG developed a standard framework to describe the inputs that are needed to establish and sustain PPM activities at national and sub-national levels (Table 4). This is based on experience in India, which has been at the forefront of efforts to pilot and scale up PPM. The framework and associated costs can be refined as more experience becomes available.

Sub-national level inputs for PPM were defined by the DOTS Expansion WG for a population size of 5 million, which is the population size assumed for a large city or a small state. Personnel below the state level, i.e. at district or sub-district levels (the sub-district, or “Tuberculosis Unit”, is the basic planning and management unit for the TB control programme in India, and is expected to cover a population of 500,000) were assumed to be accounted for in the cost per patient treated, as
was the case in the costing studies undertaken in India. To be consistent with the costing methodology of the other initiatives, the unit costs per 5 million population were converted into a unit cost per 500,000 population. The DOTS Expansion WG also specified the countries in each region where PPM should be implemented, and the planned coverage levels.

Costing was based on combining the quantities of inputs required (Table 4) with regional unit prices as defined in DCPP (for staff at different levels, computers, and motorcycles) and planned population coverage as defined by the DOTS Expansion WG. Recurrent and capital costs were estimated from the year that the initiative was scheduled to start. Coordinators for each 5 million population unit, a focal point at national level and a consultant at national level were assumed to be labour level 5 in the United Nations Educational, Scientific and Cultural Organization (UNESCO) classification, an assistant was assumed to be labour level 4, and the costs associated with motorcycles were assigned to the year of their purchase (i.e. not spread over the lifetime of the item) and assumed to be needed again seven years later.

In other words, unit and total regional costs were calculated as follows:

1) Regional unit recurrent costs per 500,000 population calculated as:
   \[ \text{Regional unit recurrent cost per 500,000 population} = \frac{(1 \text{ state-level coordinator} \times \text{DCPP regional annual salary level } 5 + 1 \text{ assistant} \times \text{DCPP regional annual salary level } 4)}{10} \]

2) Regional unit capital costs per 500,000 population calculated as:
   \[ \text{Regional unit capital cost per 500,000 population} = \frac{(1 \text{ motorcycle} \times \text{DCPP price for a motorcycle})}{10} \]
   (assigned to the start-up year and repeated seven years later)

3) Regional unit recurrent costs at national level calculated as:
   \[ \text{Regional unit recurrent cost at national level} = \frac{1 \text{ focal point} \times \text{DCPP regional annual salary level } 5 + 1 \text{ assistant} \times \text{DCPP regional annual salary level } 4}{10} \]

4) Regional unit start-up costs at national level calculated as:
   \[ \text{Regional unit start-up cost at national level} = \frac{1 \text{ focal point} \times \text{DCPP regional annual salary level } 5 + 1 \text{ consultant} \times \text{DCPP regional annual salary level } 4 + 2 \text{ assistants} \times \text{DCPP regional annual salary level } 4 + 4 \text{ computers} \times \text{estimated price of a new computer (US$ 1,600)} + 4 \text{ consultative meetings}}{10} \]

5) Total regional costs in any year were then calculated as:
   \[ \text{Total regional cost in any year} = \text{Regional unit start-up cost at national level} + \frac{\text{Regional unit recurrent costs at national level}}{10} + \frac{\text{Regional unit recurrent cost per 500,000 population} \times \text{cumulative proportion of population covered} \times \text{regional population} + \text{Regional unit capital costs per 500,000 population} \times \text{proportion of population covered} \times \text{regional population}}{500,000} \]

Again, these calculations were done in the spreadsheet model that combined demographic, epidemiological, planning and unit cost data (described in section 1).

5.3.2 Community-based TB care

Community-based TB care is considered to be the primary initiative capable of overcoming two major constraints to TB control in Africa: the shortage of human resources in the health sector, and poor geographical access to existing health facilities (especially in rural areas). Economic evaluations are available for five African countries, and in all cases show that treatment outcomes can be sustained or improved and that costs fall when community-based TB care is introduced. The DOTS Expansion WG developed a standard framework for the inputs and costs associated with implementing community-based TB care in Africa, based in particular on experience in Uganda (Table 5). Costs in countries other than Uganda were estimated by extrapolating costs from Uganda, with adjustment for relative GNI per capita. A regional weighted average was then calculated, with the weight being the proportion of the regional population accounted for by each country.

Although it is of particular relevance in Africa, the DOTS Expansion WG plan included extension of community-based TB care to other regions, and for GP2 defined both a) the countries where it is relevant and b) the percentage of the population to be covered. Costs in other regions were extrapolated for the relevant countries by adjusting the costs for Uganda according to relative GNI, i.e. the cost was estimated by multiplying costs in Uganda (GNI per capita in country for which extrapolation was being done / GNI per capita in Uganda).

In other words, costs in other regions were estimated as follows:

1) Unit prices for costs in other regions were extrapolated to the main countries in the region where implementation of community-based TB care is planned.

2) Regional unit cost per year at sub-national level calculated as:
   \[ \text{Regional unit cost per year at sub-national level} = \frac{\text{Average start-up costs across countries implementing community-based TB care (regional unit start-up cost) + 24 visits of one officer \times per diem (regional unit recurrent cost)}}{\text{It is assumed that recurrent costs start in the same year as the start-up costs.}} \]

3) Total regional cost in any given year calculated as:
   \[ \text{Total regional cost in any given year} = \frac{\text{Regional unit start-up cost per 500,000 population \times proportion population covered \times regional population}}{500,000} + \frac{\text{Regional unit recurrent cost per 500,000 population \times cumulative proportion of population covered \times regional population}}{500,000} \]

The proportion of the regional population to be covered each year was based on the DOTS Expansion WG plan. The population of the region was based on United Nations Development Programme (UNDP) population projections, which were part of the spreadsheet model described in section 1.
5.3.3 Practical Approach to Lung Health

The Practical Approach to Lung Health (PAL) is designed to improve the management of patients with respiratory symptoms. PAL targets general health workers, nurses, doctors and managers in primary health-care settings. The DOTS Expansion WG developed a standard framework for defining the inputs and costs associated with implementing PAL, based on experience to date with PAL implementation (Table 6). The DOTS Expansion WG also specified the countries in each region where PAL should be implemented, and the planned coverage levels.

Implementation costs were assumed to be incurred from the year after the initiative is planned to start.

Based on the inputs and costs defined in Table 6, regional unit and total costs were calculated as follows:

1) Regional unit start-up costs at national level estimated at US$ 40,000 per country
2) Regional unit costs at sub-national level (per 500,000 population) calculated as:
   \[ X \times \text{number of health workers to be provided with guidelines} \times \text{US$ 5} + X \times \text{number of health workers} \times \text{estimated regional per diem} \times 4 + Y \times \text{number of peripheral health facilities} \times \text{US$ 10} + Z \times \text{number of second referral health facilities} \times \text{US$ 4,000} \]
3) Total regional costs in any given year calculated as:
   \[ \text{Regional unit costs at national level} \times \text{number of countries implementing PAL} + \text{Regional unit costs at sub-national level, per 500,000 population} \times \text{proportion of population covered} \times \text{regional population} / 500,000 \]

The following assumptions would benefit from further refinement:

- The estimated number of health workers per 500,000 population in each region. In GP2, this was assessed as half the number of doctors and nurses as estimated by the Global Atlas of the Health Workforce.
- The estimated number of peripheral health facilities per 500,000 population. The value used in the GP2 estimates was 20.
- The estimated number of second referral health facilities per 500,000 population. In GP2 this was estimated as two.
- The number of days of training required per health worker (in GP2, this was estimated as four).

Other underlying assumptions that could be refined in future by the DOTS Expansion WG are:

- whether or not the spirometer and peak-flow meter costs should be included, since those are not meant specifically for TB control;
- whether the unit cost for the development phase can really be assumed to be the same for all countries;
- whether there are any recurrent costs once the initial implementation phase is completed.

5.3.4 Introducing culture and DST services

Laboratory services are an essential component of DOTS. However, in most countries culture and DST tests are not yet widely implemented, although it is recognized that culture increases the number of TB cases found and detects cases earlier, often before they become infectious. The laboratory subgroup of the DOTS Expansion WG developed a standard framework for defining the inputs and costs associated with implementing culture and DST services (Table 7). This sets out the basic needs and costs of inputs required for one laboratory.
### TABLE 6: INPUTS AND COSTS FOR ESTABLISHING AND SUSTAINING PAL AT SUB-NATIONAL AND NATIONAL LEVELS, BASED ON EXPERIENCE OF THE PRACTICAL APPROACH TO LUNG HEALTH SUBGROUP OF THE DOTS EXPANSION WORKING GROUP

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Sub-national (per 500,000 population)</th>
<th>National</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up costs (development phase)</td>
<td>Not applicable</td>
<td>Development of training material and guidelines</td>
<td>Estimated cost US$ 40,000 per country in all regions</td>
</tr>
<tr>
<td>Implementation costs</td>
<td>Guidelines for health workers. Number of health workers requiring guidelines currently estimated as half of the number of physicians and nurses in the region(^a)</td>
<td>Estimated cost US$ 5 per copy multiplied by the number of health workers that need to be provided with the guidelines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 days training for the relevant number of health workers</td>
<td>Estimated at the moment as half of the number of physicians and nurses in the region(^b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>One peak-flow meter per peripheral-level health facility</td>
<td>Estimated cost at US$ 10 per peak flow meter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>One spirometer per second referral-level health facility</td>
<td>Estimated at US$ 4,000 per spirometer</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) As available in the Global Atlas of the Health Workforce, available at: http://www.who.int/hrh/en/


### TABLE 7: INPUTS AND COSTS FOR ESTABLISHING AND SUSTAINING CULTURE AND DRUG SUSCEPTIBILITY TESTING (DST) SERVICES, PER LABORATORY, BASED ON EXPERIENCE OF THE LABORATORY SUBGROUP OF THE DOTS EXPANSION WORKING GROUP

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Inputs required per laboratory</th>
<th>Estimated costs</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up costs</td>
<td>Equipment and supplies for culture services</td>
<td>US$ 190,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment and supplies for DST services</td>
<td>US$ 50,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Infrastructure (at least 3 air-conditioned rooms)</td>
<td>US$ 45,000</td>
<td>Half of this amount is currently included in the cost, due to the assumption that the regions already have a certain level of infrastructure.</td>
</tr>
<tr>
<td>Recurrent costs</td>
<td>Consumables for 1,000 cultures per year</td>
<td>US$ 7,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumables for 1,000 DST per year</td>
<td>US$ 15,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human resources: 1 microbiologist, 2 laboratory technicians, 1 cleaner</td>
<td>Estimated using DCPP regional prices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Training, 8 weeks internationally, for microbiologists and laboratory technicians</td>
<td>US$ 20,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>External quality assurance for culture and DST</td>
<td>US$ 10,000</td>
<td></td>
</tr>
</tbody>
</table>
to provide culture and DST services using conventional methods (i.e. culture on Lowenstein-Jensen media and the proportion method).

It was then assumed that one laboratory with culture and DST capacity serves 5 million people. Recurrent costs were assumed to be incurred from the year after the initiative is started.

The DOTS Expansion WG defined the planned population size (in millions) to be covered by these services for each country in each region, and the time period over which services would be introduced. On this basis, the number of laboratories to be introduced in each region in each year, and the cumulative number of laboratories providing culture and DST services in each year, were determined. Total regional costs in any given year were then calculated by multiplying the unit costs with the number of laboratories established in the region each year and the cumulative number of laboratories that are operating, as follows:

\[
\text{Total Regional Costs} = \text{Regional unit start-up costs} \times \text{number of laboratories being established} + \text{Regional unit recurrent costs} \times \text{cumulative number of laboratories operating culture and DST services}
\]

Again, these calculations were done in the spreadsheet model that combined demographic, epidemiological, planning and unit cost data (described in section 1).
6. DOTS-PLUS

6.1 Quantity data

The DOTS-Plus WG provided assumptions about the kinds of patients for whom drug susceptibility tests would be done in each region, estimates of the proportion of tested patients who would be MDR, and the percentage of those found to have MDR who would be enrolled on DOTS-Plus treatment. These assumptions and estimates were part of the “input” variables included in each regional spreadsheet (see also section 1), and when combined with demographic data and the epidemiological model (also described in section 1) produced estimates of the total number of patients to be treated in DOTS-Plus programmes for each year 2006–2015.

6.2 Unit costs for treatment

The cost per patient treated in each region was estimated using data from detailed costing studies undertaken in Estonia (2002), Peru (2000), the Philippines (2002) and the Russian Federation (Tomsk Oblast, 2003). These costing studies documented all costs relevant to DOTS-Plus treatment, including items such as the drug regimen (including both first- and second-line anti-TB drugs), hospitalization, DOT visits, laboratory tests (smear, culture, DST), X-rays, training, programme and data management, food parcels and management of adverse events. The costing studies included data on both the overall cost per patient treated, and the unit costs of the different components of treatment (e.g. cost per day in hospital, cost per drug dose, cost per DOT visit, cost per culture).

For each region, the unit cost per patient treated in a DOTS-Plus programme was calculated for each country by extrapolating from one of the four countries (the most similar) that has been studied in detail. All costs apart from those for drugs were adjusted according to income level (GNI per capita). Drug costs were not adjusted because they are assumed to be the same across all countries. However, for some regions the drug regimens used in the four study sites were revised by the DOTS-Plus WG secretariat, according to the regional drug resistance pattern. Furthermore, while costs in SEAR and WPR were based on the Philippines costing study, the amount of hospitalization was adjusted based on experience in China. It was assumed that three months of hospitalization at the beginning of treatment would be used, compared with an average of seven days in the Philippines. Hospital costs were based on those observed in China, with appropriate adjustment for differing GNI per capita among countries.

The average regional cost per patient treated was calculated as a weighted average, with the weight being the proportion of regional MDR-TB cases accounted for by the country in 2003.
7. TB/HIV

The TB/HIV WG plan covered implementation of the 12 collaborative TB/HIV activities recommended in the WHO TB/HIV interim policy. In line with this policy, these activities were classified in three broad categories:

- **Establishment of mechanisms for collaboration between TB and HIV/AIDS programmes.** These include coordinating bodies at different administrative levels, joint TB/HIV planning, monitoring and evaluation, and HIV surveillance among TB patients (i.e. four activities).

- **Activities aimed at reducing the burden of TB in HIV+ people.** These include intensified TB case-finding among HIV+ people, isoniazid preventive therapy (IPT) for HIV+ people without active TB, and infection control in care and congregate settings (i.e. three activities).

- **Activities aimed at reducing the burden of HIV in TB patients.** These include HIV testing and counselling, HIV prevention services, co-trimoxazole preventive therapy (CPT), ART, and care and support (i.e. five activities).

It is important to highlight that, in line with the interim policy, the TB/HIV WG plan allowed for all recommended activities to be implemented in countries or parts of countries where HIV prevalence is above 1% in the general adult population. Where this is the case, testing and counselling is recommended for all TB patients, and thus HIV surveillance through special surveys is unnecessary. Wherever HIV prevalence is below 1%, only HIV surveillance among TB patients was planned. Furthermore, collaborative TB/HIV activities were built on the plans of the DOTS Expansion WG, and therefore focused on activities that were additional to DOTS treatment of TB cases.

The total costs of collaborative TB/HIV activities in each year 2006–2015 were based on four major kinds of data:

- **Projected numbers of people living in areas where the full range of collaborative TB/HIV activities is appropriate.** This was estimated as the percentage of the population in each region living in areas where HIV prevalence is above 1% in the general adult population. Data on HIV prevalence by country were provided by UNAIDS. For countries or parts of countries where HIV prevalence in the general population is below 1%, it was assumed that HIV testing of 10% of TB patients for HIV surveillance purposes would be needed.

- **Planned coverage of the full range of collaborative TB/HIV activities.** This was based on estimates of the percentage of the population to be covered by the full range of collaborative TB/HIV activities for each country in each region, and WG assumptions about the rate at which activities could be scaled up.

- **Projected numbers of people being provided with interventions.** The number of people with HIV who would be screened for TB was based on estimates of the number of people testing HIV+ in testing and counselling services provided by UNAIDS, combined with a) the assumption that all those identified to be HIV+ would be screened for TB and b) TB/HIV WG estimates of the rate at which collaborative activities could be scaled up. The number of people to be enrolled on ART was also based on the estimated numbers of people testing HIV+ in testing and counselling services provided by UNAIDS, combined with TB/HIV WG assumptions about the percentage of those testing HIV+ who would choose to start IPT. The number of HIV+ TB patients to be enrolled on ART was based on a joint analysis with UNAIDS. The TB/HIV WG provided estimates of the total number of HIV+ people who would be treated in DOTS programmes and eligible for ART in each year (based on combined analysis of the input variables provided by the TB/HIV and DOTS Expansion WGs and the epidemiological model outlined in section 1) to the team working on the UNAIDS resource needs estimates during 2005. Using these data, the team working on the UNAIDS estimates provided projections of the number of HIV+ TB patients who should be enrolled on ART; these projections were designed to be consistent with the goal of universal access to ART by 2010. The number of HIV+ TB patients enrolled on CPT was assumed to be the same as the number enrolled on ART. The number of people receiving HIV prevention and care and support (other than ART) services was based on the assumption that all TB patients living in areas where the full range of collaborative TB/HIV activities was being implemented would benefit from such services.

- **Unit regional costs for each of the 12 collaborative TB/HIV activities.** These were estimated using two major sources of data: costing studies of ProTEST pilot projects in Malawi, South Africa and Zambia (undertaken during 2000–2003), and the cost analysis undertaken by UNAIDS in 2005 to produce resource needs estimates for HIV/AIDS during the period up to 2010. The pilot ProTEST projects were used to make estimates of the unit costs of mechanisms for collaboration (excluding HIV surveillance), IPT, CPT, and intensified TB case-finding. The UNAIDS analysis of resource needs up to 2010 provided estimates of unit costs for HIV prevention, HIV testing and counselling services, CPT, HIV care and support, and ART for 135 low- and middle-income countries. The unit costs reflected all the inputs required to implement the activity (including, for example, staff, training, supplies, vehicles, drugs). If there was evidence that costs varied by country according to income level, the unit cost was adjusted according to relative GNI per capita for any country for which data were lacking. If there was no evidence that the cost was associated with income levels (e.g. unit costs were similar for both low and middle-income countries, and sometimes lower in middle-income countries), no adjustment was made (this applied, for example, to IPT). A regional average cost was then estimated for each activity. This was calculated as a weighted average, with the weight for each country based on its share of the total number of people being provided with each activity or intervention in the region.

Total costs in any given year were then calculated as the total number of people covered by an intervention or the total number of people receiving an intervention (as appropriate, depending on how the activity is defined) multiplied by the regional unit cost.

Details of the planned coverage of activities, the number of people projected to benefit from interventions, and unit costs are provided for each region in section 11.
8. ADVOCACY, COMMUNICATION AND SOCIAL MOBILIZATION

Implementation of ACSM activities by TB control programmes has, to date, been limited. This also means that there is limited information about the cost of these activities, or their likely impact on case detection and treatment success rates. Nonetheless, a small number of countries developed plans and related budgets for ACSM activities as part of round five applications to the GFATM. Based on consultations with experts from the ACSM WG, proposals from five countries that were considered to conform to “best practice principles” were used to estimate a unit cost for ACSM activities (per 500,000 population). These countries were Bangladesh, Indonesia, Kazakhstan, Kenya and Mexico. Costs for other countries in a given region were based on extrapolation from one of these countries (the country considered the most similar), with adjustment made according to GNI per capita. Once unit costs had been estimated for each country, a regional weighted average was estimated according to the fraction of the regional population for which each country accounted in 2003.

Estimates were also made using a second method. Evidence from a variety of public health programmes suggests that about 5–15% of total planned costs should be allocated for ACSM: 5% in areas where programmes are already performing relatively well and stigma is not a major issue, and up to 15% in areas where major improvements in programme performance are needed and there are high levels of stigma. Costs for ACSM in each GP2 region were estimated as 5% of the cost per patient treated in a DOTS programme multiplied by the number of patients to be treated in the EMR and AFR low regions; as 10% of the cost per patient treated in a DOTS programme multiplied by the number of patients to be treated in the WPR and LAC regions; and as 15% of the cost per patient treated in a DOTS programme multiplied by the number of patients to be treated in the AFR high, EEUR and SEAR regions. This method produced results that were almost identical to those based on GFATM “best practice” proposals. The estimates that appear in GP2 are those based on GFATM proposals.

9. RESEARCH AND DEVELOPMENT

As noted in section 1.2, the secretariats of the new tools WGs assessed the budget needed for research and development in their respective areas of responsibility. Detailed budget breakdowns were provided to the core team responsible for the epidemiological and cost estimates for GP2, and appear in Part III of the plan itself. Since all the analyses provided to the core team appear in GP2, no further details are provided in this document. Those interested in further information should contact the secretariat of the relevant WG.
10. FUNDING AND FUNDING GAPS

Once the cost estimates had been produced as described in sections 1–9, an assessment of likely funding and remaining funding gaps was made.

10.1 Implementation costs (i.e. excluding research and development)

Funding for implementation (i.e. DOTS expansion, DOTS-Plus, collaborative TB/HIV activities and ACSM) for each year 2006–2015 was categorized into three major sources: domestic financing (including loans); GFATM grants; and donor funding from sources other than the GFATM (e.g. bilateral agencies and foundations). Funding from each of these sources in each year 2006–2015 was assessed for each region separately, based on the following data sources and assumptions:

- **Domestic funding (including loans).** The WHO Global Financial Monitoring project has been compiling, analysing and reporting on financing for TB control since 2002. Countries that submitted complete financial data for 2005 were grouped according to GP2 region; South Africa was also included in the AFR high region, with the assumption, justified by recent costing studies, that (to all intents and purposes) 100% of funding is from domestic sources. The percentage of total TB control costs that was financed from domestic sources in these countries in 2005 was then calculated. Countries for which data were available represented over 90% of the regional burden of TB in WPR and SEAR, about 80% of the burden in the African regions, about 30% of the burden in LAC, about 60% of the burden in EMR and about 40% of the burden in EEUR. Although figures were relatively low for EMR, EEUR and LAC, these regions account for a relatively small share of the global burden of TB (16%). It was assumed that the percentage of total costs financed from domestic sources in the subset of countries for which data were available applied to any countries in the region for which data were not available. The percentage of funding estimated to be provided from domestic sources in each region was then multiplied by the total cost of TB control in that region in 2005 (which could be estimated within each GP2 regional spreadsheet) to give an estimate of total domestic funding for TB control in each region in 2005. Finally, it was assumed that this absolute amount of domestic funding per year (about US$ 1.6 billion in 2005) would be sustained throughout the period 2006–2015, increasing only in line with inflation.

- **GFATM funding.** GFATM funding commitments for TB control from proposals approved in rounds 1–5 were assessed using GFATM databases that are in the public domain. GFATM commitments for each year 2006–2015 and every country were entered into a spreadsheet, using these databases. At the time the analysis was done, commitments existed for the period 2006–2011 and totalled almost US$ 1 billion. Total funding commitments in each year were summed for each region.

- **Donor funding from sources other than the GFATM.** Data on funding from donors other than the GFATM were available from a donor survey commissioned by the Stop TB partnership during 2004. These data were available on a country-by-country basis. Countries were grouped according to GP2 region, and then total donor funding (excluding funding from the GFATM) in 2004 in each region was calculated (across all regions, donor funding other than from the GFATM was about US$ 150 million per year in 2004). It was assumed that in each region this absolute amount of funding would be sustained during the period 2006–2015, increasing only in line with inflation.

The funding gap was then estimated by subtracting these projections of funding from domestic, GFATM and other donor sources from total plan costs. This means that the funding gap is, in effect, a measure of the additional effort that is required in TB control over the period 2006–2015, above and beyond what had been achieved by 2005.

The Excel spreadsheet within which the data and related analysis is laid out is available upon request.

10.2 Research and development

As for the cost estimates, the secretariats of the new tools WGs estimated the funding available, and remaining funding gaps, in their respective areas of responsibility. These were provided to the core team responsible for the epidemiological and cost estimates for GP2, and appear in Part 3 of the plan itself. Since all the data provided to the core team appear in GP2, no further details are provided in this document. Those interested in further information should contact the secretariat of the relevant WG.
### TABLE 8: AFRICA, HIGH HIV PREVALENCE COUNTRIES (AFR HIGH)

<table>
<thead>
<tr>
<th>WG and intervention</th>
<th>Countries considered for planned quantities</th>
<th>Planned quantities to be delivered</th>
<th>Sources/assumptions for planned quantities</th>
<th>Regional unit costs</th>
<th>Sources of cost data</th>
<th>Important assumptions used to estimate regional unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline DOTS (DOTS as implemented in 2005)</td>
<td>All</td>
<td>Number of patients to be treated equivalent to 55% case detection rate in 2005, increasing to 83% in 2015.</td>
<td>DOTS Expansion WG (DEWG). Constant progress to 83% case detection rate from 2005. Cost per sm-+ patient treated US$ 549. Cost per sm- / extrapulmonary patient treated US$ 536. Cost per sm- / sm- excluding South Africa are US$ 211. US$ 192.</td>
<td>Financial data reported to WHO in 2004 by DR Congo, Ethiopia, Kenya, Nigeria, Mozambique, UR Tanzania, Uganda and Zimbabwe. DCPP; costing studies in South Africa (these countries = 82% of regional cases in 2003). Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiatives to reach 100% DOTS coverage and improve existing DOTS quality</td>
<td>All</td>
<td>100% population coverage by 2010, and sustained thereafter.</td>
<td>Standard frameworks developed by DEWG, experience in Uganda.</td>
<td>Sub-national cost (per 500,000 population) US$ 72,071. National level costs (per country covered) US$ 663,800.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New initiatives to enhance DOTS</td>
<td>All</td>
<td>Incremental improvement in existing (2005) population coverage of community-based TB care (CBC) reaches 100% by 2010, sustained thereafter. For PPM, further 13% of the population is covered by 2011, sustained thereafter. For PAL, a further 20% of the population is covered by 2012. A total of 350 million people (63% of the population) covered by DST and culture services by 2015.</td>
<td>Standard frameworks developed by DEWG and PPM, PAL and laboratory subgroups, experience in Uganda (CBC). 1 laboratory serves a population of 5 million. Constant progress to coverage levels from 2005.</td>
<td>Running cost at sub-national level (per 500,000 population) US$ 742 for CBC, US$ 2,321 for PPM and US$ 15,798 for PAL. Running cost at national level (per country), US$ 23,208 for PPM. Start-up cost at national level (per country) US$ 173,306 for PPM, US$ 4,120 for PAL and US$ 22,127 for CBC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOTS-Plus</td>
<td>All</td>
<td>DST coverage in new cases is 0%; in re-treatment cases coverage rises from 29% in 2006 to 100% by 2015; in chronic cases, coverage increases from 28% in 2006 to 50% in 2015. Plans are to provide DOTS-Plus treatment to 10% (=230 patients) of diagnosed MDR-TB cases in 2006 increasing to 100% (=3,300) by 2015. MDR-TB diagnosed cases on second-line drugs but not on DOTS-Plus falls from 86% (=1,900) in 2006 to 0% in 2015. MDR-TB diagnosed cases on other treatment falls from 5% (=100) to 0%.</td>
<td>DOTS-Plus WG. MDR-TB prevalence 2% in new cases, 5% in previously treated cases and 40% in chronic cases.</td>
<td>Cost per patient treated US$ 2,158.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cost analysis of DOTS-Plus in Peru; DOTS-Plus secretariat for price of drug regimen appropriate for Africa. Costs for AFR can be reliably estimated by adjusting Peru costs according to relative GNI per capita. Drug regimen revised to US$ 1,600 per patient treated.
### TB/HIV

<table>
<thead>
<tr>
<th>Countries considered for planned quantities</th>
<th>Planned quantities to be delivered</th>
<th>Sources/assumptions for planned quantities</th>
<th>Regional unit costs</th>
<th>Sources of cost data</th>
<th>Important assumptions used to estimate regional unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mechanisms for collaboration</strong></td>
<td>All</td>
<td>Population coverage grows from 60% in 2006 to 100% by 2010 and sustained thereafter.</td>
<td>TB/HIV WG. 100% of total population covered by mechanisms for collaboration in areas covered by DOTS.</td>
<td>Costs of mechanisms for collaboration, per capita, are US$ 0.06.</td>
<td>HIV surveillance not costed because assumed to be covered by testing and counselling.</td>
</tr>
<tr>
<td><strong>Reducing TB burden in people living with HIV/AIDS (PLWHA)</strong></td>
<td>All</td>
<td>Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB increases from 34% in 2008 (~9 million people) to 69% in 2015 (~20 million people). 16% of newly diagnosed HIV+ people who were screened for TB complete 6 months of IPT. Numbers on IPT increase from 200,000 in 2006 to 470,000 in 2015.</td>
<td>TB/HIV WG. 4–9% of PLWHA are newly diagnosed each year and 60% of PLWHA who already know their status are in chronic care. No TST. 95% of those newly diagnosed and screened for TB are eligible for IPT (i.e. do not have active TB, of whom 50% accept, of whom 40% complete). IPT only provided to newly diagnosed PLWHA (i.e. not those in chronic care).</td>
<td>Cost for TB screening US$ 0.42 per person screened. Cost of IPT US$ 33 for 6 person-months of treatment.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
</tr>
<tr>
<td><strong>Reducing burden of HIV in TB patients</strong></td>
<td>All</td>
<td>43% of TB patients are tested and counselled in 2008, increasing to 85% and sustained thereafter. Numbers increase from 640,000 to 1.2 million people. 22% of diagnosed HIV+ TB cases complete 6 months ART (+CPT) in 2006, increasing to 29% in 2015 (+180,000 to 280,000). 40% of HIV+ TB cases not on ART but on CPT in 2006, increasing to 61% in 2015. Numbers rise from 340,000 to 600,000. Percentage of HIV+ TB patients who receive care and support increases from 50% in 2006 to 100% in 2013. Number increases from 500,000 to 900,000. HIV prevention services provided to all TB patients in areas covered by collaborative TB/HIV activities.</td>
<td>TB/HIV WG. 85% of TB patients are tested and counselled in areas covered by collaborative TB/HIV activities. When both ART and CPT are available, 95% of HIV+ TB patients are eligible for ART; 45%–60% will actually start ART of whom 100% complete 6 months of ART. When only CPT is available (i.e. no ART), 95% of HIV+ TB patients are eligible for CPT; 95% choose to start treatment, and 90% complete 6 months of CPT. Care and support provided for all HIV+ TB patients.</td>
<td>Cost per TB patient tested and counselled US$ 21.60. Cost of ART (and CPT) for HIV+ TB patients is in average US$ 649 for 6 person-months. Cost of CPT for HIV+ TB patients US$ 71 for 6 person-months. Cost of care and support for HIV+ TB patients US$ 106 for 6 months (per HIV+ TB patient). Cost of HIV prevention services US$ 23.80 per TB patient.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
</tr>
</tbody>
</table>

**Notes:**
- **Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB:**
  - **2006:** 34%
  - **2015:** 69%
- **Percentage of PLWHA who already know their status are in chronic care:**
  - **2008:** 22%
  - **2015:** 61%
- **IPT completion rate:**
  - **2006:** 43%
  - **2015:** 85%
- **HIV prevention services provided:**
  - **2006:** 50%
  - **2013:** 100%
- **HIV surveillance not costed:**
  - Because assumed to be covered by testing and counselling.
### METHODS USED TO ESTIMATE COSTS, FUNDING AND FUNDING GAPS

#### TABLE 9: AFRICA, LOW HIV PREVALENCE COUNTRIES (AFR LOW)

<table>
<thead>
<tr>
<th>WG and intervention</th>
<th>Countries considered for planned quantities</th>
<th>Planned quantities to be delivered</th>
<th>Sources/assumptions for planned quantities</th>
<th>Regional unit costs</th>
<th>Sources of cost data</th>
<th>Important assumptions used to estimate regional unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOTS Expansion</td>
<td>All</td>
<td>Number of patients to be treated equivalent to 55% case detection rate in 2005, increasing to 80% in 2015.</td>
<td>DOTS Expansion WG (DEWG). Constant progress to 80% case detection rate from 2005.</td>
<td>Cost per s+m patient treated US$ 731. Cost per s-m / extrapulmonary patient treated US$ 700.</td>
<td>Financial data reported to WHO in 2004 by Algeria, Benin, Burkina Faso, Eritrea, Ghana, Madagascar, Mali, Sierra Leone and Togo. Angola extrapolated from Mozambique, Chad from Mali, Guinea from Benin, Niger from Burkina Faso, Senegal from Ghana and Somalia and Sudan from Ethiopia. DCPP. These 16 countries account for 96% of regional TB cases in 2003. Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003. Costs beyond those countries that reported financial data to WHO can be reliably estimated by adjusting costs in reporting countries according to GNI per capita.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>100% population coverage by 2010, and sustained thereafter.</td>
<td>Standard frameworks developed by DEWG, experience in Uganda.</td>
<td>Cost at sub-national level (per 500,000 population) US$ 81,693. Cost at national level (per country covered) US$ 460,022.</td>
<td>Prices that applied in Uganda; DCPP. Costs beyond Uganda can be reliably estimated by adjusting Uganda costs according to relative GNI per capita.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>Incremental improvement in existing DOTS (2005) population coverage for community-based TB care (CBG) is 100% by 2010. For PPM, further 13% of population is covered by 2010 and sustained thereafter. For PAL, further 26% by 2012. 150 million people (60% of the population) covered by DST and culture services by 2015.</td>
<td>Standard frameworks developed by DEWG and PPM, PAL, and laboratory subgroups, experience in Uganda (CBG). 1 laboratory serves a population of 5 million. Constant progress to coverage levels from 2005.</td>
<td>Running cost at sub-national level (per 500,000 population) US$ 742 for CBC, US$ 2,321 for PPM and US$ 15,796 for PAL. Running cost at national level (per country) US$ 23,208 for PPM. Start-up cost at national level (per country) US$ 173,936 for PPM, US$ 41,200 for PAL.</td>
<td>DCPP; prices estimated by each DEWG subgroup.</td>
<td></td>
</tr>
<tr>
<td>DOTS-Plus</td>
<td>All</td>
<td>DST coverage in new cases is 0%; in re-treatment cases coverage rises from 28% in 2006 to 100% in 2015, and in chronic cases coverage is 28% in 2006 increasing to 50% by 2015. DOTS-Plus treatment provided to 17% (=150 patients) of diagnosed MDR-TB cases in 2006 increasing to 100% (=2,000) in 2015. MDR-TB diagnosed cases on second-line drugs but not on DOTS-Plus falls from 78% (=700) in 2006 to 0% in 2015.</td>
<td>DOTS Plus WG. MDR-TB prevalence in new cases is 1%, in previously treated cases is 24% and in other cases (not new) is 40%.</td>
<td>Cost per patient treated US$ 1,979.</td>
<td>Cost analysis of DOTS-Plus in Peru; DOTS-Plus secretariat for price of drug regimen appropriate for Africa. Costs for AFR can be reliably estimated by adjusting Peru costs according to relative GNI per capita. Drug regimen revised to US$ 1,600 per patient treated.</td>
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</table>
### METHODS USED TO ESTIMATE COSTS, FUNDING AND FUNDING GAPS

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<thead>
<tr>
<th>TB/HIV</th>
<th>Countries considered for planned quantities</th>
<th>Planned quantities to be delivered</th>
<th>Sources/assumptions for planned quantities</th>
<th>Regional unit costs</th>
<th>Sources of cost data</th>
<th>Important assumptions used to estimate regional unit cost</th>
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<tbody>
<tr>
<td>Mechanisms for collaboration</td>
<td>All</td>
<td>Population coverage grows from 38% in 2006 to 76% in 2011, sustained thereafter. Percentage of DOTS TB patients tested for HIV surveillance increases from 0.2% (=840 patients) in 2006 to 2% (=7,600) by 2011 and sustained thereafter.</td>
<td>TB/HIV WG 76% of total population covered by mechanisms for collaboration in areas covered by DOTS. 2% of DOTS TB cases tested for HIV surveillance purposes.</td>
<td>Unit cost per capita for mechanisms for collaboration, excluding HIV surveillance, not estimated. See assumptions for how total costs were estimated. Cost for HIV surveillance, per TB patient tested is US$ 21.60.</td>
<td>Estimates for AFR high. Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>About 8% of the total cost for TB/HIV activities is for mechanisms for collaboration, as in AFR high.</td>
</tr>
<tr>
<td>Reducing TB burden in people living with HIV/AIDS (PLWHA)</td>
<td>All</td>
<td>Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB increases from 25% in 2006 (=600,000 people) to 51% in 2015 (=2 million people). 19% of those newly diagnosed with HIV and screened for TB complete 6 months of IPT. Numbers on IPT increase from 12,000 in 2006 to 39,000 in 2015.</td>
<td>TB/HIV WG. 3–7% of PLWHA are newly diagnosed each year and 61% of PLWHA who already know their status are in chronic care. No TST. 95% of those newly diagnosed and screened for TB eligible for IPT (i.e., do not have active TB), of whom 50% choose to start treatment, of whom 40% complete. IPT only provided to PLWHA newly diagnosed.</td>
<td>Cost per person screened for TB US$ 0.27. Cost of IPT US$ 33 for 6 person-months of treatment.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS; cost study in Uganda.</td>
<td>Screening does not include X-ray.</td>
</tr>
<tr>
<td>Reducing burden of HIV in TB patients</td>
<td>All</td>
<td>35% of TB patients are tested and counselled in 2006, increasing to 63% in 2010 and 71% in 2015. Numbers increase from 89,000 to 190,000 to 215,000. 23% of diagnosed TB HIV+ cases complete 6 months ART (+CPT) in 2006, increasing to 24% in 2015. (=7,000 to 17,000). 28% of TB HIV+ cases are provided with CPT (but not ART) in 2006, increasing to 51% in 2015. Numbers on CPT (but not ART) rise from 11,000 to 37,000. Coverage of care and support for TB HIV+ patients increases from 42% in 2006 to 83% in 2015. Numbers increase from 17,000 to 61,000.</td>
<td>TB/HIV WG. 85% of TB patients are tested and counselled in areas covered by collaborative TB/HIV activities. When ART and CPT are both available, 50% of HIV+ TB patients are eligible for ART, 50–60% will start treatment, 100% of whom complete 6 months of ART. When only CPT is available (i.e., no ART), 95% of HIV+ TB patients are eligible for CPT, 95% choose to start treatment, of whom 95% complete 6 months of CPT.</td>
<td>Cost per TB patient tested and counselled US$ 21.60. Cost of ART (and CPT) for HIV+ TB patients is in average US$ 942 for 6 person-months. Cost of CPT for HIV+ TB patients US$ 41 for 6 person-months. Cost of care and support for HIV+ TB patients US$ 75 for 6 person-months. Cost of HIV prevention services US$ 23.80 per TB patient.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>Cost of ART is considered only during period when ART and TB treatment overlap, which is assumed to be 6 months.</td>
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<tr>
<td>WG and intervention</td>
<td>Countries considered for planned quantities</td>
<td>Planned quantities to be delivered</td>
<td>Sources/assumptions for planned quantities</td>
<td>Regional unit costs</td>
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<tr>
<td>DOTS Expansion</td>
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<td>DOTS Expansion WG (DEWG). Constant progress to 98% case detection rate from 2005.</td>
<td>Unit cost per patient treated ranges from US$ 1,400 to US$ 2,100.</td>
<td>Financial data reported to WHO in 2004 by the Russian Federation, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Romania, Tajikistan, Turkmenistan, Turkey, Ukraine and Uzbekistan extrapolated from the Russian Federation. These countries account for all regional TB cases in 2003.</td>
<td>Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003. Costs beyond those countries that reported financial data to WHO can be reliably estimated by adjusting them according to GNI per capita.</td>
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<tr>
<td>Baseline DOTS</td>
<td>All</td>
<td>Number of patients to be treated equivalent to 40% case detection rate in 2005, increasing to 98% in 2015.</td>
<td>DOTS Expansion WG (DEWG). Constant progress to 98% case detection rate from 2005.</td>
<td>Unit cost per patient treated ranges from US$ 1,400 to US$ 2,100.</td>
<td>Financial data reported to WHO in 2004 by the Russian Federation, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Romania, Tajikistan, Turkmenistan, Turkey, Ukraine and Uzbekistan extrapolated from the Russian Federation. These countries account for all regional TB cases in 2003.</td>
<td>Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003. Costs beyond those countries that reported financial data to WHO can be reliably estimated by adjusting them according to GNI per capita.</td>
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<td>WHO Regional Office for Europe and DOTS Expansion WG.</td>
<td>Cost at sub-national level (per 500,000 population) US$ 128,149 in 2006 increasing to US$ 170,240 in 2010 and falling to about US$ 31,690 until 2015.</td>
<td>WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe.</td>
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<td>WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe.</td>
<td>Costs have been reliably estimated by the WHO Regional Office for Europe.</td>
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<td>WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe.</td>
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<td>WHO Regional Office for Europe.</td>
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<tr>
<td>Initiatives to reach 100% DOTS coverage and improve existing DOTS quality</td>
<td>All</td>
<td>100% population coverage by 2010, and sustained thereafter. Activities for increasing geographical coverage of DOTS, for improving the quality of DOTS, and for implementation of new initiatives to enhance DOTS (PPM, PNL, community-based TB care, introduction of DST and culture services) were planned together as a package by the WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe and DOTS Expansion WG.</td>
<td>Cost at sub-national level (per 500,000 population) US$ 128,149 in 2006 increasing to US$ 170,240 in 2010 and falling to about US$ 31,690 until 2015.</td>
<td>WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe.</td>
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<tr>
<td>New initiatives to enhance DOTS</td>
<td>All</td>
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<td>WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe.</td>
<td>WHO Regional Office for Europe.</td>
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<td>WHO Regional Office for Europe.</td>
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<tr>
<td>DOTS-Plus</td>
<td>All</td>
<td>DST coverage for new cases increases from 85% in 2006 to 100% in 2015; coverage for re-treatment cases rises from 85% in 2006 to 100% in 2015; in chronic cases coverage increases from 85% in 2006 to 100% in 2015; DOTS-Plus treatment provided to 16% (&gt;14,000 patients) of diagnosed MDR-TB cases in 2006 increasing to 100% (&gt;44,000) in 2015. MDR-TB diagnosed cases on second-line drugs but not on DOTS-Plus falls from 27% (&gt;20,000) in 2006 to 0% in 2015.</td>
<td>DOTS Plus WG. MDR-TB prevalence 10% in new cases, 44% in previously treated cases and 70% in “other” cases (not new).</td>
<td>Cost per patient treated US$ 8,196.</td>
<td>Cost analysis of DOTS-Plus in Tomsk, the Russian Federation.</td>
<td>Costs for countries beyond Russian Federation can be reliably estimated by adjusting costs in the Russian Federation according to relative GNI per capita.</td>
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**TABLE 10: EASTERN EUROPE (EEUR)**
### Methods Used to Estimate Costs, Funding and Funding Gaps

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<tr>
<th>TB/HIV</th>
<th>Countries considered for planned quantities</th>
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<th>Important assumptions used to estimate regional unit cost</th>
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<tbody>
<tr>
<td>Mechanisms for collaboration</td>
<td>All</td>
<td>Population coverage grows from 14% in 2006 to 62% in 2010, and sustained thereafter. Percentage of DOTS TB patients tested for HIV surveillance increases from 0.7% in 2006 to 4% by 2009 and sustained thereafter.</td>
<td>TB/HIV WG. 35–62% of total population covered by mechanisms for collaboration in areas covered by DOTS. 2–4% of DOTS TB cases tested for HIV surveillance in 2006 increasing to 4% in 2009, sustained thereafter.</td>
<td>Unit cost per capita not estimated. See assumptions for how total costs were estimated. Cost per TB patient tested for HIV for surveillance purposes US$ 15.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>About 8% of the total cost for TB/HIV activities is for mechanisms for collaboration, as in AFR high.</td>
</tr>
<tr>
<td>Reducing TB burden in people living with HIV/AIDS (PLWHA)</td>
<td>All</td>
<td>Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB increases from 12% in 2006 (=82,000 patients) to 47% in 2010 (=745,000 patients) and is sustained thereafter. 2% of those screened for TB and found to be skin-test positive complete 6 months of IPT. Number of people on IPT, positive skin tested, increases from 370 in 2006 to 3,600 in 2015. 15% of those screened for TB who do not have a skin test complete 6 months of IPT. (&gt;3,200 in 2006 and 32,000 in 2015).</td>
<td>TB/HIV WG. 9–16% of PLWHA are newly diagnosed each year and 60% of PLWHA who already know their status are in chronic care. 95% newly diagnosed and screened for TB are eligible for IPT (i.e. do not have active TB) of whom 15% are skin-tested and 85% are not skin-tested. 30% are skin-test positive of whom 50% accept IPT of whom 60% complete IPT. 50% of those without a skin test accept IPT of whom 40% complete IPT. IPT only provided to PLWHA newly diagnosed.</td>
<td>Cost per PLWA screened for TB US$ 3.50. Cost of IPT US$ 3.3 per 6 person-months of treatment.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS; cost study in Uganda.</td>
<td>Screening does not include X-ray.</td>
</tr>
<tr>
<td>Reducing burden of HIV in TB patients</td>
<td>All</td>
<td>11% (18,000 patients) of TB patients are tested and counselled in 2006, increasing to 51% (10,000) in 2010, sustained thereafter (=19,000 in 2015). When both ART and CPT are available, 8% (=500) of diagnosed HIV+ TB cases complete 6 months ART (+CPT) in 2006, increasing to 17% (=3,000) in 2011, which is sustained thereafter (=6,000 in 2015), 9% (=580) of HIV+ TB cases on CPT (but not ART) in 2006, increasing to 37% in 2011–2015 (=8,000 to 11,000). Coverage of care and support for TB HIV+ patients increases from 13% (=2,000) in 2006 to 60% in 2010-2015 (=11,000 to 18,000).</td>
<td>TB/HIV WG. 85% of TB patients are tested and counselled in areas covered by collaborative TB/HIV activities. When both ART and CPT are available, 90% of HIV+ TB patients are eligible for ART, 50–60% will start treatment, of whom 100% complete 6 months of ART. When CPT only is available (i.e. no ART), 95% of HIV+ TB patients are eligible for CPT, of whom 95% choose to start treatment, of whom 95% complete 6 months of CPT.</td>
<td>Cost per TB patient tested and counselled US$ 15. Cost of ART (and CPT) for HIV+ TB patients is between US$ 1,500 and US$ 2,500, per 6 person-months.</td>
<td>Cost of CPT for HIV+ TB patients, US$ 143 per 6 person-months of treatment. Cost of care and support for HIV+ TB patients US$ 186 for 6 person-months. Cost of HIV prevention services per TB patient US$ 21.</td>
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<tr>
<td>WG and intervention</td>
<td>Countries considered for planned quantities</td>
<td>Planned quantities to be delivered</td>
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<tr>
<td>DOTS Expansion</td>
<td>All</td>
<td>Number of patients to be treated equivalent to 50% case detection rate in 2005, increasing to 80% in 2015.</td>
<td>DOTS Expansion WG (DEWG). Constant progress to 80% case detection rate from 2005.</td>
<td>Cost per sm+ patient treated US$ 469. Cost per sm- / extrapulmonary patient treated US$ 296.</td>
<td>Financial data reported to WHO in 2004 by Afghanistan, Pakistan, Djibouti, Egypt, Islamic Republic of Iran, Morocco, Yemen, Somalia and Sudan; DCPP; countries considered account for 89% of regional cases in 2003.</td>
<td>Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003.</td>
</tr>
<tr>
<td>Initiatives to reach 100% DOTS coverage and improve existing DOTS quality</td>
<td>All</td>
<td>Activities for improving the quality of DOTS were planned by each country reported above and calculated as a package for the WHO Eastern Mediterranean Region.</td>
<td>DOTS Expansion WG, Country strategic planning process.</td>
<td>COUNTRY STRATEGIC PLANS.</td>
<td>Country strategic plans.</td>
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<tr>
<td>New initiatives to enhance DOTS</td>
<td>All</td>
<td>Incremental improvement in existing DOTS (2005) population coverage for PPM increases from 12% in 2007 to 54% by 2015. For PAL, a further 6% of the population is covered by 2007 and a further 60% by 2015. Community-based TB care (CBC) reaches 45% of population covered by 2015 and sustained thereafter. A total of 315 million people (48% population of these two countries) covered by DST and culture services by 2015.</td>
<td>Standard frameworks developed by DOTS Expansion WG and PPM, PAL and laboratory subgroups. 1 laboratory serves 5 million population.</td>
<td>Running costs at sub-national level (per 500,000 population) US$ 3,656 for PPM, US$ 17,716 for PAL and US$ 1,235 for CBC. Running cost at national level (per country) US$ 36,557 for PPM, Start-up cost at national level (per country) US$ 157,607 for PPM, US$ 41,203 for PAL and US$ 42,469 for CBC.</td>
<td>DCPP; prices estimated by each DEWG subgroup.</td>
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<tr>
<td>DOTS-Plus</td>
<td>All</td>
<td>DST coverage in new cases is 0%; in re-treatment cases it rises from 21% in 2005 to 100% by 2015; in chronic cases it increases from 13% in 2005 to 50% in 2015. DOTS-Plus treatment provided to 25% (=700 patients) of diagnosed MDR-TB cases in 2006 increasing to 100% (=9,000) in 2015. MDR-TB diagnosed cases on second-line drugs but not DOTS-Plus falls from 15% (=450) in 2006 to 0% in 2015. MDR-TB diagnosed cases on other treatment falls from 60% (=1,700) in 2006 to 0% in 2015.</td>
<td>DOTS-Plus WG, MDR-TB prevalence 7% in new cases, 4.3% in previously treated cases, and 40% in other cases (not new).</td>
<td>Cost per patient treated US$ 3,897.</td>
<td>Cost analysis of DOTS-Plus in the Philippines; DOTS-Plus secretariat for price of drug regimen appropriate for EMR.</td>
<td>Costs for EMR can be reliably estimated by adjusting costs in the Philippines according to relative GNI per capita. Drug regimen revised to US$ 2,500 per patient treated.</td>
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<tr>
<td><strong>TB/HIV</strong></td>
<td><strong>Countries considered for planned quantities</strong></td>
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<td><strong>Sources/assumptions for planned quantities</strong></td>
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<tr>
<td><strong>Mechanisms for collaboration</strong></td>
<td>All</td>
<td>Population coverage grows from 60% in 2006 to 100% in 2011, sustained thereafter.</td>
<td>TB/HIV WG. 100% of total population covered by mechanisms for collaboration in areas covered by DOTS.</td>
<td>Unit cost per capita of mechanisms for collaboration, not estimated.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>About 8% of the total cost for TB/HIV activities is for mechanisms for collaboration, as in AFR high.</td>
</tr>
<tr>
<td><strong>Reducing TB burden in people living with HIV/AIDS (PLWHA)</strong></td>
<td>All</td>
<td>Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB increases from 39% in 2006 (=200,000 people) to 61% in 2015 (=200,000 people). 19% of newly diagnosed HIV+ people who were screened for TB complete 6 months of IPT. Numbers on IPT increase from 1,200 in 2006 to 1,300 in 2015.</td>
<td>TB/HIV WG. 2% of PLWHA are newly diagnosed each year and 60% of PLWHA who already know their status are in chronic care. No TST. 95% of those newly diagnosed and screened for TB are eligible for IPT (i.e. do not have active TB, of whom 50% accept, of whom 40% complete). IPT only provided to newly diagnosed PLWHA (i.e. not those in chronic care).</td>
<td>Cost for TB screening US$ 0.11 per person screened. Cost of IPT US$ 33 for 6 person-months of treatment.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
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<tr>
<td><strong>Reducing burden of HIV in TB patients</strong></td>
<td>All</td>
<td>51% of TB patients are tested and counselled in 2006, increasing to 85% in 2010 and sustained thereafter. Numbers increase from 150,000 to 340,000 to 290,000. 23% of diagnosed HIV+ TB cases complete 6 months of ART (+CPT) in 2006, increasing to 27% in 2015. (=1,500 to 4,300). 40% of HIV+ TB cases not on ART but on CPT in 2006, increasing to 63% in 2015. Numbers rise from 2600 to 10,000. Percentage of HIV+ TB patients who receive care and support increases from 60% in 2006 to 100% in 2010 and sustained thereafter. Number increases from 4,000 to 13,000, reaching 16,000 by 2015. HIV prevention services provided to all TB patients in areas covered by collaborative TB/HIV activities.</td>
<td>TB/HIV WG. 85% of TB patients are tested and counselled in areas covered by collaborative TB/HIV activities. When both ART and CPT are available, 50% of HIV+ TB patients are eligible for ART, 50–80% will start ART, of whom 100% complete 6 months of ART. When only CPT is available (i.e. no ART), 95% of HIV+ TB patients are eligible for CPT; 95% choose to start treatment, and 95% complete 6 months of CPT. Care and support provided for all HIV+ TB patients.</td>
<td>Cost per TB patient tested and counselled US$ 10.60. Cost of ART (and CPT) for HIV+ TB patients in average US$ 1,530 for 6 person-months. Cost of CPT for HIV+ TB patients US$ 24 for 6 person-months. Cost of care and support for HIV+ TB patients US$ 76 for 6 months (per HIV+ TB patient).</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
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<tr>
<td>WG and intervention</td>
<td>Countries considered for planned quantities</td>
<td>Planned quantities to be delivered</td>
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<tr>
<td><strong>DOTS Expansion</strong></td>
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<tr>
<td>Baseline DOTS</td>
<td>All</td>
<td>Number of patients to be treated equivalent to 68% case detection rate in 2005, increasing to 90% in 2015.</td>
<td>DOTS Expansion WG (DEWG). Constant progress to 90% case detection rate from 2005.</td>
<td>Cost per smear+ patient treated US$ 430.</td>
<td>Financial data reported to WHO in 2004 by Brazil, Guyana and Haiti, Argentina, Bolivia, Colombia, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua and Venezuela extrapolated from Brazil. Costing studies in Peru, DCPP. These countries had 94% of regional TB cases in 2003.</td>
<td>Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003. Costs beyond those countries that reported financial data to WHO can be reliably estimated by adjusting data from reporting countries according to GNI per capita.</td>
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<td>Planned coverage of 100% DOTS by 2015. Strengthening of human resources and laboratory services are included to improve DOTS quality and access.</td>
<td>DOTS Expansion WG, WHO Regional Office for the Americas.</td>
<td>Cost at regional level decreases from US$ 1,500,000 in 2006 to US$ 600,000 in 2015.</td>
<td>WHO Regional Office for the Americas.</td>
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<td>Incremental improvement in existing DOTS (2005) population coverage for community-based TB care (CBC) increases from 24% in 2006 to 38% in 2012 (sustained thereafter). For PPM, further coverage of population increases from 7% in 2007 to 17% in 2015. Further coverage of population for PAL reaches 51% in 2010. A total of 162 million people (26% of the population) covered by DST and culture services by 2015.</td>
<td>Standard frameworks developed by DEWG, and PPM, PAL and laboratory subgroups, experience in Uganda (CBC). 1 laboratory serves 2 million population. Constant progress to coverage rates from 2005.</td>
<td>Running cost at sub-national level (per 500,000 population) US$ 1,236 for CBC, US$ 2,818 for PPM and US$ 67,671 for PAL. Running cost at national level (per country) US$ 28,177 for PPM. Start-up cost at national level (per country) US$ 202,423 for PPM and US$ 41,200 for PAL.</td>
<td>DCPP; prices estimated by each DEWG subgroup.</td>
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<td><strong>DOTS-Plus</strong></td>
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<td>DST coverage in new cases increases from 13% in 2006 to 20% by 2015; coverage for re-treatment cases rises from 48% in 2006 to 100% in 2015; in chronic cases it increases from 43% in 2006 to 80% by 2015. DOTS-Plus treatment provided to 36% (n=1,000 patients) of diagnosed MDR-TB cases in 2006 increasing to 100% (n=2,600) by 2015.</td>
<td>DOTS Plus WG. MDR-TB prevalence 2% in new cases, 11% in previously treated cases and 40% in chronic cases.</td>
<td>Cost per patient treated US$ 5,189.</td>
<td>Cost analysis of DOTS-Plus in Peru; DOTS-Plus secretariat for price of drug regimen appropriate for Latin America.</td>
<td>Costs for LAC can be reliably estimated by adjusting Peru costs according to relative GNI per capita. Drug regimen revised to US$ 2,500 per patient treated.</td>
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### TB/HIV

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<tr>
<th>Mechanisms for collaboration</th>
<th>Countries considered for planned quantities</th>
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<tr>
<td>TB/HIV countries</td>
<td>All</td>
<td>Population coverage grows from 25% in 2006 to 89% in 2011, sustained thereafter. Percentage of DOTS TB patients tested for HIV surveillance increases from 0.5% (=1,400 patients) in 2006 to 5% (=11,000) by 2011 and sustained thereafter.</td>
<td>Full coverage of collaborative TB/HIV activities only needed where HIV prevalence above 1% in general population. 5% of DOTS TB cases tested for HIV surveillance for the period 2006-2015. Unit cost per capita for mechanisms of collaboration not estimated. See assumptions for how total costs were estimated. Cost per TB patient tested for HIV surveillance purposes US$ 12.80.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>Percentage of total costs accounted for by mechanisms for collaboration estimated to be as in ART high.</td>
<td></td>
</tr>
<tr>
<td>Reducing TB burden in people living with HIV/AIDS (PLWHA)</td>
<td>All</td>
<td>Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB grows from 18% in 2006 (=180,000 patients) to 58% in 2011 (=900,000 patients), sustained thereafter (950,000 patients by 2015), 2% of those screened for TB skin-tested positive complete 6 months of IPT. Patients increase from 400 in 2006 to 1,100 in 2015. 15% of those screened for TB no skin test complete 6 months of IPT. Patients increase from 4,000 in 2006 to 10,000 in 2015.</td>
<td>85% of PLWHA are newly diagnosed each year and 60% of PLWHA who already know their status are in chronic care. 95% newly diagnosed screened for TB are eligible for IPT (i.e. do not have active TB), of whom 20% are skin tested and 80% are not skin tested. 30% are skin-test-positive, of whom 50% accept IPT, of whom 60% complete IPT. 50% of no skin test accept IPT, of whom 40% complete IPT. IPT only provided to PLWHA newly diagnosed.</td>
<td>Cost for TB screening among PLWHA, per person screened US$ 1.13. Cost of IPT US$ 33 per 6 person-months of treatment.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>Costs beyond African countries can be reliably estimated according to GNI per capita. Screening does not include X-ray.</td>
</tr>
<tr>
<td>Reducing burden of HIV in TB patients</td>
<td>All</td>
<td>21% of TB patients (=41,000 patients) are tested and counselled in 2006, rising to 72% (=143,000) in 2011, sustained thereafter. Percentage of DOTS TB cases complete 6 months ART (+CPT) in 2006, increasing to 15% (=3,700 patients) by 2011, sustained thereafter. Percentage of HIV+ TB cases not on ART but on IPT increase from 18% (=3800 patients) in 2006 to 60% by 2011 (=15,000 patients), sustained thereafter. Coverage for HIV+ TB patients who receive care and support rises from 24% (=4,300 patients) in 2006 to 85% by 2011 (=22,000 patients), sustained thereafter.</td>
<td>85% of TB patients are tested and counselled in areas covered by collaborative TB/HIV activities. In scenario ART+CPT: 50% of HIV+ TB patients are eligible for ART, of whom 24–34% accept, of whom 100% complete 6 months of ART. When CPT only is available (i.e., there is no ART), 95% of HIV+ TB patients are eligible for CPT, of whom 95% accept, of whom 95% complete 6 months of CPT.</td>
<td>Cost of HIV testing and counselling for TB patients, per TB patient tested and counselled US$ 12.80. Cost of ART (and CPT) for HIV+ TB patients, per 6 person-months US$ 1,204–US$ 2,511. Cost of CPT for HIV+ TB patients, per 6 person-months of treatment US$ 157. Cost of care and support for HIV+ TB patients, for 6 months per HIV+ TB patient receiving care and support US$ 4,336. Cost of HIV prevention, per DOTS TB patient treated, is US$ 14.70.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>Cost of ART is considered only during period when ART and TB treatment overlap, which is assumed to be 6 months. Costs beyond African countries can be reliably estimated according to relative GNI per capita.</td>
</tr>
<tr>
<td>WG and intervention</td>
<td>Countries considered for planned quantities</td>
<td>Planned quantities to be delivered</td>
<td>Sources/assumptions for planned quantities</td>
<td>Regional unit costs</td>
<td>Sources of cost data</td>
<td>Important assumptions used to estimate regional unit cost</td>
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<tr>
<td>DOTS Expansion</td>
<td>All</td>
<td>Number of patients to be treated equivalent to 64% case detection rate in 2005, increasing to 84% in 2015.</td>
<td>DOTS Expansion WG (DEWG). Constant progress to 84% case detection rate from 2005.</td>
<td>Cost per sm+ patient treated US$ 135. Cost per sm− / extrapulmonary patient treated US$ 135.</td>
<td>Financial data reported to WHO in 2004 by Bangladesh, India, Indonesia, Myanmar and Thailand. DCPP. These 5 countries account for 94% of regional TB cases in 2003.</td>
<td>Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003.</td>
</tr>
<tr>
<td>Initiatives to reach 100% DOTS coverage and improve existing DOTS quality</td>
<td>DOTS coverage already 100% in the region. Initiatives to improve DOTS quality are already accounted for in existing or “baseline” DOTS in 2005.</td>
<td>DOTS Expansion WG. Financial data reported to WHO 2002–2004.</td>
<td>Standard frameworks developed by DEWG and PPM, PAL and laboratory subgroups, experience in Uganda (QBQ). 1 laboratory serves a population of 5 million.</td>
<td>Running cost at sub-national level (per 500,000 population) US$ 494 for CBC, US$ 1,727 for PPM and US$ 24,411 for PAL. Running cost at national level (per country) US$ 17,270 for PPM. Start-up cost at national level (per country) US$ 164,378 for PPM and US$ 41,200 for PAL.</td>
<td>DCPP: prices estimated by each DEWG subgroup.</td>
<td></td>
</tr>
<tr>
<td>New initiatives to enhance DOTS</td>
<td>Incremental improvement in existing (2005) population coverage of community-based TB care (CBC) is 2% in 2006 and 10% by 2015. For PPM, the incremental improvement is coverage of a further 11% of the population by 2007 and a further 95% (compared with 2003) by 2015. For PAL, a further 2% of the population is covered by 2008 and a further 25% by 2015 (total incremental improvement 24%). A total of 1.3 billion people (89% of the population) are covered by DST and culture services by 2015.</td>
<td>DOTS-Plus WG. DST coverage in new cases increases from 5% in 2006 to 20% in 2015; for re-treatment cases it increases from 26% in 2006 to 100% in 2015; in chronic cases it increases from 13% in 2006 to 50% by 2015. DOTS-Plus treatment provided to 9% (~2,000 patients) of diagnosed MDR-TB cases in 2006 increasing to 100% (~26,000 patients) by 2015. MDR-TB diagnosed cases on second-line drugs but not on DOTS-Plus falls from 71% (~15,000 patients) in 2006 to 0% in 2015. MDR-TB diagnosed cases on other treatment falls from 19% (~3,000 patients) in 2006 to 0%.</td>
<td>Cost per patient treated US$ 3,908.</td>
<td>Cost analysis of DOTS-Plus in the Philippines; DOTS-Plus secretariat for price of drug regimen appropriate for South-East Asia.</td>
<td>Costs for SEAR can be reliably estimated by adjusting Philippine costs according to relative GNI per capita. Drug regimen revised to US$ 2,500. Cost of hospitalization during treatment revised according to the Chinese experience, i.e. CNY 2,000 per month/patient including injections + 3 months hospitalization.</td>
<td></td>
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</tbody>
</table>
### Regional unit costs

<table>
<thead>
<tr>
<th>Sources of cost data</th>
<th>Important assumptions used to estimate regional unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>About 8% of the total cost of TB/HIV activities is for mechanisms for collaboration, as in AFR high.</td>
</tr>
<tr>
<td>Costs beyond African countries can be reliably estimated by adjusting costs in Africa according to relative GNI per capita.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanisms for collaboration</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population coverage rises from 39% in 2006 to 77% in 2011, and sustained thereafter. Percentage of DOTS TB patients tested for HIV surveillance increases from 1% (=16,000 patients) in 2006 to 3% (=61,000 patients) in 2011 and sustained thereafter. Coverage of full range of TB/HIV activities only needed in areas where HIV prevalence in the general population is above 1%. 3% of DOTS TB cases tested for HIV surveillance.</td>
<td>Unit cost per capita not estimated. See assumptions for how total costs were estimated. Cost per TB patient tested for HIV surveillance purposes US$ 14.10.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources/assumptions for planned quantities</th>
<th>Cost per PLWHA screened for TB US$ 0.47. Cost of IPT US$ 3.3 per 6 person-months.</th>
</tr>
</thead>
<tbody>
<tr>
<td>About 8% of the total cost of TB/HIV activities is for mechanisms for collaboration, as in AFR high.</td>
<td></td>
</tr>
<tr>
<td>Costs beyond African countries can be reliably estimated by adjusting costs in Africa according to relative GNI per capita.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reducing TB burden in people living with HIV/AIDS (PLWHA)</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB increases from 29% in 2006 (=300,000 patients) to 61% in 2011 (=770,000 patients), and is sustained thereafter (=890,000 patients by 2015), 19% of those newly diagnosed and screened for TB complete 6 months of IPT. Number of patients completing 6 months of IPT increases from 12,000 in 2006 to 40,000 in 2015.</td>
<td>Cost per PLWHA screened for TB US$ 0.47. Cost of IPT US$ 3.3 per 6 person-months.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reducing burden of HIV in TB patients</th>
<th>All</th>
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</thead>
<tbody>
<tr>
<td>29% of TB patients (=50,000 patients) are tested and counselled in 2006 rising to 99% (=890,000 patients) in 2011, and sustained thereafter. 15% (=21,000 patients) of diagnosed HIV+ TB cases complete 6 months ART (+CPT) in 2006, increasing to 21% (33,000) by 2015, which is sustained thereafter. 23% (=31,000 patients) of HIV+ TB cases not on ART but on CPT in 2006 increasing to 41% (=66,000) by 2015, are eligible for IPT. 85% of TB patients are tested and counselled in areas covered by collaborative TB/HIV activities. When both ART and CPT are available, 85% of HIV+ TB patients are eligible for ART, of whom 50% complete 6 months of ART. When CPT only is available, 50% complete 6 months of CPT.</td>
<td>Cost per TB patient tested and counselled US$ 14.10. Cost of ART and CPT for HIV+ TB patients ranges from US$ 727 to US$ 1,031 per 6 person-months. Cost of CPT for HIV+ TB patients US$ 157 per 6 person-months of treatment. Cost of care and support for HIV+ TB patients US$ 117 for 6 months. Cost of HIV prevention services US$ 37.40 per TB patient.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources/assumptions for planned quantities</th>
<th>Important assumptions used to estimate regional unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>Cost of ART is considered only during period when ART and TB treatment overlap, which is assumed to be 6 months. Costs beyond African countries can be reliably estimated according to relative GNI per capita.</td>
</tr>
</tbody>
</table>
### TABLE 14: WESTERN PACIFIC (WPR)

<table>
<thead>
<tr>
<th>WG and intervention</th>
<th>Countries considered for planned quantities</th>
<th>Planned quantities to be delivered</th>
<th>Sources/assumptions for planned quantities</th>
<th>Regional unit costs</th>
<th>Sources of cost data</th>
<th>Important assumptions used to estimate regional unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOTS Expansion</td>
<td>An</td>
<td>Number of patients to be treated equivalent to 71% case detection rate in 2005, increasing to 81% in 2015.</td>
<td>DOTS Expansion WG (DEWG). Constant progress to 81% case detection rate from 2005.</td>
<td>Cost per sm+ patient treated US$ 242. Cost per sm- / extrapulmonary patient treated US$ 233.</td>
<td>Financial data reported to WHO in 2004 by Cambodia, China, Philippines and Viet Nam. These four countries account for 96% of regional TB cases in 2003. DCPP.</td>
<td>Regional weighted average assumes distribution of cases treated under DOTS among countries remains as in 2003.</td>
</tr>
<tr>
<td>Initiatives to reach 100% DOTS coverage and improve existing DOTS quality</td>
<td>DOTS coverage already 100% in the region. Initiatives to improve DOTS quality are already accounted for in existing or “baseline” DOTS in 2005.</td>
<td>DOTS Expansion WG. Financial data reported to WHO 2002–2004.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New initiatives to enhance DOTS</td>
<td>Incremental improvement in existing (2005) population coverage for community-based TB care (CBC) increases from 2% in 2006 to 25% by 2013, sustained thereafter. For PPM, an additional 30% of the population is covered by 2017 and an additional 94% by 2018 (both as compared with 2005). For PAL, the incremental increase in coverage is 6% by 2009 and 46% by 2015. A total of 1.4 billion people (87% of population) are covered by DST and culture services by 2015.</td>
<td>DOTS Expansion WG and PPM, PAL, and laboratory subgroups, experience in Uganda (CBC). 1 laboratory serves a population of 5 million.</td>
<td>Running cost at sub-national level (per 500,000 population) US$ 494 for CBC, US$ 1,380 for PPM and US$ 24,411 for PAL. Running cost at national level (per country) US$ 13,804 for PPM. Start-up cost at national level (per country) US$ 171,310 for PPM and US$ 41,200 for PAL.</td>
<td>DCPP: prices estimated by each DEWG subgroup.</td>
<td>Standard frameworks developed by DEWG.</td>
<td></td>
</tr>
<tr>
<td>DOTS-Plus</td>
<td>All</td>
<td>DST coverage in new cases increases from 2% in 2006 to 20% by 2015; in re-treatment cases coverage rises from 19% in 2006 to 100% in 2015; and in chronic cases coverage increases from 17% in 2006 to 80% by 2015. DOTS-Plus treatment provided to 17% (=2,100 patients) of diagnosed MDR-TB cases in 2006 increasing to 100% (=20,400 patients) in 2015. MDR-TB diagnosed cases on second-line drugs but not on DOTS-Plus falls from 78% (=9,400 patients) in 2006 to 0% in 2015. MDR-TB diagnosed cases on other treatment falls from 5% (=540 patients) in 2006 to 0% by 2015.</td>
<td>DOTS-Plus WG. MDR-TB prevalence 5% in new cases, 26% in previously treated cases and 40% in chronic cases.</td>
<td>Cost per patient treated US$ 5,197.</td>
<td>Cost analysis of DOTS-Plus in the Philippines; DOTS-Plus secretariat for price of drug regimen appropriate for WPR.</td>
<td>Costs for WPR can be reliably estimated by adjusting Philippines costs according to relative GNI per capita. Drug regimen being revised to US$ 2,500. Cost of hospitalization during treatment revised according to the Chinese experience, i.e. CNY 2,000 per month/patient including injections +3 months hospitalization.</td>
</tr>
</tbody>
</table>
### Regional unit costs

**Sources of cost data**
- Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.
- Cost studies of ProTEST pilot projects in Malawi South Africa and Zambia; UNAIDS; costing study in Uganda.
- Costs beyond African countries can be reliably estimated according to GNI per capita.

**Important assumptions used to estimate regional unit cost**
- About 8% of the total cost of TB/HIV activities is for mechanisms for collaboration, as in AFR high.

#### Methods Used to Estimate Costs, Funding and Funding Gaps

<table>
<thead>
<tr>
<th>TB/HIV</th>
<th>Countries considered for planned quantities</th>
<th>Planned quantities to be delivered</th>
<th>Sources/assumptions for planned quantities</th>
<th>Regional unit costs</th>
<th>Sources of cost data</th>
<th>Important assumptions used to estimate regional unit cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanisms for collaboration</td>
<td>All</td>
<td>Population coverage rises from 11% in 2006 to 19% in 2010, and sustained thereafter. Percentage of DOTS TB patients tested for HIV surveillance increases from &lt;1% (=10,000 patients) in 2006 to 8% (=92,000 patients) in 2010, and sustained thereafter.</td>
<td>19% of total population is covered by mechanisms for collaboration in DOTS areas. 8% of DOTS TB cases tested for HIV surveillance.</td>
<td>Unit cost per capita for mechanisms of collaboration not estimated. See assumptions for how total costs were estimated. Cost per TB patient tested for HIV surveillance purposes US$ 14.10.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>About 8% of the total cost of TB/HIV activities is for mechanisms for collaboration, as in AFR high.</td>
</tr>
<tr>
<td>Reducing TB burden in people living with HIV/AIDS (PLWHA)</td>
<td>All</td>
<td>Percentage of adult PLWHA (newly diagnosed and those in chronic care) screened for TB increases from 9% in 2006 (&lt;1,700 patients) to 18% by 2015 (&lt;57,000 patients). 2% of those screened for TB, skin-tested positive, complete 6 months of IPT. Patients increase from 70 in 2006 to 380 in 2015. 15% of those screened for TB, no skin test, complete 6 months of IPT. Patients increase from 580 in 2006 to 3,400 in 2015.</td>
<td>1–30% of PLWHA are newly diagnosed each year and 60% of PLWHA who already know their status are in chronic care. 95% newly diagnosed screened for TB are eligible for IPT (i.e. do not have active TB), of whom 20% are skin tested and 60% are not skin tested. 30% are skin-tested positive, of whom 50 accept IPT, of whom 60% complete IPT. 50% of no skin test accept IPT, of whom 40% complete IPT. IPT only provided to PLWHA newly diagnosed.</td>
<td>Cost per PLWHA screened for TB screening US$ 0.41. Cost of IPT US$ 33 per 6 person-months of treatment.</td>
<td>Cost studies of ProTEST pilot projects in Malawi South Africa and Zambia; UNAIDS; costing study in Uganda.</td>
<td>Costs beyond African countries can be reliably estimated according to GNI per capita.</td>
</tr>
<tr>
<td>Reducing burden of HIV in TB patients</td>
<td>All</td>
<td>10% (=115,000 patients) of TB patients tested and counselled in 2006 and 17% by 2010 (=157,000 patients), and sustained thereafter. 3% (=70,000 patients) of diagnosed HIV+ TB cases complete 6 months ART (&lt;CPT) in 2006, increasing to 5% by 2014 (=1,300 patients), and sustained thereafter. 9% (=2,000 patients) of TB HIV+ cases not on ART but on CPT in 2006 increasing to 13% by 2011 (=4,300 patients), sustained thereafter. Coverage of care and support for HIV+ TB patients 12% (=2,800 patients) in 2006, increasing to 20% by 2010 (=6,400 patients), and sustained thereafter.</td>
<td>85% of TB patients are tested and counselled in areas covered by collaborative TB/HIV activities. When both ART and CPT are available: 50% of HIV+ TB patients are eligible for ART, of whom 30–47% accept, of whom 100% complete 6 months of ART. When CPT only is available (i.e. there is no ART), 95% of HIV+ TB patients are eligible for CPT, of whom 95% accept, of whom 95% complete 6 months of CPT.</td>
<td>Cost of per TB patient tested and counselled US$ 14.10. Cost of ART (and CPT) for HIV+ TB patients ranges US$ 1,040 – US$ 1,993 per 6 person-months. Cost of CPT for HIV+ TB patients US$ 109 per 6 person-months of treatment. Cost of care and support for HIV+ TB patients US$ 110 for 6 person-months. Cost of HIV prevention services US$ 37.40 per TB patient.</td>
<td>Cost studies of ProTEST pilot projects in Malawi, South Africa and Zambia; UNAIDS.</td>
<td>Cost of ART is considered only during period when ART and TB treatment overlap, which is assumed to be 6 months. Costs beyond African countries can be reliably estimated according to relative GNI per capita.</td>
</tr>
</tbody>
</table>
## Appendix

This appendix lists the countries and territories in each of the eight TB epidemiological regions considered in *The Global Plan to Stop TB, 2006–2015*: (1) Africa, high HIV prevalence (AFR High); (2) Africa, low HIV prevalence (AFR Low); (3) American Region (AMR) – Latin American countries (LAC); (4) Eastern European Region (EEUR); (5) Eastern Mediterranean Region (EMR); (6) the Established Market Economies (EME) and Central Europe (CEUR); (7) South-East Asian Region (SEAR); and (8) Western Pacific Region (WPR). As explained in the main text of this document, cost estimates were not produced for countries in the Established Market Economies category or countries in Central Europe (these countries are listed in section 6 below).

### 1) Africa, High HIV Prevalence (AFR High)
- Botswana
- Burundi
- Cameroon
- Central African Republic
- Democratic Republic of Congo
- Ethiopia
- Gabon
- Kenya
- Lesotho
- Malawi
- Mozambique
- Namibia
- Nigeria
- Rwanda
- South Africa
- Swaziland
- Uganda
- United Republic of Tanzania
- Zambia
- Zimbabwe

### 2) Africa, Low HIV Prevalence (AFR Low)
- Algeria
- Angola
- Benin
- Burkina Faso
- Cape Verde
- Chad
- Comoros
- Equatorial Guinea
- Eritrea
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Liberia
- Madagascar
- Mali
- Mauritania
- Mauritius
- Niger
- Sao Tome & Principe
- Senegal
- Seychelles
- Sierra Leone
- Togo

### 3) American region (AMR) – Latin American countries (LAC)
- Anguilla
- Antigua & Barbuda
- Argentina
- Bahamas
- Barbados
- Belize
- Bermuda
- Bolivia
- Brazil
- British Virgin Islands
- Cayman Islands
- Chile
- Colombia
- Costa Rica
- Cuba
- Dominica
- Dominican Republic
- Ecuador
- El Salvador
- Grenada
- Guatemala
- Guyana
- Haiti
- Honduras
- Jamaica
- Mexico
- Montserrat
- Netherlands Antilles
- Nicaragua
- Panama
- Paraguay
- Peru
- Puerto Rico
- Saint Kitts and Nevis
- Saint Lucia
- St Vincent and the Grenadines
- Suriname
- Trinidad and Tobago
- Turks & Caicos Islands
- Uruguay
- US Virgin Islands
- Venezuela

### 4) Eastern Europe (EEUR)
- Armenia
- Azerbaijan
- Belarus
- Bulgaria
- Estonia
- Georgia
- Kazakhstan
- Kyrgyzstan
- Latvia
- Lithuania
- Republic of Moldova
- Romania
- Russian Federation
- Tajikistan
- Turkey
- Turkmenistan
- Ukraine
- Uzbekistan

### 5) Eastern Mediterranean (EMR)
- Afghanistan
- Bahrain
- Djibouti
- Egypt
- Islamic Republic of Iran
- Iraq
- Jordan
- Kuwait
- Lebanon
- Libyan Arab Jamahiriya
- Morocco
- Oman
- Pakistan
- Qatar
- Saudi Arabia
- Somalia
- Sudan
- Syrian Arab Republic
- Tunisia
- United Arab Emirates
- West Bank & Gaza Strip
- Yemen
6) Established Market Economies (EME)

- Andorra
- Australia
- Austria
- Belgium
- Canada
- Czech Republic
- Denmark
- Finland
- France
- Germany
- Greece
- Iceland
- Ireland
- Israel
- Italy
- Japan
- Luxembourg
- Malta
- Monaco
- Netherlands
- New Zealand
- Norway
- Portugal
- San Marino
- Singapore
- Spain
- Sweden
- Switzerland
- United Kingdom
- USA

and Central Europe (CEUR)

- Albania
- Bosnia and Herzegovina
- Croatia
- Cyprus
- Hungary
- Poland
- Serbia and Montenegro
- Slovakia
- Slovenia
- The Former Yugoslav Republic of Macedonia

7) South-East Asia (SEAR)

- Bangladesh
- Bhutan
- Democratic People’s Republic of Korea
- India
- Indonesia
- Maldives
- Myanmar
- Nepal
- Sri Lanka
- Thailand
- Timor-Leste

8) Western Pacific (WPR)

- American Samoa
- Brunei Darussalam
- Cambodia
- China
- China, Hong Kong SAR
- China, Macao SAR
- Cook Islands
- Fiji
- French Polynesia
- Guam
- Kiribati
- Lao People’s Democratic Republic
- Malaysia
- Marshall Islands
- Micronesia
- Mongolia
- Nauru
- New Caledonia
- Niue
- Northern Mariana Islands
- Palau
- Papua New Guinea
- Philippines
- Republic of Korea
- Samoa
- Solomon Islands
- Tokelau
- Tonga
- Tuvalu
- Vanuatu
- Viet Nam
- Wallis & Futuna Islands

The 22 TB high-burden countries, 2005

- Afghanistan
- Bangladesh
- Brazil
- Cambodia
- China
- Democratic Republic of Congo
- Ethiopia
- India
- Indonesia
- Kenya
- Mozambique
- Myanmar
- Nigeria
- Pakistan
- Philippines
- Russian Federation
- South Africa
- United Republic of Tanzania
- Thailand
- Uganda
- Viet Nam
- Zimbabwe
End notes

1 Economic costs include financial costs (items that must be paid for) plus the value of resources that are not paid for, e.g. voluntary labour.

2 Analysis of various scenarios using the epidemiological model developed for GP2 showed that the distribution of TB cases among countries in a given region will not vary significantly over the period of the plan (2006–2015).


4 In 2005, such information was available for 21 high-burden countries and 37 non high-burden countries through the financial section of the annual WHO questionnaire that is sent to all countries. Trends in national TB control programme budgets and costs for the past 3–4 years are available for almost all of the high-burden countries.

5 Brazil, Guyana and Haiti submitted complete financial data to WHO in 2004; for Peru, a recent detailed costing study was available and was therefore used to estimate the cost per patient treated.

6 DCPP levels refer to the job classification. The job categories were divided into five educational levels, corresponding to the educational classifications of the United Nations Educational, Scientific and Cultural Organization. Level 1 job categories require lower secondary education or second stage of basic education; level 2 jobs require (upper) secondary education; level 3 jobs require post-secondary non-tertiary education, or the first stage of tertiary education (not leading directly to an advanced research qualification); level 4 jobs require the second stage of tertiary education (leading to an advanced research qualification); and level 5 jobs are the same as level 4 but require additional substantial work experience or specialist training.
