

**Warning: This report is out-of-date. In particular, entire time-series of TB disease burden estimates are updated every year. For the latest data and analysis, please see the most recent edition of the global TB report.**



# Global Tuberculosis Control 2010

WHO REPORT 2010

# Global Tuberculosis Control



**World Health  
Organization**

WHO Library Cataloguing-in-Publication Data

Global tuberculosis control: WHO report 2010.

1.Tuberculosis – epidemiology. 2.Tuberculosis, Pulmonary – prevention and control. 3.Tuberculosis, Multidrug-resistant – drug therapy. 4.Directly observed therapy. 5.Treatment outcome. 6.National health programs – organization and administration. 7.Statistics. I.World Health Organization.

ISBN 978 92 4 156406 9

(NLM classification: WF 300)

© World Health Organization 2010

All rights reserved. Publications of the World Health Organization can be obtained from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857; e-mail: [bookorders@who.int](mailto:bookorders@who.int)). Requests for permission to reproduce or translate WHO publications – whether for sale or for noncommercial distribution – should be addressed to WHO Press, at the above address (fax: +41 22 791 4806; e-mail: [permissions@who.int](mailto:permissions@who.int)).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

Cover design by Tom Hiatt, Stop TB Department. The image shows the decline in the estimated rate of TB mortality at global level (solid blue line) from 1990 to 2009 and the projected decline (dashed line) from 2010 to 2015. See [FIGURE 25](#).

Designed by minimum graphics  
Printed in Switzerland

WHO/HTM/TB/2010.7

# Contents

Abbreviations	iv
Acknowledgements	v
Summary	1
Introduction	2
1. Methods	3
2. The global burden of TB	5
3. Global targets, the Stop TB Strategy and the Global Plan to Stop TB	8
4. Progress in implementing the Stop TB Strategy and the Global Plan to Stop TB	10
5. Financing for TB control	25
6. Progress towards global targets for reductions in disease burden	32
7. Improving measurement of the global burden of TB	37
8. Conclusions	42
Annex 1. Methods used to estimate the global burden of disease caused by TB	45
Annex 2. Global, regional and country-specific data for key indicators	57
Annex 3. Country profiles	205

# Abbreviations

ACSM	advocacy, communication and social mobilization
AFR	WHO African Region
AIDS	acquired immunodeficiency syndrome
AMR	WHO Region of the Americas
ARI	annual risk of infection
ART	antiretroviral therapy
CDR	case detection rate
CPT	co-trimoxazole preventive therapy
CBC	community-based TB care
DOT	directly observed treatment
DOTS	the basic package that underpins the Stop TB Strategy
DRS	drug resistance surveillance or survey
DST	drug susceptibility testing
ECDC	European Centre for Disease Prevention and Control
EMR	WHO Eastern Mediterranean Region
EU	European Union
EUR	WHO European Region
FIND	Foundation for Innovative New Diagnostics
GDF	Global TB Drug Facility
GLC	Green Light Committee
GLI	Global Laboratory Initiative
Global Fund	The Global Fund to fight AIDS, Tuberculosis and Malaria
Global Plan	Global Plan to Stop TB, 2011–2015
GNI	gross national income
HBC	high-burden country of which there are 22 that account for approximately 80% of all new TB cases arising each year
HIV	human immunodeficiency virus
HRD	Human resource development
ICD-10	International Classification of Diseases (tenth revision)
IPT	isoniazid preventive therapy
IRR	incidence rate ratio
ISTC	International Standards for Tuberculosis Care
LED	Light-emitting diode
LPA	Line-probe assay
MDG	Millennium Development Goal
MDR-TB	multidrug-resistant tuberculosis (resistance to, at least, isoniazid and rifampicin)
NGO	nongovernmental organization
NTP	national tuberculosis control programme or equivalent
PAL	Practical Approach to Lung Health
PPM	Public–Private Mix
SEAR	WHO South-East Asia Region
TB	tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNITAID	international facility for the purchase of diagnostics and drugs for diagnosis and treatment of HIV/AIDS, malaria and TB
USAID	United States Agency for International Development
VR	Vital registration
WHA	World Health Assembly
WHO	World Health Organization
WPR	WHO Western Pacific Region
XDR-TB	Extensively drug-resistant TB
ZN	Ziehl-Neelsen

# Acknowledgements

This report on global tuberculosis control was produced by a core team of 12 people: Léopold Blanc, Dennis Falzon, Christopher Fitzpatrick, Katherine Floyd, Inés Garcia, Christopher Gilpin, Philippe Glaziou, Tom Hiatt, Delphine Sculier, Charalambos Sismanidis, Hazim Timimi and Mukund Uplekar. The team was led by Katherine Floyd and Léopold Blanc. Overall guidance was provided by the Director of the Stop TB Department, Mario Raviglione.

The data collection forms (long and short versions) were developed by Philippe Glaziou, with input from staff throughout the Stop TB Department. Hazim Timimi led and organized all aspects of data management, with support from Tom Hiatt. Christopher Fitzpatrick and Inés Garcia conducted all review and follow-up of financial data. Annemieke Brands, Dennis Falzon, Christopher Gilpin, Malgosia Grzemska, Christian Gunneberg, Tom Hiatt, Eva Nathanson, Salah Ottmani, Delphine Sculier, Hazim Timimi, Wayne Van Gemert, Fraser Wares, Matteo Zignol and four colleagues from the Global Fund – Nino Mdivani, Sai Pothapregada, John Puvimanasinghe and Lal Sadasivan Sreemathy – conducted the review and follow-up of data related to epidemiology and the implementation of the Stop TB Strategy. Data for the European Region were collected and validated jointly by the WHO Regional Office for Europe and the European Centre for Disease Prevention and Control (ECDC), an agency of the European Union based in Stockholm, Sweden.

Philippe Glaziou and Charalambos Sismanidis analysed surveillance and epidemiological data and prepared the figures and tables on these topics, with assistance from Tom Hiatt. Delphine Sculier and Tom Hiatt analysed TB/HIV data and prepared the associated figures and tables. Dennis Falzon analysed data and prepared the figures and tables related to MDR-TB. Mukund Uplekar contributed a summary of recent progress in engaging all care providers through public-private and public-public mix (PPM) approaches, Christopher Gilpin and Karin Weyer provided an update on the Global Laboratory Initiative and Karin Bergstrom analysed data related to human resource development. Christopher Fitzpatrick and Inés Garcia analysed financial data, and prepared the associated figures and tables. Tom Hiatt checked and finalized all figures and tables in an appropriate format, ensuring that they were ready for layout and design according to schedule, and was the focal point for communications with the graphic designer.

The main part of the report was written by Katherine Floyd. Annex 1, which explains methods used to produce estimates of disease burden, was written by Philippe Glaziou, Katherine Floyd, Charalambos Sismanidis and Hazim Timimi. Karen Ciceri edited the report.

Annex 2, which contains a wealth of global, regional and country-specific data from the global TB database, was prepared by Tom Hiatt and Hazim Timimi.

We thank Sue Hobbs for her excellent work on the design and layout of this report; her contribution, as in previous years, is greatly appreciated.

The principal source of financial support for WHO's work on monitoring and evaluation of TB control is the United States Agency for International Development (USAID), without which it would be impossible to produce this report. Data collection, validation and analysis were also supported by funding from the government of Japan and the Global Fund. We acknowledge with gratitude their support.

In addition to the core report team and those mentioned above, the report benefited from the input of many staff at the World Health Organization (WHO) and the Joint United Nations Programme on HIV/AIDS (UNAIDS), particularly for data collection, validation and review. Among those listed below, we thank in particular Amal Bassili, Andrei Dadu, Khurshid Alam Hyder, Daniel Kibuga, Rafael López Olarte, Angélica Salomão, Nobuyuki Nishikiori and Daniel Sagebiel for their major contribution to data collection, validation and review.

## WHO headquarters Geneva and UNAIDS

Pamela Baillie, Victoria Birungi, Daniel Chemtob, Haileyesus Getahun, Eleanor Gouws, Wieslaw Jakubowiak, Ernesto Jaramillo, Tracy Mawer, Paul Nunn, Alasdair Reid and Diana Weil.

## WHO African Region

Diriba Agegnehu, Shalala Ahmadova, Ayodele Awe, Gani Alabi, Dorothée Ntakirutimana, Joseph Imoko, Kalpesh Rahevar, Joel Kangangi, Hilary Kipruto, Bah Keita, Daniel Kibuga, Mwendaweli Maboshe, Vainess Mfungwe, André Ndongosieme, Nicolas Nkiere, Ishmael Nyasulu, Wilfred Nkhoma, Roberta Pastore, Angélica Salomão, Kefas Samson, Neema Simkoko and Henriette Wembanyama.

## WHO Region of the Americas

Jarbas Barbosa, Mirtha del Granado, Jacobo Finkelman, Rafael López Olarte, Yamil Silva, Rodolfo Rodríguez, Alfonso Tenorio and Adriana Bacelar Gomes.

## WHO Eastern Mediterranean Region

Samiha Baghdadi, Salem Barghout, Amal Bassili, Philip Ejikon, Sevil Huseynova, Ridha Jebeniani, Wasiq Khan, Peter Metzger, Aayid Munim, Syed Karam Shah, Akihiro Seit, Ireneaus Sindani, Bashir Suleiman, Khaled Sultan, Rahim Taghizadeh and Martin van den Boom.

## WHO European Region

Pierpaolo de Colombani, Evgeny Belilovskiy, Andrei Dadu, Jamshid Gadoev, Bahtygul Karriyeva, Hans Kluge, Peter Knudsen, Sayohat Hasanova, David Mercer, Valentin Rusovich, Roman Spataru, Javahir Suleymanova, Gombogaram Tsogt and Richard Zaleskis.

## WHO South-East Asia Region

Mohammed Akhtar, Erwin Cooreman, Puneet Dewan, Khurshid Alam Hyder, Partha P. Mandal, Ye Myint, Nani Nair, Chadrakant Revankar, Kim Son Il, Sombat Thanprasertuk and Supriya Warusavithana.

## WHO Western Pacific Region

Cornelia Hennig, Woo-Jin Lew, Catherine Lijinsky, Ngyuen Nhat Linh, Nobuyuki Nishikiori, Giampaolo Mezzabotta, Yamuna Mundade, Katsunori Osuga, Daniel Sagebiel, Fabio Scano, Jacques Sebert, Marithel Tesoro, Kitty van Weezenbeek, Rajendra Yadav and Liu Yuhong.

The main purpose of this report is to provide the latest data on the TB epidemic and progress in TB care and control, based on data collected in the 2010 round of global TB data collection and previous years. Data are supplied primarily by national TB control programme managers and their staff. Those who used the online data collection system to report data to WHO in 2010 are listed below, and we thank them all for their invaluable contribution and collaboration.

## WHO African Region

Oumar Abdelhadi, Abdou-Salam Abderemane, Juan Acoresila, Francis Adatu, Nkou Bikoe Adolphe, Shalala Ahmadowa, Sofiane Alihalassa, Inacio de Carvalho Alvarenga, Omoniyi Amos, Géneviève Angue, Ghislaine Nkone Asseko, Younoussa Assoumani, Fantché Awokou, Jorge Barreto, Adama Bangoura, Mohammed Berthe, Frank Bonsu, Ballé Boubakar, Marafa Boubacar, Maria da Conceição Palma Caldas, Miguel Camará, Edelmiro Castaño Bizantino, Joconiah Chirenda, Ernest Cholopray, Nkem Chukwueme, Fodé Cisse, Catherine Cooper, Claudina Cruz, Foday Dafe, Isaiah Dambe, Mathurin Sary Dembélé, Aicha Diakité, Awa Diop, Themba Dlamini, Ismael Edris, Saidi Egwaga, Justin Freminot, Evariste Gasana, Michel Gasana, Francis Gausi, Martin Gninafon, Andre Gotingar, Thabo Hlophe, Adama Jallow, Mansur Kabir, Nathan Kapata, Javan Kayobotsi, Aristide Komangoya-Nzonzo, André Kouabosso, Jacquemin Kouakou, Egidio Langa, Mame Bocar Lo, Llang Maama, Marie-Léopoldine Mawagali, Angelo Makpenon, Omphemetse Mokgatlhe, Azmera Molla, Momar Talla Mbodji, Farai Mavhunga, Médard Mvé, Clifford Munyandi, Lindiwe Mvusi, Diallo Naco, Fulgence Ndayikengurukiye, Thadée Ndikumana, Adolphe Nkou, Gérard Ntahizaniye, Jean Paul Okiata Kenkana Mayala, Augé Wilson Ondon, Jucael Hermann Ongouo, Mohamed Ould Sidatt, Aleixo Rodrigues de Sousa Pires, Martin Rakotonjanahary, Thato Raleting, Gabriel Marie Ranjalay, Bakoliarisoa Ranivomahefa, F Rujeedawa, Charles Sandy, Mineab Sebhatu, Joseph Sitienei, Nicholas Siziba, Tandaogo Saouadogo, Celestino Teixeira, Desta Tiruneh, Dawit Tsegaye, Mohamed Vadel, Abbas Zezai and Assefash Zehaie.

## WHO Region of the Americas

Christian Acosta, Shalauddin Ahmed, Xochil Alemán de Cruz, Mirian Álvarez, Raúl Álvarez, Alister Antoine, Wiedjaiprekash Balesar, Stefano Barbosa Codenotti Draurio Barreira, María del Carmen Bermúdez, Jaime Bravo, Marta Isabel Calona de Abrego, Martín Castellanos Joya, Kenneth Castro, Gemma Chery, Roger Duncan, Mercedes F. España Cedeño, Ed Ellis, Victor Gallant, Julio Garay Ramos, Christian García Calavaro, Jennifer George, Margarita Godoy, Alexis Guilarte, Rosalinda Hernández Munoz, Jorge Iñiguez, Alina Jaime, Ronala Jamanca Shuan, Héctor Oswaldo Jave Castillo, Carla Jeffries, Eva Lewis Fuller, Cecilia Lyons De Arango, María Josefa Llanes Cordero, Andrea Yvette Maldonado Saavedra, Francisco Maldonado, Marvin Maldonado, Raúl Marcelo Manjón Tellería, R.A. Manohar Singh, Belkys Marcelino, Ada Martínez Cruz, Celia Martínez de Cuellar, Zeidy Azofeifa Mata, Pearl Mc Millan, Mery Mercedes, Leilawati Mohammed, Jeetendra Mohanlall, Evelyn Morales, Yndira Morales, Ernesto Moreno Naranjo,

Francis Morey, Merciana Moxey, Miriam Nogales Rodríguez, Persaud Nordia, Pablo Pacheco, E. Areli Paredes García, Tomasa Portillo, Bob Pratt, Dottin Ramoutar, Anna Esther Reyes Godoy, Leonarda Reyes, Paul Ricketts, Adalberto Rodríguez, María Rodríguez, Jorge Rodríguez-De Marco, David Rodríguez Pérez, Nilda Romero, Orlando Sequeira, Clarita Torres, Zulema Torres Gaete, Christopher Ulisses Trujillo García, William Turner, Melissa Valdez, Reina Valerio, Daniel Vázquez, Michael Williams, Oritta Zachariah, Nydia Zelaya and Elsa Zerbini.

### WHO Eastern Mediterranean Region

Mohammad Salama Abouzeid, Naila Abuljadayel, Khaled Abu Rumman, Nadia Abu Sabrah, Khadiga Adam, Shahnaz Ahmadi, Amin Noman Alabsi, Samia Alagab, Hala Alkjhayer, Abdelbari Al-Hammadi, Abdul Latif Al-Khal, Ali Mohammed Hussain Al-Lawati, Rashid Al-Owaish, Issa Ali Al-Rahbi, Saeed Alsaffar, Kifah Saleh Alshaqeldi, Noor Ahmad Baloch, Kenza Bennani, Salah Ben Mansour, Kinaz Chiekh, Walid Daoud, Mohamed Elfurjani, Essam Elmoghazy, Awatef El Shamry, Hashim Suleiman El Wagie, Ameera Fabella, Razia Fatima, Rachid Fourati, Mohamad Gaafar, Amal Galal, Dhikrayet Gamara, Said Abdallah Guelleh, Dhafer Hashim, Kalthoom Hassan, Kefah, Kinaz, Laasri Lahsen, Joseph Lasu, Stephen Macharia, Sayed Daoud Mahmoodi, Assia Haissama Mohammed, Mahshid Nasehi, Ejaz Qadeer, Mtanios Saade, Mohmmad Khalid Seddiq, Bashir Suleiman and Mohemmed Tbeni.

### WHO European Region

Elmira Abdrakhmanova, Tleukhan Abildaev, Ibrahim Abubakar, Natavan Alikhanova, Aftandil Alisherov, Ekkehardt Altpeter, Peter Anderson, Delphine Antoine, Andrei Astrovko, António Antunes, Thorsteinn Blondal, Stefanos Bonvas, Bonita Brodhun, Norbert Charle, Ana Ciobanu, Radmila Curcic, Edita Davidavičienė, Gurbanmammets Elyasov, Connie Erkens, Damijan Erzen, Noa Cedar, Svetlana Cherenko, Margarida Coll Armangué, Olivera Bojovic, Hamza Bozkurt, Jennifer Fernández García, Maria Grazia Pompa, Ulgen Gullu, Gennady Gurevich, Efrat Haddad, Hasan Hafizi, Peter Helbling, Elmira Ibraim, Abdurkarim Jalolovich, Jerker Jonsson, Iagor Kalandadze, Jean-Paul Klein, Maria Korzeniewska-Kosela, Kai Kliiman, Gábor Kovács, Olga Krivoanos, Wanlin Maryse, Rukije Mehmeti, Donika Mema, Narine Mezhliumyan, Vladimir Milanov, Zohar Mor, Ucha Nanava, Joan O'Donnell, Elena Pavlenko, Bozidarka Rakocevic, Vija Riekstina, Elena Rodríguez-Valín, Karin Ronning, Petri Ruutu, Dmitri Sain, Firuza Sharipova, Aleksander Simunovic, Elena Skachkova, Ivan Solovic, Antonella Sorcinelli, Soteroulla Soteriou, Gianfranco Spiteri, Ileana Stoicescu, Stefan Talevski, Aigul Tursynbaeva, Gulnoz Uzakova, Piret Viiklepp, Jiri Wallenfels, Maja Zakoska and Hasan Zutic.

### WHO South-East Asia Region

Sunil de Alwis, Ratna Bhattarai, Lakbir Singh Chauhan, Emdadul Haque, Jang Yong Hui, Kim Jong Guk, Kim Tong Hyok, Nazrul Islam, Usha Jayasuriya, Kashi Kanta Jha, Suksont Jittimanee, Badri Nath Jnawali, Yuttichai Kasetjaren, Constantino Lopes, Thandar Lwin, Partha Pratim Mandal, Dyah Mustika, Fathmath Reeza, Chewang Rinzin and Asik Surya.

### WHO Western Pacific Region

Farzana Adam, Paul Aia, Cecilia Arciaga, Susan Barker, Iobi Batio, Lokman Hakim Bin Sulaiman, Pengiran Khalifah bin Pg Ismail, Kennar Briand, Richard Brostrom, Risa Bukbuk, Nou Chanly, Phonenaly Chittamany, Suzana Binte Mohd Hashim, Chou Kuok Hei, Nese Ituaso Conway, Du Xin, Dinh Ngoc Sy, Khandaasuren Dovdon, Jane Dow-

预览已结束，完整报告链接和

<https://www.yunbaogao.cn/report/index/report>