



II WORKSHOP DA REDE SUL DE MICOBACTÉRIAS
II MOSTRA ESTADUAL DE ATENÇÃO À SAÚDE PRISIONAL
IV ENCONTRO REGIONAL DE TUBERCULOSE

22 E 23 DE OUTUBRO DE 2018
UNISC- SANTA CRUZ DO SUL, RS
AUDITÓRIO CENTRAL

REALIZAÇÃO:  UNISC PARCEIROS:  FURG  UNICAP  CEYS  UNICAP  UNICAP  UNICAP  UNICAP APOIO:  Bogen  Y.A.

Estratégia para o fim da tuberculose da OMS: Impacto no Brasil e no Mundo

Julio Croda
22 de outubro 2018



Período Revolução Industrial 1720-1850

- Elevada incidência
- Elevada mortalidade
- Etiologia desconhecida
- Tratamento ineficiente



Revolução Industrial na Inglaterra – século XVIII / XIX

- **Alta mortalidade – Peste Branca**
- **1750: mortalidade de 200-400/100.000 hab ao ano na Europa Ocidental**
(hoje no Brasil seria 800.000 mil mortes/ano)
- **25% entre todas as mortes era por Tuberculose**
- **1840: mortalidade de 800/100 mil ao ano em Londres /Inglaterra (urbanização /favelas)**

Tuberculose, "a tísica"

uma antiga história sempre presente



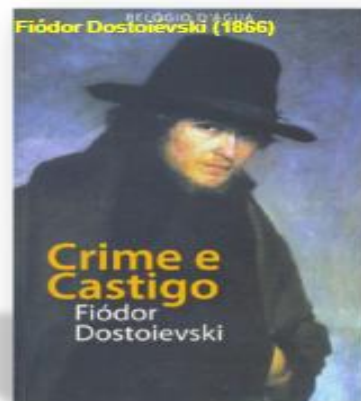
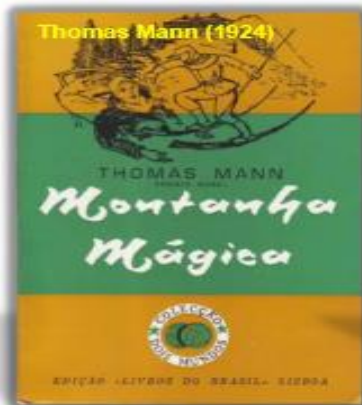
A Miseria - Cristóbal Rojas (1886)



Sleep death - Jann Williams (1874)



A criança doente - Edward Munch (1885)



TB Mortality Trend, 1750—1945

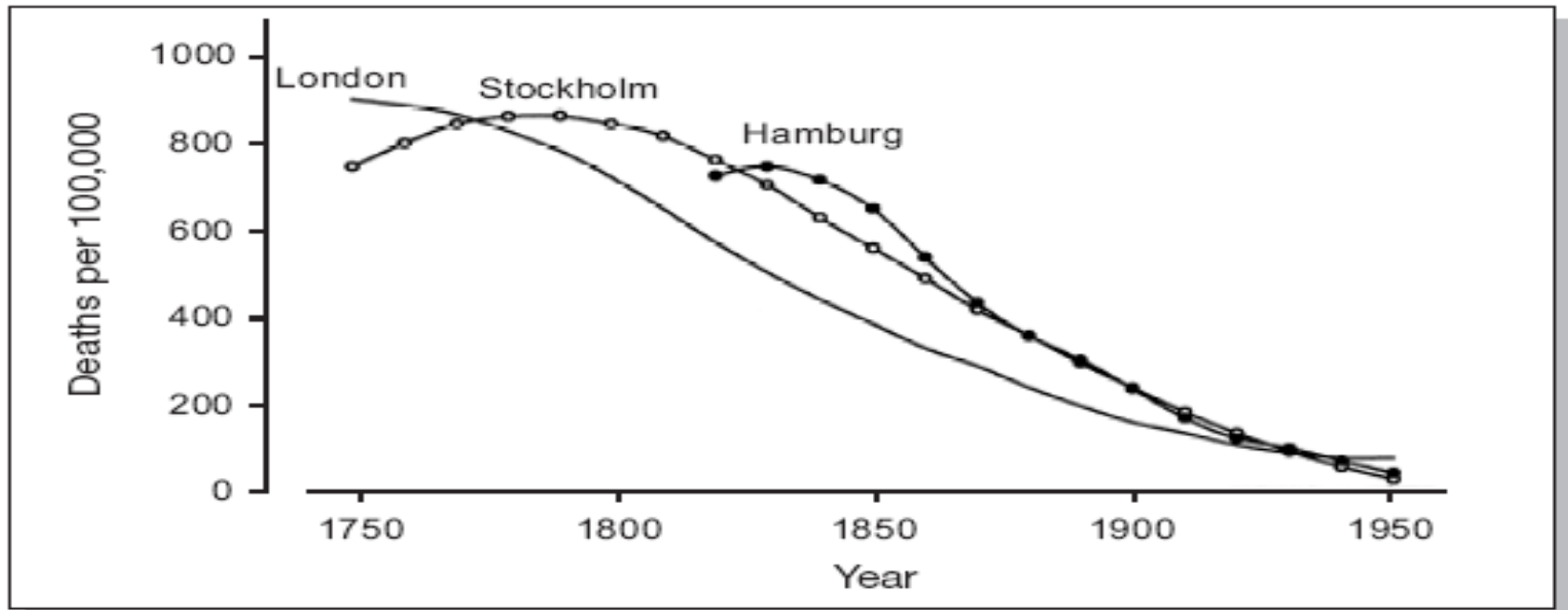


Figure 106. Mortality from tuberculosis in London, Stockholm, and Hamburg, modeled from available data. Figure reproduced with the permission of the American Thoracic Society / American Lung Association from [399].

From: Rieder HL. Epidemiologic Basis of Tuberculosis Control. 1999. IUATLD.

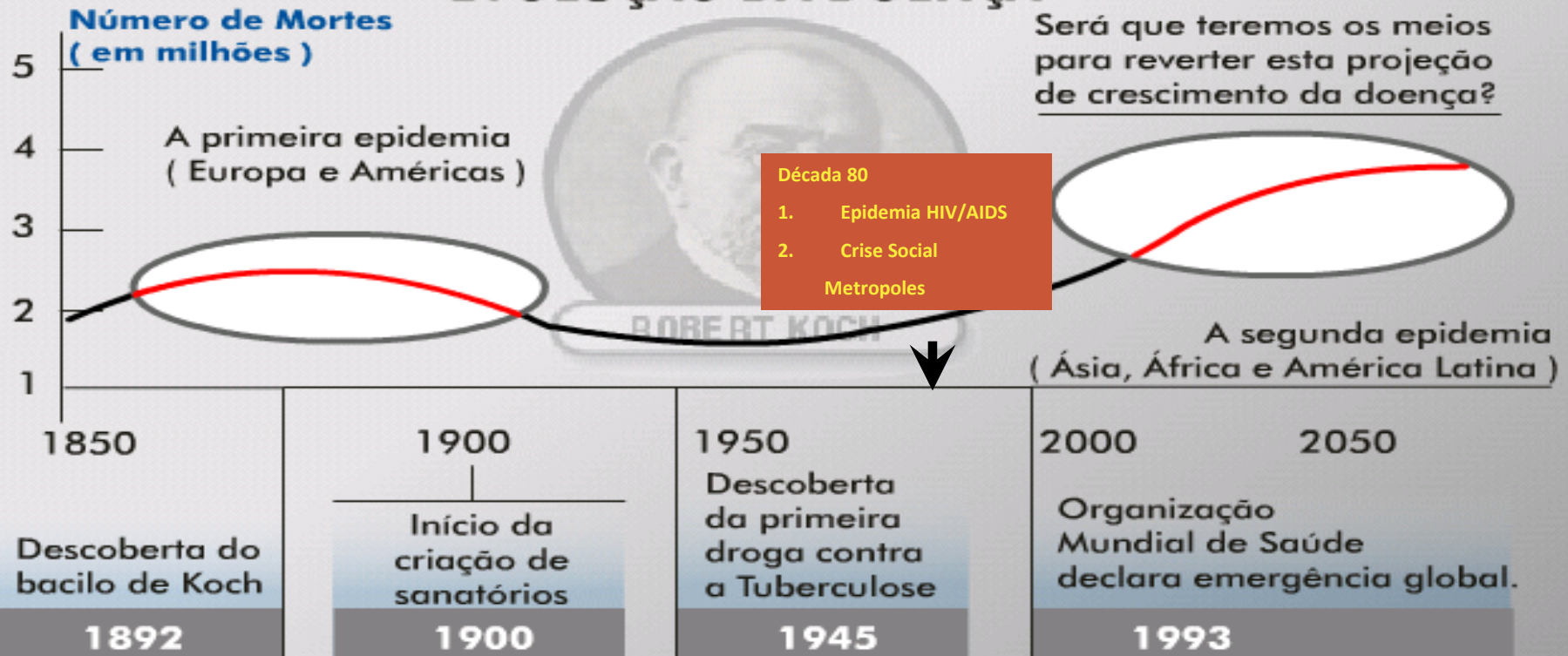
DADOS ESTATÍSTICOS

Problemas

Soluções

Histórico

EVOLUÇÃO DA DOENÇA



The SDGs, 2016–2030

Adopted by UN member states in September 2015



17 goals

Goal 3 . Ensure healthy lives and promote well-being for all at all ages

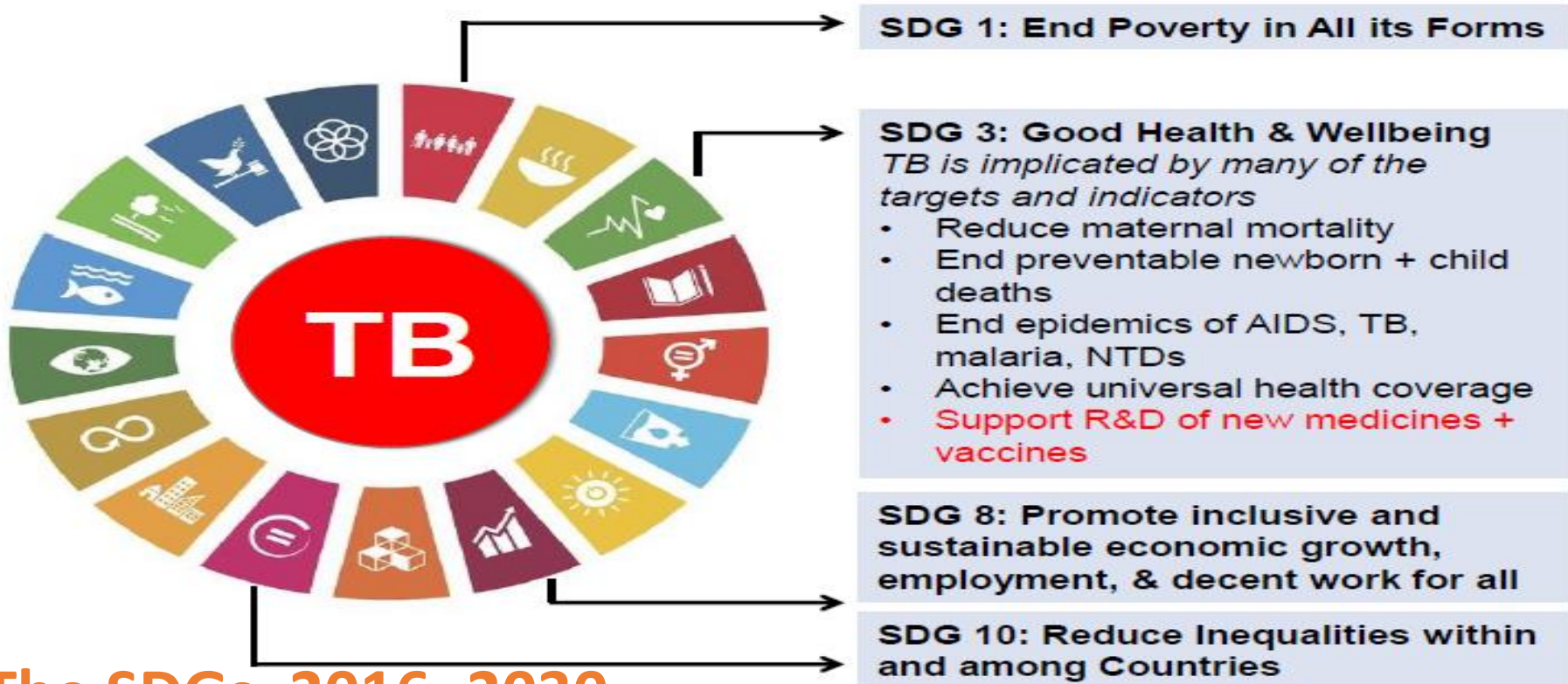
Target 3.3: By 2030, **end the epidemics** of AIDS, **tuberculosis**, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases

Target 3.8: **Achieve universal health coverage**, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all

Indicator for TB
incidence

Case Detection and TB treatment coverage are a “tracer” indicators

TB SITS AT THE HEART OF THE SDGs



The SDGs, 2016–2030

Adopted by UN member states in September 2015

TB IS THE TOP INFECTIOUS DISEASE KILLER IN THE WORLD

IN 2016

1.7 MILLION PEOPLE DIED FROM TB

INCLUDING NEARLY 400 000 PEOPLE WITH HIV-ASSOCIATED TB



10.4 MILLION PEOPLE FELL ILL FROM TB



TB IS THE MAIN CAUSE OF DEATHS RELATED TO ANTIMICROBIAL RESISTANCE AND THE LEADING KILLER OF PEOPLE WITH HIV



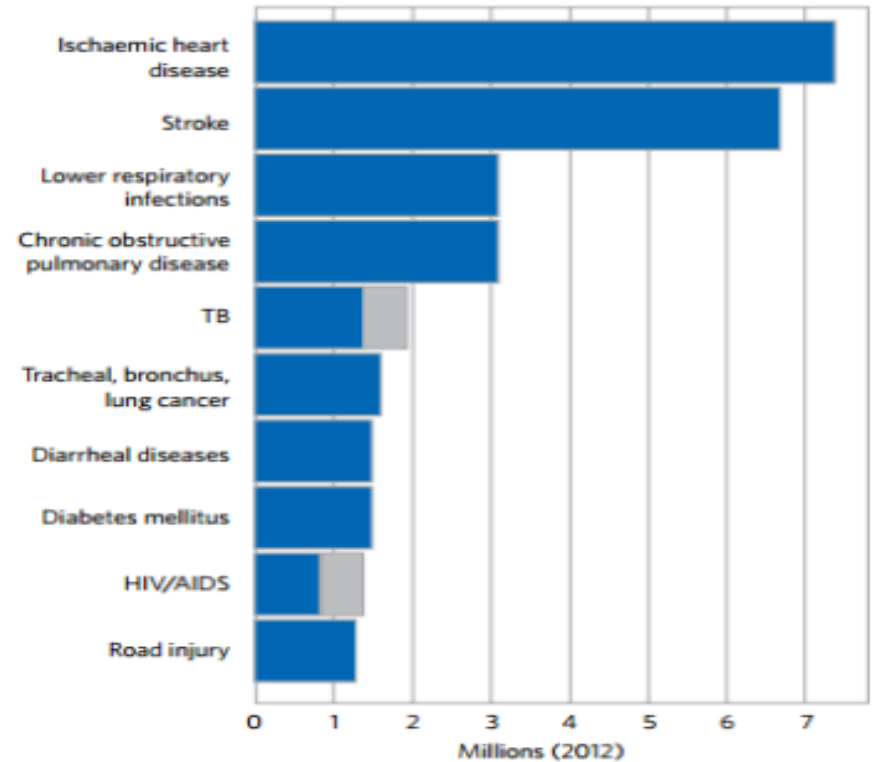
EACH DAY -
4700 PEOPLE LOSE THEIR LIVES AND
28,500 PEOPLE FALL ILL DUE TO TB

The End TB Strategy at a glance

VISION	A WORLD FREE OF TB — zero deaths, disease and suffering due to TB			
GOAL	END THE GLOBAL TB EPIDEMIC			
INDICATORS	MILESTONES		TARGETS	
	2020	2025	SDG 2030 ^a	END TB 2035
Percentage reduction in the absolute number of TB deaths (compared with 2015 baseline)	35%	75%	90%	95%
Percentage reduction in the TB incidence rate (compared with 2015 baseline)	20%	50%	80%	90%
Percentage of TB-affected households experiencing catastrophic costs due to TB (level in 2015 unknown)	0%	0%	0%	0%

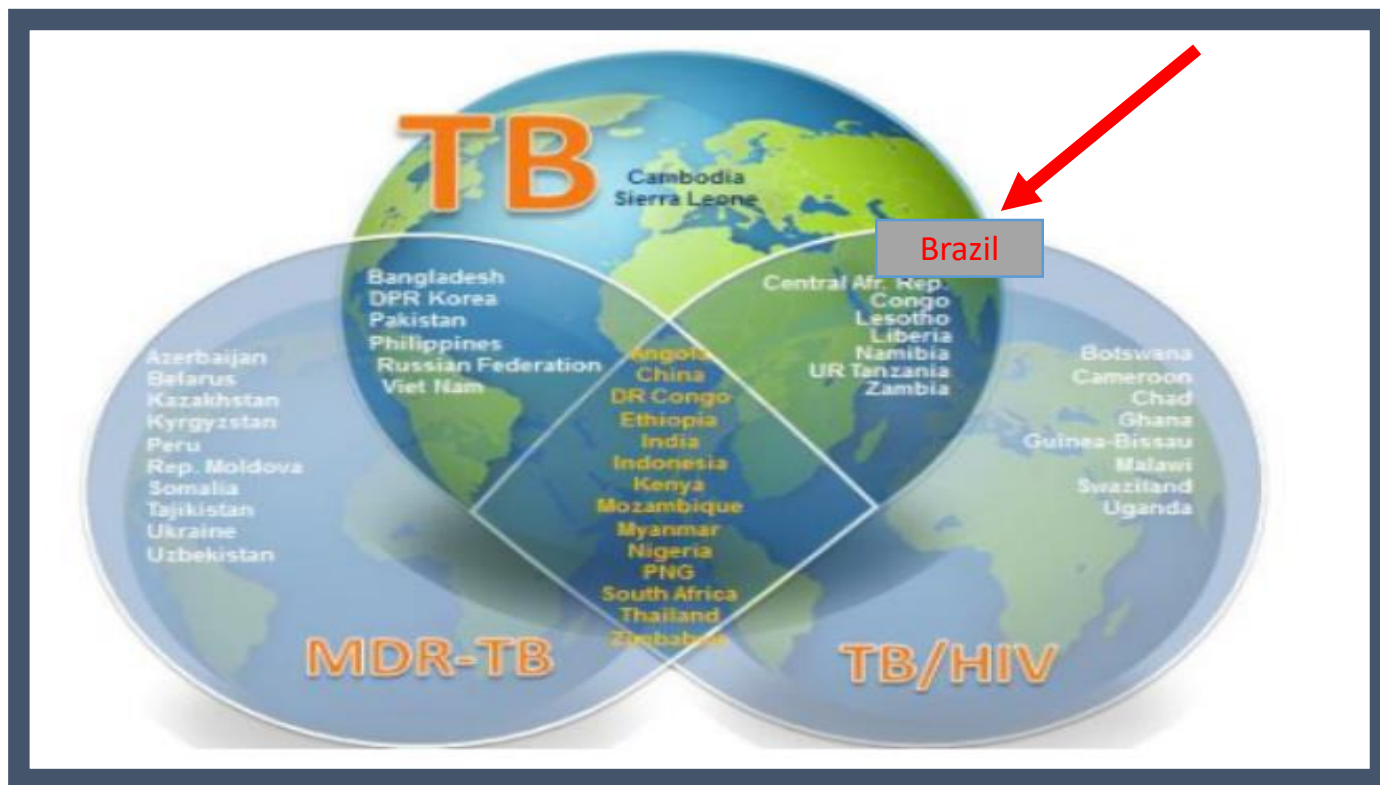
Pela primeira vez a TB supera o HIV em óbitos

Top causes of death worldwide in 2012.^{a,b,c,d} Deaths from TB among HIV-positive people are shown in grey.^d

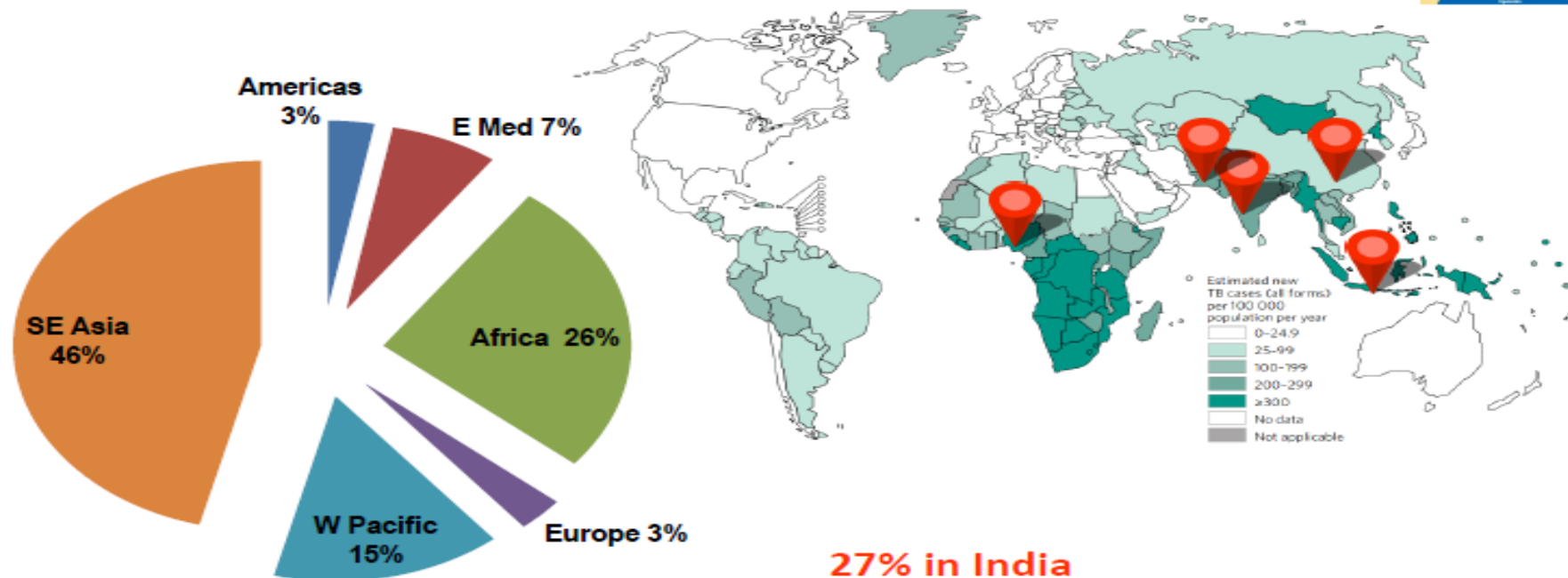


Fonte: Global TB Report 2016

Países de alta carga para TB, TB-HIV e TB DR



TB incidence: countries and regions



27% in India

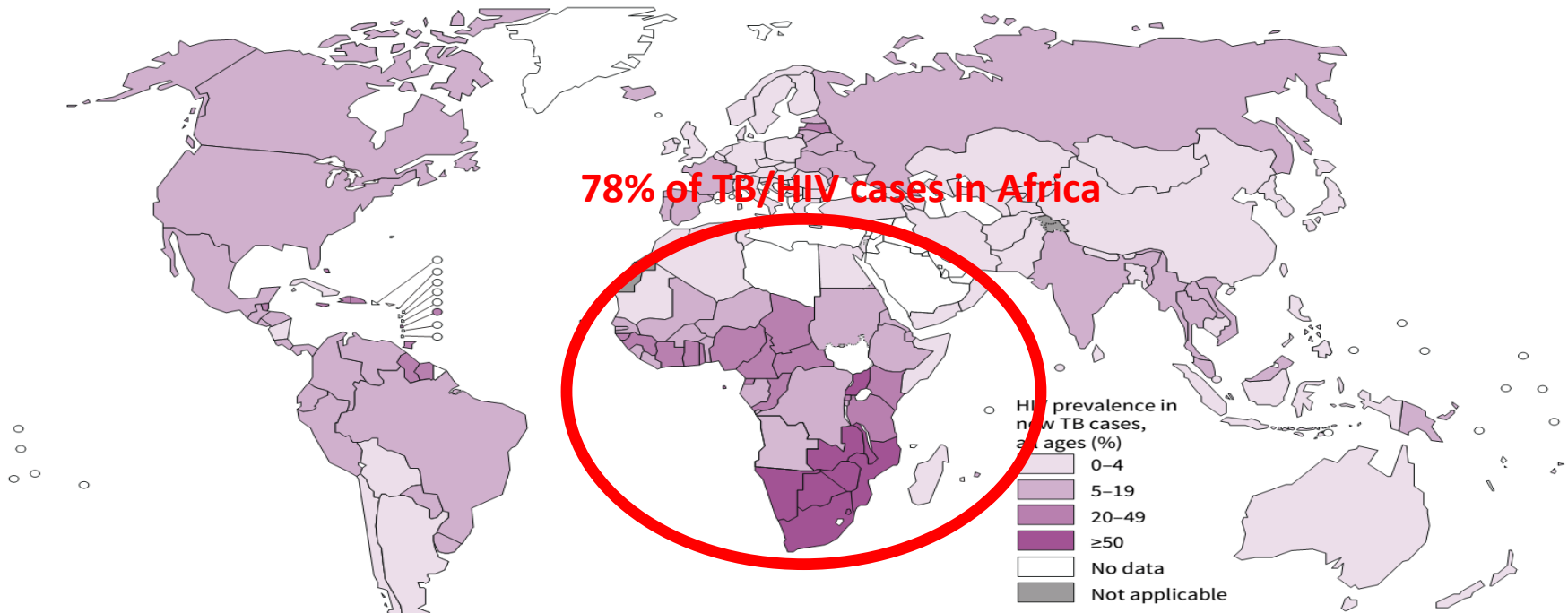
9-10% each: Indonesia & China

5-6% each: Nigeria & Pakistan

Accelerating response to TB/HIV means cutting transmission and mortality



Estimated HIV prevalence in new TB cases, 2013



Other co-morbidities emerging in other regions

Ref: Global TB Control Report 2014

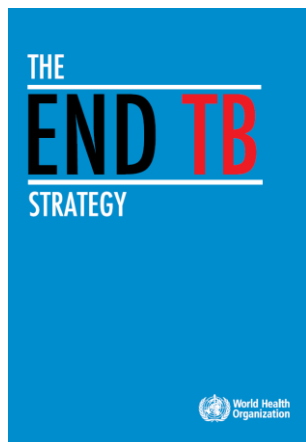
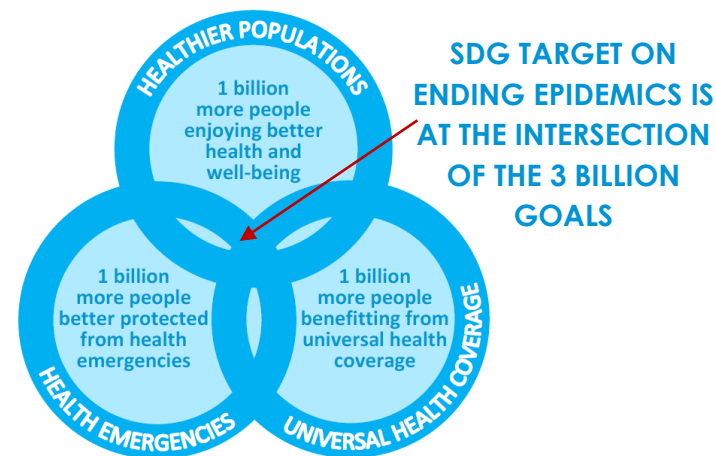
SDGs, Universal Health Coverage and GPW: Key opportunities to End TB and AIDS by 2030



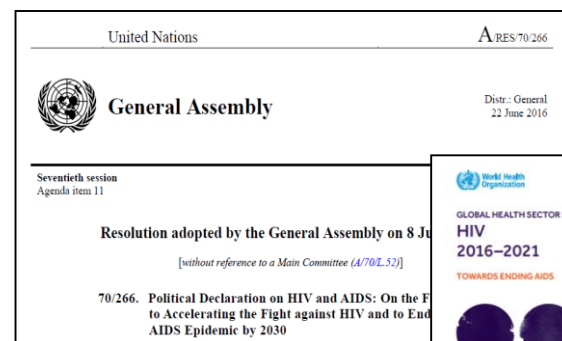
TARGET 3.3: BY 2030, END THE EPIDEMICS OF AIDS, TUBERCULOSIS



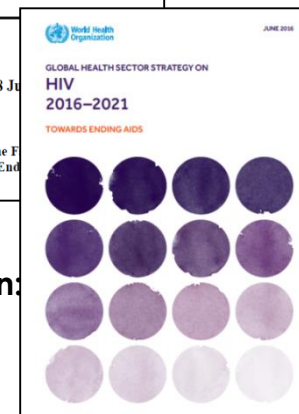
WHO GENERAL PROGRAMME OF WORK



End TB Strategy targets:
 90% reduction in TB deaths by 2030
 80% reduction in TB incidence rate
 0% TB affected families facing catastrophic costs



HIV Strategy and UN 2016 Political Declaration: Reduce TB deaths among people living with HIV by 75% by 2020





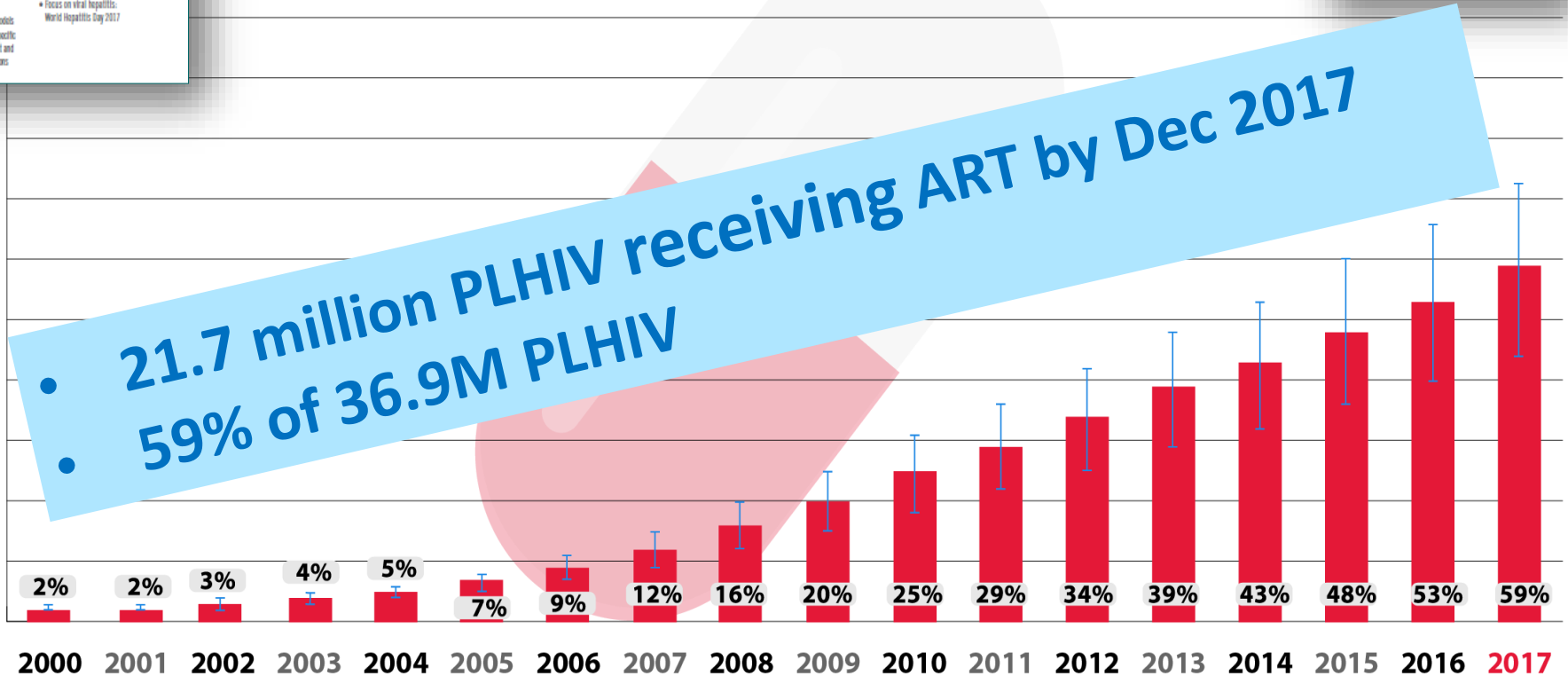
Impressive scale-up of ART in People living with HIV



WHO LAUNCHES NEW GUIDANCE TO 'FAST-TRACK' THE HIV RESPONSE TOWARDS 2020 GOALS

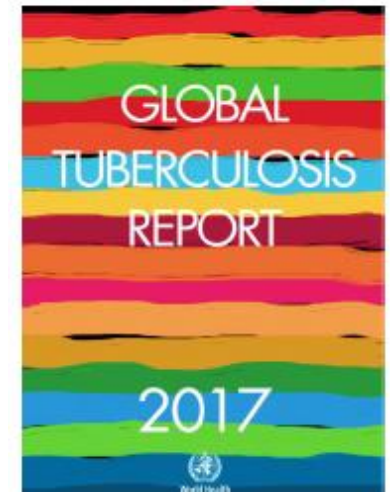
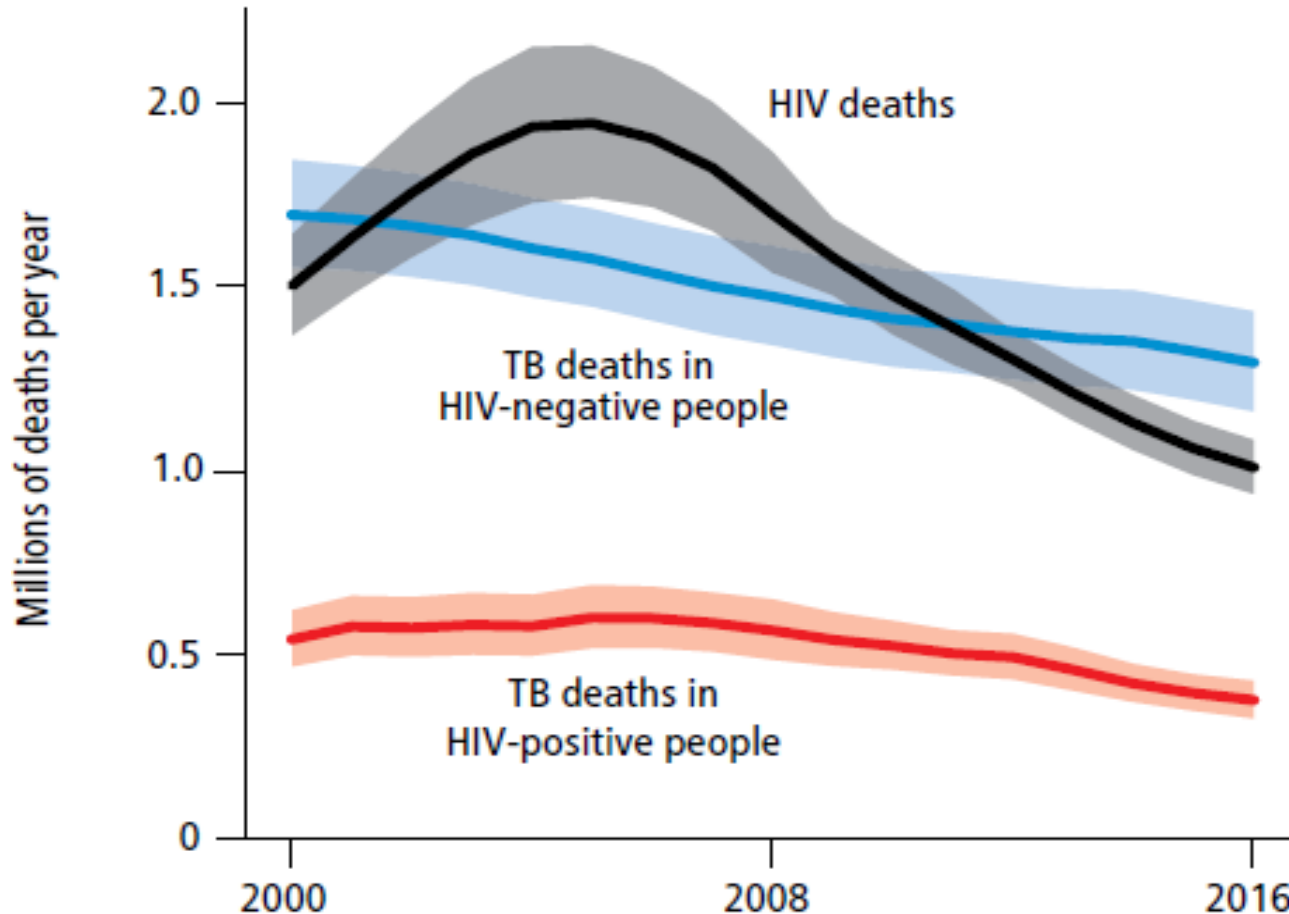
New publications:

- 90% of people with HIV diagnosed**
 - Information tools on novel point-of-care tools for early infant diagnosis of HIV
 - Landscape for rapid diagnostic tests for HIV self-testing
- 90% of people on treatment virally suppressed**
 - Global report, guidelines and Global Action Plan on HIV drug resistance
 - INSPIRE results - implementation research on retention of mothers on treatment
- Beyond 90-90-90**
 - Sustained prevention, pre-exposure prophylaxis of HIV infection (PrEP) implementation tool
 - Focus on country implementation
 - Focus on viral hepatitis: World Hepatitis Day 2017
- 90% of diagnosed people treated**
 - Guidelines for managing advanced HIV disease and rapid initiation of antiretroviral therapy
 - Technical update on transition to new antiretrovirals in HIV programmes
 - Key considerations for differentiated models of delivering antiretroviral therapy to specific groups: children, adolescents, pregnant and breastfeeding women and key populations



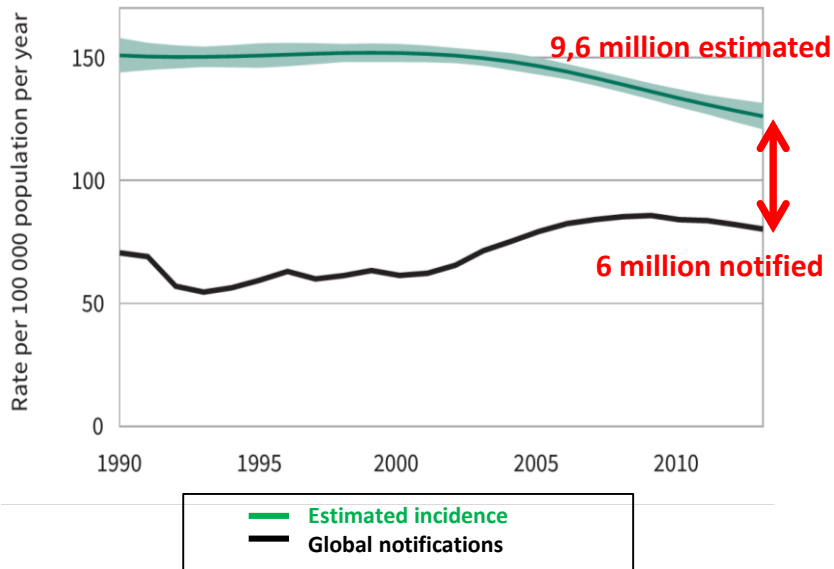
Source: UNAIDS/WHO estimates

Trends of Estimated TB and HIV deaths, 2000–2016



37% of the 1 million AIDS deaths in 2016 were due to TB

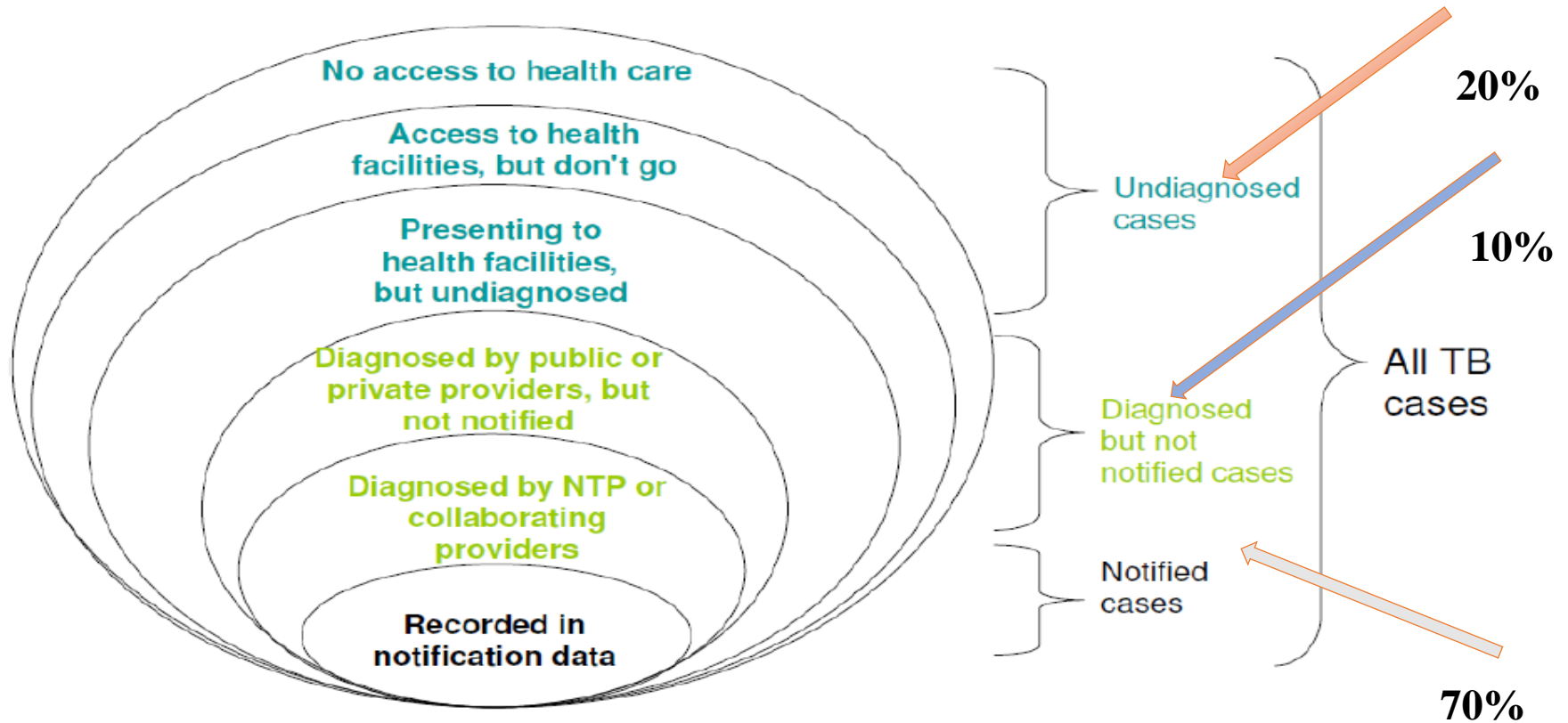
Reaching the "missed" cases **early** means cutting transmission (*nearly 3 million not diagnosed or reported*)



Share of total missed cases



10 countries account for 74% (2.4 million) of the estimated "missed" cases globally



NTP, national TB control programme

Figure 2. The "Onion" model: a framework for assessing the fraction of TB cases accounted for in TB notification data

End TB Global Strategy

Proposed Pillars

Targets: 95% reduction in deaths and 90% reduction in incidence (≤ 10 cases / 100,000 population) by 2035

Integrated, patient-centered TB Care and Prevention

Early diagnosis of TB including universal drug-susceptibility testing ; systematic screening of contacts and **high-risk groups**

Treatment of all forms of TB including drug -resistant TB with patient support

Collaborative TB/HIV activities and management of co-morbidities

Preventive treatment for high-risk groups and vaccination of children

Bold policies and supportive systems

Government stewardship , commitment, and adequate resources for TB care and control with monitoring and evaluation

Engagement of communities , civil society organizations, and all public and private care providers

Universal health coverage policy; and regulatory framework for case notification, vital registration, drug quality and rational use, and infection control

Social protection, poverty alleviation, and actions on other determinants of TB

Intensified Research and Innovation

Discovery, development and rapid uptake of new tools, interventions and strategies

Operational research to optimize implementation and impact, and promote innovations

The trajectory of the TB Epidemic

RESEARCH:

- Optimize current tools using **Operational Research Approach**
- Evaluate the impact of incorporation of new tools and new social protection approaches using **Implementation Research**
- **Develop** new diagnostics, new shorter treatment regimens, more effective treatment for latent TB infection and effective pre- and post-exposure vaccines.

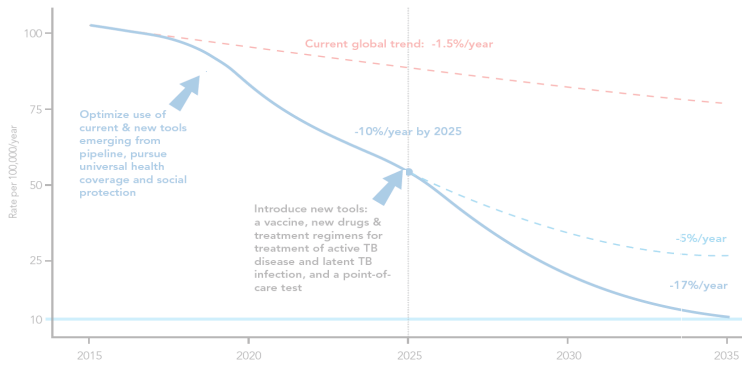


World Health
Organization



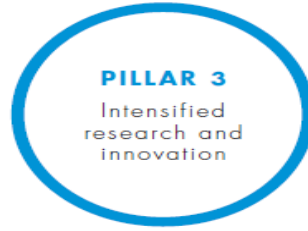
GLOBAL TB
PROGRAMME

END TB

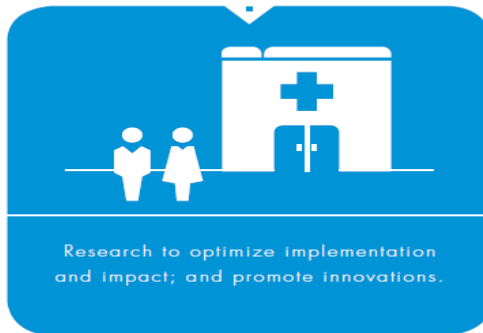


WHO's END TB Strategy Goals: *By 2035, REDUCE*

- TB Incidence (*by 90%*);
- TB Mortality (*by 95%*);
- Achieve *zero* Catastrophic costs for TB-affected households



Pillar 3: Intensified Research and Innovation





FIRST WHO GLOBAL MINISTERIAL CONFERENCE
ENDING TB IN THE SUSTAINABLE DEVELOPMENT ERA:
A MULTISECTORAL RESPONSE
WORLD TRADE CENTER
MOSCOW, RUSSIAN FEDERATION
16 – 17 NOVEMBER 2017



MINISTERIAL PARALLEL PANEL SCIENCE, RESEARCH AND INNOVATION

Prioritized and well-financed research is needed to enable the urgent development and swift adoption of innovative tools and strategic interventions critical to the fight against TB.



MINISTRY OF HEALTH
OF THE RUSSIAN FEDERATION



World Health
Organization



END TB SUMMIT

FIRST WHO GLOBAL MINISTERIAL CONFERENCE

ENDING TB IN THE SUSTAINABLE DEVELOPMENT ERA: A MULTISECTORAL RESPONSE



MINISTRY OF HEALTH
OF THE RUSSIAN FEDERATION



World Health
Organization

PURSuing SCIENCE, RESEARCH AND INNOVATION

We commit to:

- **Aumentar a capacidade nacional e/ou regional e financiamento para Pesquisa e Inovação em TB, priorizando a criação de Redes Nacionais de Pesquisa em TB**

- **Priorizar o desenvolvimento e avaliação de:**

- a) testes diagnósticos *Point of Care*;**

- b) novos regimes terapêuticos encurtados e mais efetivos para todas formas de TB;**

- c) vacina efetiva até 2025,**

- d) intervenções efetivas para cobrir determinantes sociais e ambientais**



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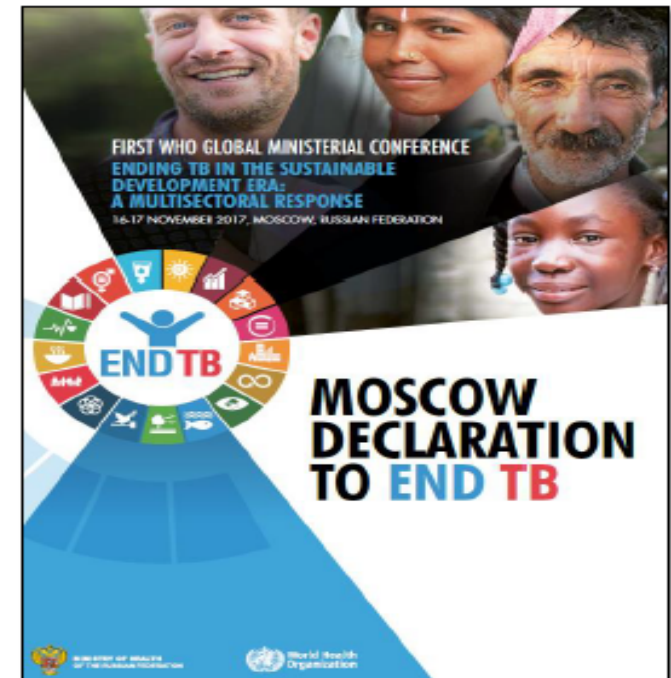
World Health
Organization

PURSuing SCIENCE, RESEARCH AND INNOVATION

We commit to:

- Aumentar os esforços de **coordenação nacional** e global na elaboração de políticas públicas que priorizem a pesquisa e inovação em TB

- Fortalecer os sistemas de vigilância, melhorar a qualidade de dados em todos os níveis, por meio de abordagens inovadoras – **Digital Health**





END TB SUMMIT

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ENDING TB IN THE SUSTAINABLE DEVELOPMENT ERA: A MULTISECTORAL RESPONSE



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PURSuing SCIENCE, RESEARCH AND INNOVATION

We call upon:

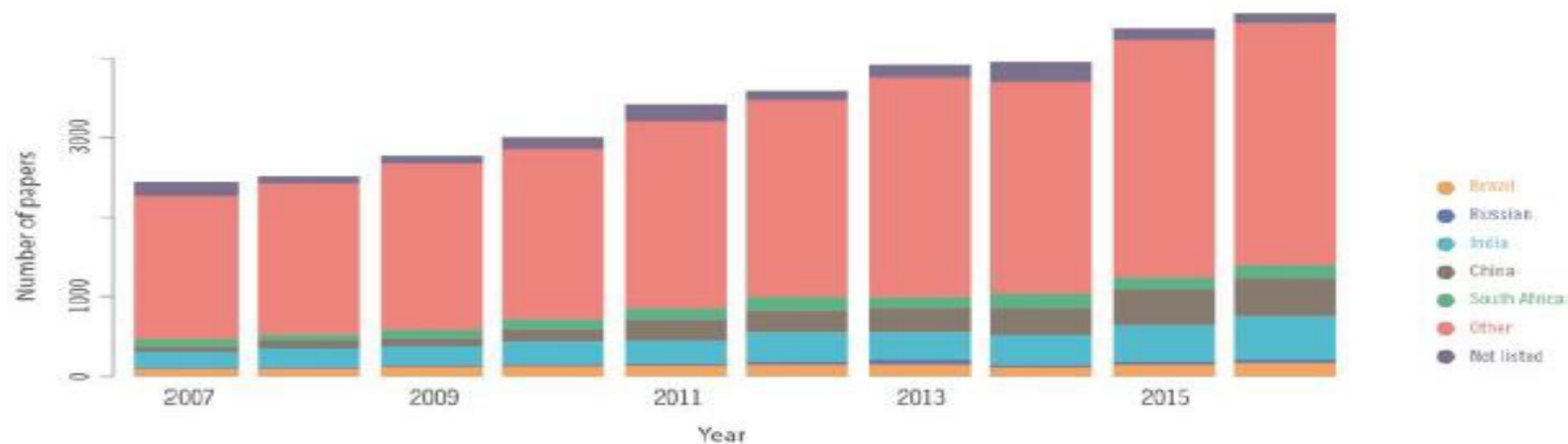
- **OMS com países, parceiros internacionais, doadores, instituições de pesquisa promovam o desenvolvimento de uma **Estratégia Global para Pesquisa, como a criação da Rede de Pesquisa em TB dos BRICS – em setembro 2017****

- **OMS com países, parceiros internacionais, doadores, instituições de pesquisa promovam aumento da cooperação e coordenação na Inovação e Pesquisa em TB**

Top 10 producing countries of TB research publications, 2007–2016

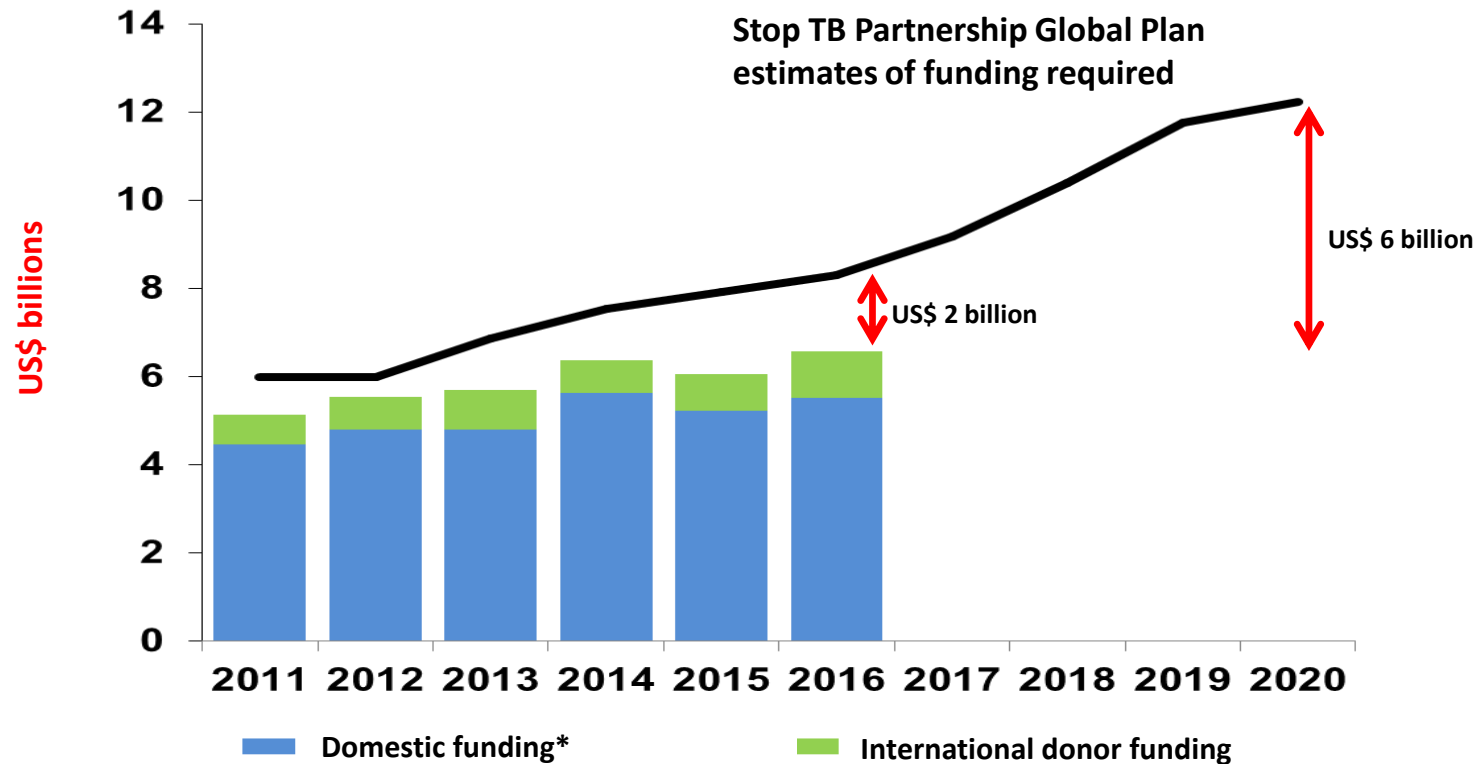
	Country	n	%
1	United States	6 365	18,4
2	India	3 342	9,7
3	China	2 534	7,3
4	England	2 244	6,5
5	South Africa	1 348	3,9
6	Brazil	1 298	3,8
7	Spain	891	2,6
8	Republic of Korea	885	2,6
9	France	827	2,4
10	Italy	776	2,2

Number of published TB articles by year, stratified by BRICS vs. non-BRICS



TB funding needs to increase

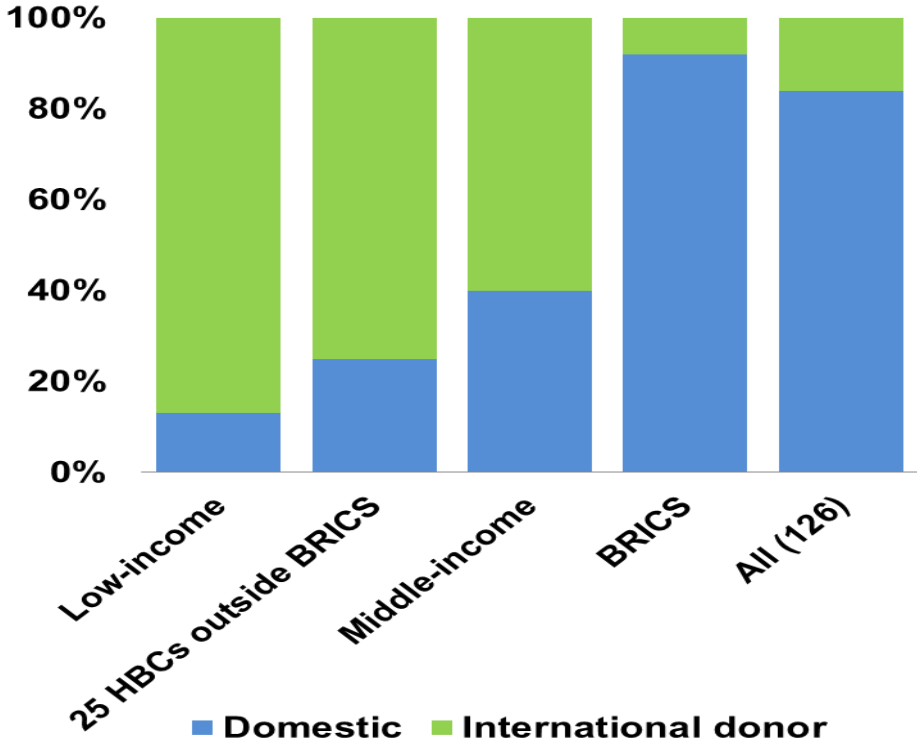
in low and middle-income countries



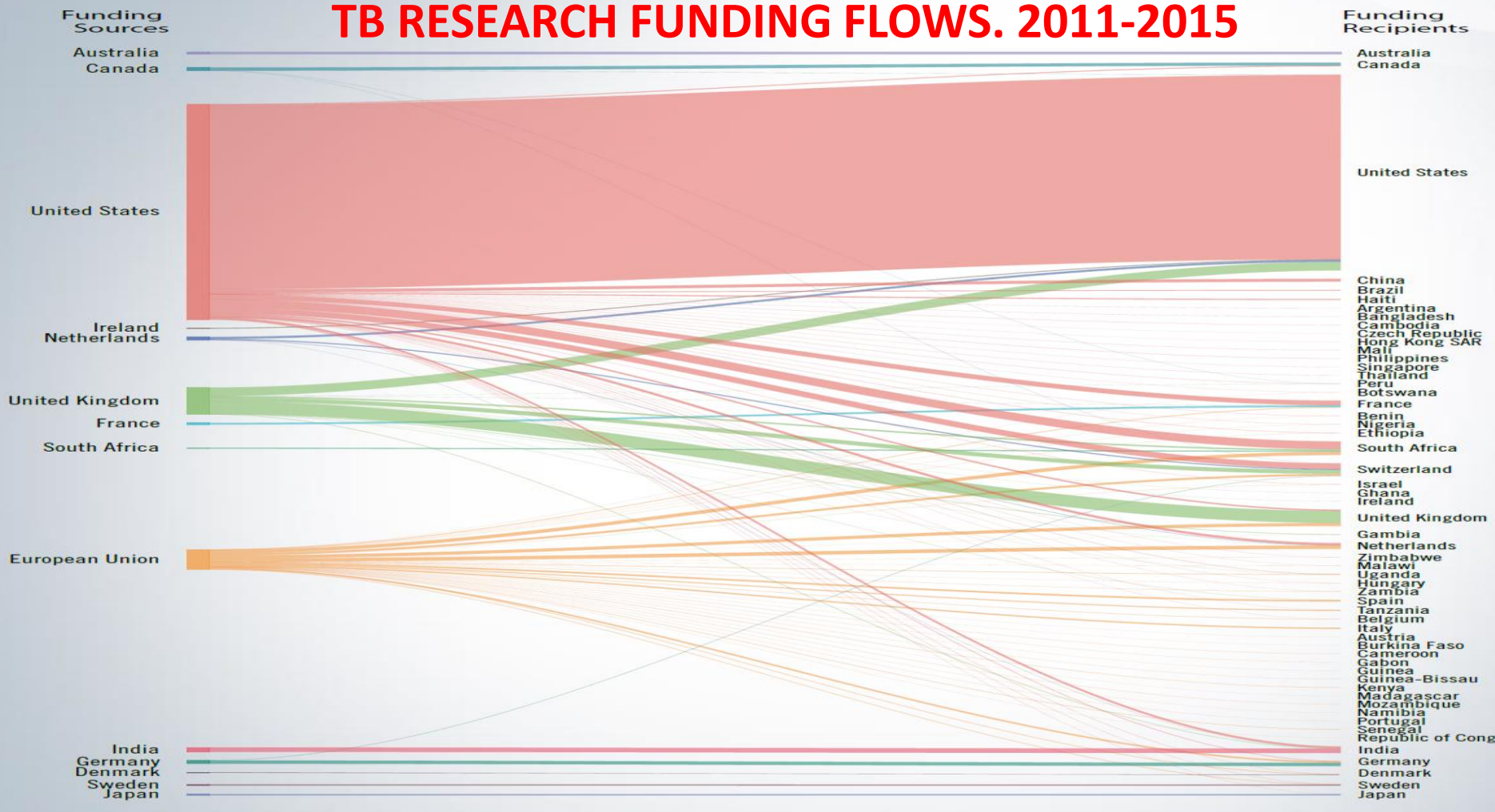
**government budgets + loans for TB; publicly funded inpatient + outpatient care for TB patients*

More domestic and international donor funding needed

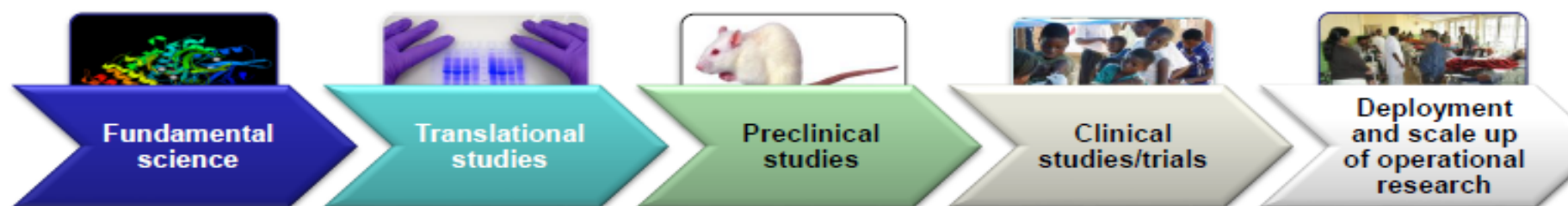
Share of available funding in 2016



TB RESEARCH FUNDING FLOWS. 2011-2015



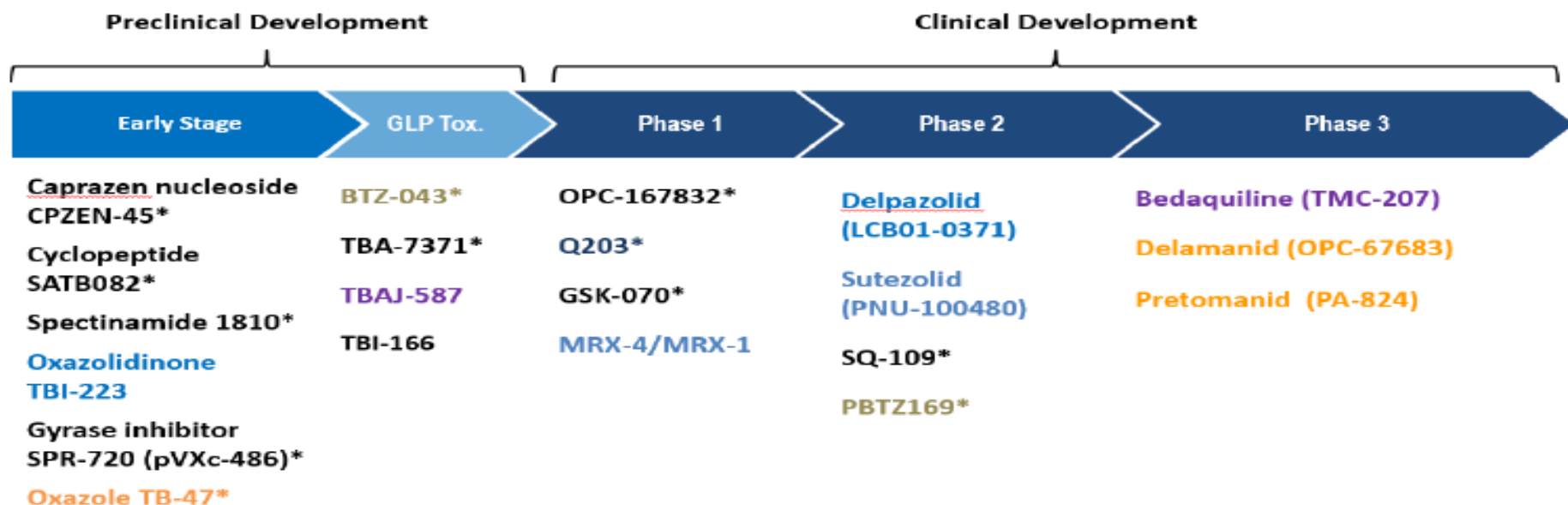
What research is required to end TB ?



A radical intensification of efforts is needed *along the full spectrum of research*:

- **Basic science (immunology, pathogenesis)** to prompt discovery of new tools
- **R&D pipeline** for testing and validating new tools
- **Innovative strategic approaches** adapted to specific country needs.
- **Factors influencing health-related practices** of patients and health care workers.
- **Social determinants of health** and financial protection

Global New TB Drug Pipeline ¹



New chemical class* Known chemical classes are color coded: fluoroquinolone, rifamycin, oxazolidinone, nitroimidazole, diarylquinoline, benzothiazinone, imidazopyridine amide.

¹ New Molecular Entities not yet approved, being developed for TB or only conditionally approved for TB. Showing most advanced stage reported for each. Details for projects listed can be found at <http://www.newtbdrugs.org/pipeline/clinical>

Ongoing projects without a lead compound series identified can be viewed at <http://www.newtbdrugs.org/pipeline/discovery>

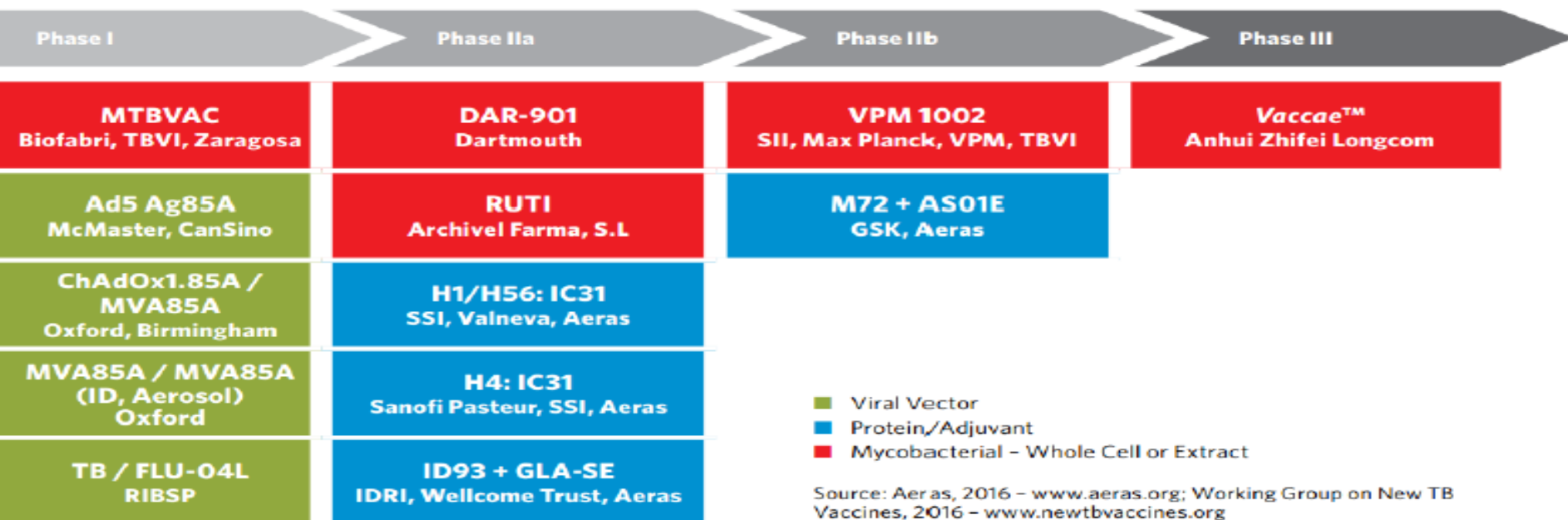


WORKING GROUP
ON NEW TB DRUGS

www.newtbdrugs.org

Updated: July 2017

The global vaccine pipeline, 2016





Brasil Livre da Tuberculose

Plano Nacional pelo Fim da Tuberculose como Problema de Saúde Pública

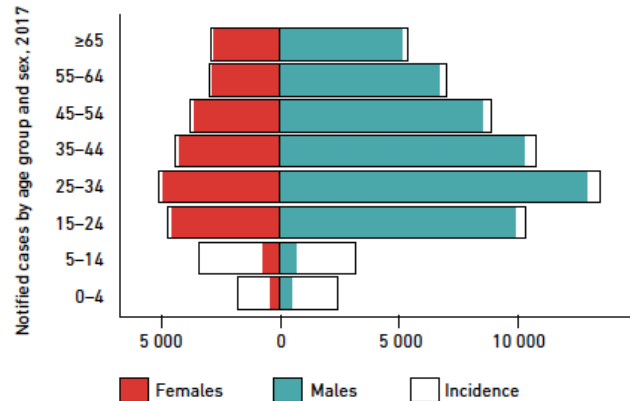
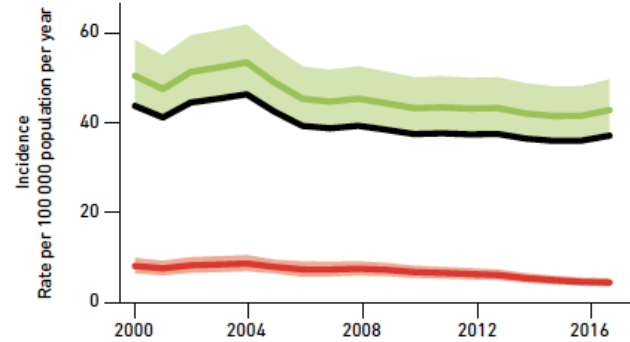
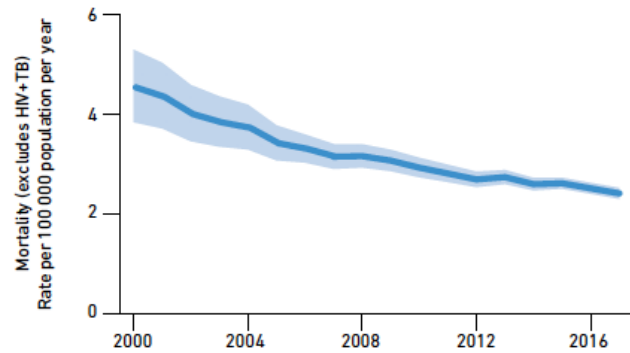
3^a causa de mortes entre doenças infecciosas

1^a causa de mortes entre infectados por HIV

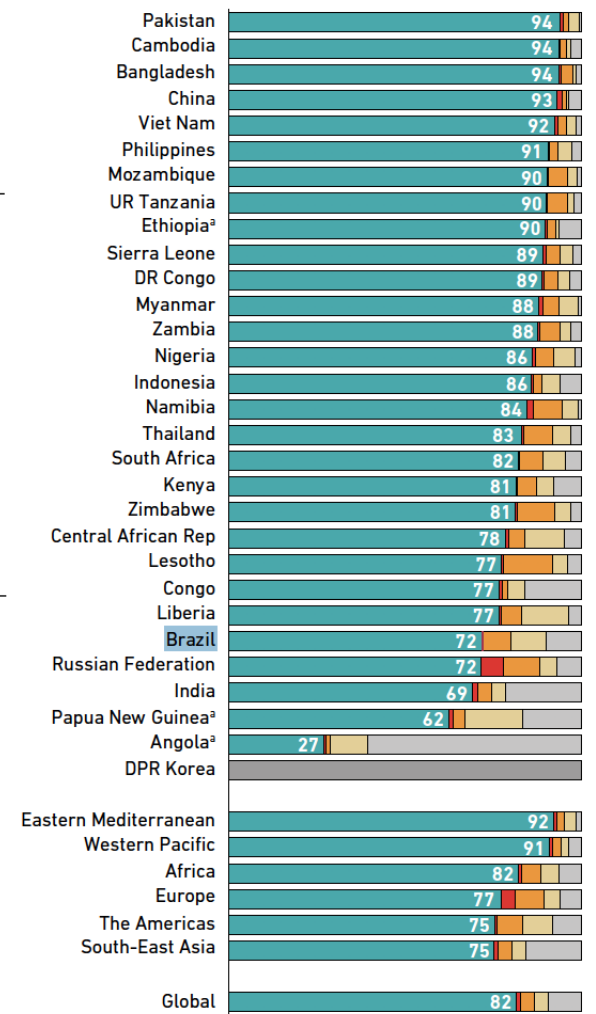
20^a posição entre os 30 países com maior carga de TB

19^a posição entre os 30 países com maior carga de TB/HIV

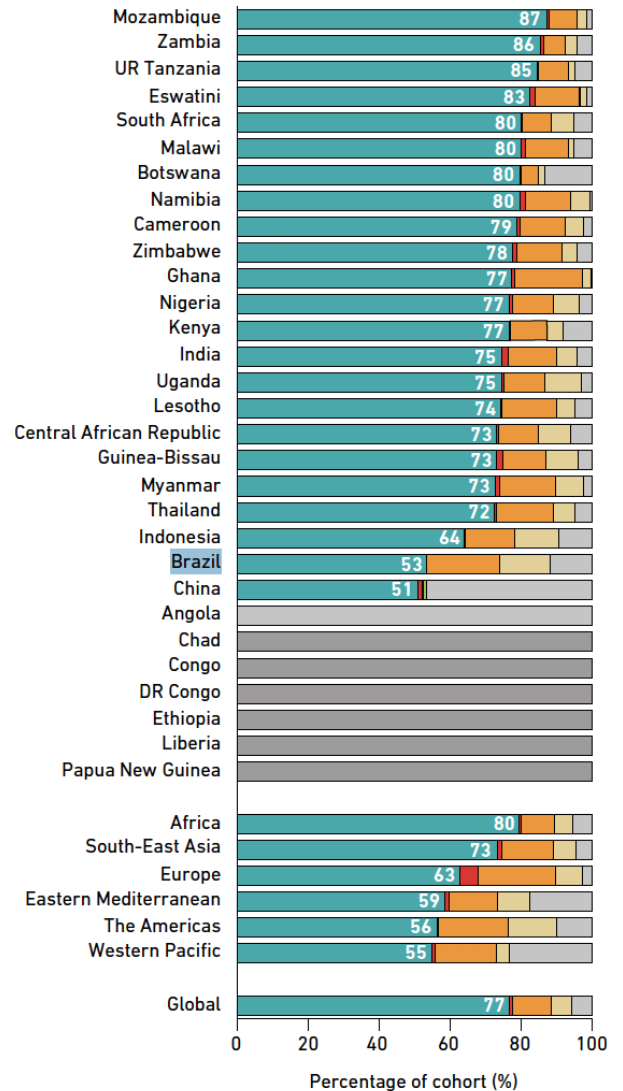
POPULATION 2017 209 MILLION



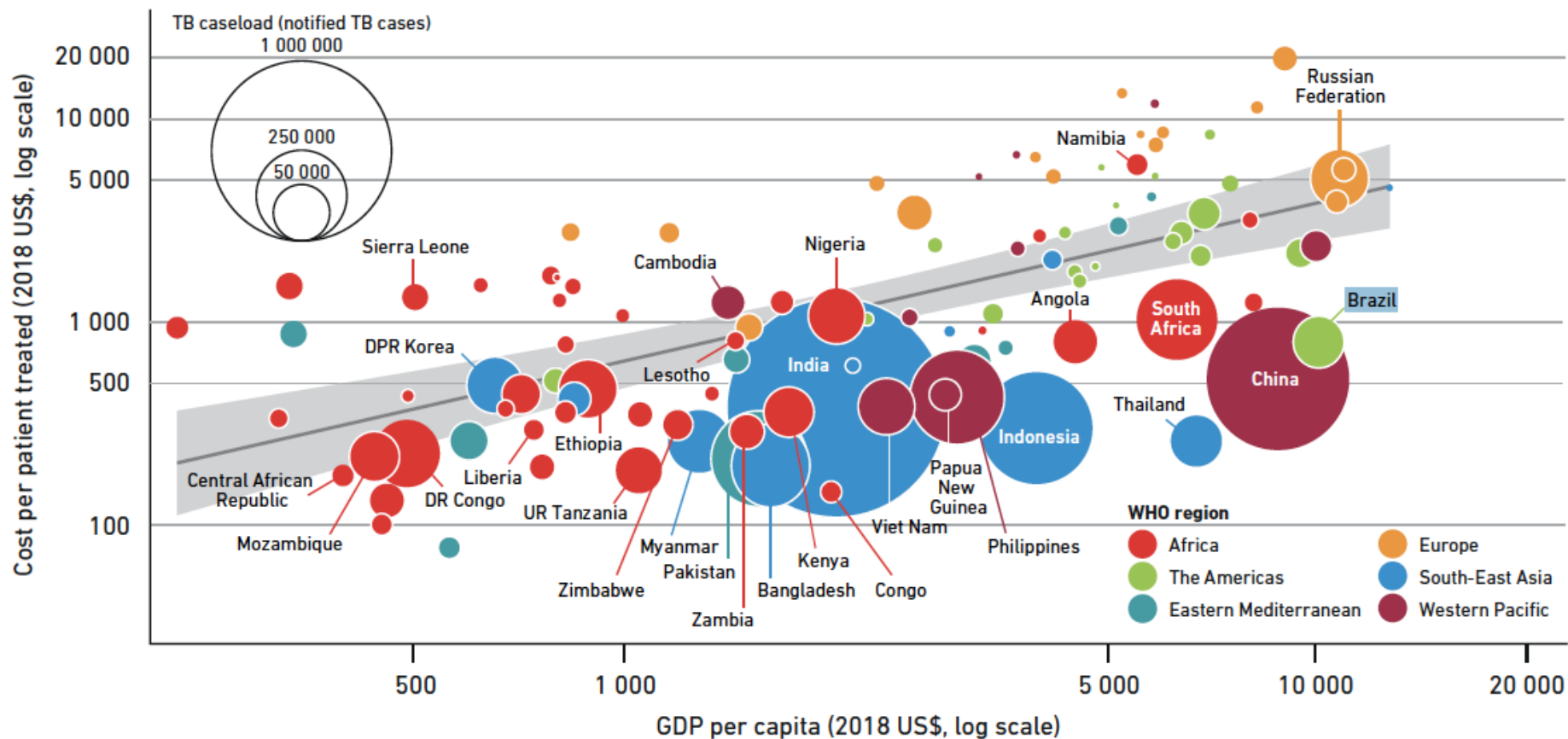
Treatment outcomes for new and relapse TB cases in 2016, 30 high TB burden countries, WHO regions and globally



Treatment outcomes for new and relapse HIV-positive TB cases in 2016, 30 high TB/HIV burden countries, WHO regions and globally

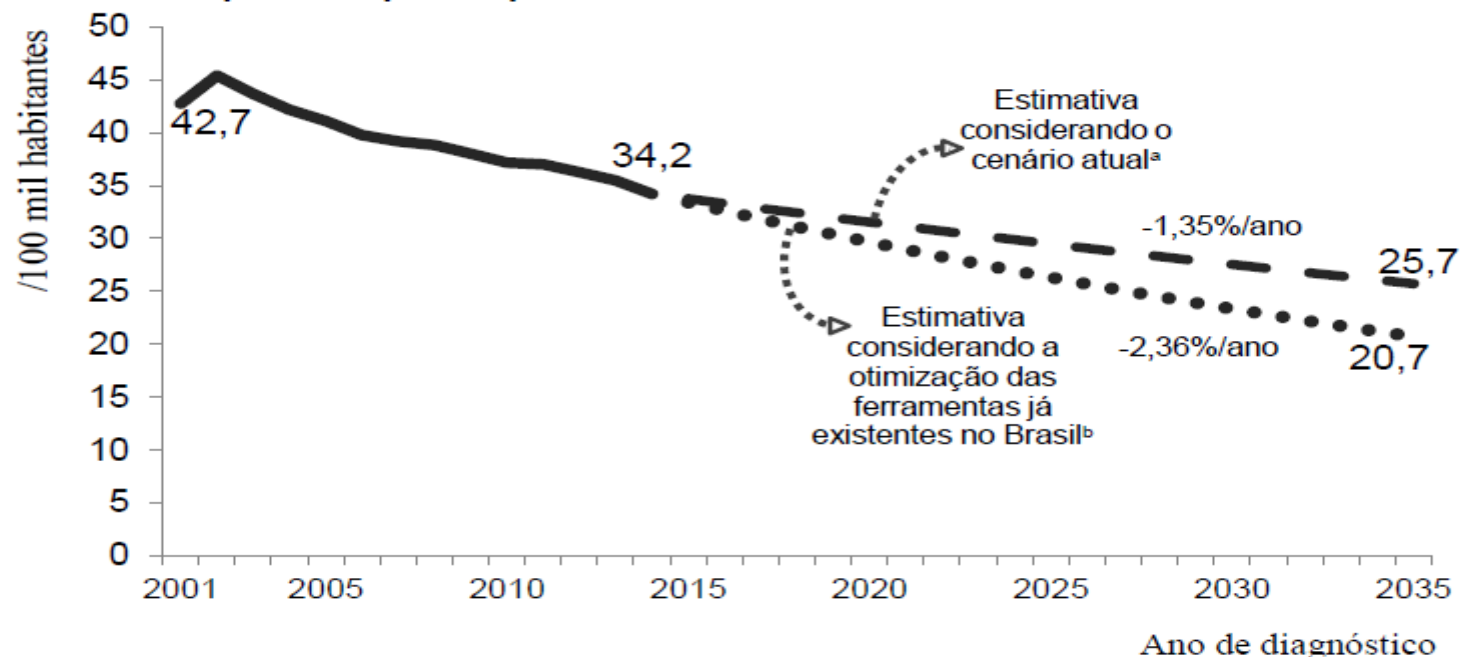


Estimated cost per patient treated for drug-susceptible TB in 113 countries, 2017^a



^a Limited to countries with at least 100 patients on first-line treatment in 2017.

Figura 4 - Coeficiente de incidência de tuberculose no Brasil: valores observados de 2001 a 2014 e preditos para o período 2015 a 2035



Fonte: Boletim Epidemiológico 2016

^a Modelo de Poisson se o cenário atual das variáveis ano, coeficiente de incidência de aids, ESF e TDO, não sofrer alteração dos valores observados em 2014.

^b Modelo de Poisson ajustado por ano com a melhoria progressiva até 2035 das variáveis: coeficiente incidência de aids para 10/100 mil hab., ESF para 90,0% e TDO para 90,0%.

Brazil

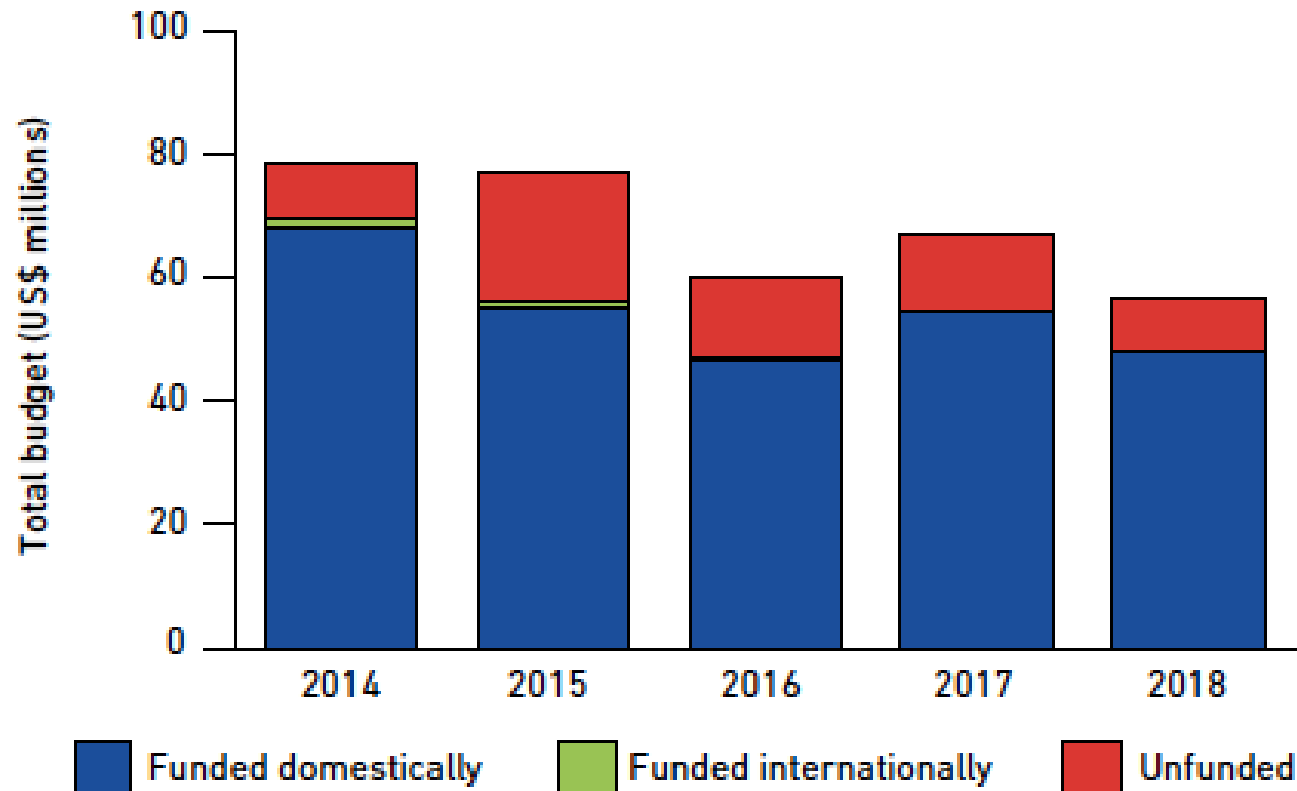
TB FINANCING, 2018

National TB budget (US\$ millions)

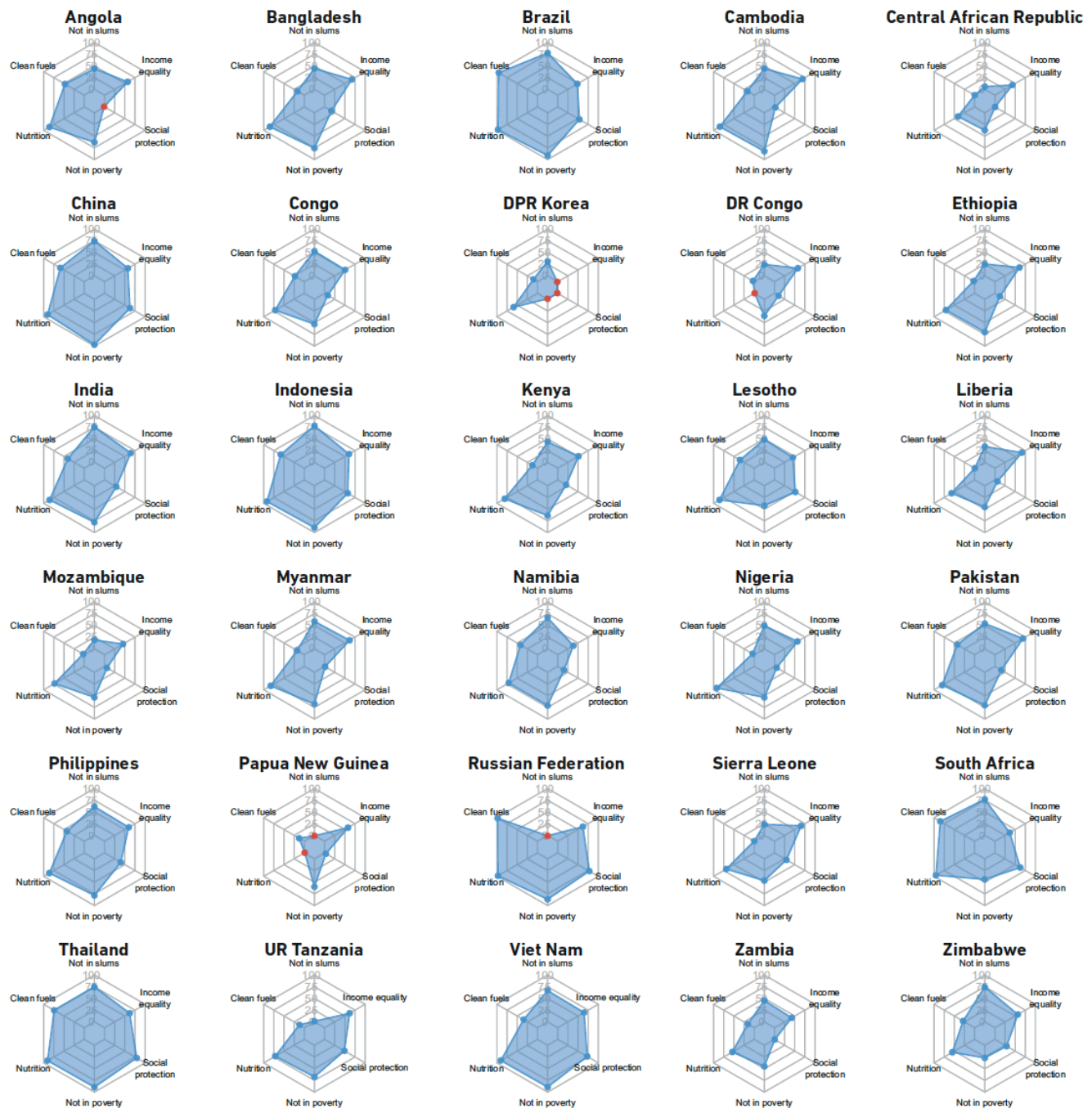
57

Funding source:

85% domestic, 0% international, 15% unfunded



Status of selected SDG indicators beyond SDG 3, 30 high TB burden countries, latest available year^a



PILAR 3 – Intensificação da pesquisa e inovação

OBJETIVOS

ESTRATÉGIAS

Estabelecer parcerias para fomentar a realização de pesquisas no País em temas de interesse para saúde pública

- Fortalecer a integração dos programas de controle da tuberculose com instituições acadêmicas e sociedade civil.
- Participar da implementação da agenda prioritária de pesquisas de tuberculose em todas as esferas de governo.
- Fomentar parcerias intersetoriais para promover a realização de pesquisa em tuberculose.
- Apoiar o desenvolvimento científico e tecnológico no País.
- Incentivar a divulgação dos resultados das pesquisas desenvolvidas.

Promover a incorporação de iniciativas inovadoras para aprimorar o controle da tuberculose

- Estimular a utilização dos resultados das pesquisas no enfrentamento da tuberculose.
- Estimular a troca e a implantação de experiências exitosas das ações de controle entre os programas de controle da tuberculose.
- Incorporar, de maneira oportuna, novas tecnologias de diagnóstico.
- Incorporar, de maneira oportuna, novos medicamentos aos esquemas de tratamento da doença ativa e infecção latente.

Fonte: Coordenação-Geral do Programa Nacional de Controle da Tuberculose.

Inovação em Saúde. 1980-2016

- 7ª Economia do Mundo
- 4º Mercado Farmacêutico (US\$ 26.2 bilhões)
- Ministério da Saúde prioriza provimento de assistência de qualidade, e nas últimas décadas, a incorporação de tecnologias estrangeiras
- Ministério da Saúde não prioriza o desenvolvimento e produção de tecnologias (vacinas, medicamentos, insumos e equipamentos), em nível nacional
- Nas últimas décadas, houve baixa interação entre Ministério da Saúde e outros Ministérios: Educação, Ciência Tecnologia e Indústria e Comércio

Inovação em Saúde. 1980-2016

Resultado

- Baixa competitividade internacional do setor privado em biotecnologia
- Baixa disponibilidade de profissionais para atuar nas indústrias (Academia na Saúde não interage com indústria nacional)
- Dificuldades no Sistema Regulatório
- Academia e Sistema Saúde não priorizam Sistema de Gestão de Qualidade (raros Laboratórios ou Unidades de Saúde Públicas com acreditação/habilitação pelo INMETRO ou ANVISA)
- **Importamos mais do que exportamos**

Saúde e Desenvolvimento Nacional

Déficit no Patamar de US\$ 11,5 bilhões

BALANÇA COMERCIAL DO SETOR DE SAÚDE
2006-2014



Evolução da Balança Comercial da Saúde
(valores em US\$ bilhões - IPC/ EUA)

PESQUISA TB NO BRASIL (1980-2000)

- Privado
- Publico
- Industrias
- Institutos de Pesquisa

MDIC

MCT

Sociedade Civil

Pesquisadores

- Stop TB
- ONGs-Advocacy
- Associações Biomedicas

- UNION
- USAID
- PAHO
- MSH
- Gates
- Dawn

Org Int.

Ausência de Coordenação

PNCT - Fiocruz
MS

MEC
Universidades
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MCT: Ministerio da Ciencia e Tecnologia; **MS:** Ministerio da Saude **MEC:** Ministerio da Educação; **MDIC:** Ministry of Industry and Trade **Sociedade Civil:** ONGs, Conselhos de Saude, Associações Profissionais

PESQUISA TB NO BRASIL (2001-2016)

- Privado
- Publico
- Industrias
- Institutos de Pesquisa

MDIC

MCT

Sociedade Civil

- UNION
- USAID
- PAHO
- MSH
- Gates
- Dawn

Org Int.

Pesquisadores

- Stop TB Parceria Brasileira
- ONGs-Advocacy
- Associações Biomedicas

Rede TB

PNCT - Fiocruz

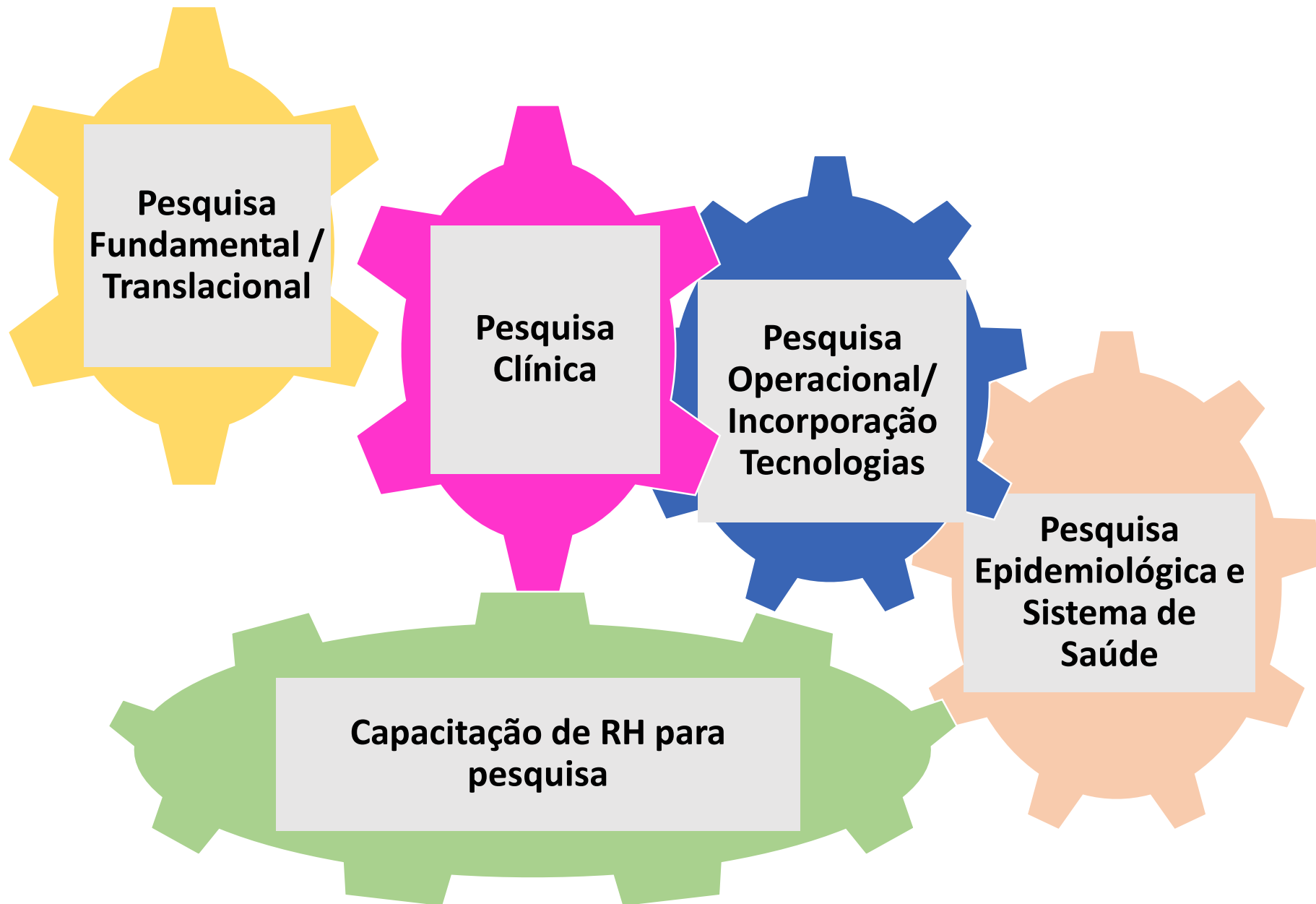
MS

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Plataformas de Pesquisa da Rede TB



Atividades da Rede TB

- Prioridade não deve ser apenas importar e incorporar tecnologias
- Urgente plano B, caso não possamos comprar as tecnologias, hoje subsidiadas. Focar numa proposta de Estado, a longo prazo
- Transferência de tecnologia de Universidades / Instituições de Pesquisa para Indústria Nacional
 - Novo Medicamento
 - Novos testes diagnósticos - Ex: Kit Detect TB

Plano Global de 5 anos (até 2020)

Propostas para países de nível médio de desenvolvimento

1. Estabelecer Rede Nacional de Pesquisa em TB (2001)
2. Desenvolver Agenda Nacional de Pesquisa (2015)
3. Elaborar Plano de Capacitação para Pesquisa
4. Desenvolver Mecanismos de financiamento nacional para Pesquisa em TB
5. Integrar atividades de Pesquisa com outros países

Resposta do Brasil ao Plano Global de Eliminação de TB (2015)

- Desenvolvida a Agenda Nacional de Pesquisa - – Junho 2015
- **73 Projetos de Pesquisa foram identificados**



Revista da Sociedade Brasileira de Medicina Tropical 49(1):, Jan-Feb, 2016
<http://dx.doi.org/10.1590/0037-8682-0330-2015>

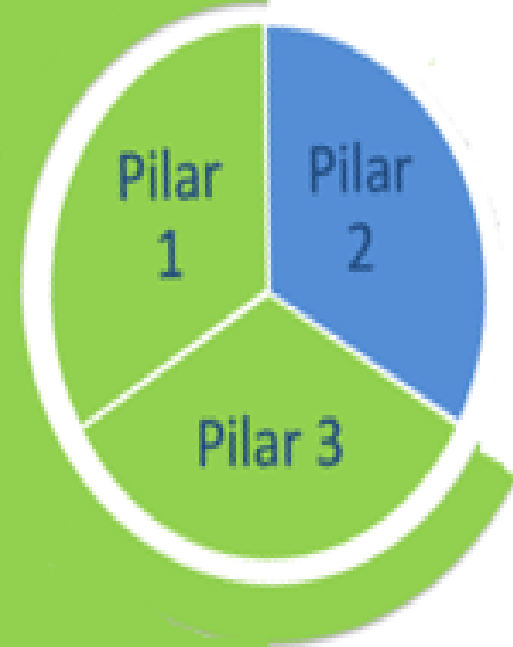
Technical Report

Brazilian Response to *Global End TB Strategy*: The National Tuberculosis Research Agenda

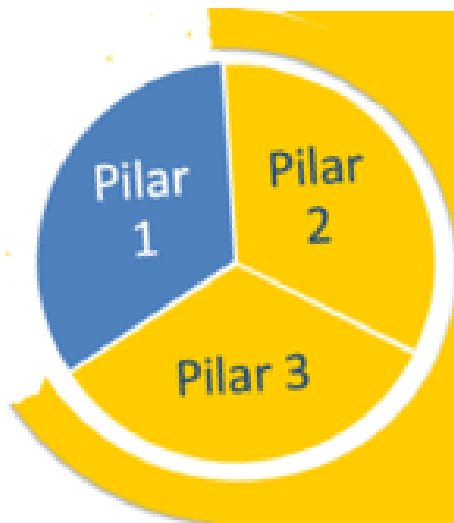
Afranio Kritski^{[1],[2]}, Draurio Barreira^[3], Ana Paula Junqueira-Kipnis^{[1],[4]}, Milton Ozorio Moraes^[5], Maria Martha Campos^{[1],[6]}, Wim Mauritz Degrave^[7], Silvana Spindola Miranda^{[1],[8]}, Marco Aurelio Krieger^{[1],[9]}, Erica Chimara^{[1],[10]}, Carlos Morel^[11], Margareth Pretti Dalcolmo^{[1],[12]}, Ethel Leonor Noia Maciel^{[1],[13]}, Maria do Socorro Nantua Evangelista^{[3],[14]}, Teresa Scatena Villa^{[1],[15]}, Mauro Sanchez^{[1],[16]}, Fernanda Dockhorn Costa^[3], Inacio Queiroz^[17], Martha Maria Oliveira^{[1],[11]}, Ruy Souza Junior^[3], Jose Roberto Lapa e Silva^{[1],[2]} and Antonio Ruffino-Netto^{[1],[18]}

Interação entre os Pilares 1 e 3

- Pesquisa operacional (avaliação de atividades programáticas)
- Pesquisas epidemiológicas
- Análise de situação em saúde
- Avaliação de Tecnologias em Saúde
- Pesquisa avaliativa/Avaliação em Saúde



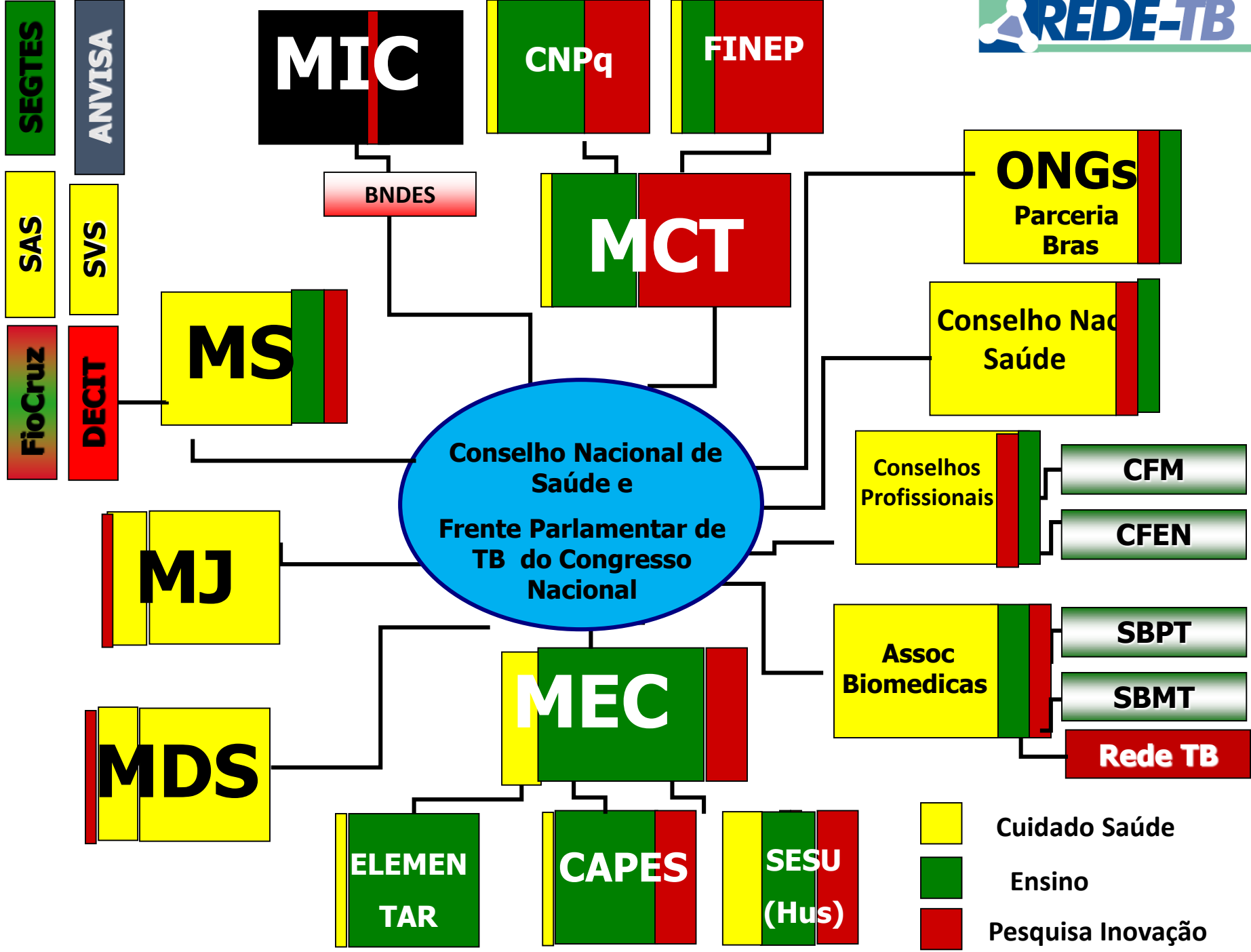
Interação entre os Pilares 2 e 3



- Pesquisas em Proteção Social
- Epidemiologia / Pesquisa Social
- Avaliação de Políticas Públicas

Pilar 3 - BRASIL

- Criar **Comitê Nacional de Ciência Tecnologia e Inovação em TB**, para auxiliar na implementação e monitoramento do Plano Nacional pelo Fim da TB
- Alocação de **financiamentos para Capacitação de RH em Pesquisa e realização das pesquisas** identificadas como prioritárias
- Participar na implementação e monitoramento da **Rede de Pesquisa em TB dos BRICS, aprovada em dezembro 2016**



Creation BRICS TB Research Network

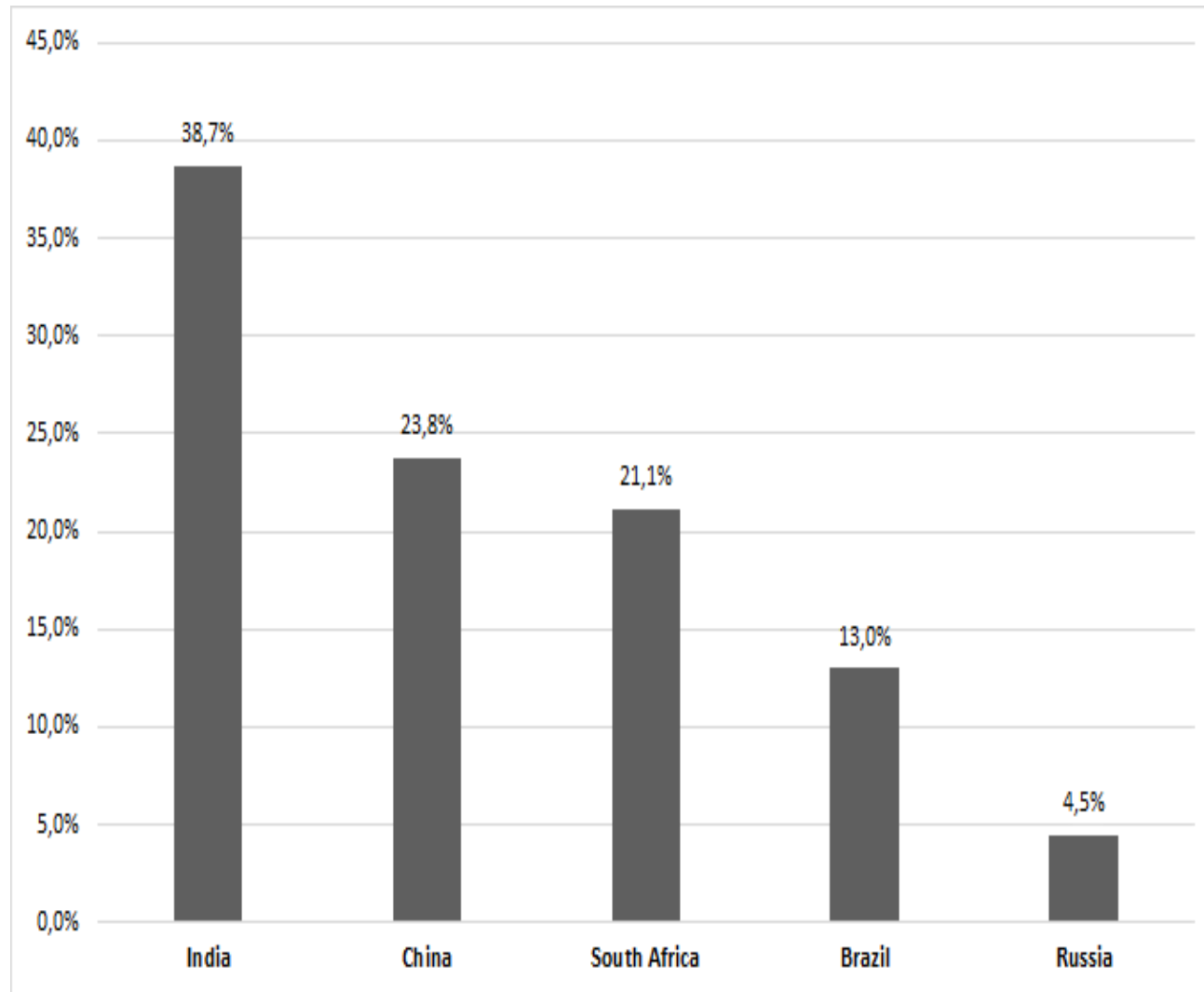


Sept 12-13– Created the BRICS TB Research Network in Rio de Janeiro

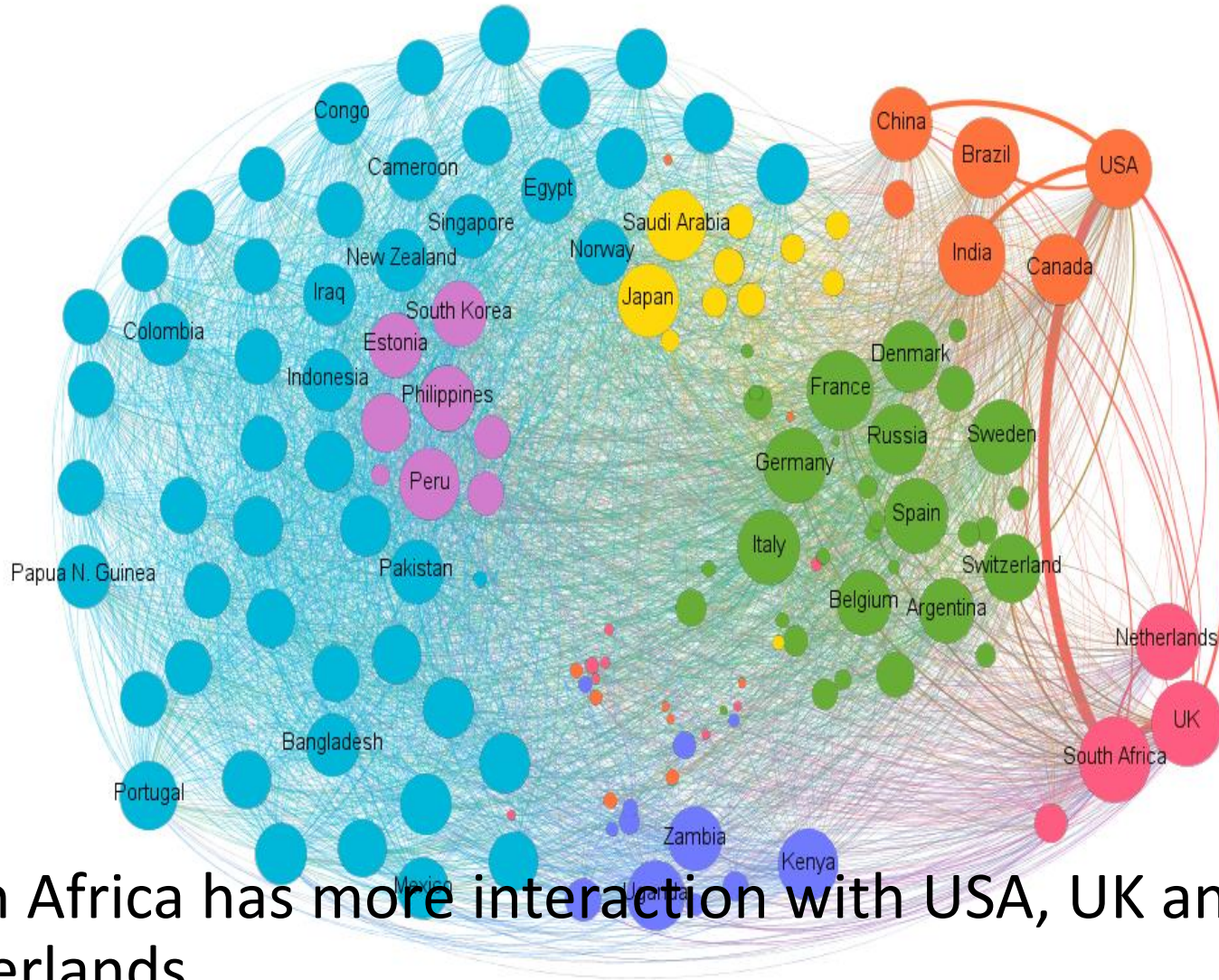
<http://www.redetb.org/index.php/296-estabelecimento-da-rede-de-pesquisa-em-tuberculose-dos-paises-pertencentes-ao-brics-brasil-russia-india-china-e-africa-do-sul>

Publicações científicas em Tuberculose entre os BRICS, 2000-2016

- Índia e China tem maior proporção de publicações
- BRICS corresponde a 30% da publicação mundial

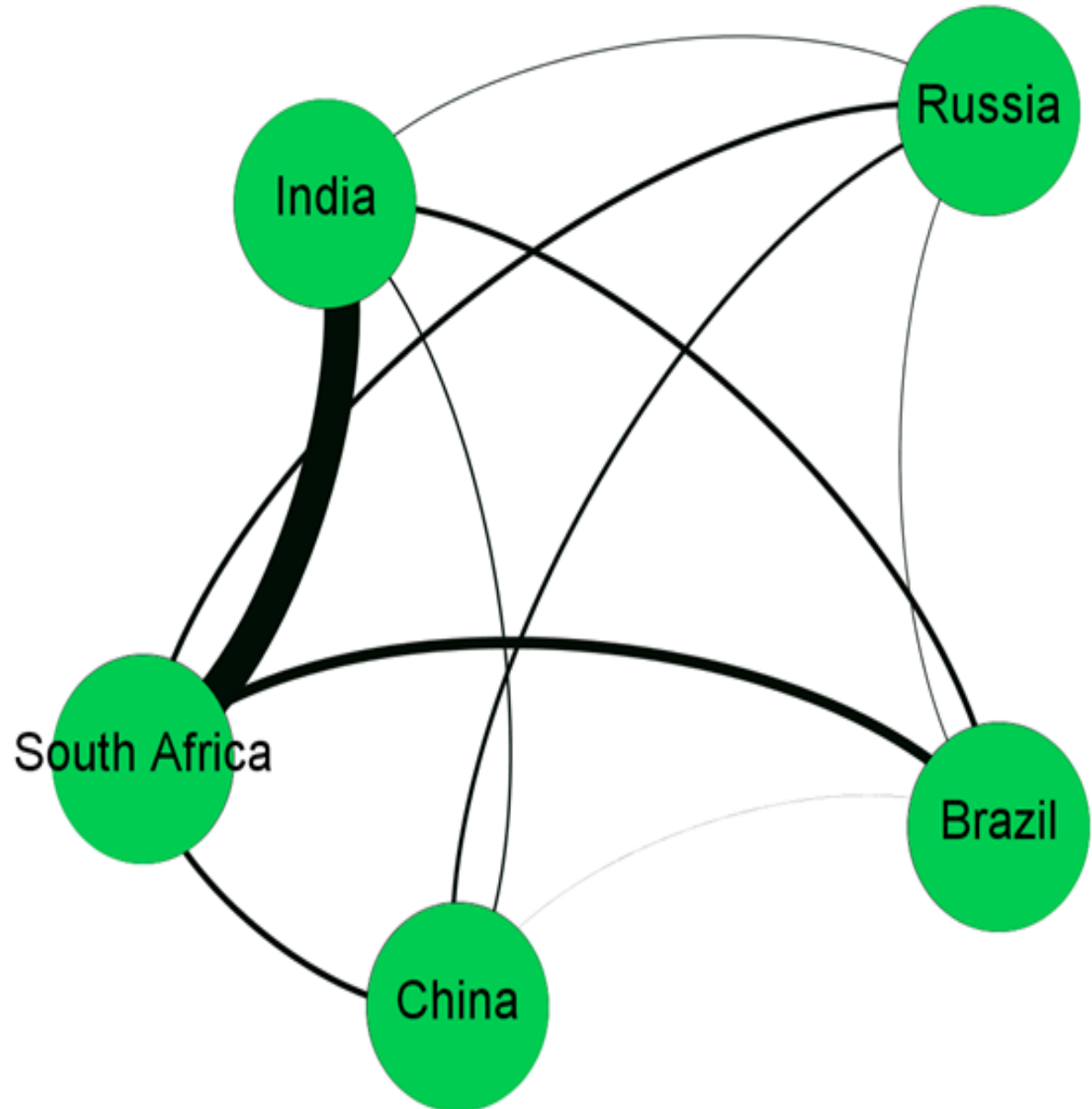


BRICS: country co-authorship network



BRICS: network of BRICS countries only

- India and South Africa have major interaction among BRICS countries
- Research relationships among BRICS countries are not so strong



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www.redetb.org