

The Global Partnership  
to Stop TB



# Special Session on Vaccines

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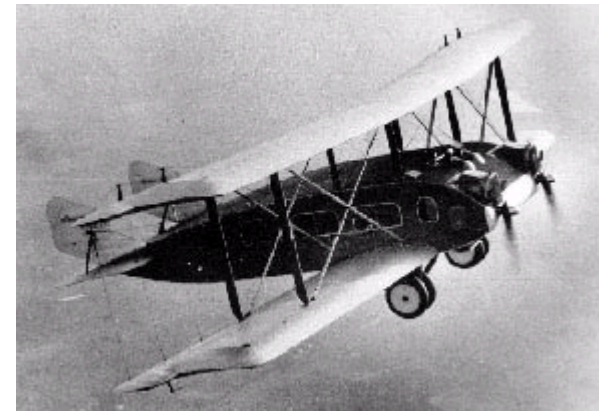
Stop TB Partnership Coordinating Board Meeting  
Johannesburg, South Africa  
15 October 2010



# Need for a New Vaccine



## BCG introduced in 1921



- BCG provides unreliable protection against pulmonary TB, which accounts for most TB disease worldwide
- BCG is not known to protect against latent TB
- BCG is not recommended for use in infants infected with HIV due to increased risk for severe BCG-related complications
- Despite wide use, particularly in high burden countries, BCG has had no apparent impact on the growing global TB epidemic
- BCG does reduce risk of severe pediatric TB disease, so it should continue to be used until a better TB vaccine is available

# Goals for New TB Vaccines



- Contribute to global health target to eliminate TB as a public health threat ( $<1$  case/million), as part of a comprehensive TB control strategy
- Safe and effective in preventing TB in children, adolescents and adults, including people with HIV
- Protect against all forms of TB – including MDR and XDR
- Reduce the cost and burden of TB on patients, health care systems and national economies





# Strategy for New TB Vaccines



## ■ Types of Vaccines

- Preexposure
- Postexposure
- Immunotherapy

## ■ Prime-Boost Strategy

- Boost BCG or a recombinant BCG (rBCG) with a second, different vaccine designed to extend and enhance immune protection
- Replace BCG with a recombinant BCG (rBCG) or attenuated live M.tb vaccine as the prime

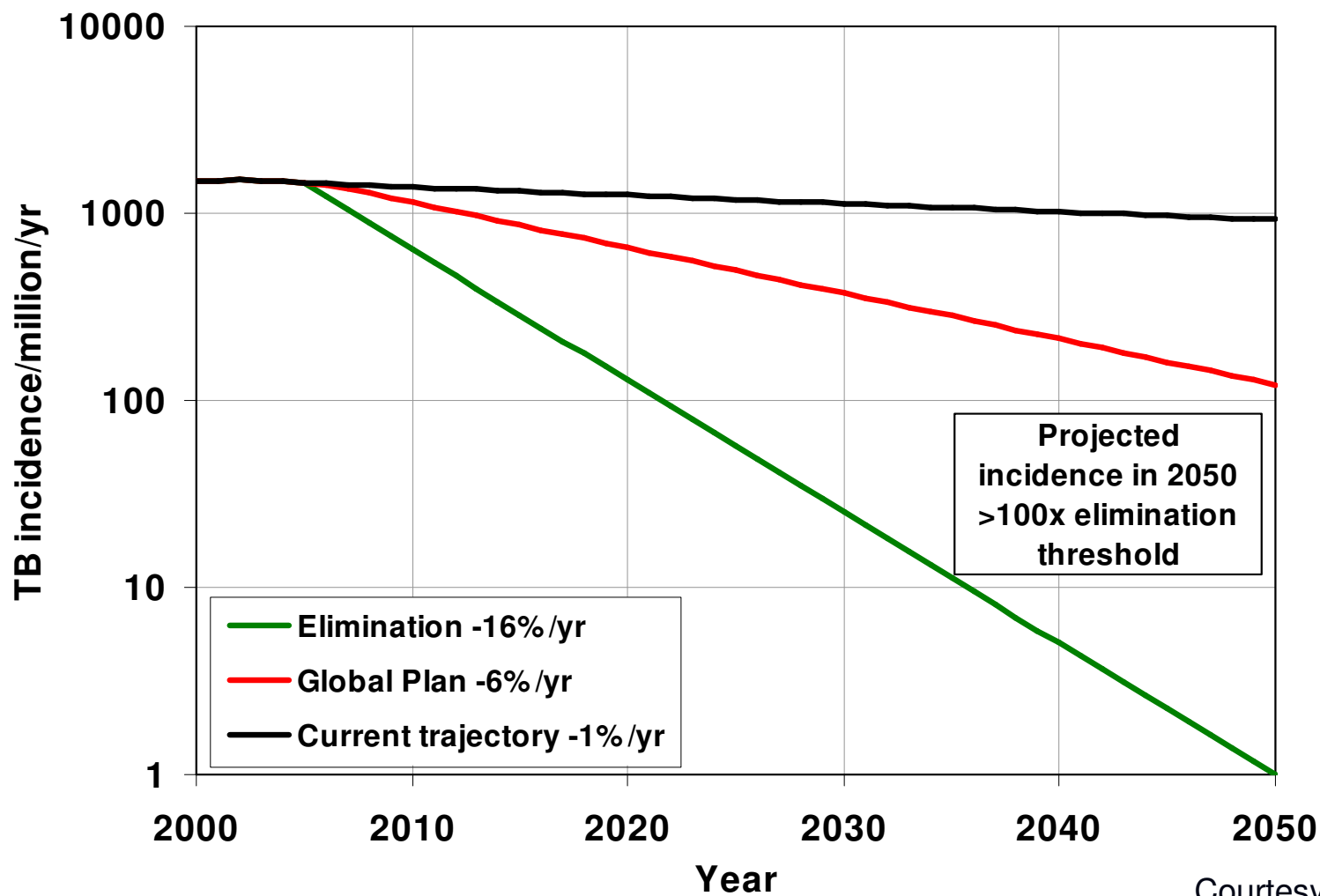


# Progress in TB Vaccine Development



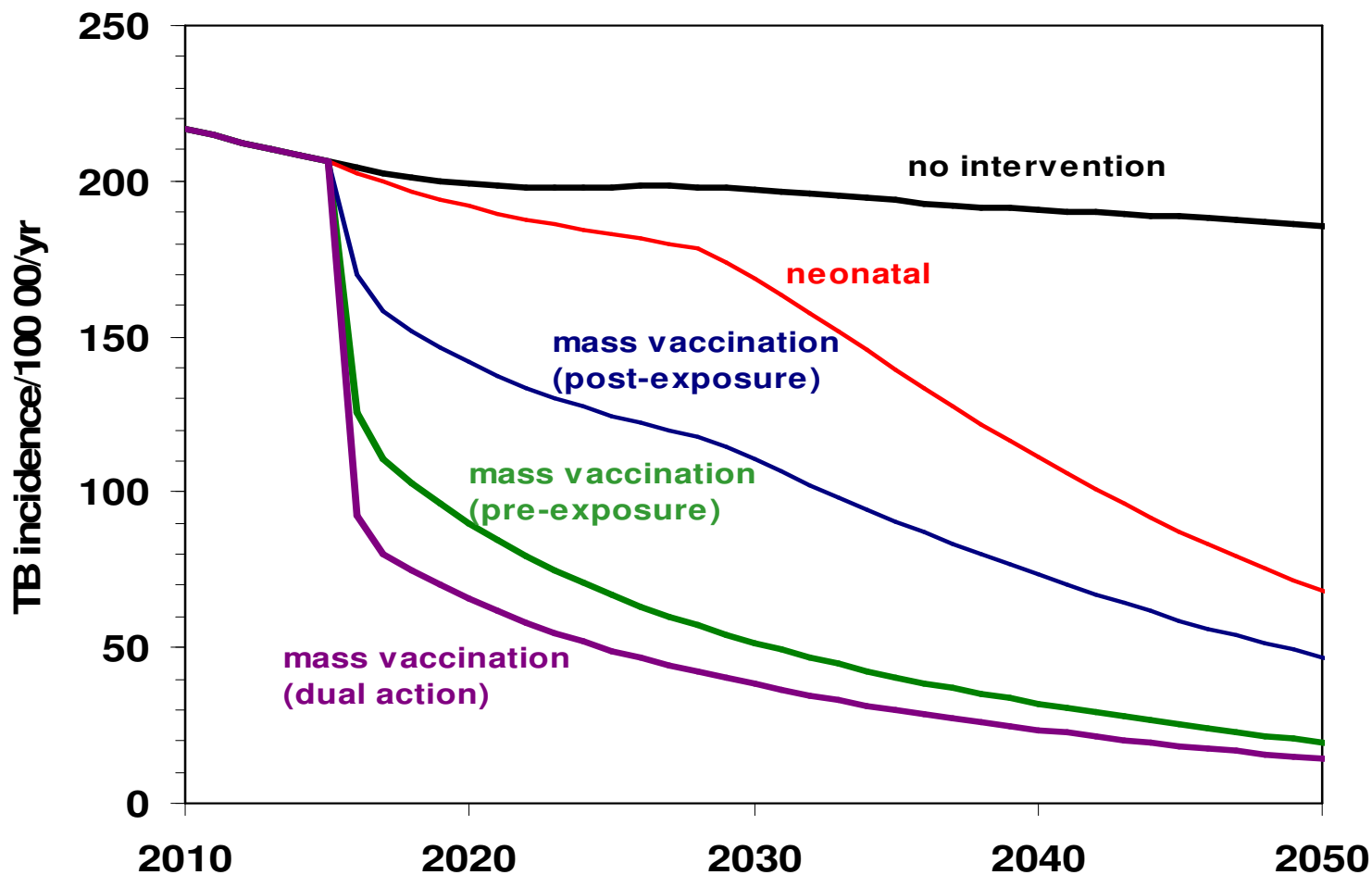
- 12 candidates have entered clinical trials; 9 are currently being tested; a 10<sup>th</sup> will enter trials this year
- Robust pipeline of candidates in preclinical development
- Capacity and infrastructure developed or being developed at several sites, including South Africa, Kenya, Uganda, Mozambique, Ethiopia, Senegal and the Gambia
- Manufacturing capacity being developed and manufacturing agreements are being explored with particular emphasis on emerging economies
- Regulatory pathways and market and economic impact research being conducted now to lay the groundwork to accelerate adoption and uptake of new TB vaccines

# Progress Needed to Eliminate TB by 2050



Courtesy Chris Dye, WHO

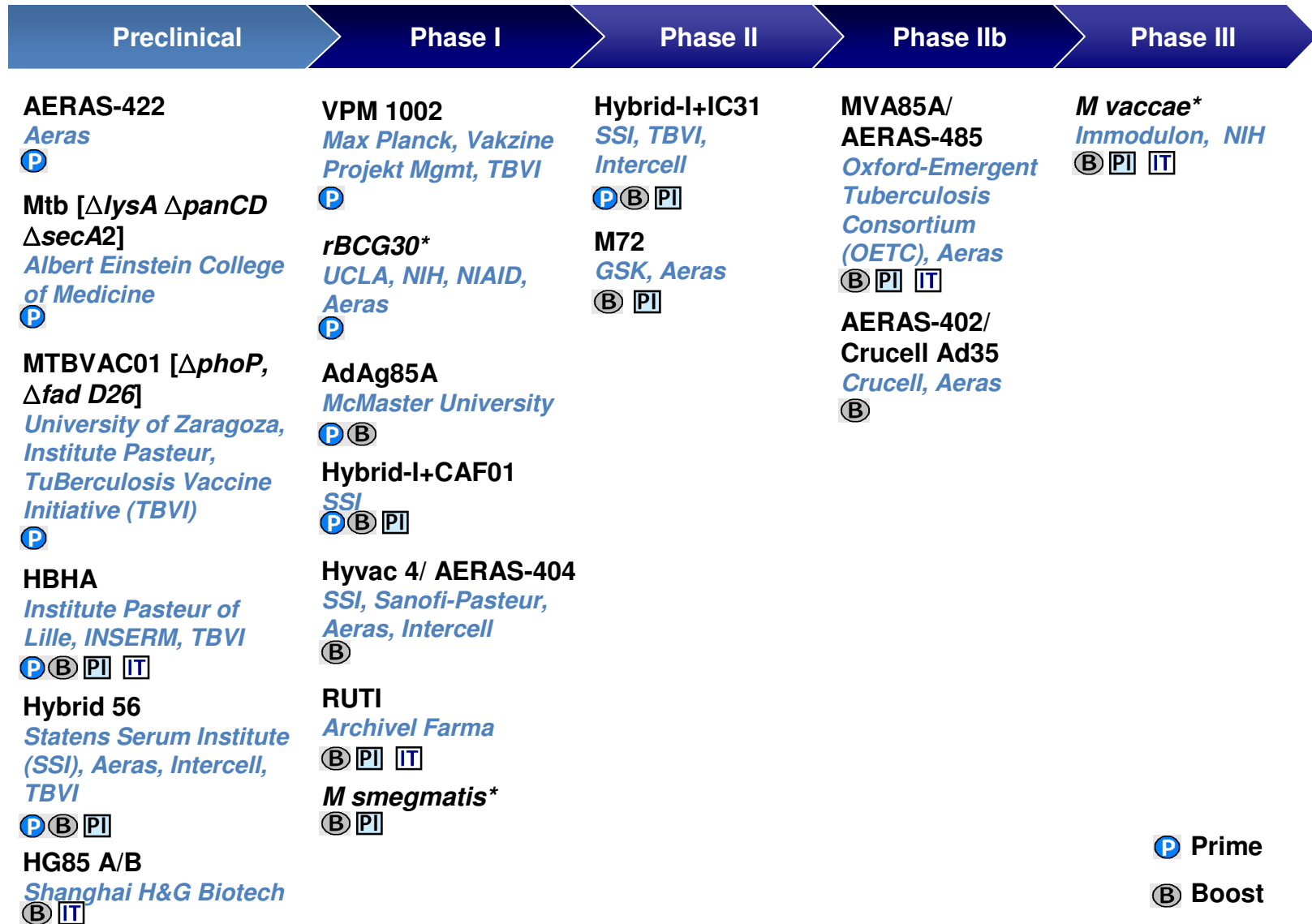
# Predicted Impact of a 50% Effective New TB vaccine



Young and Dye Cell 2006

# TB Vaccine Pipeline

As of November 2009



 Prime

 Boost

 Post-infection

 Immunotherapy

Preclinical vaccine candidates are not yet in clinical trials, but have been manufactured under Good Manufacturing Practice (GMP) for clinical use and have undergone some preclinical testing that meets regulatory standards.

\*indicates candidates that have been in clinical trials in the past, but are not currently being tested in clinical trials

Source: Tuberculosis Vaccine Candidates – 2009; Stop TB Partnership Working Group on New TB Vaccines



# South African Contributions to TB Vaccine Development



- Vaccine preparedness studies were conducted in over 25,000 infants and adolescents in Western Cape
- Phase I, II and IIb studies of 5 vaccine candidates are being conducted in South Africa
- Participating in global efforts to better understand the immune response to TB
- Conducting research to better understand BCG
- UCT has the most advanced site for large-scale TB vaccine trials in the world, located in Worcester

## South African Institutions Involved in TB Vaccine Research

- South African Tuberculosis Vaccine Initiative, University of Cape Town
- Aurum Institute
- University of Cape Town Lung Institute
- Farmovs-Parexel
- Triclinium
- Stellenbosch University
- HJ-CTC George
- Aeras Global TB Vaccine Foundation, Africa Office

# **TB Vaccines**

**A Second Global Forum**



- Forum held in Tallinn, Estonia on 21-24 September 2010
- 200 participants from 31 countries
- Discussed next decade of TB vaccine development activities and priorities
- Participant survey and interactive workshops will form basis for *Blueprint for TB Vaccine Development* in 2011

# Blueprint for TB Vaccine Development



The *Blueprint for TB Vaccine Development* will identify transformational ideas and innovative mechanisms to achieve targets identified in the Global Plan and provide guidance to the TB vaccine research community over the next decade

## Process:

- Initiated at the 2<sup>nd</sup> Global Forum on TB Vaccines, Tallinn, 21-24 Sept 2010 and will conclude by the end of 2011
- Blueprint will be coordinated by Stop TB Partnership Working Group on New TB Vaccines with input from a variety of stakeholders including Stop TB Partnership Research Movement

# Priorities for TB Vaccine Development



## ■ **Discovery and Basic Research**

- Maintain a robust TB vaccine pipeline
- Develop vaccines that address multiple targets in all age groups, including latency and prevention of infection, safety in HIV+, and drug-resistance

## ■ **Translational and Preclinical Research**

- Identify biomarkers that shorten clinical trials and reduce timeframes for regulatory approval
- Better understand natural immunity to accelerate vaccine development and strengthen pipeline



# Priorities for TB Vaccine Development



## ■ Clinical Trials

- Increase site capacity to conduct Phase III TB vaccine trials
- Clinical development paths for multiple target populations (infants, adolescents/adults, HIV+)

## ■ Manufacturing Capacity

- Ensure sufficient capacity in place for large-scale trials and global distribution
- Role of emerging economies in manufacturing and distribution

## ■ Regulatory and Access Strategies

- Accelerated regulatory strategies for new TB vaccines
- Role of WHO in facilitating TB vaccine acceptance and adoption

# Priorities for TB Vaccine Development



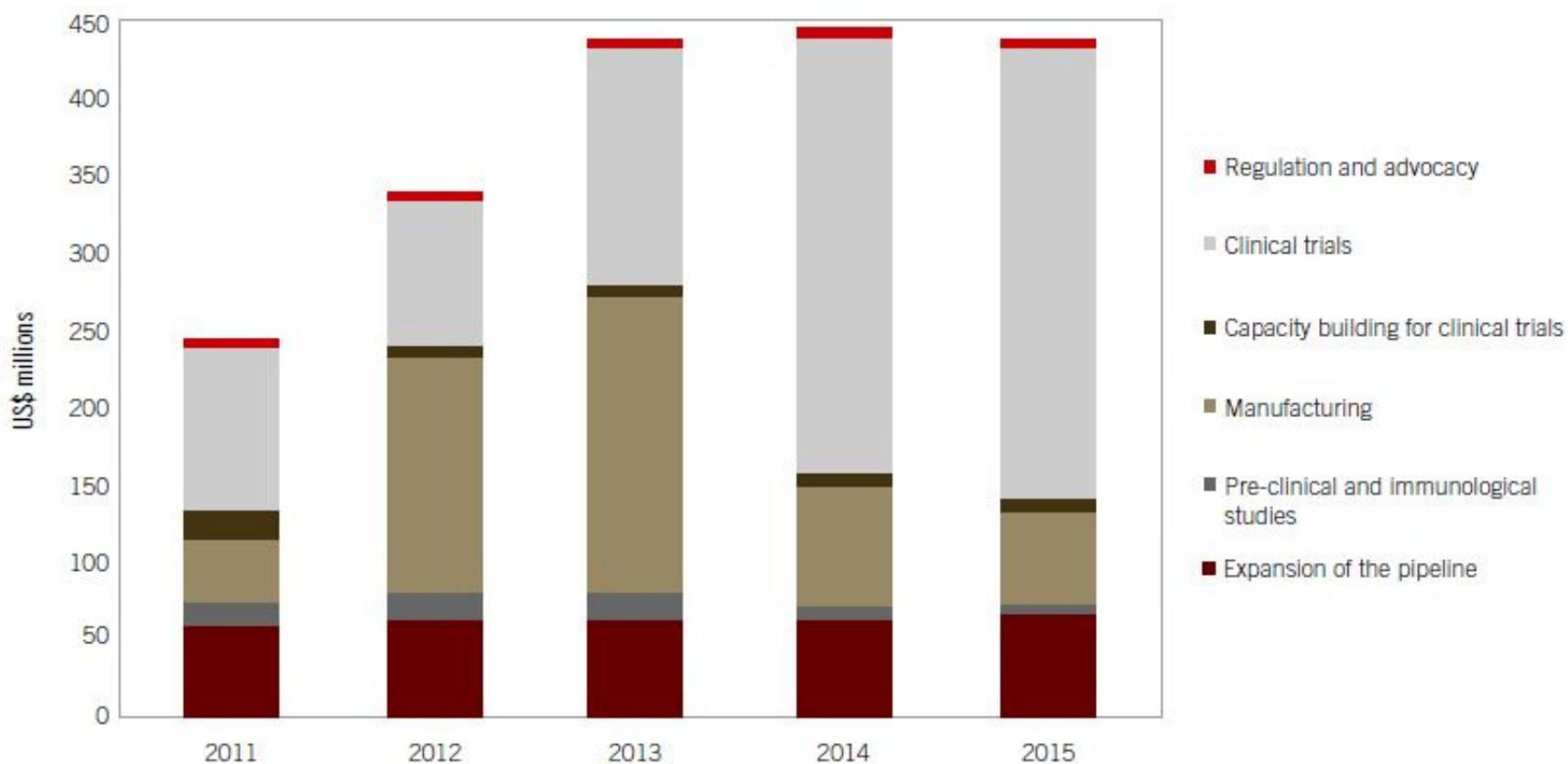
## ■ Advocacy and Resource Mobilization

- Need to raise awareness and support for potential of new TB vaccines to control and eliminate TB
- Mobilize sufficient resources to support and accelerate TB vaccine development

# Funding Needs 2011-2015: US\$1.9B



FIGURE 8 FUNDING REQUIRED FOR NEW VACCINES



Source: Global Plan to Stop TB 2011-2015

# Market Research: Barriers and Drivers to Introduction of New TB Vaccines



## Key Project Elements

- Market study to analyze acceptability of 3 new pre-exposure vaccine scenarios
- Interviews conducted in 8 high TB burden countries: Brazil, Cambodia, China, India, Mozambique, Romania, Russia, South Africa



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# Market Research: Barriers and Drivers to Introduction of New TB Vaccines



## Key Barriers and **Drivers**, lessons learned:

- Wide recognition that TB is serious and neglected problem; MDR-TB threat
- Widespread dissatisfaction with current BCGs
- Likely demand for partially effective vaccine better than BCG
- Willingness to commit to rapid introduction
- FDA or EMEA approval will speed adoption
- Willingness to spend money out of existing budgets for prime-boost; private sector



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# Market Research: Barriers and Drivers to Introduction of New TB Vaccines



Key **Barriers** and Drivers, lessons learned

- Clarify expected benefits (20-30) years
- **Fatalism about TB** – lack of political will and competing priorities, e.g., HIV/AIDS
- Waiting for **strong efficacy** data, especially in own country
- Some resistance, to adolescent boosting (transient populations)
- Some skepticism about aerosol delivery

# Market Research: Barriers and Drivers to Introduction of New TB Vaccines



## Key Barriers, Drivers, **Lessons Learned**

- Heterogeneity of responses within and between countries
- **Strong efficacy data** will be a critical success factor for introduction, including in-country data
- Cost, if kept low, not likely to be major issue; not an issue in private markets
- Education and preparation will be necessary, but raising awareness and expectations too high needs to be avoided

# Access to New TB Vaccines



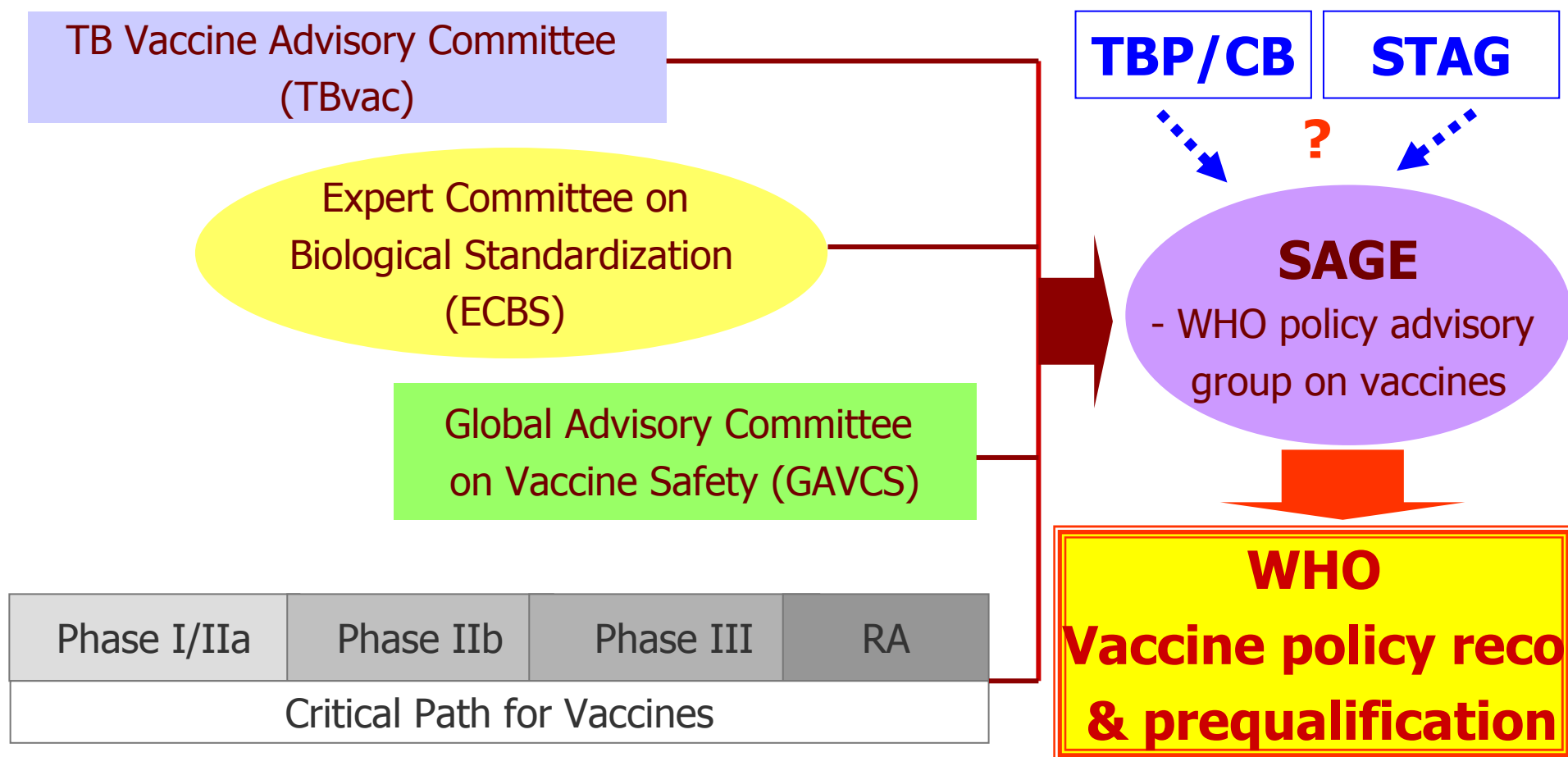
- **Strengthen existing EPI** systems to include new TB vaccines and extend the system to adolescent/ adult vaccination
- **Licensure:** consider appropriate and innovative licensure procedures to accelerate access to market
- **In the field:** strengthen health systems and identify innovative approaches to allow for mass vaccinations
- **Price:** find the “reasonable” balance between affordability, direct and indirect return on investment, societal benefits and sustainable production



# Access to New TB Vaccines



## WHO Policy Pathway for TB Vaccine Development & Use



# Requests from Coordinating Board



- Commitment by Coordinating Board to support *TB Vaccine Blueprint* process
- Provide a statement supporting the designation of TB and TB vaccine products for the prevention of TB, to be included in the TB vaccine discussions at the spring 2011 Strategic Advisory Group of Experts (SAGE) meeting
- Call upon the donor community to expand the financial basis for research, development and delivery of new TB vaccines