

# TB Research Challenge in Indonesia

Erlina Burhan

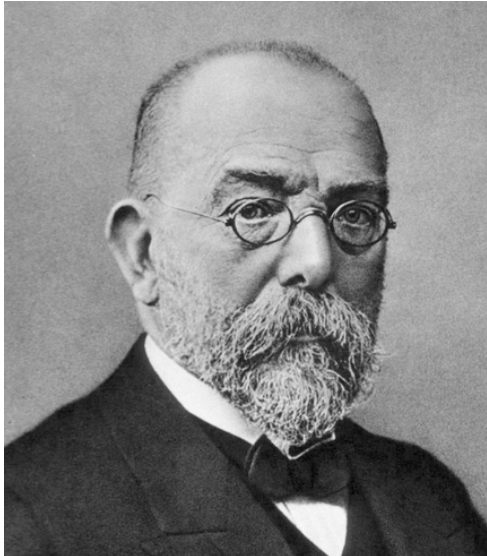
Department of Pulmonology and Respiratory  
Medicine, Faculty of Medicine University of  
Indonesia/ Persahabatan Hospital

**Thanks to two innovators:**

**..... but the world has changed.**

*“....for the control of the disease, the sources from which the infectious material flows must be closed as far as is humanly possible.....”*

*Robert Koch*



*the most essential one, is the sputum of consumptives.”*

*Karel Styblo*

***70% case detection***

***85% treatment success***



Courtesy of D. Manissero

# WHO End TB Strategy

---

## VISION:

- **A WORLD FREE OF TB**

*Zero deaths, disease and suffering due to TB*

## GOAL:

- **End the Global TB Epidemic**

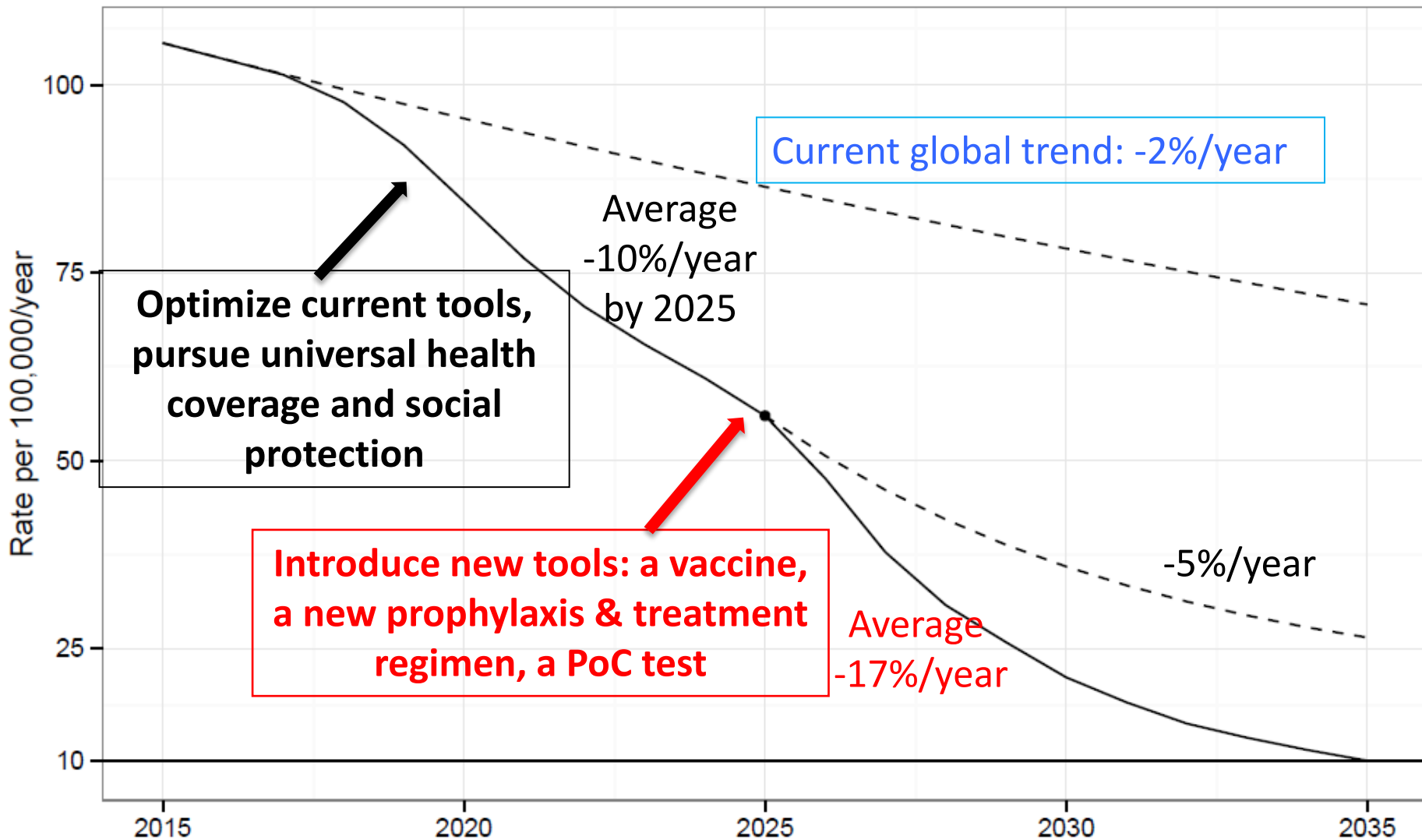
## TARGETS FOR 2035:

- **95% reduction in TB deaths (compared with 2015)**
- **90% reduction in TB incidence rate ( $\leq 10/100,000$ )**
- **No affected families face catastrophic costs due to TB**

## MILESTONES FOR 2025:

- **75% reduction in TB deaths (compared with 2015)**
- **50% reduction in TB incidence rate ( $\leq 55/100,000$  (compared with 2015))**
- **No affected families face catastrophic costs due to TB**

# Projected acceleration of TB incidence decline to target levels



## 1. INTEGRATED, PATIENT-CENTRED CARE AND PREVENTION

- A. Early diagnosis of tuberculosis including universal drug-susceptibility testing, and systematic screening of contacts and high-risk groups
- B. Treatment of all people with tuberculosis including drug-resistant tuberculosis, and patient support
- C. Collaborative tuberculosis/HIV activities, and management of co-morbidities
- D. Preventive treatment of persons at high risk, and vaccination against tuberculosis

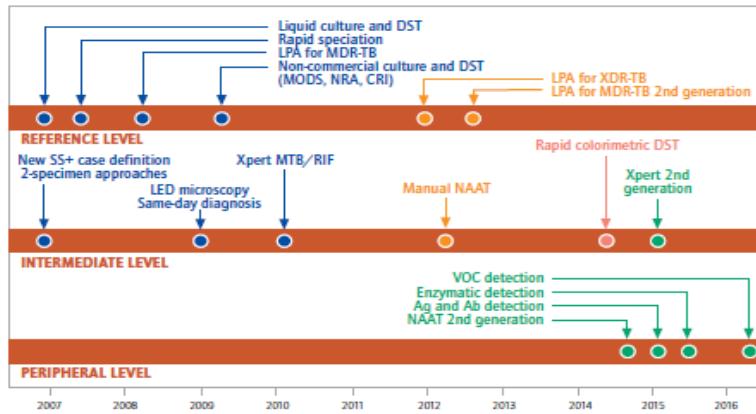
## 2. BOLD POLICIES AND SUPPORTIVE SYSTEMS

- A. Political commitment with adequate resources for tuberculosis care and prevention
- B. Engagement of communities, civil society organizations, and public and private care providers
- C. Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control
- D. Social protection, poverty alleviation and actions on other determinants of tuberculosis

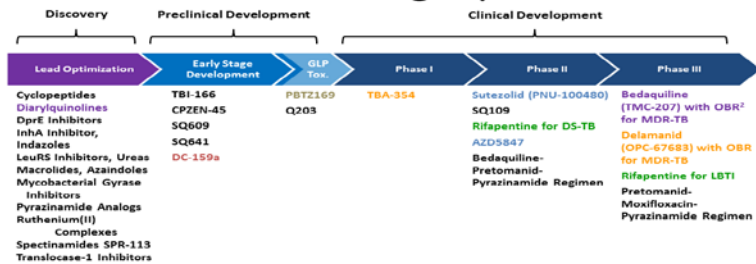
## 3. INTENSIFIED RESEARCH AND INNOVATION

- A. Discovery, development and rapid uptake of new tools, interventions and strategies
- B. Research to optimize implementation and impact, and promote innovations

# What is in the pipelines for new diagnostics, drugs and vaccines in 2015?



## Global TB Drug Pipeline <sup>1</sup>



Chemical classes: fluoroquinolone, rifamycin, oxazolidinone, nitroimidazole, diarylquinoline, benzothiazinone  
<sup>1</sup>Details for projects listed can be found at <http://www.newtbdrugs.org/pipeline.php> and ongoing projects without a lead compound series identified can be viewed at <http://www.newtbdrugs.org/pipeline-discovery.php>



PHASE I	PHASE IIa	PHASE IIb	PHASE III
Ad5 Ag85A McMaster CanSino	VPM 1002 Max Planck, VPM, TBI, SII	MVA85A/AERAS-485 Oxford, Aeras	M. Vaccae Anhui Zhifei Longcom, China
MTBVAC TBI, Zaragoza, Biofabri	H1 + IC31 SSI, TBI, EDCTP, Intercell	M72 + AS01E GSK, Aeras	
ID93 + GLA-SE IDRI, Aeras	RUTI Archivel Farma, S.L		
Cruceil Ad35/MVA85A Cruceil, Oxford, Aeras	H4: IC31 SSI, Sanofi-Pasteur, Aeras, Intercell		
DAR-901 Dartmouth, Aeras	H56: IC31 SSI, Aeras, Intercell		
TB/FLU-04L RIBSP	Cruceil Ad35/AERAS-402 Cruceil, Aeras		

■ VIRAL VECTOR    ■ PROTEIN/ADJUVANT    ■ MYCOBACTERIAL – WHOLE CELL OR EXTRACT  
■ rBCG    ■ ATTENUATED M.Tb

## Diagnostics:

- 7 new diagnostics or diagnostic methods endorsed by WHO since 2007;
- Several in development;
- By 2020: rapid & sensitive PoC test, triage test, predictive LTBI test, rapid DST

## Drugs and regimens:

- 2 new drugs for MDR-TB approved in 2012-2013
- A short 3-m regimen for LTBI;
- By 2020: 4-m regimens for DS-TB, 6/9-m regimens for MDR-TB, and other 2-3 drugs

## Vaccines:

- 1 vaccine with no detectable efficacy in 2013
- 15 vaccines in various phases of clinical trials

# Indonesia Situation (WHO GLOBAL REPORT 2014)

## Estimates of TB burden<sup>a</sup> 2013

	NUMBER (thousands)	RATE (per 100 000 population)
Mortality (excludes HIV+TB)	64 (36–93)	25 (14–37)
Mortality (HIV+TB only)	3.9 (2.2–6.2)	1.6 (0.87–2.5)
Prevalence (includes HIV+TB)	680 (340–1 100)	272 (138–450)
Incidence (includes HIV+TB)	460 (410–520)	183 (164–207)
Incidence (HIV+TB only)	15 (8.7–20)	5.8 (3.5–7.8)
Case detection, all forms (%)	71 (63–80)	

## Estimates of MDR-TB burden<sup>a</sup> 2013

	NEW	RETREATMENT
% of TB cases with MDR-TB	1.9 (1.4–2.5)	12 (8.1–17)
MDR-TB cases among notified pulmonary TB cases	5 700 (4 200–7 500)	1 100 (770–1 600)

# National TB Prevalence Survey 2014

Prevalence of bacteriologically confirmed TB per 100,000 pop. 15+,  
by region and urban/rural

Domain	Estimate	95% CI	RSE (%)
National	<b>759</b>	<b>590 - 961</b>	12.5
Region			
Sumatera	913	697 - 1,177	13.4
Jawa-Bali	593	447 - 771	14.0
Others	842	635 - 1,092	13.8
Urban/rural			
Urban	846	678 - 1,048	11.2
Rural	674	512 - 874	13.7



# National TB Prevalence Survey 2014

Prevalence of bacteriologically confirmed TB per 100,000 pop.  
15+ by gender and age

Characteristic	Estimates	95% CI	RSE (%)
<b>Gender</b>			
Male	1,082.7	872.8-1,337.3	10.9
Female	460.6	353.6-290.8	13.2
<b>Age</b>			
15-24	360.8	254.3-494.7	17.0
25-34	753.4	561.8-995.0	14.6
35-44	713.8	527.4-941.0	14.8
45-54	835.5	608.9-1,108.3	15.3
55-64	1,029.5	734.1-1,398.5	16.5
65+	1,581.7	1,122.7-2,153.7	16.6

# **TUBERCULOSIS RESEARCH BY NIHRD**

NIHRD OPAC

Keyword : Tuberculosis or Tuberkulosis

# Tuberculosis Research By NIHRD Period 2010 – 20014 (1)

- Tuberculosis – Diabetes Mellitus Registry
- Risk Factor of Tuberculosis in East Nusa Tenggara and Bali
- Review the Tuberculosis Minimum Health Services Standard Associated to Indicators of MDGs)
- Factors influencing transmission level of TB Patient in Jayapura
- Pharmaco-vigilance of Anti Tuberculosis Drugs

# Tuberculosis Research By NIHRD

## Period 2010 – 20014 (2)

- Home visit efectivity, towards alteration of knowledge, attitude, and skill of TB patients in the region of Puskesmas Kecamatan Ps. Minggu, Jakarta
- Community knowledge, attitude, and behavior toward pulmonary TB disease in Kecamatan Sungai Tarub, West Sumatera
- Sociocultural factors influencing pulmonary TB case findings coverage in Puskesmas Padang Kandis, west Sumatera

# Tuberculosis Research By NIHRD

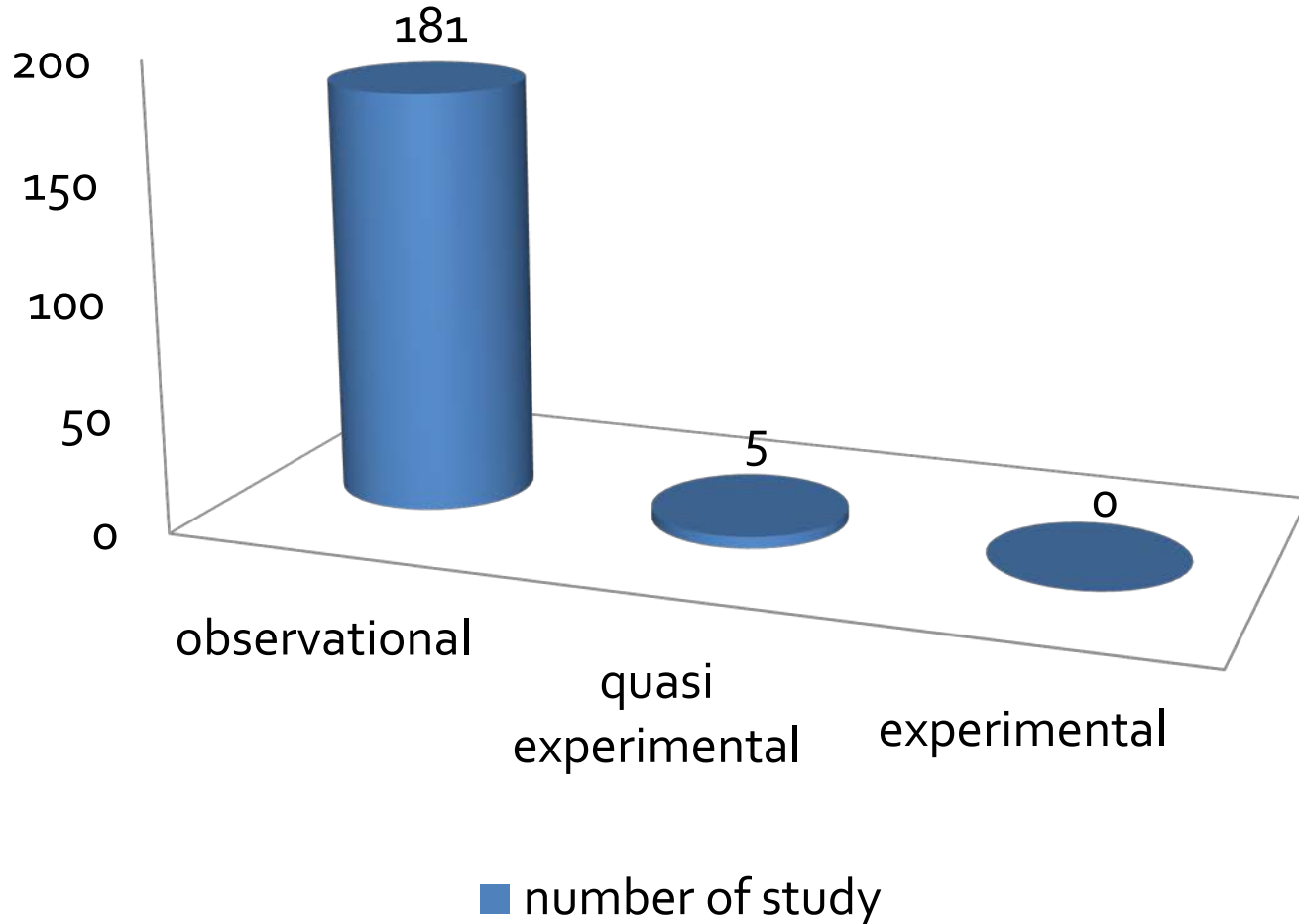
## Period 2010 – 20014 (3)

- Study of TB prophylaxis provision in Primary Health Center in Jakarta and Bekasi
- Demography characteristic and its relation with the Tuberculosis diseases in Central Java Province (from National Health Survey 2007)

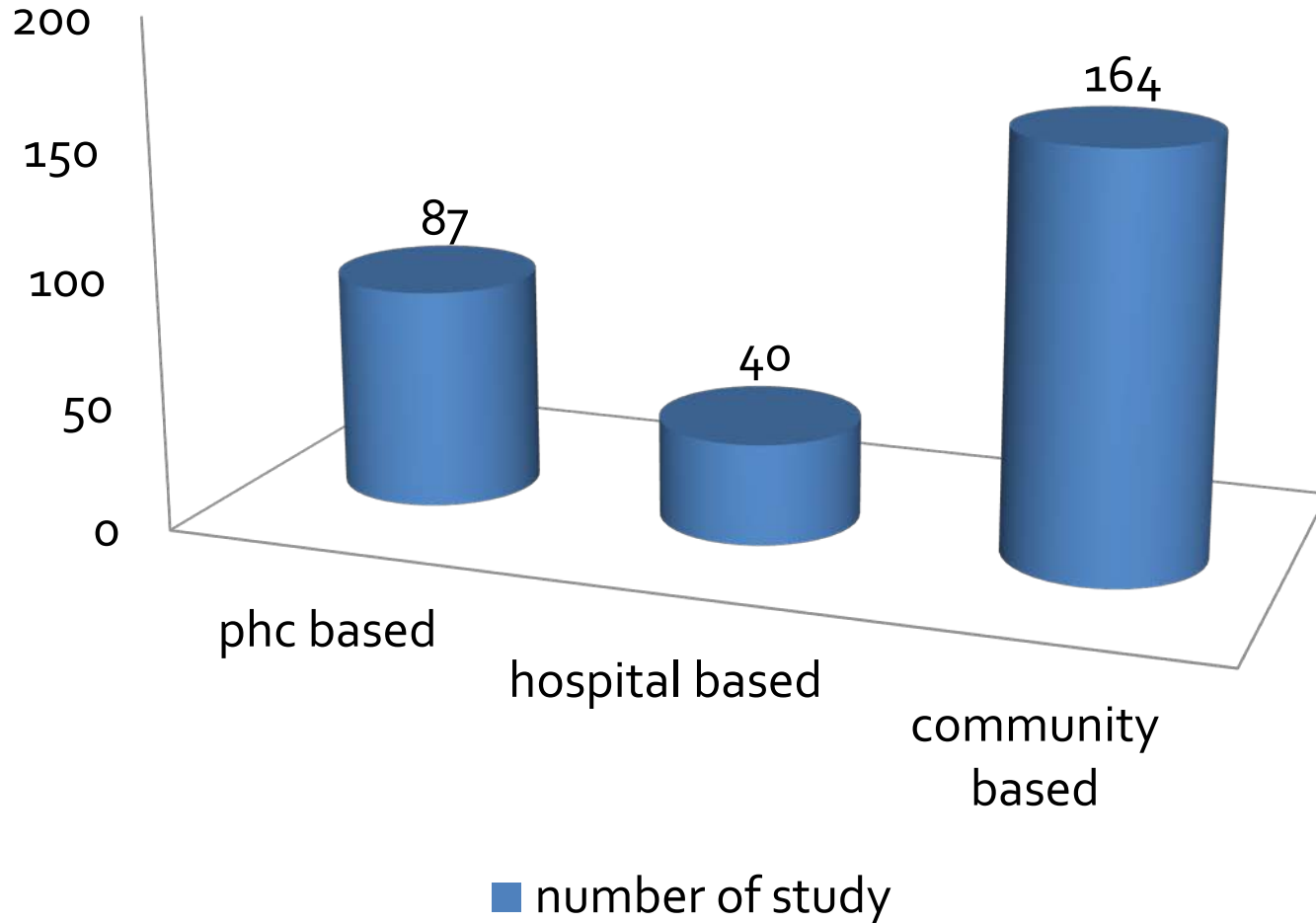
# TB Research by others

- There are 186 researches:
  - Universities
  - Hospitals
  - Research Center
  - Research Institution
  - NGO

# Number of Research by Design

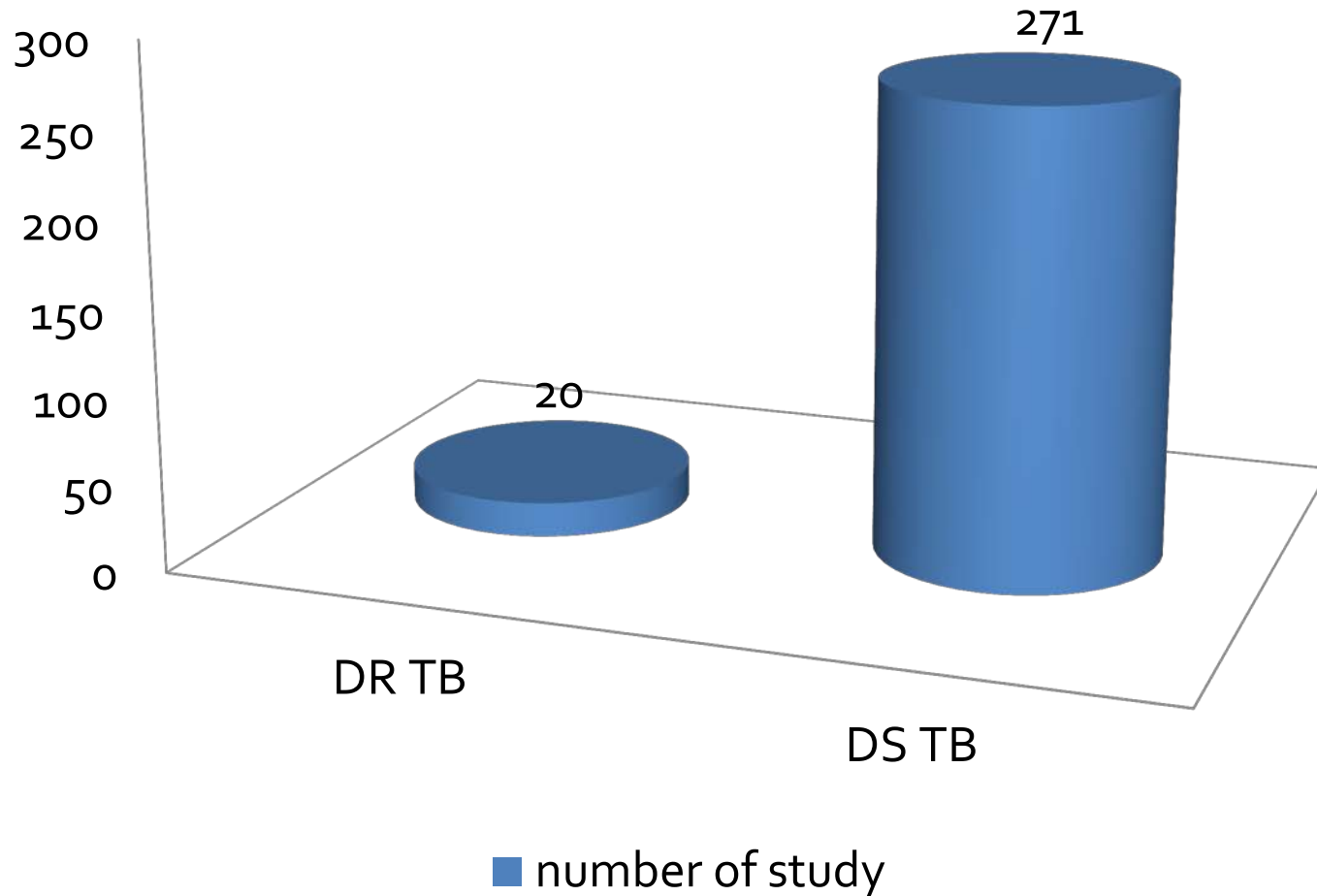


# Number of Research by Study Place

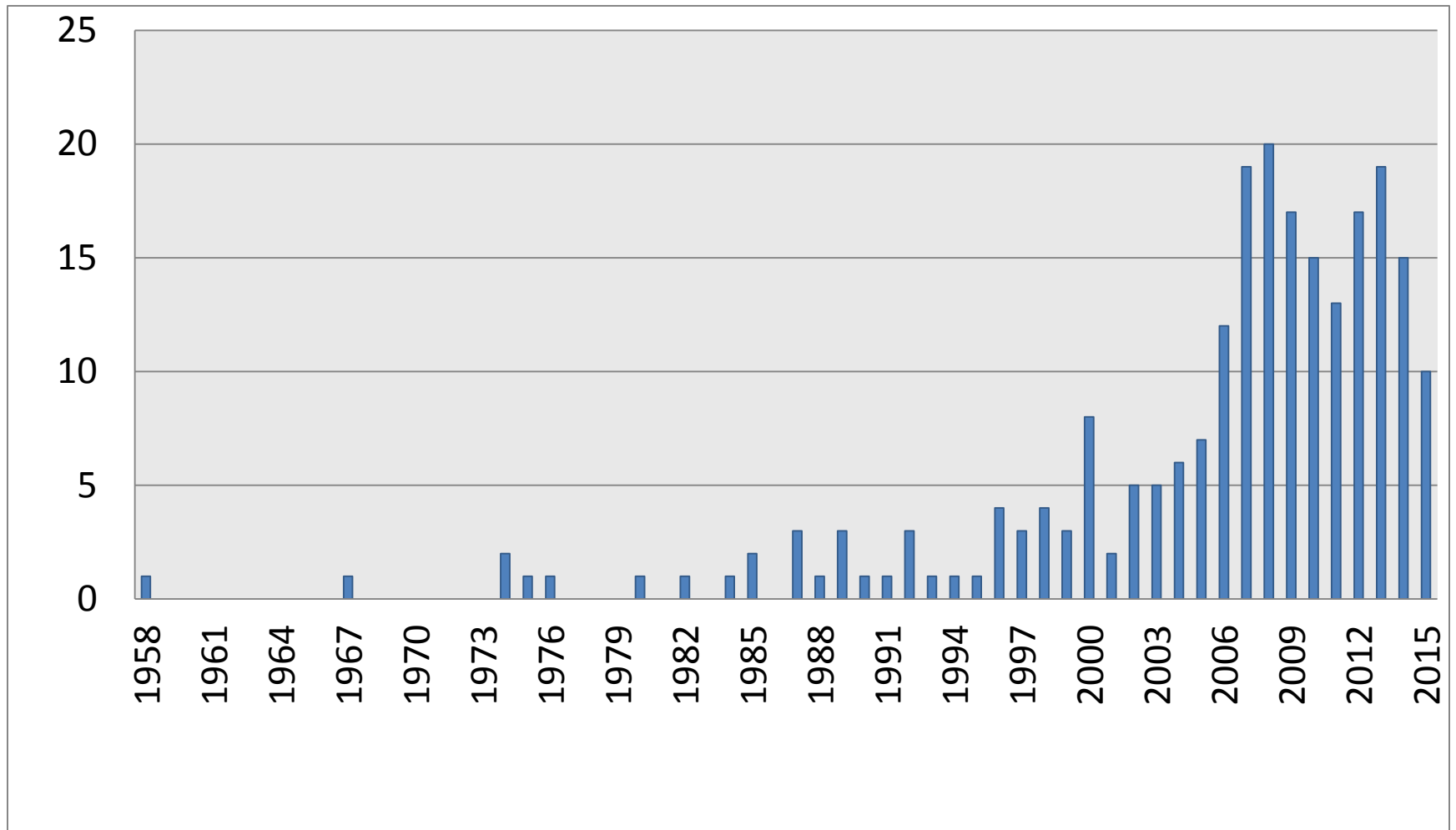




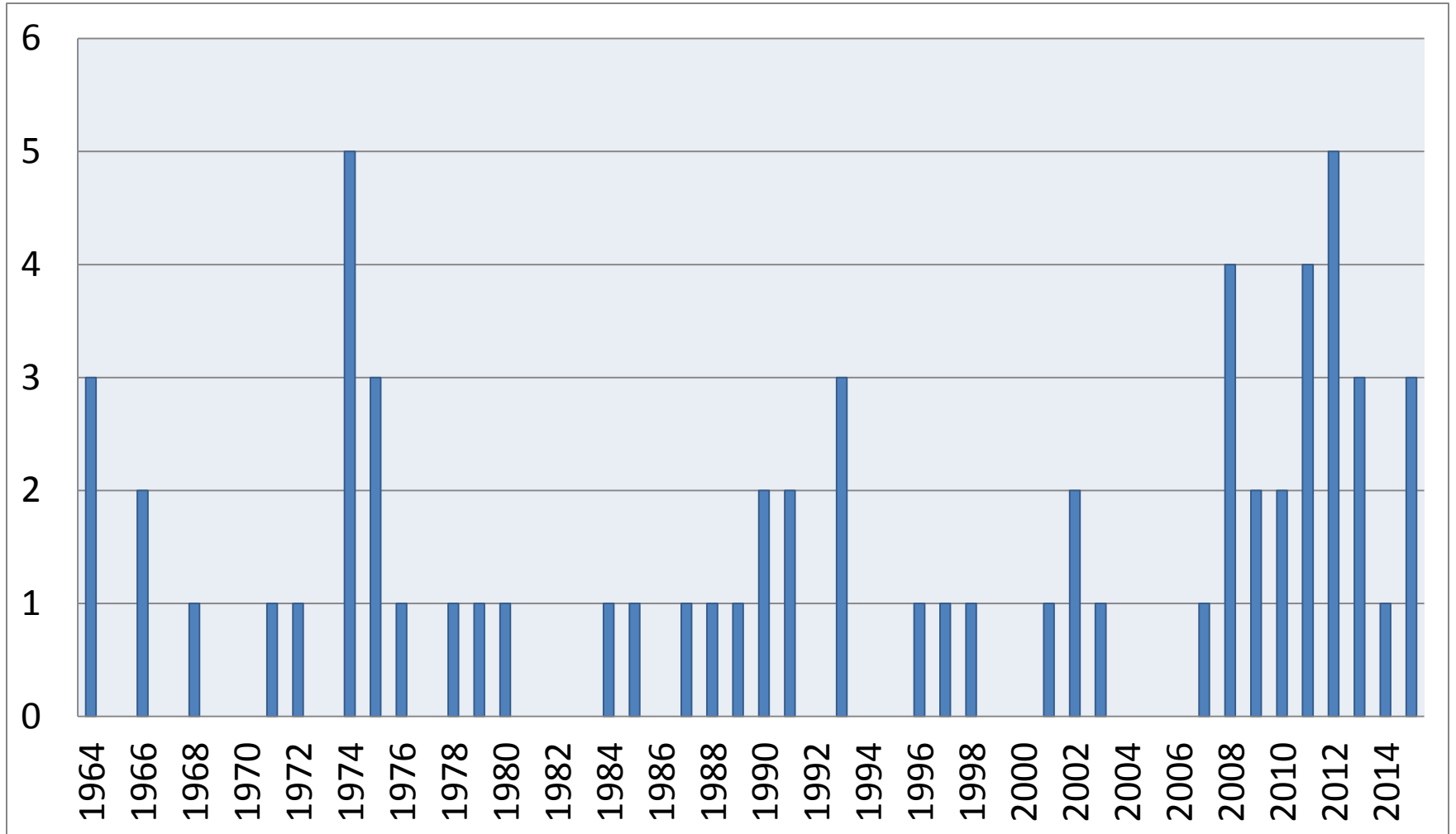
# Number of Study by Drug Resistant



# Tuberculosis Research from Pubmed Adult, N:230



# Child, N:64



# **CHALLENGES AND OPPORTUNITY**

# Challenges

- Indonesian research partnership: a proactive approach required at different levels to involve full spectrum of research expertise and private sector.
- Lack of funding and capacity as well as regulatory barriers
- Inadequate and outdated tools for rapid diagnosis
- Lack [high quality evidence](#) from RCT for optimizing treatment regimens, including the best combination of drugs and treatment duration;
- Communication and information delivery

- Lack of evidence for the best drug regimens for treating patients with DR TB
  - Very limited information about treatment of paediatric MDR-TB;
  - Identification of the most effective chemoprophylaxis for contacts of MDR-TB cases;
  - The therapy for symptomatic relief from adverse reactions linked to second-line anti-tuberculosis drug
  - Limited data on Extra Pulmonary TB
- OR:
  - insufficient involvement from key players:
  - no demand from medical colleges on OR, not aware of the needs of OR
  - insufficient capacity built (HR)

# Opportunities

- Large burden of disease making it a high public health priority
- About 75 Medical Colleges
- NIHRD/Litbangkes
  - Network of INA Respond
- Many research institutions

# Recommendations

- Development of an **interagency Indonesia TB Research Forum** (MoH, Litbangkes, LIPI, BPOM, BBLK, Universities, Private Sectors etc)
- Establish **National TB Research Strategy** covering the full spectrum of research (fundamental, translational, clinical, epidemiological and operational)
- Thinking Out loud:

## INTENSIFIED RESEARCH AND INNOVATION

- Discovery, development and rapid uptake of new tools, interventions and strategies
- Research to optimize implementation and impact, and promote innovations





# Tweet from a friend

**Mr. President:**

*@BarackObama*

**Mr. President wonders whether you have  
already established your TB research center  
accordingly**

*#obamacare #supportTripod  
#TBelimination*

