

Tuberculosis and multidrug-resistant tuberculosis: what is the impact of the work of humanitarian agencies on national health services?

Medical background, global overview and outlook

Hans L Rieder
Berlin, 25 October 2008



Khao-I-Dang Holding Centre
for Cambodian Refugees

Tuberculosis ward

Thailand, 1981

A patient with tuberculous
pyopneumothorax on
medical and surgical treatment

Are the basic needs met?

- o Nutritional rehabilitation
- o Immunization
- o Water supply
- o Sanitation
- o Shelter

Don't shoot from the hip!

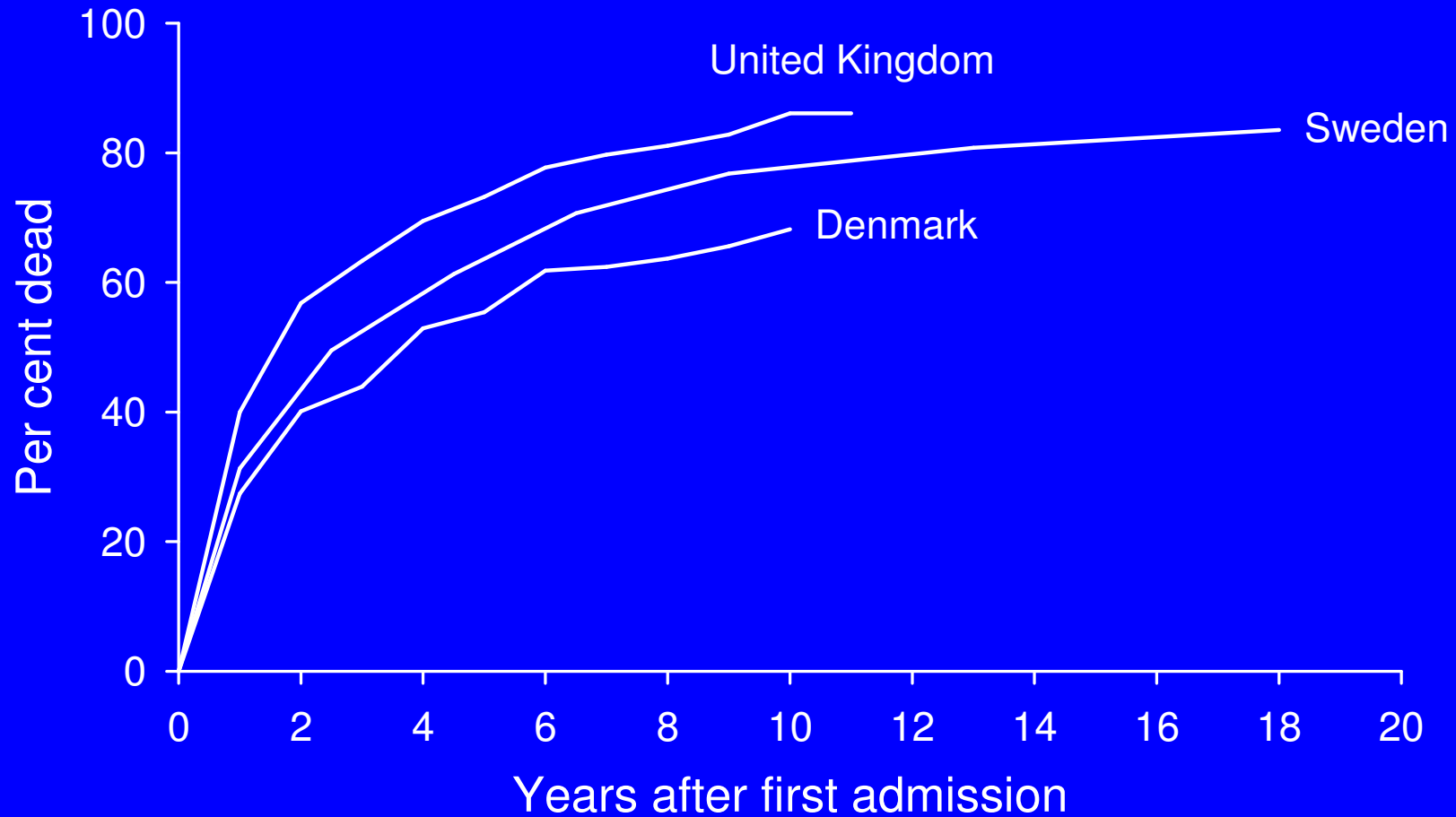
- o Coordinate with national authorities
- o Establish priorities
- o Standardize diagnostic procedures
- o Standardize treatment
- o Standardize monitoring and evaluation

Keep the priorities in focus

- o Reduce case fatality
- o Reduce transmission
- o Anything else and above

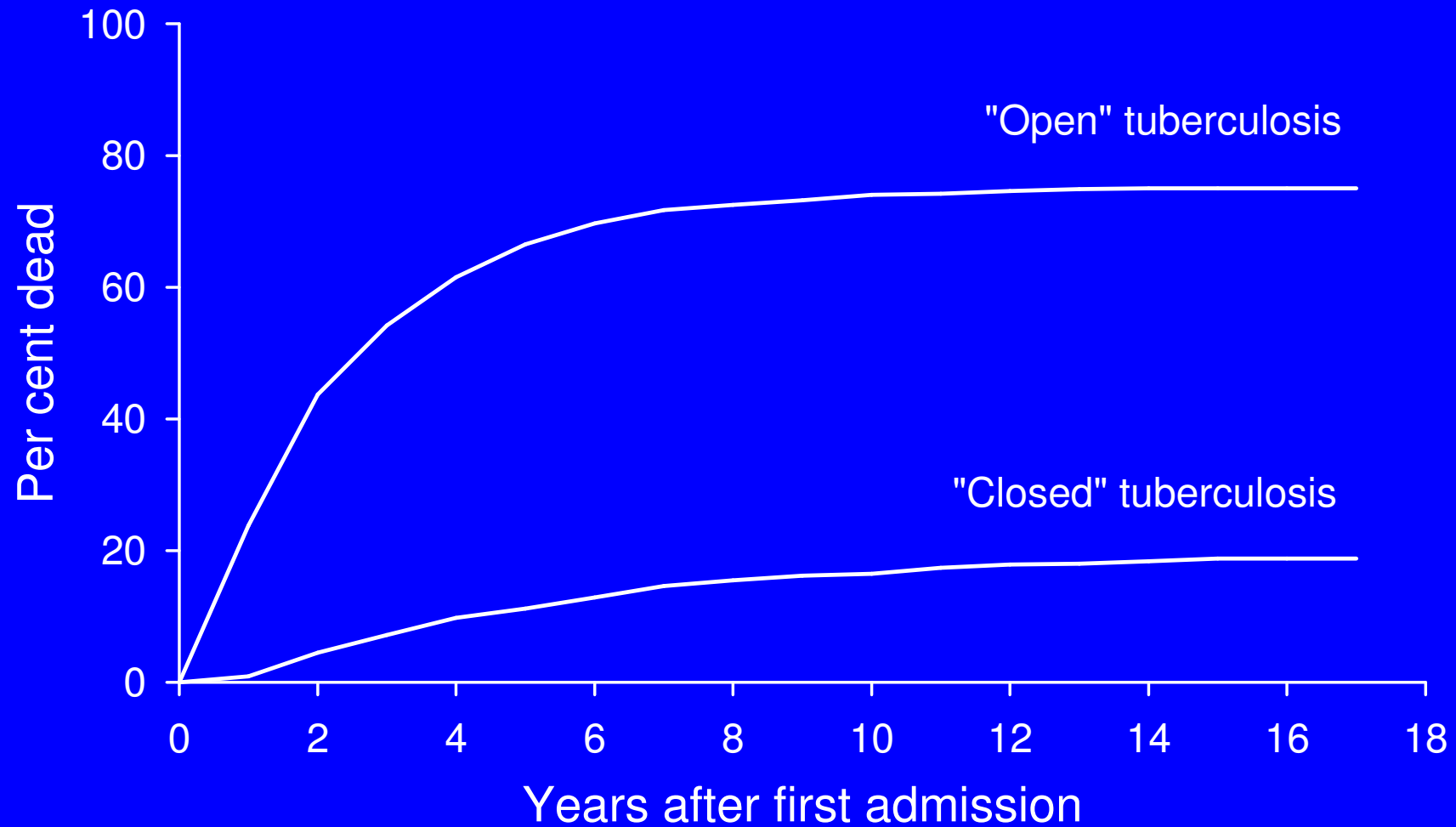
Identify the largest possible number
of those at highest risk of death

Cumulative Case Fatality from Untreated Sputum Smear-Positive Pulmonary Tuberculosis



Thompson BC. Br Med J 1943;2:721
Berg G. Acta Tuberc Scand 1939;(suppl):1-207
Buhl K, et al. Bull World Health Organ 1967;37:907-25

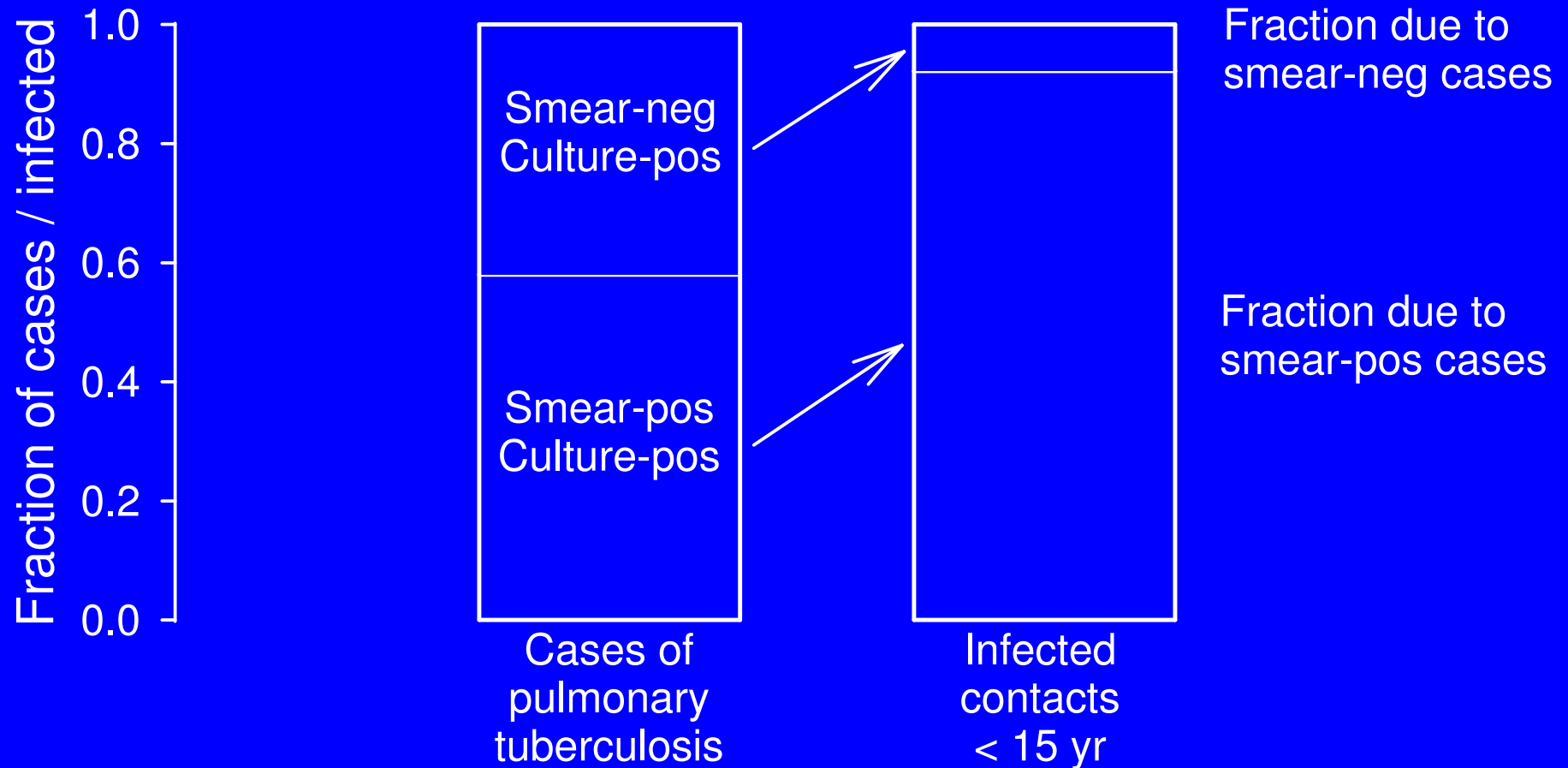
Fate of Untreated Pulmonary Tuberculosis in Sanatorium Patients, Long-Term Follow-Up, Barmelweid, Switzerland



Krebs W. Beitr Klin Tbk 1930;74:345-79

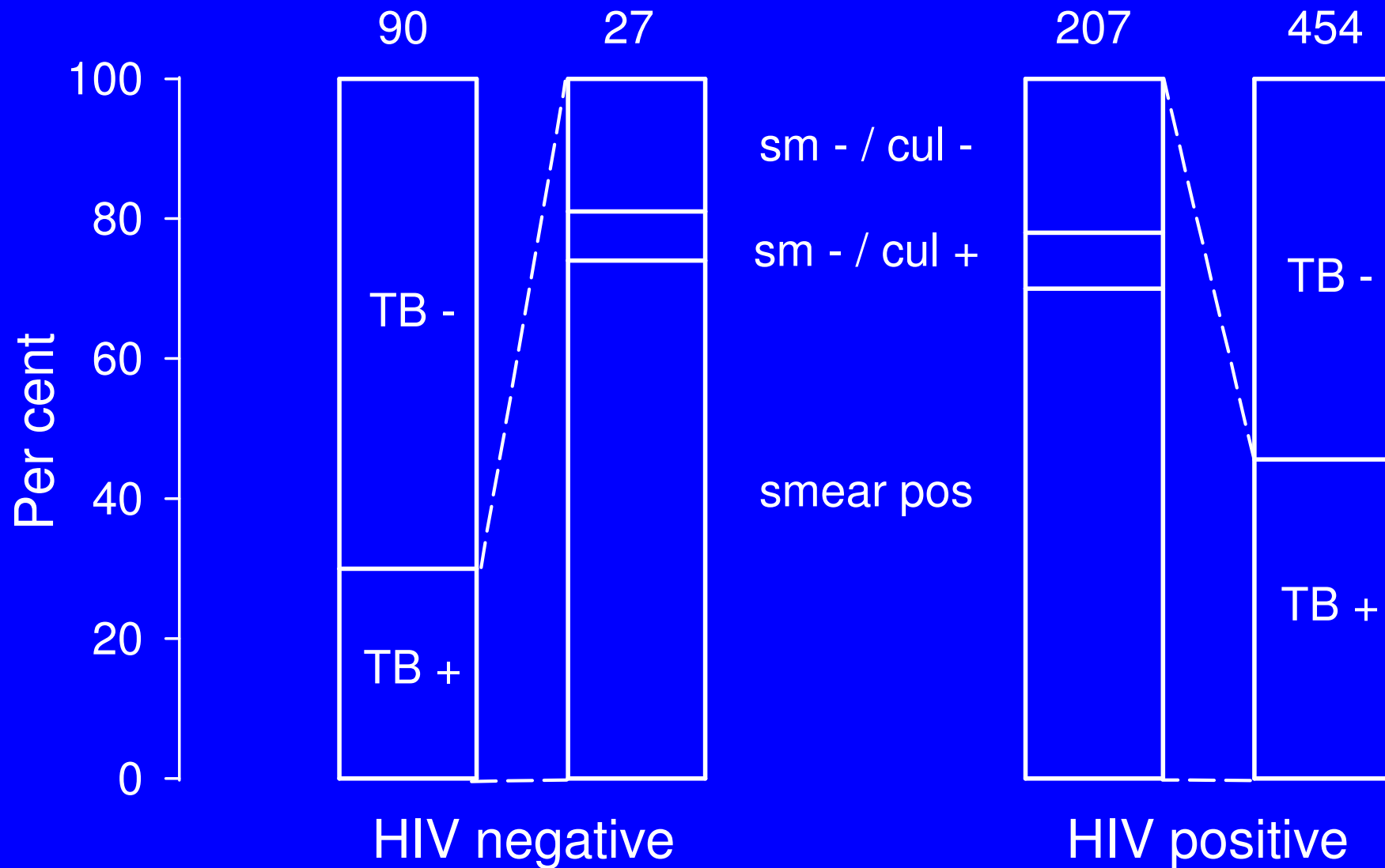
Identify the largest possible number
of those responsible for most transmission

Sensitivity of Direct Sputum Smear Examination in Identifying Pulmonary Tuberculosis and Transmitters

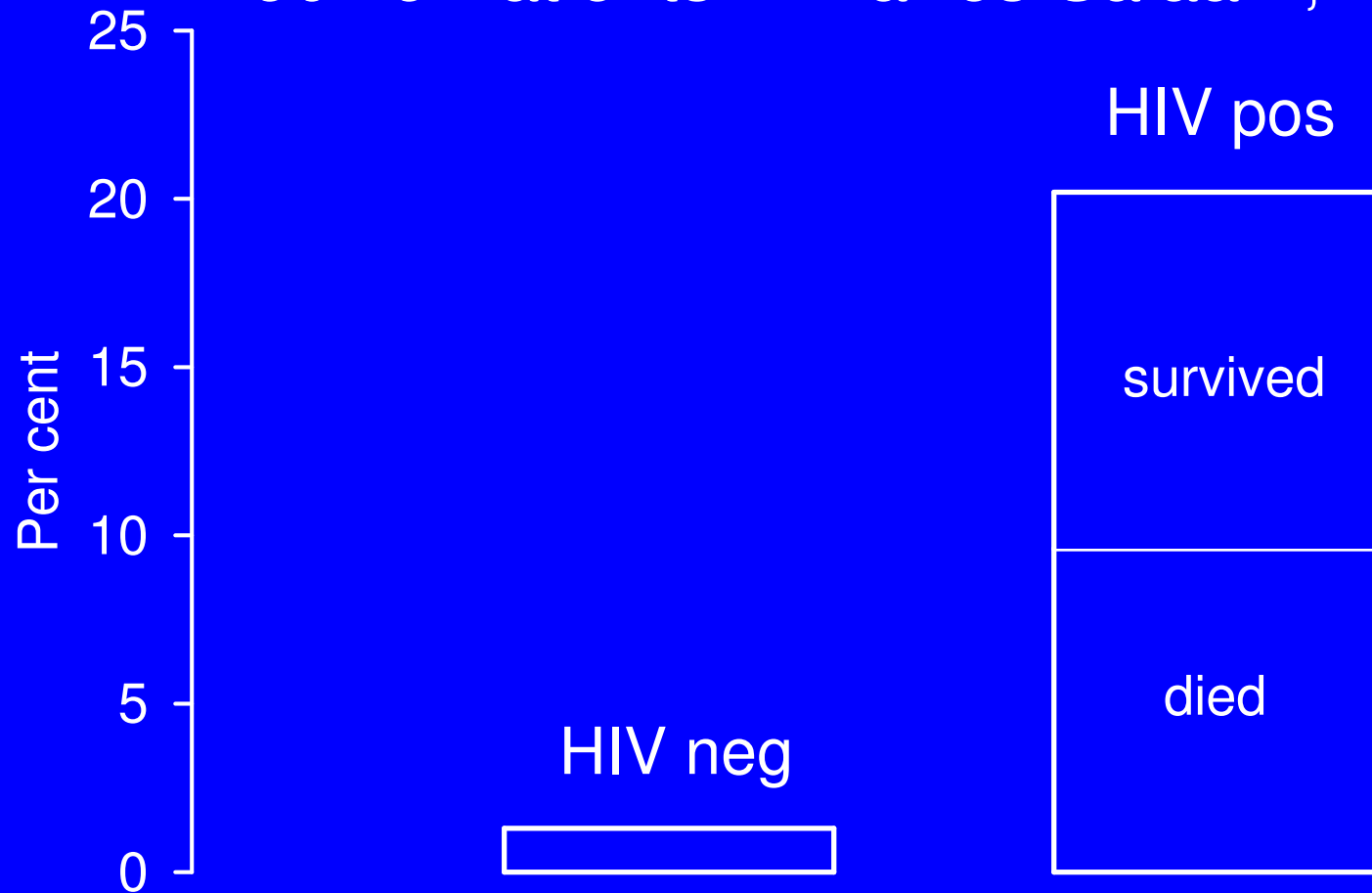


Calculated from data from:
Grzybowski S, et al. Bull Int Union Tuberc Lung Dis 1975;50:90-106

Tuberculosis Among Primary Health Care Attendees with Prolonged Cough, Harare, Zimbabwe, 2003 (?)



Mycobacterium tuberculosis Bacteremia in Febrile Patients in Dar es Salaam, Tanzania



Archibald LK, et al. Clin Infect Dis 1998;26:290-6



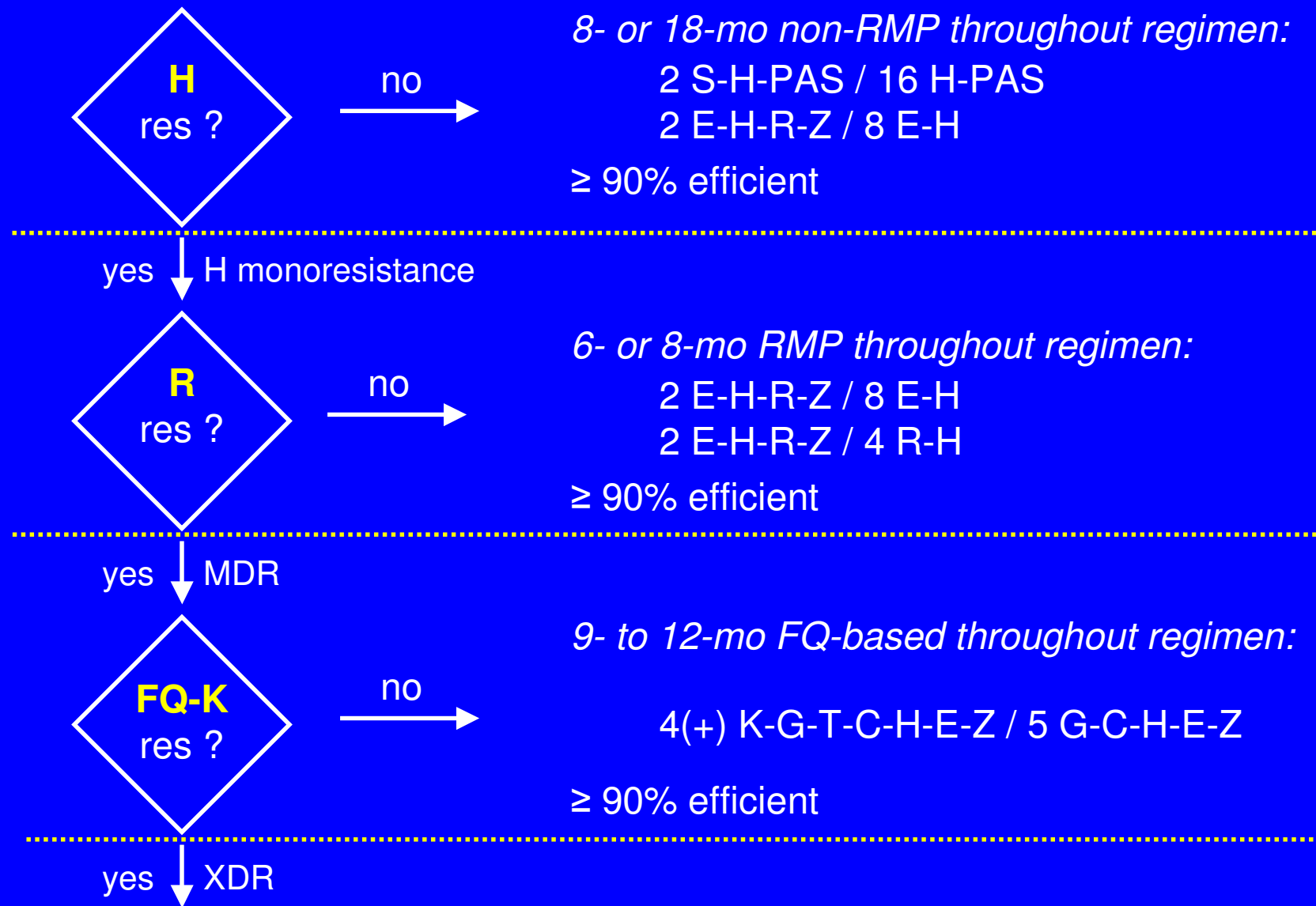
← Multipurpose, basic, inexpensive, reliable, sustainable, meets 90% of primary objective

Single purpose, sophisticated, expensive, un-sustainable, meets 10% of primary objective



Define a rational treatment strategy

The Regimen Cascade



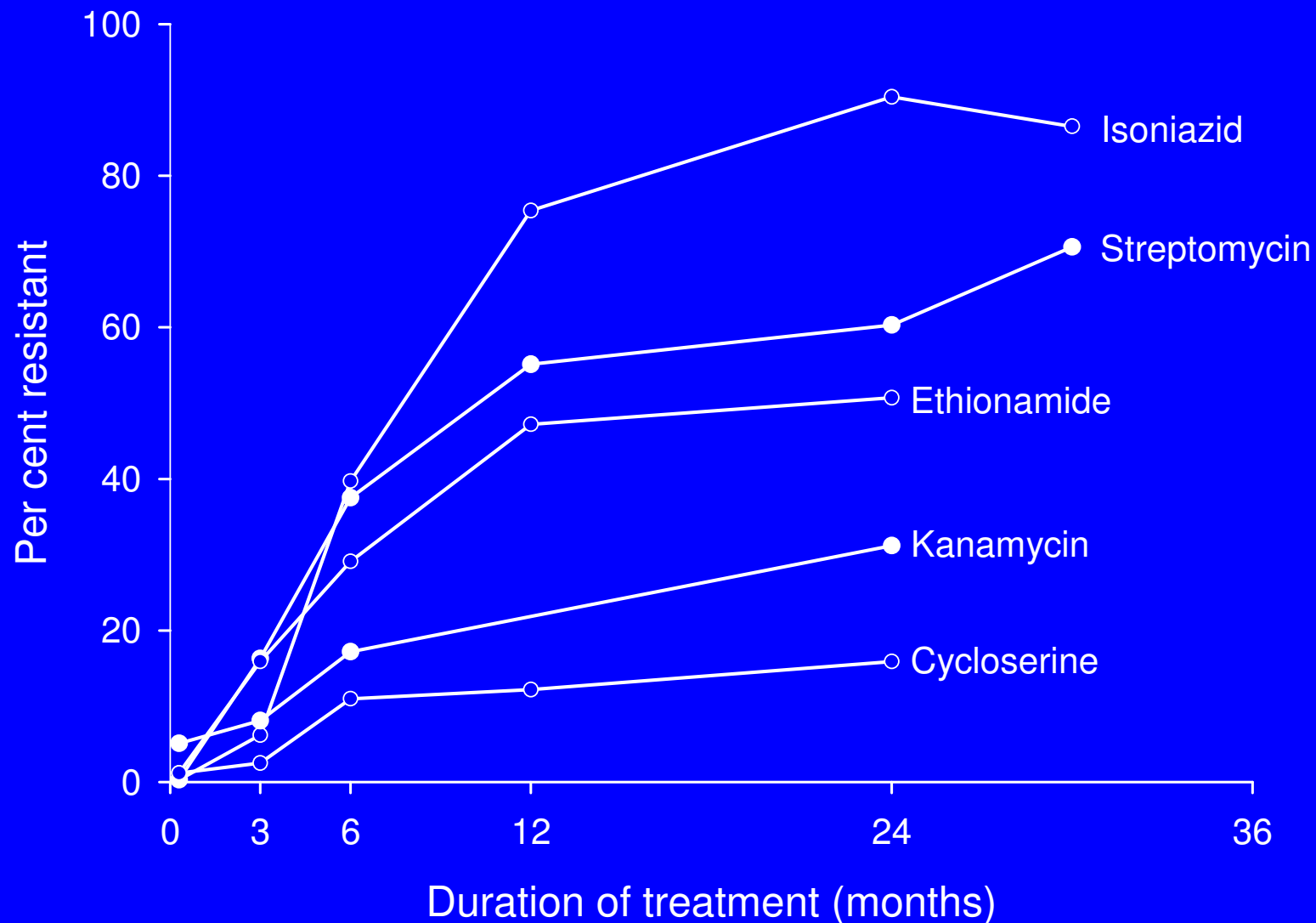
*Complex! Toxic! 21-mo regimen – poor efficiency (50%)
Keshavjee S, et al. Lancet 2008;372:1403-9*

Always have a fall-back regimen for treatment failures

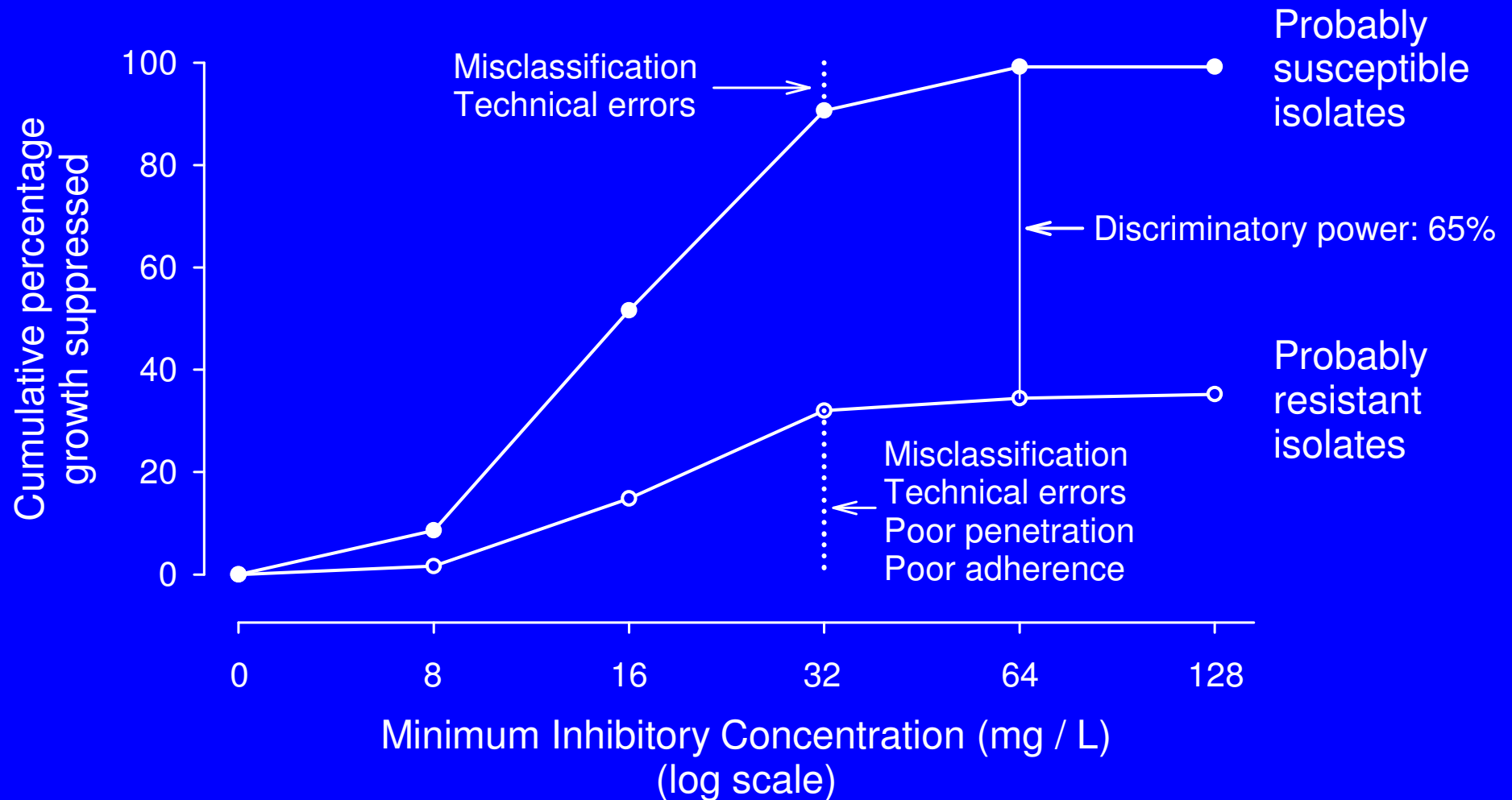
First-line	Fall-back
2 SHRZ / 6 TH	2 SHRZE / 1 HRZE / 5 HRE
2 EHRZ / 6 EH	2 SHRZE / 6 HRZE
2 EHRZ / 4 RH	MDR regimen
MDR regimen	XDR regimen

Avoid reliance on fragile technology

Proportion of Strains Cultured from Resected Lungs Resistant to Anti-Tuberculosis Drugs, as a Function of Duration of Treatment Strain Containing no Susceptible Bacilli

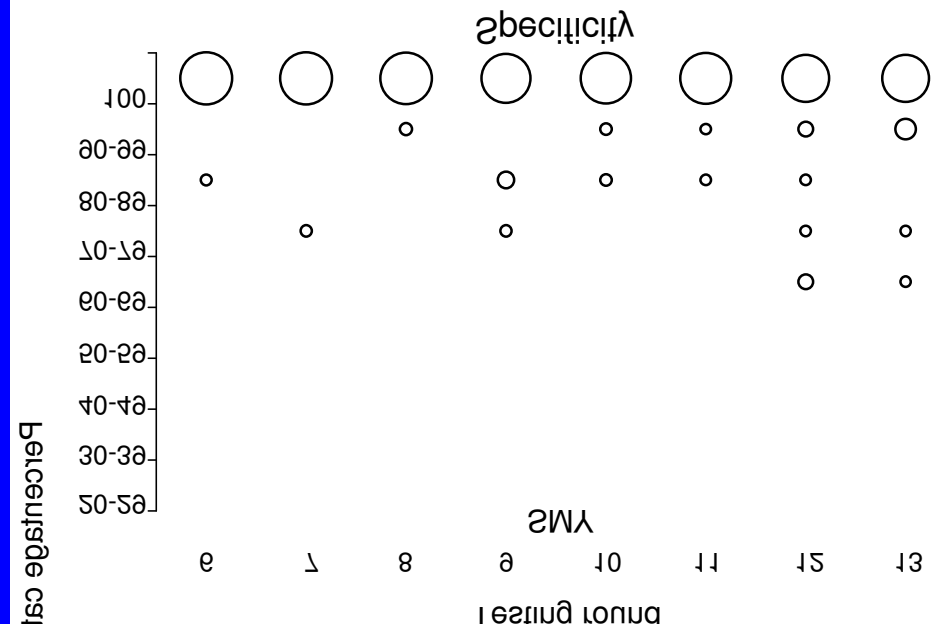
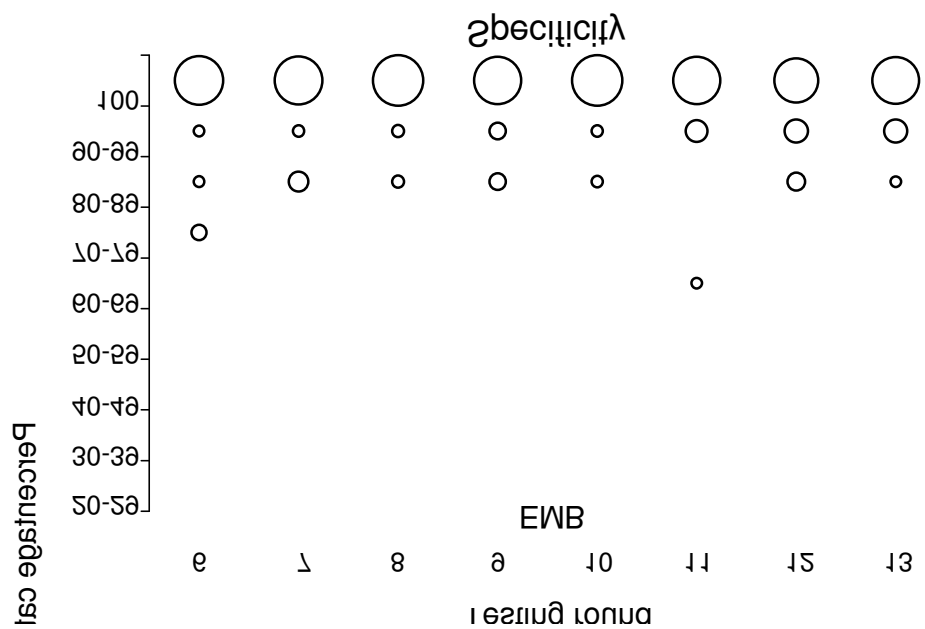
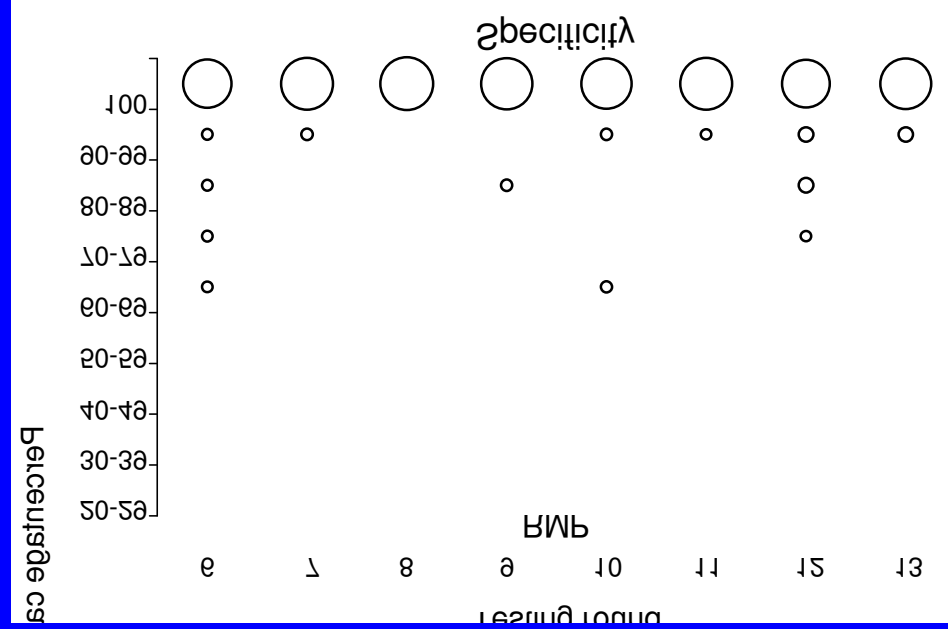
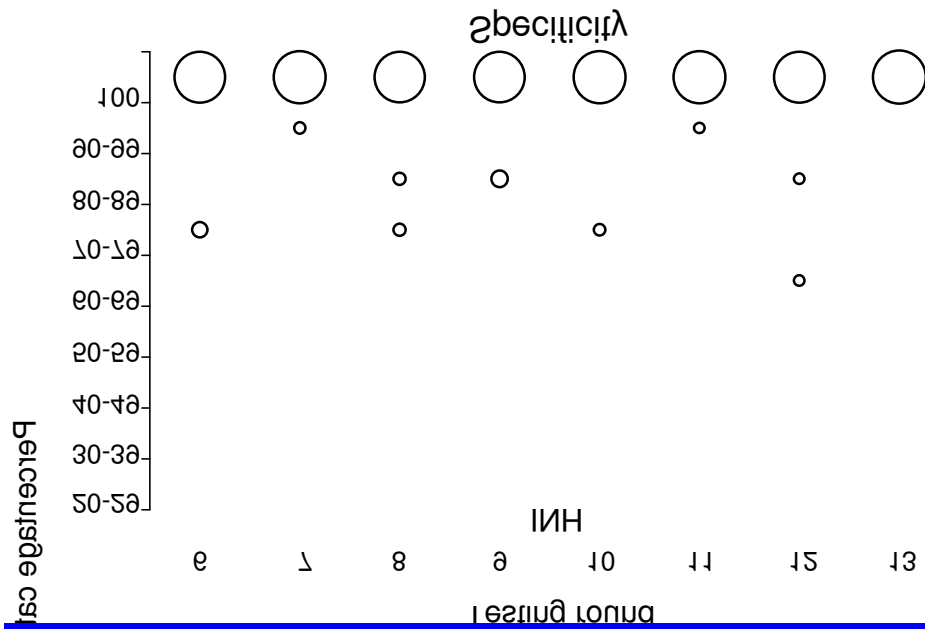


Determination of Critical Concentration for Rifampicin in Korea

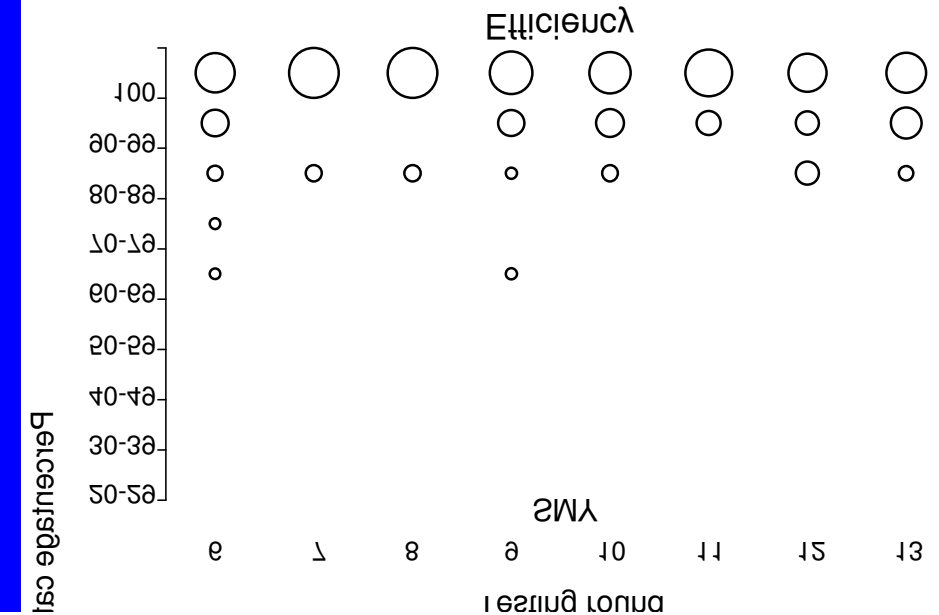
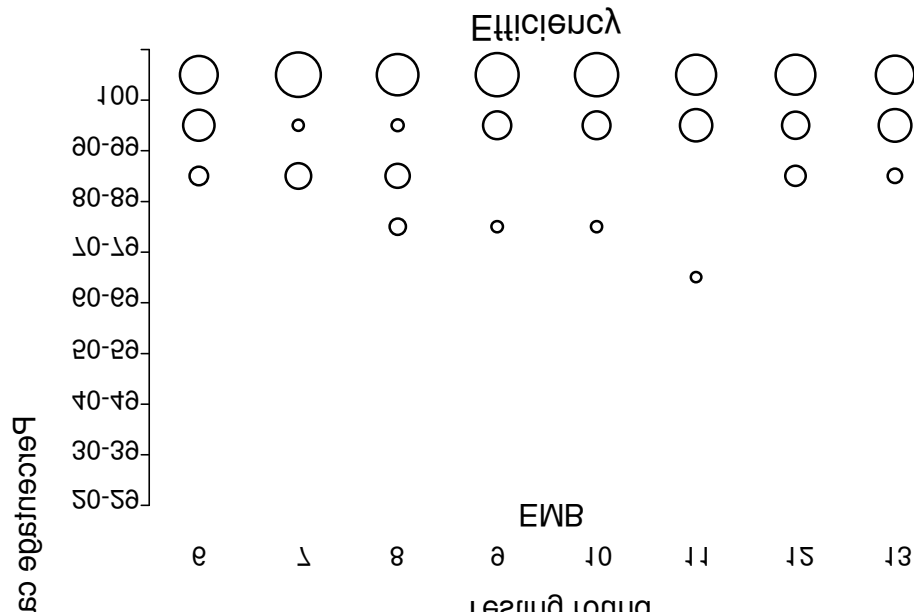
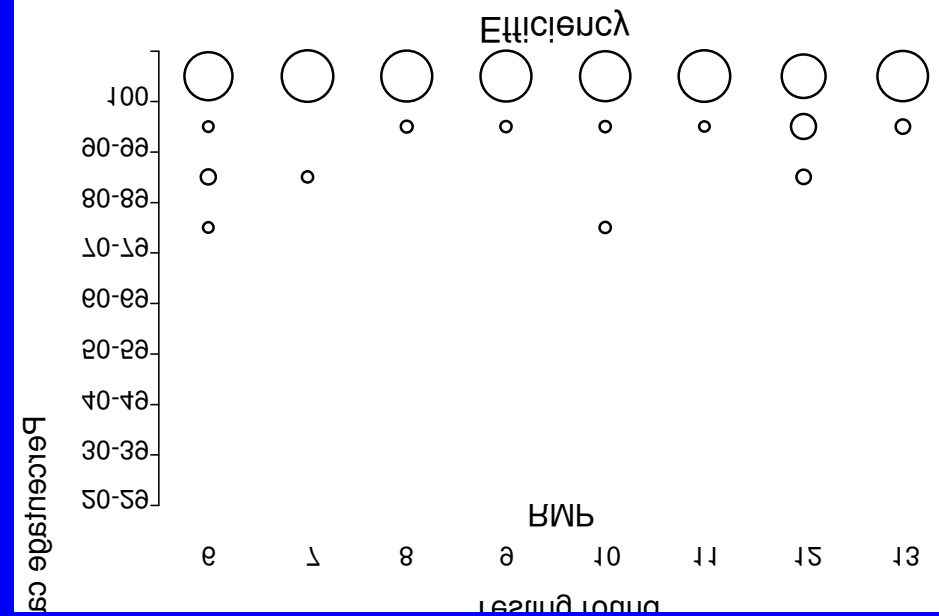
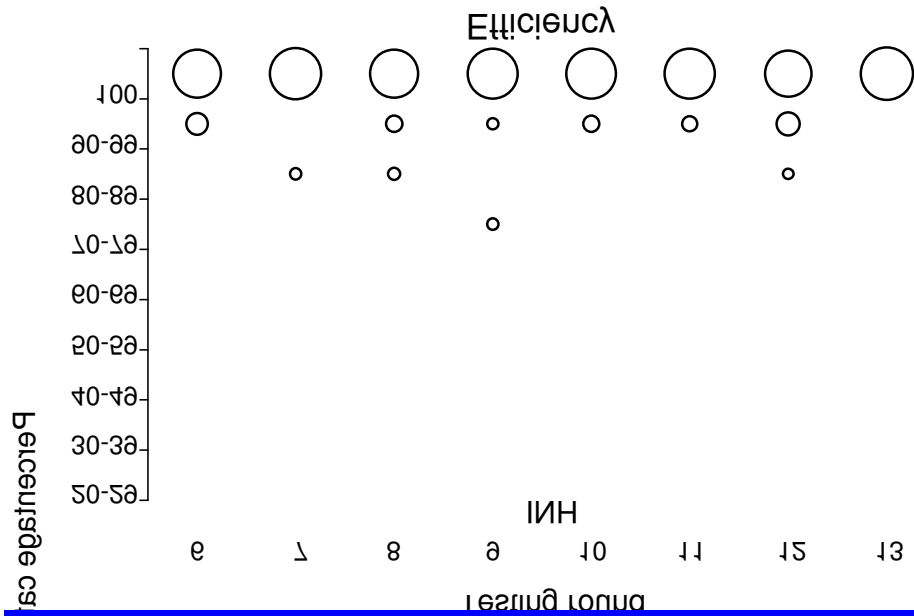


*Data courtesy: Kim SJ, Korean Institute of Tuberculosis
Unpublished lecture notes, Hanoi, September 1, 2000*

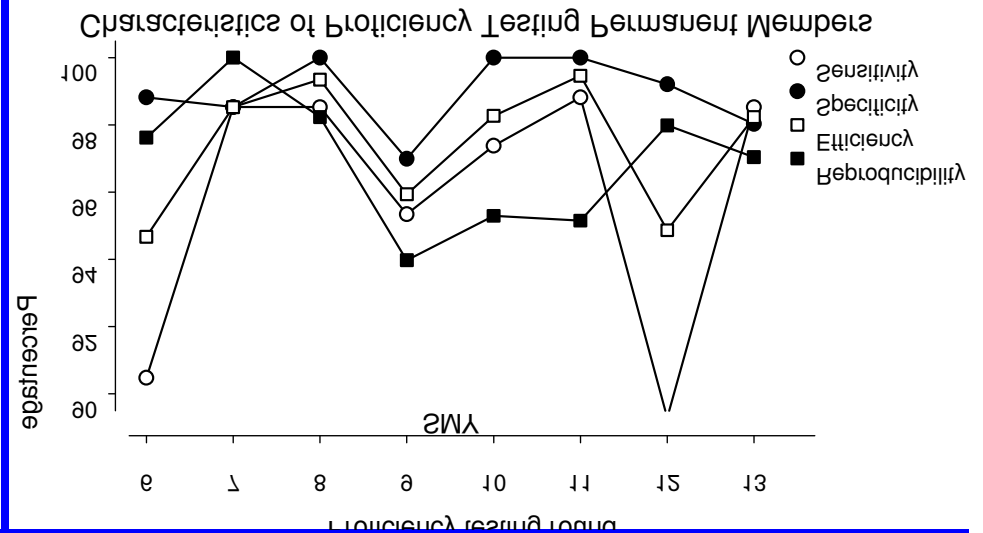
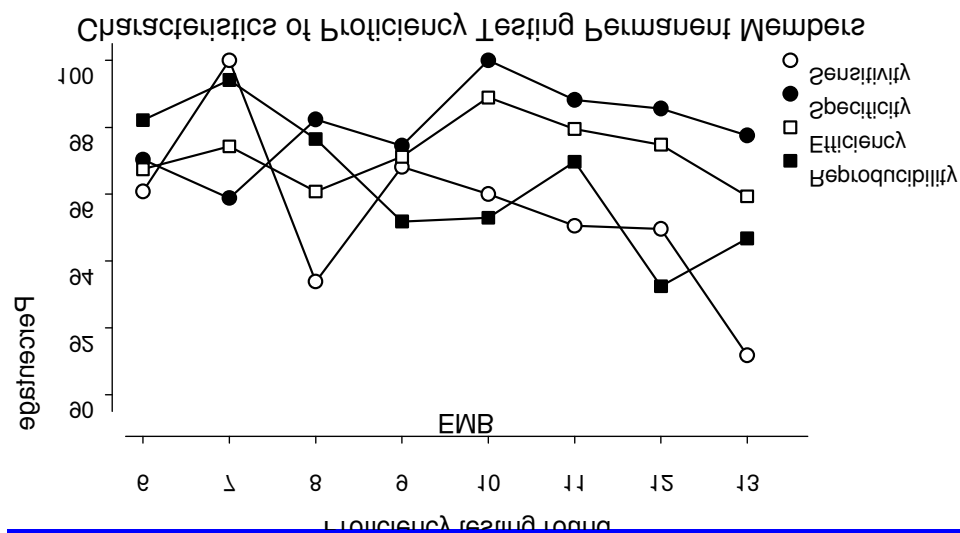
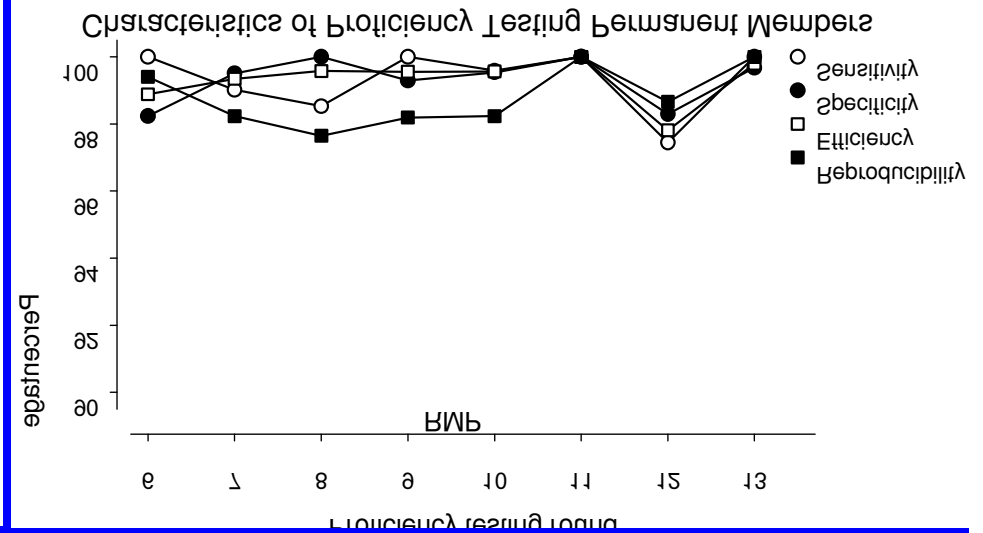
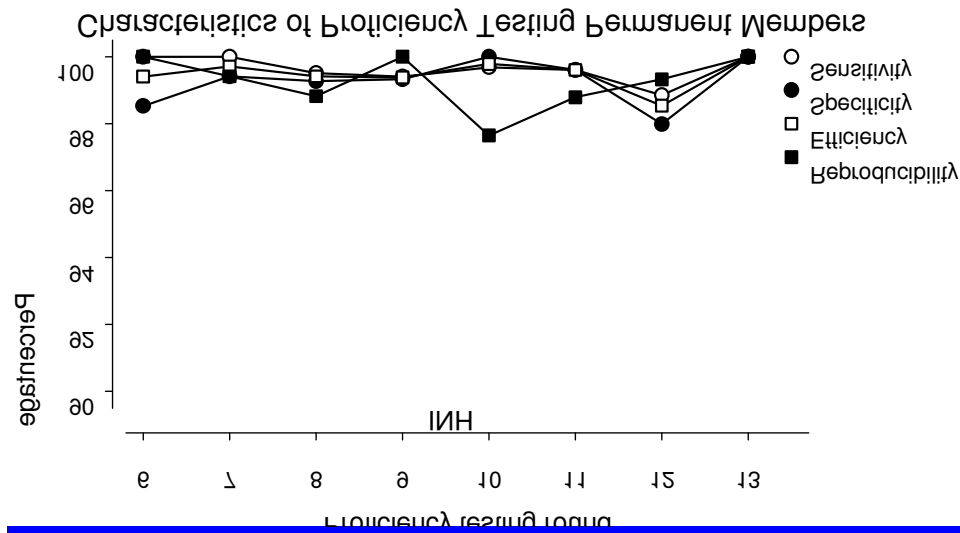
Results from all 29 laboratories ever participating in rounds



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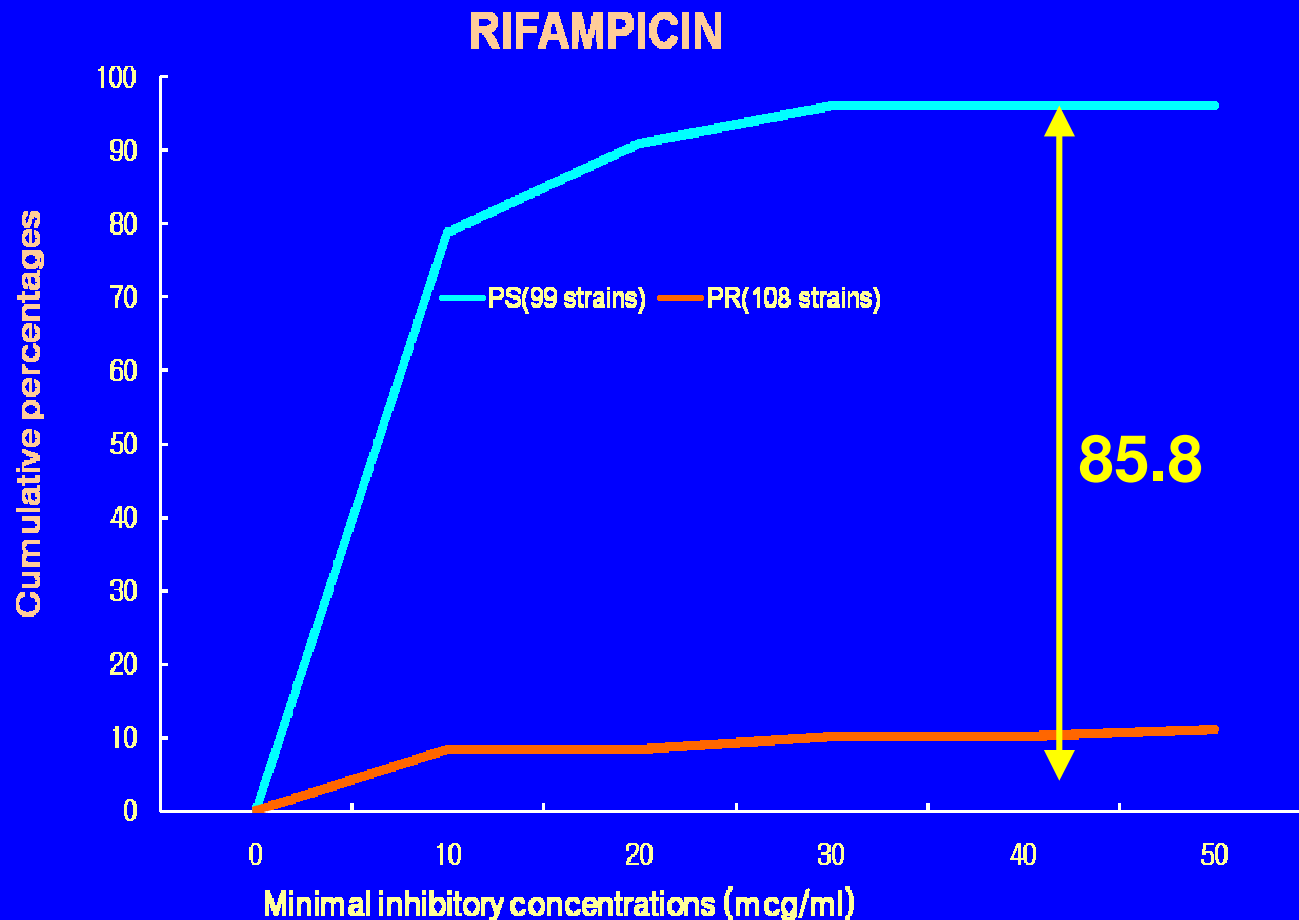


Results from 17 laboratories participating in all rounds



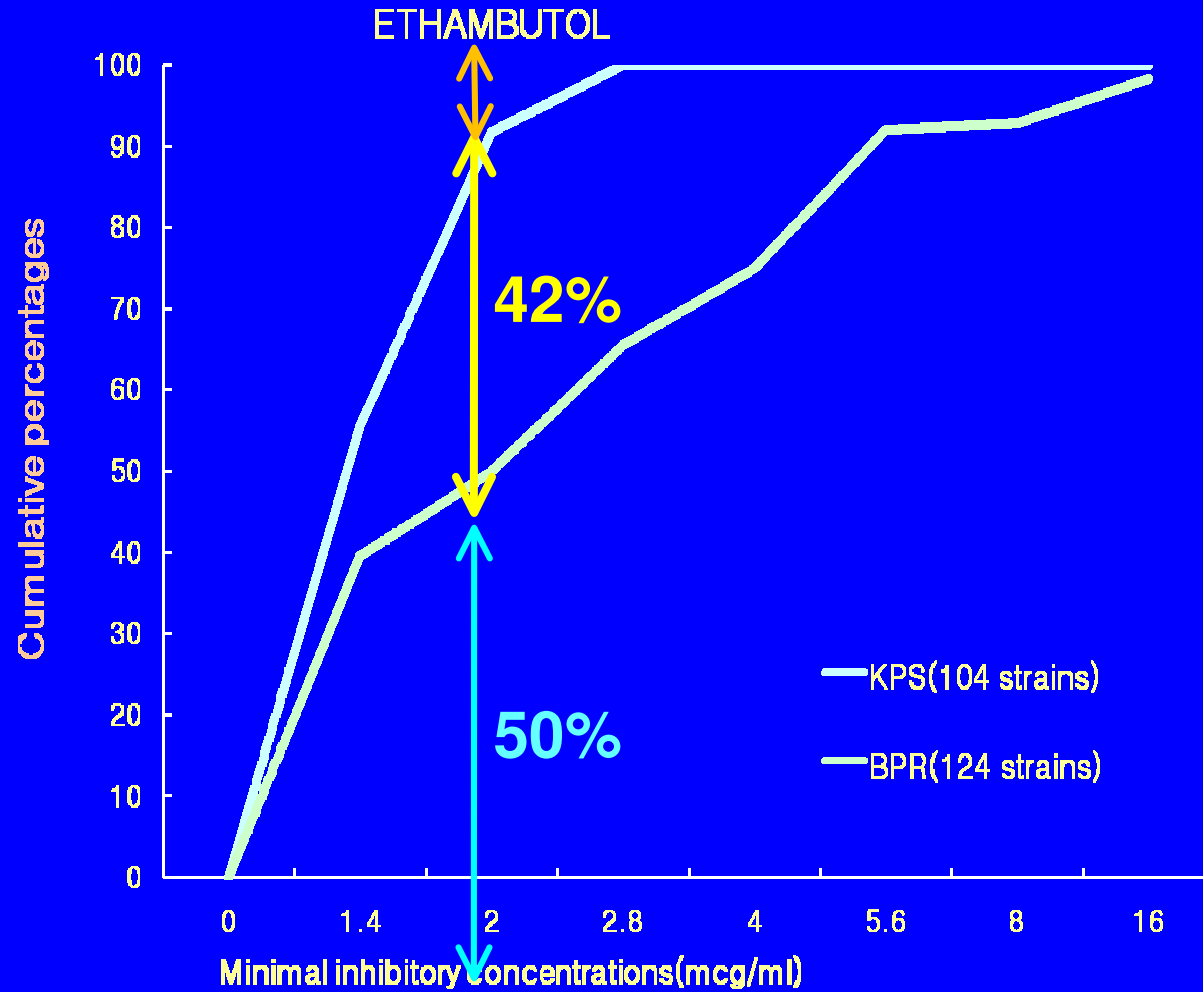
Cumulative Distribution of MIC of PS/PR Strains of *M. tuberculosis* to RFP

(Tests done in L-J medium using the absolute concentration method)

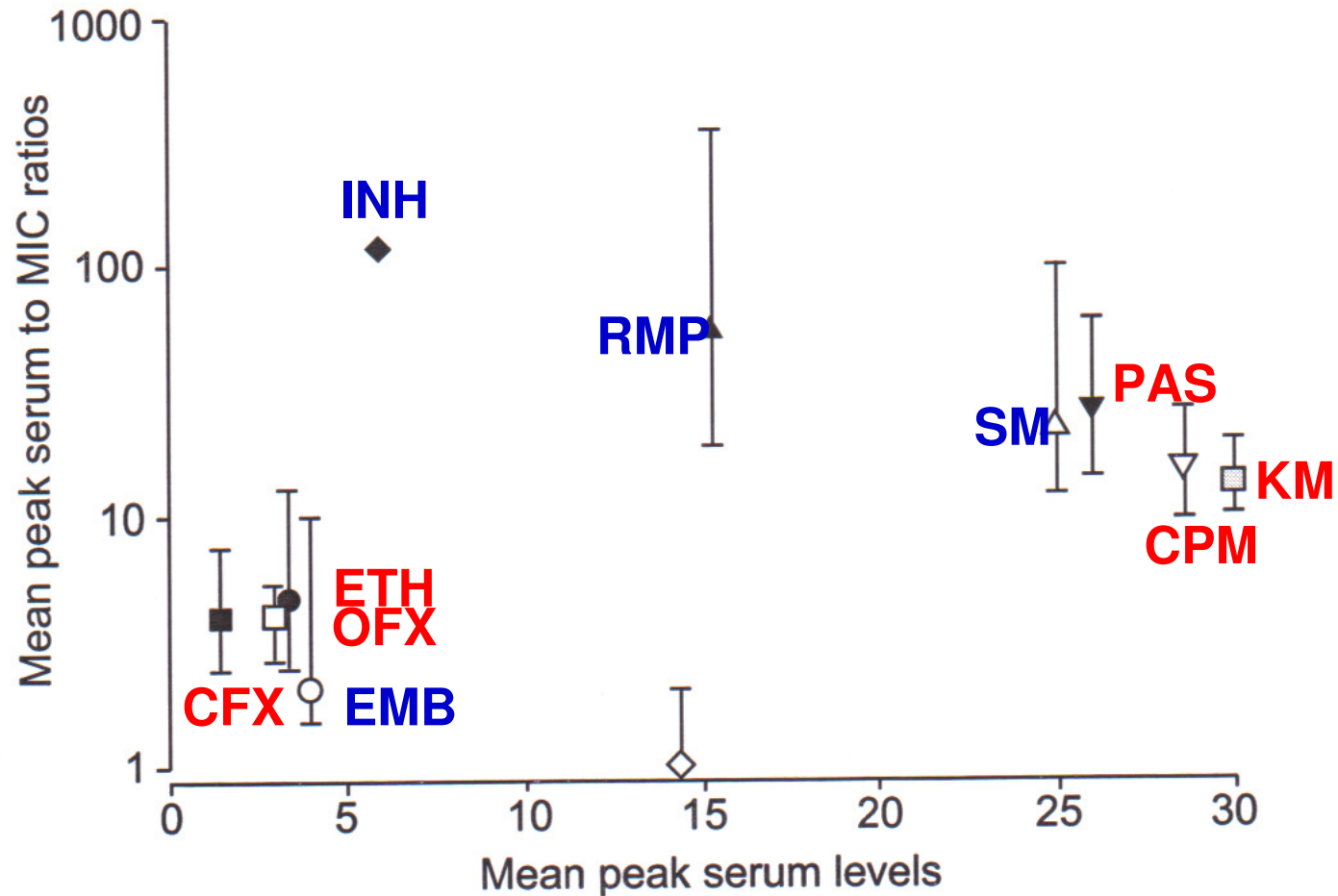


Calibration of Ethambutol Critical Concentrations

(Tests done in L-J medium using the absolute concentration method)

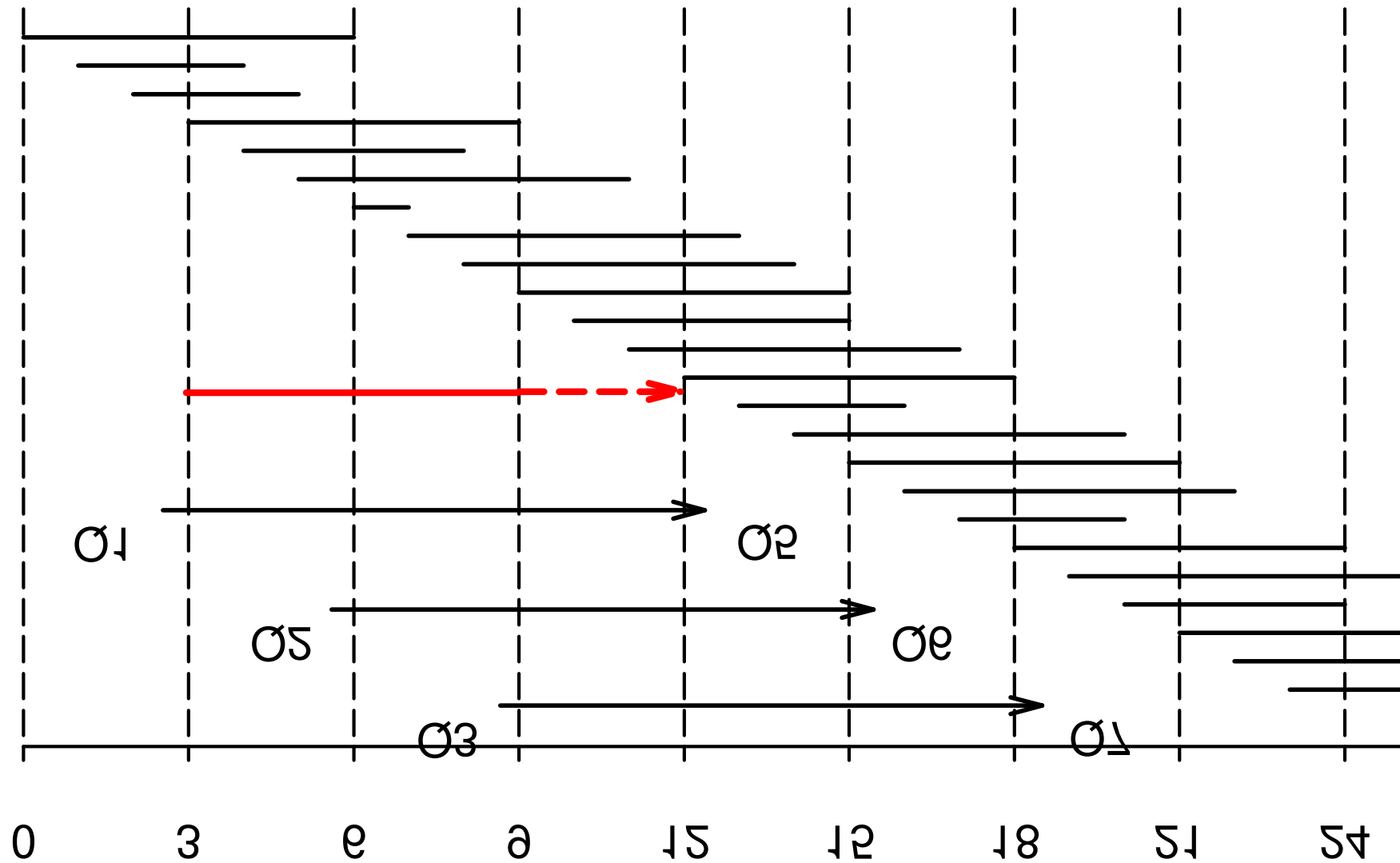


Approximate ratios of mean peak serum levels to minimal inhibitory concentrations of anti-TB drugs



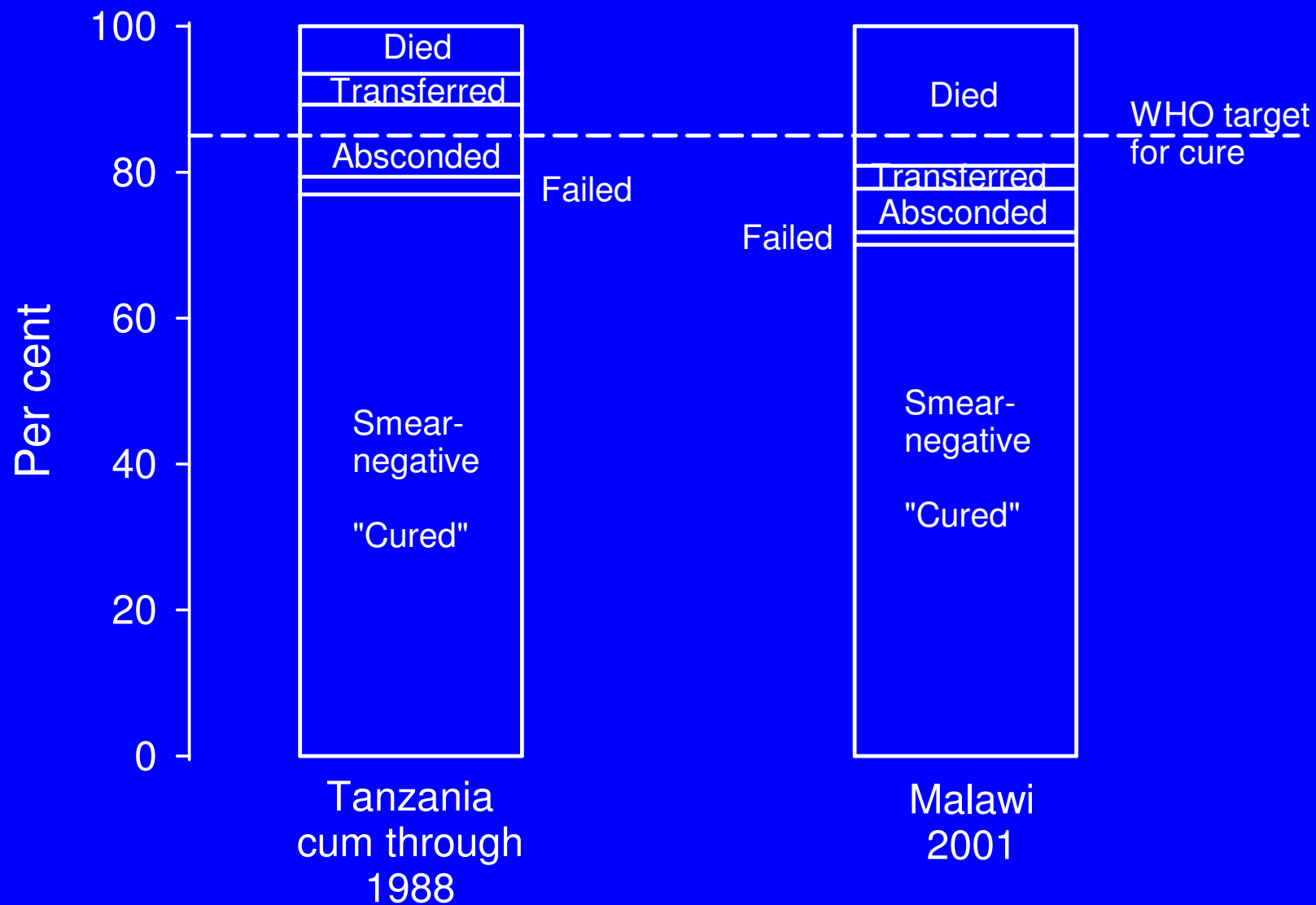
Evaluate what you are doing

Επειδή εννοούμεν individual (company member) must have opportunity to reach latest possible outcome event;



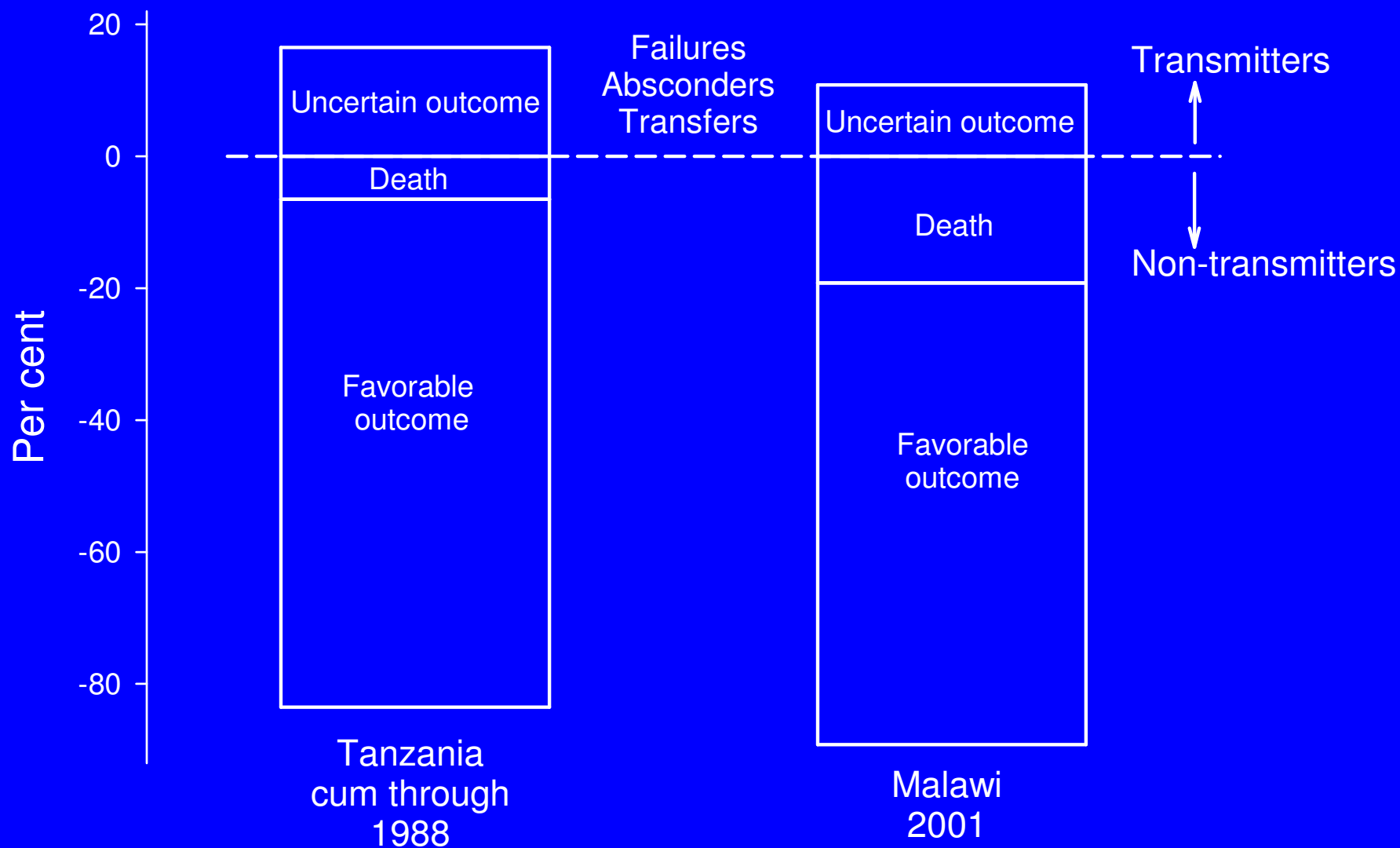
ΜΟΝΑΔΕΣ ΟΙ ΕΠΙΠΡΟΒΛΕΠΟΜΕΝΕΣ ΑΝΤΙΣΤΟΙΧΑ

Treatment Outcome of Sputum Smear-Positive Tuberculosis, Tanzania through 1988 and Malawi 2001



IUATLD / Tanzania NTL Progress Report 22, 1989
KNCV / Malawi NTP Progress Report 39, 2003

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Which question do you wish to answer?

Regimen effectiveness

Programmatically
favorable

Programmatically
unfavorable

Public health -
transmission

Bacteriologically
favorable

**Cure
Completion**

Death

Bacteriologically
uncertain

**Failure
Absconding
Transfer**

What about impact?

- o Epidemiologically minute
- o Individually tremendous

Don't think of impact, reduce human suffering

Miliary Tuberculosis



After 2 months chemotherapy



After 6 months chemotherapy