

TB in South African mines

ILO/ WHO Consultation to promote the
engagement of workplaces
12th October 2009

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INSTITUTE

The Aurum Institute

- Independent public benefit organisation that originated in the South African gold mining industry
- Mission: *“An internationally respected African institution that transforms health in the community.”*
- TB and HIV prevention and treatment
- Medical research and health systems management

Overview

- Epidemiology of TB in miners
- TB control amongst miners:
 - INH preventive therapy
 - Active case finding
- TB risk reduction in HIV-infected miners:
 - INH preventive therapy
 - Active case finding
 - Antiretroviral therapy

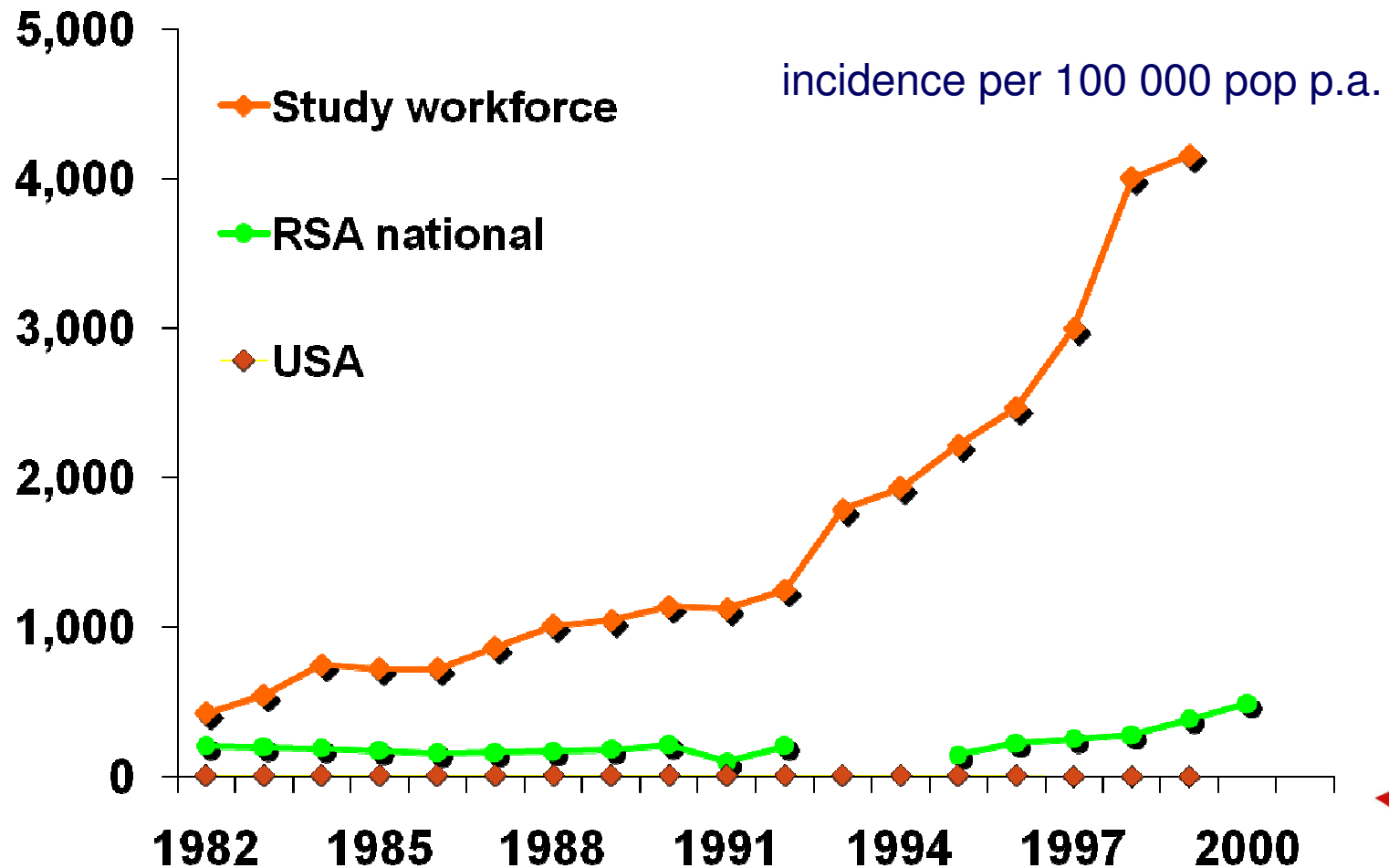


Epidemiology HIV and TB

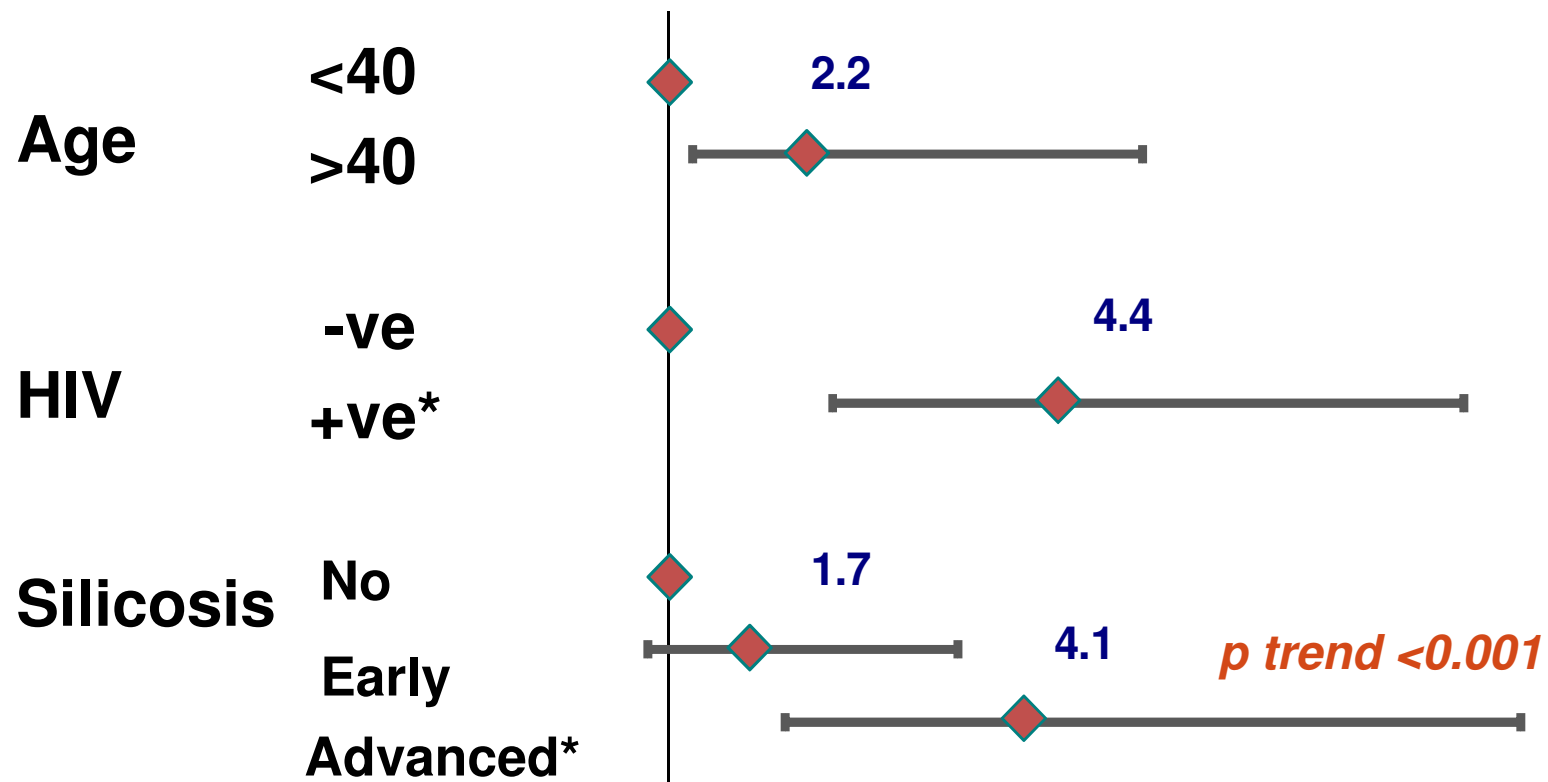


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TB in South African miners



Risk factors for TB incidence



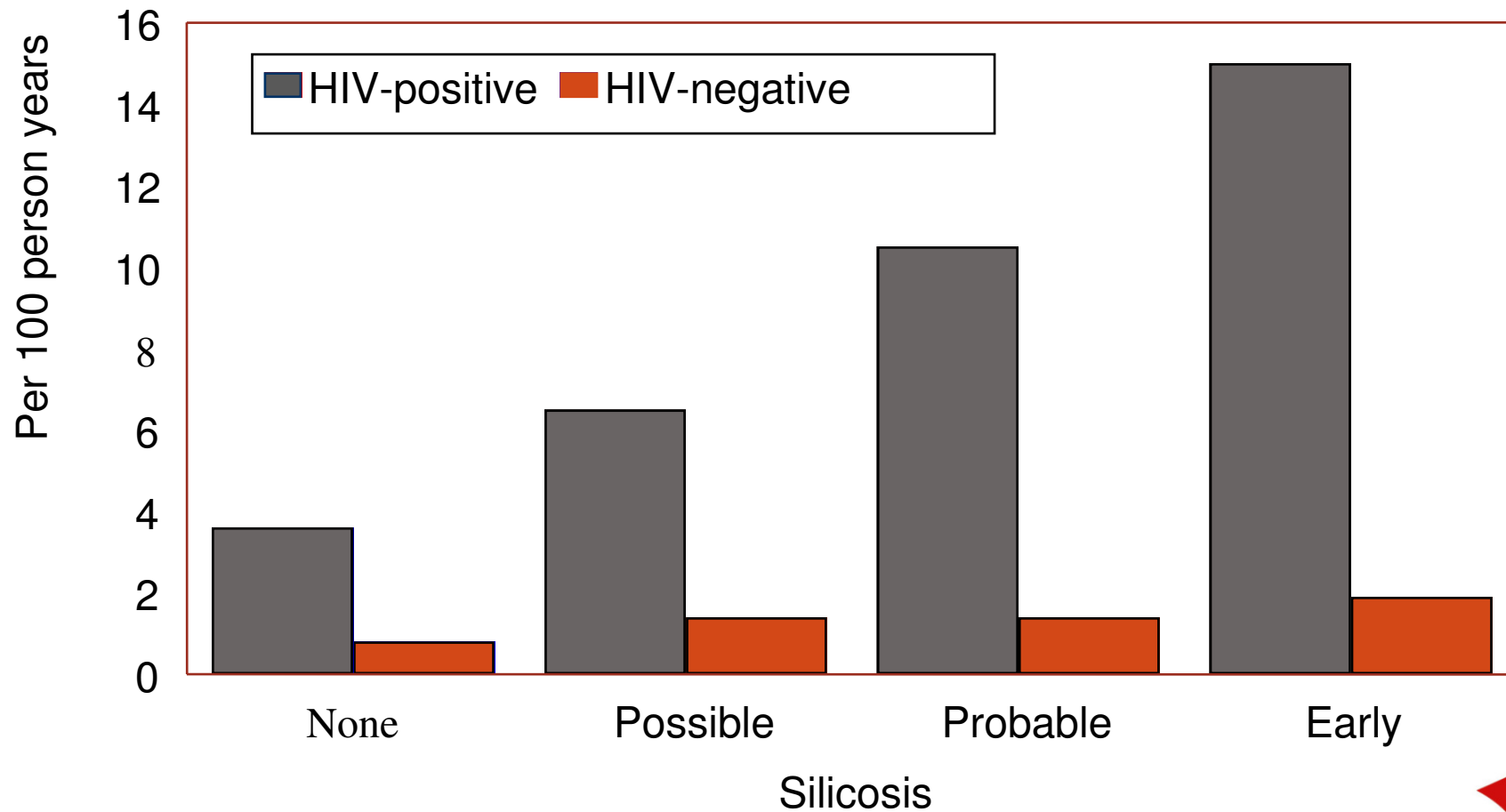
* remained significant in multivariate analysis

(Corbett. *Am J Resp Crit Care Med* 2004;170:673-9)



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TB risk with HIV & silicosis

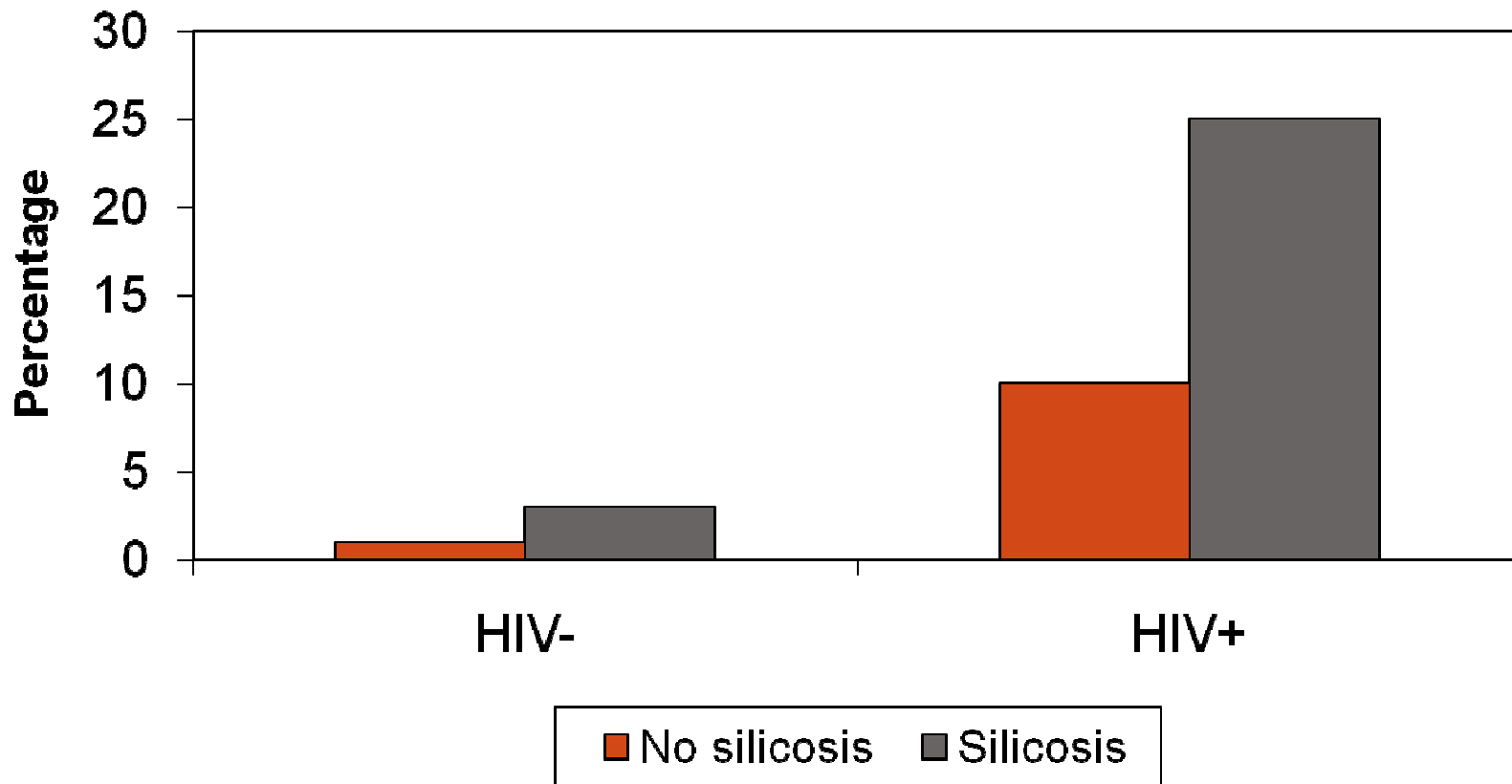


(Corbett EL, *AIDS* 2000;14:2759-68)



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Silicosis & TB case fatality



(Churchyard GJ, *Int J Tuberc Lung Dis*, 2000;4;705-712)



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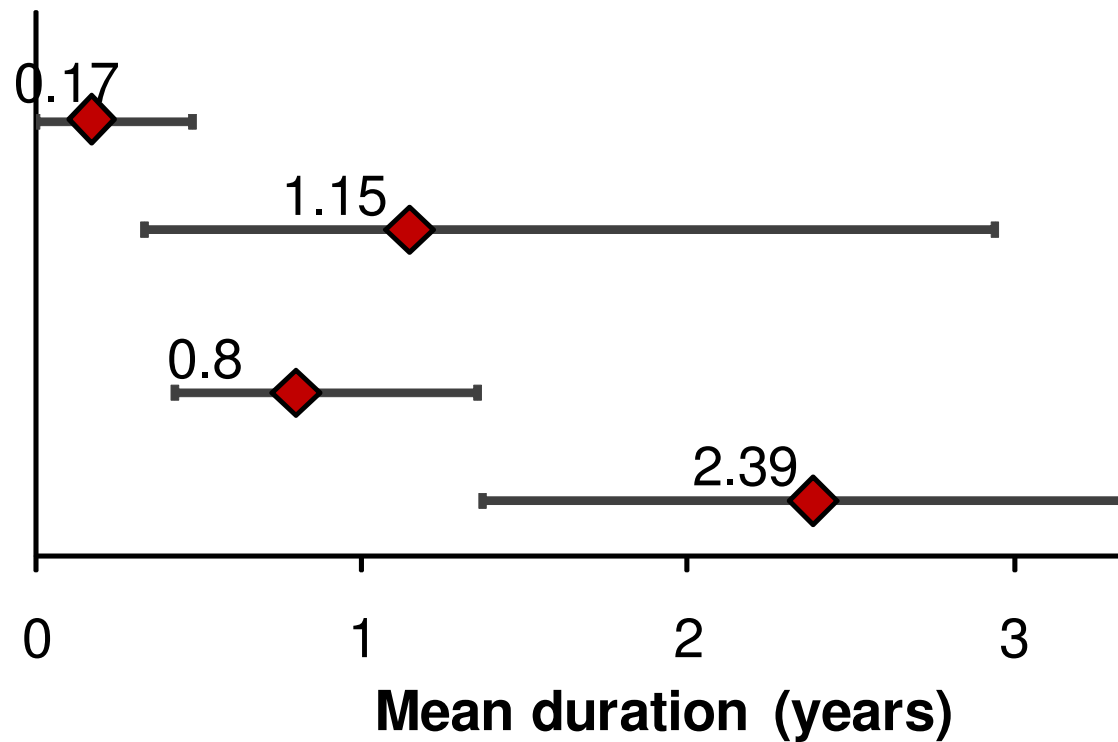
Duration of infectiousness

Smear +ve TB

HIV+ve
HIV-ve

All forms of TB

HIV+ve
HIV-ve

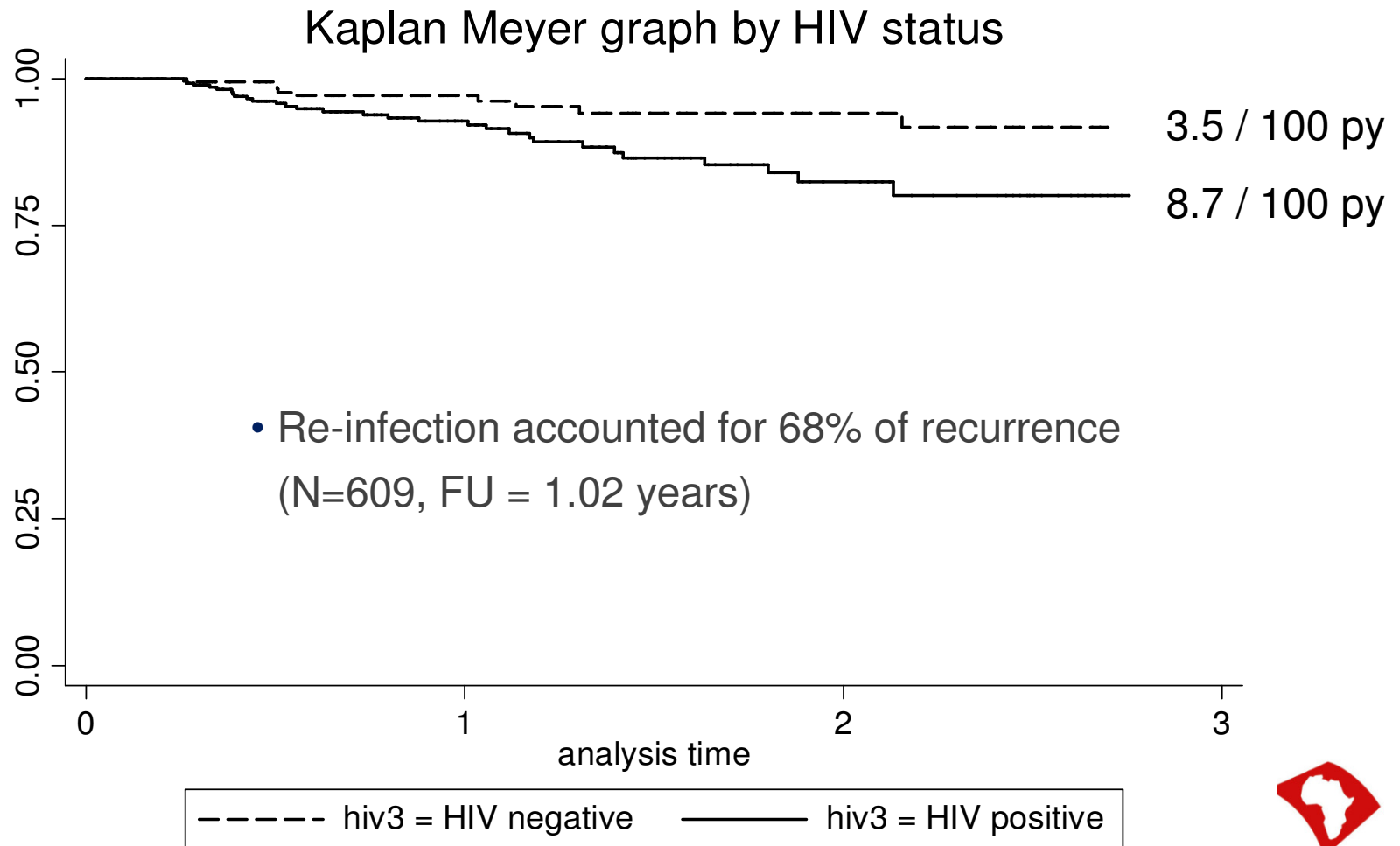


(Corbett L. *Am J Resp Crit Care Med* 2004;170:673-9)



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TB recurrence



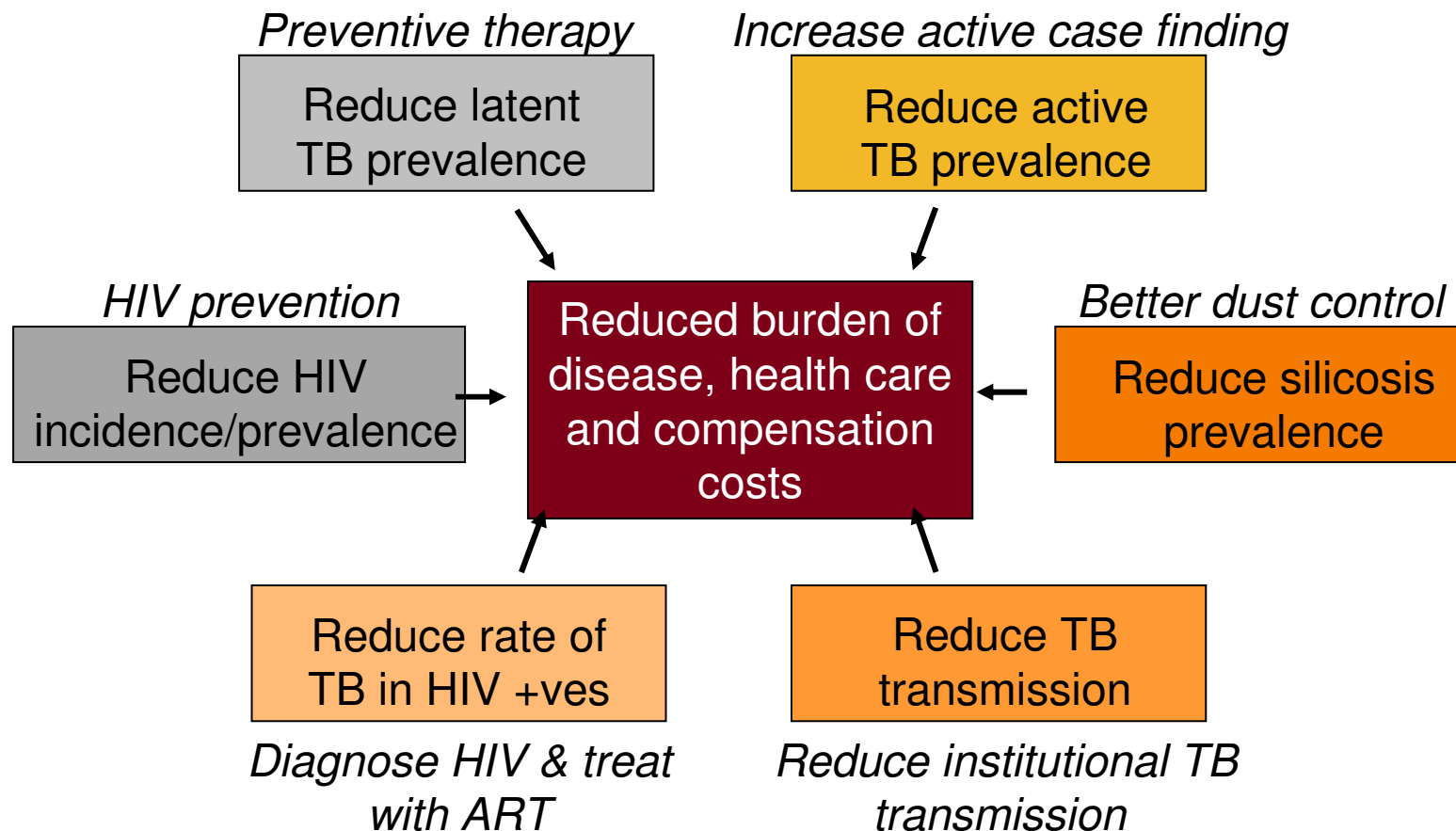
(Charalambous S et al. *Int J Tuberc Lung Dis* 2008;12(8):942–948)

Strategies to reduce TB incidence



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Strategic framework for TB control

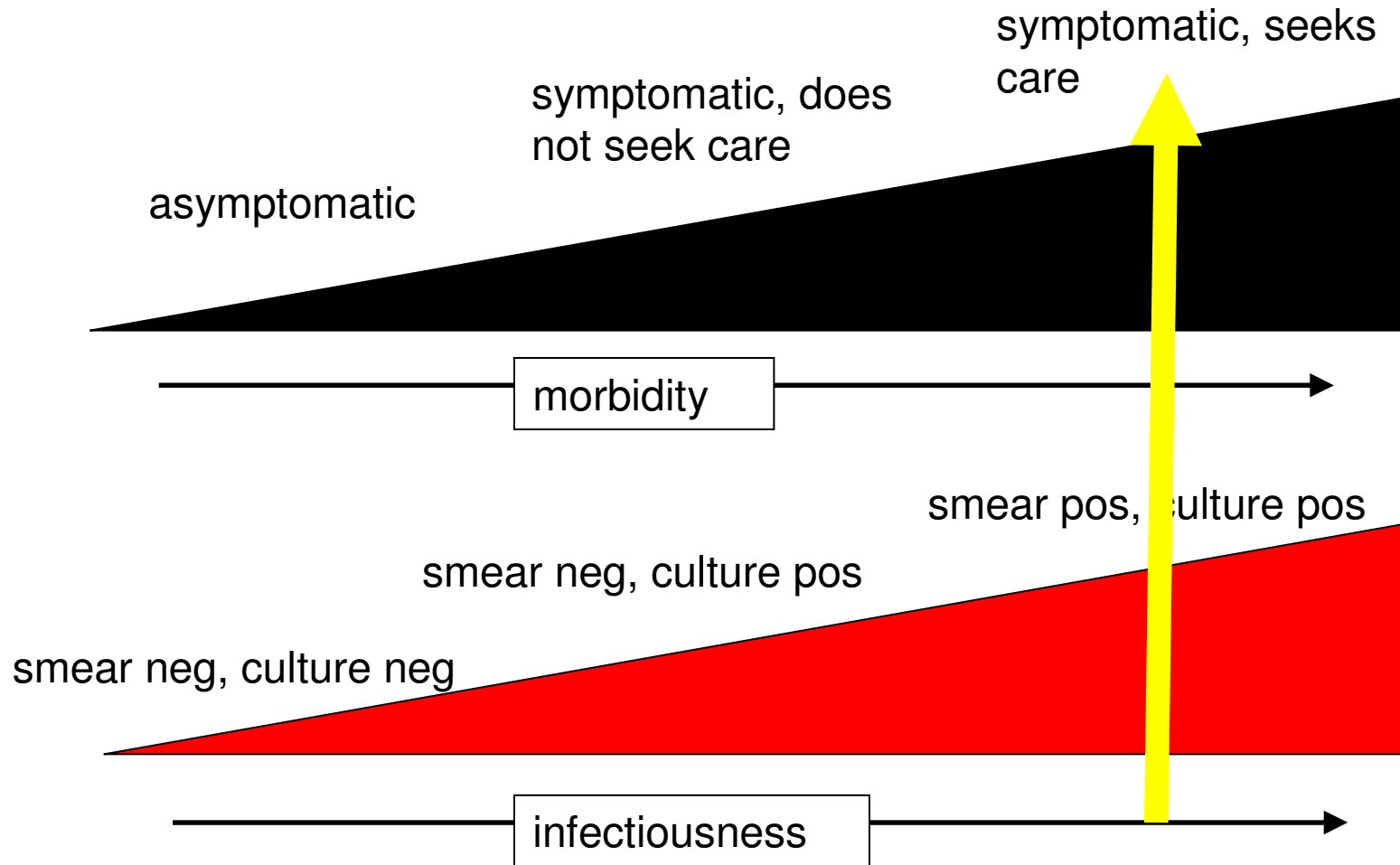


(Churchyard GJ, Corbett EL. Handbook of Occupational Health. SIMRAC, 2001)

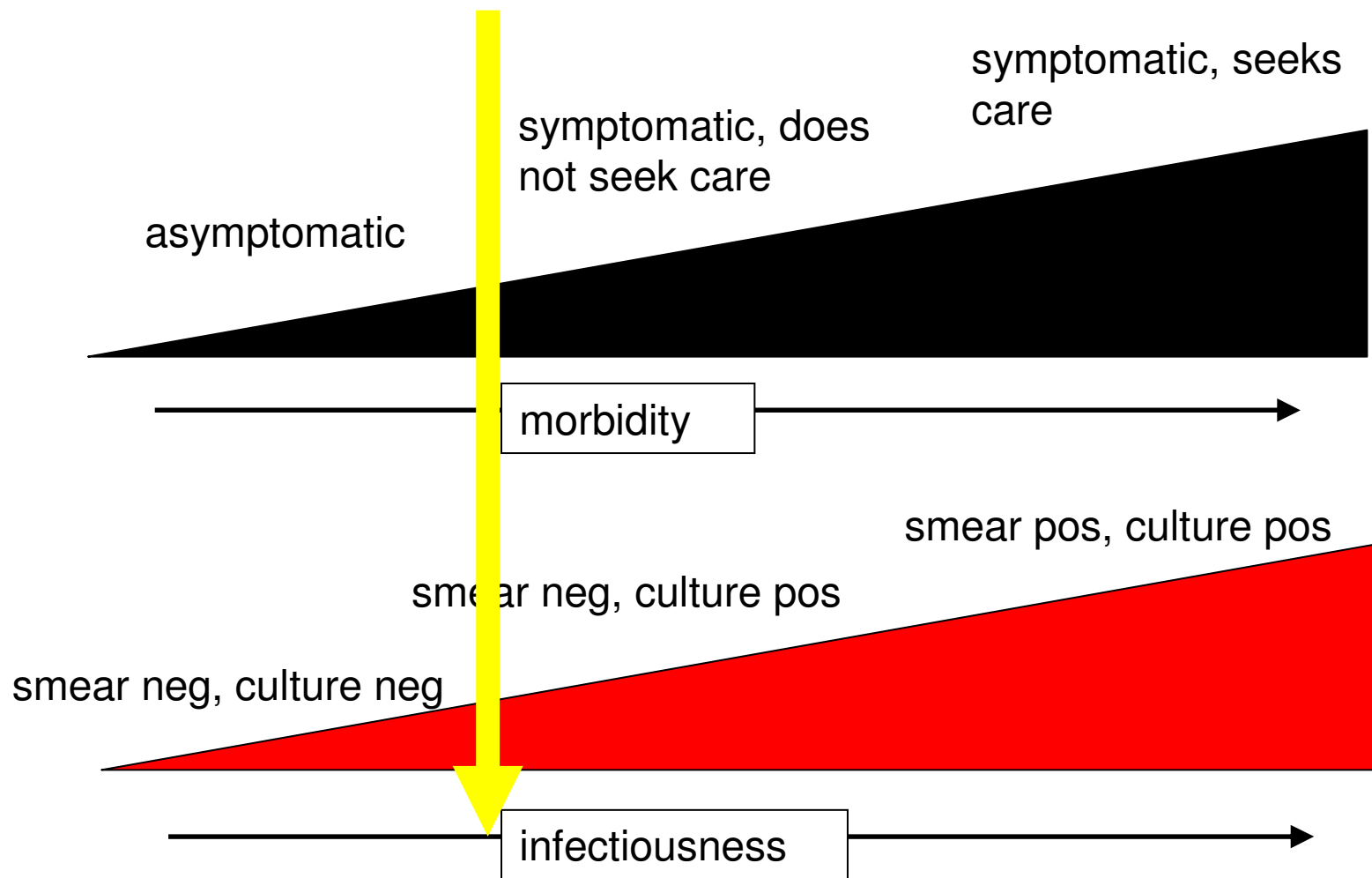


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Passive TB case finding



Active TB case finding



Active case finding

	Miners (general)		HIV-infected miners	
N	1960		899	
TB Prevalence	54 (2.7%)		44 (4.9%)	
	Sensitivity	Specificity	Sensitivity	Specificity
	%	%	%	%
Symptoms*	29.4	90.3	59.1	75.6
Symptoms & CXR	49.0	89.4	90.9	59.2

*Symptoms: Night sweats, cough or reported weight loss

Community INH preventive therapy (IPT): Thibela TB

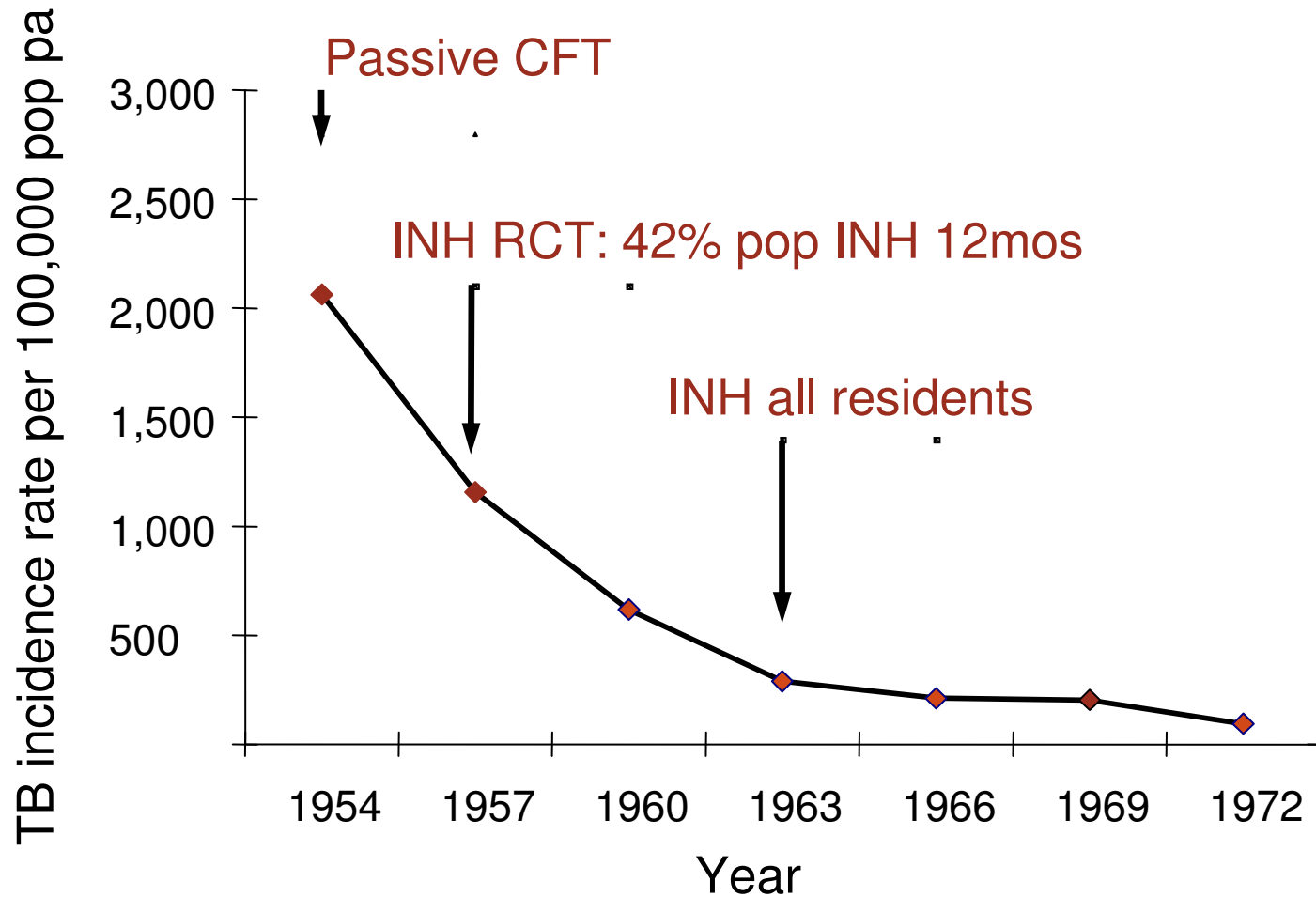


Standard TB control

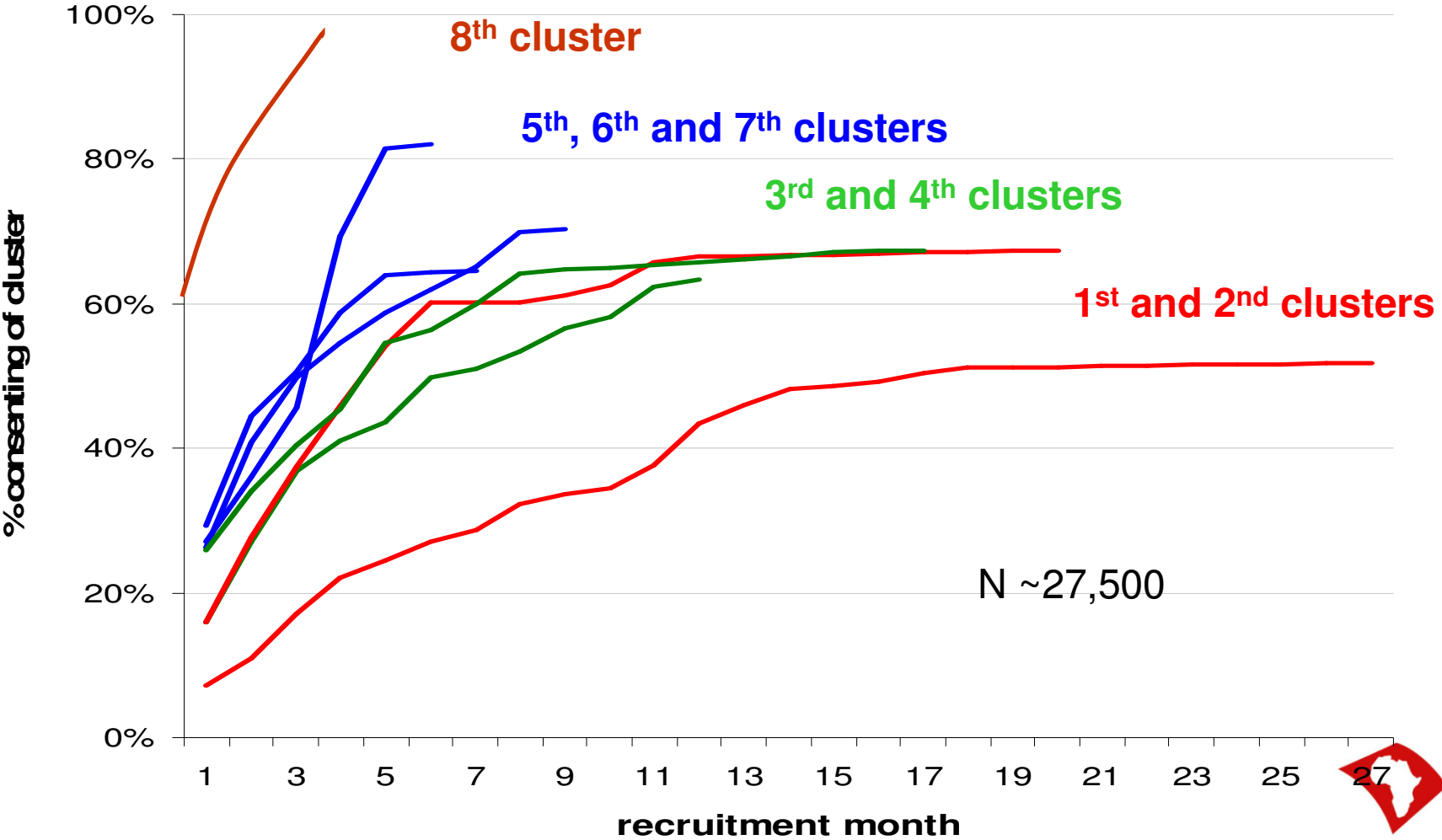
Standard TB control
plus
Community wide IPT



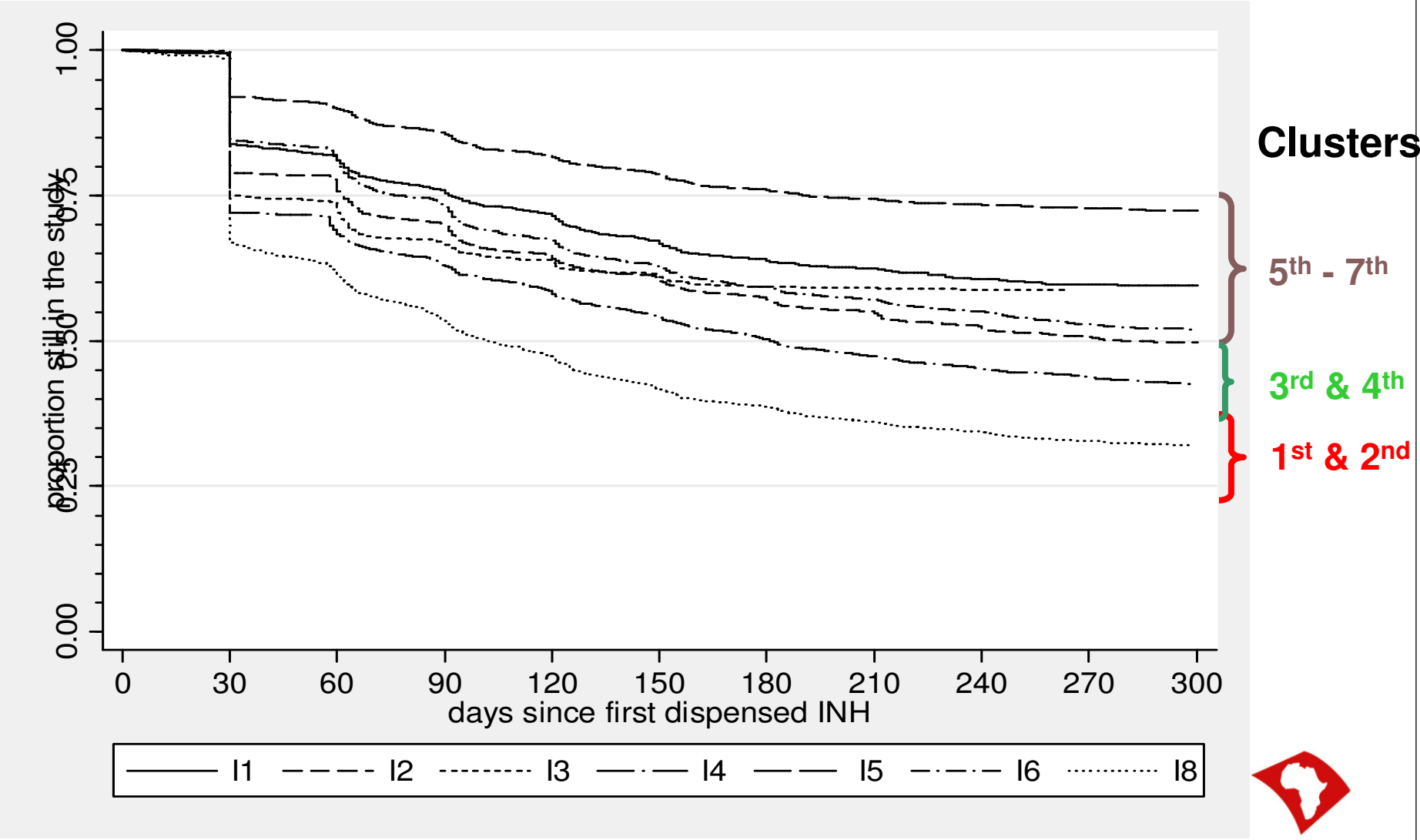
Community-wide IPT (Bethel district, Alaska)



Preliminary results: Enrollment



Reasonable retention is achievable

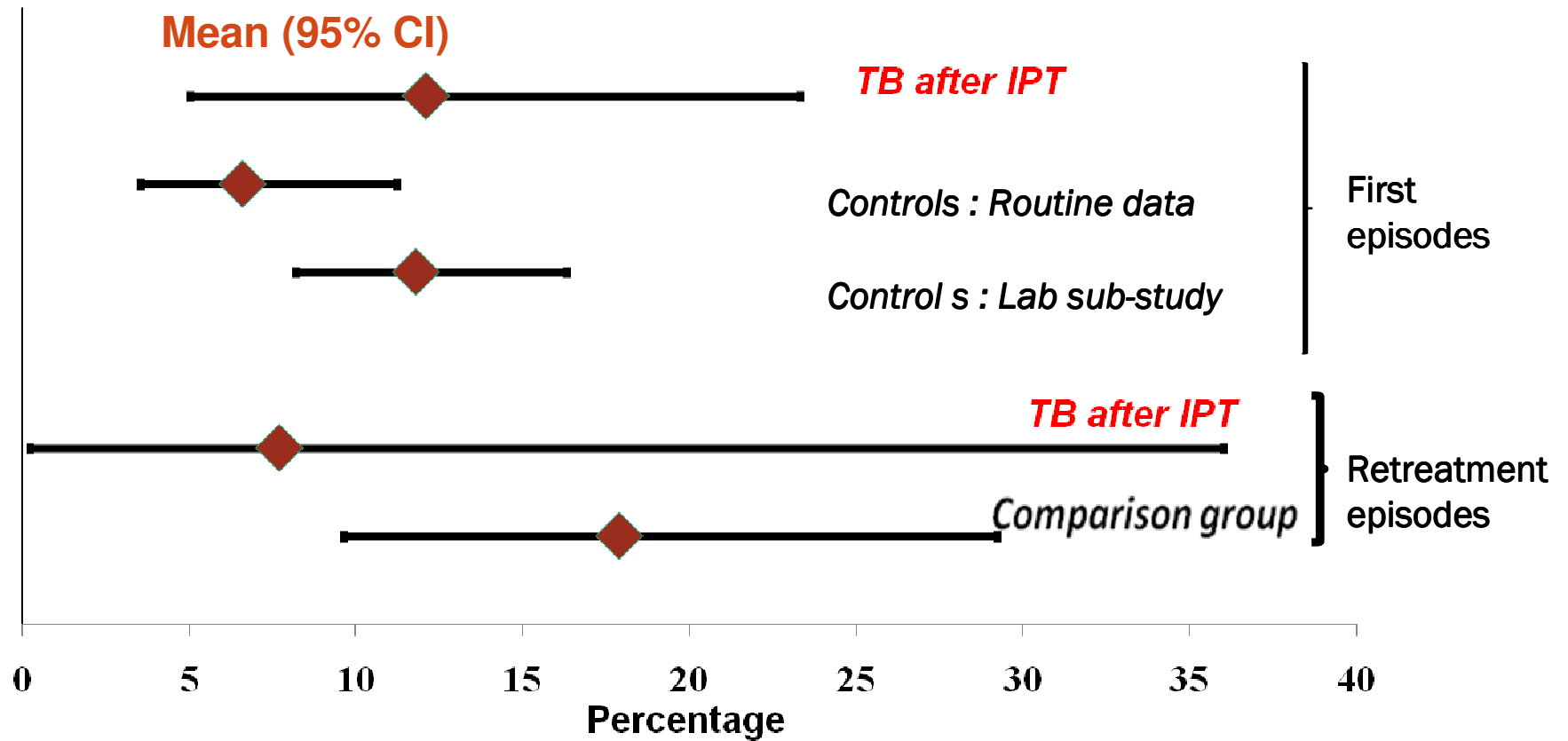


INH is safe

- 23,585 pts started INH between July 06 – 31Mar 09
- 126 adverse events recorded
 - 60 hypersensitivity
 - 49 peripheral neuropathy
 - 14 hepatitis
 - 3 convulsions
- 4 SAEs
 - 3 hepatitis; 1 definitely related
 - 1 convulsion; possibly related
- 33 deaths
 - 31 not related
 - 1 possibly related
 - 1 relationship to INH not coded



INH resistance



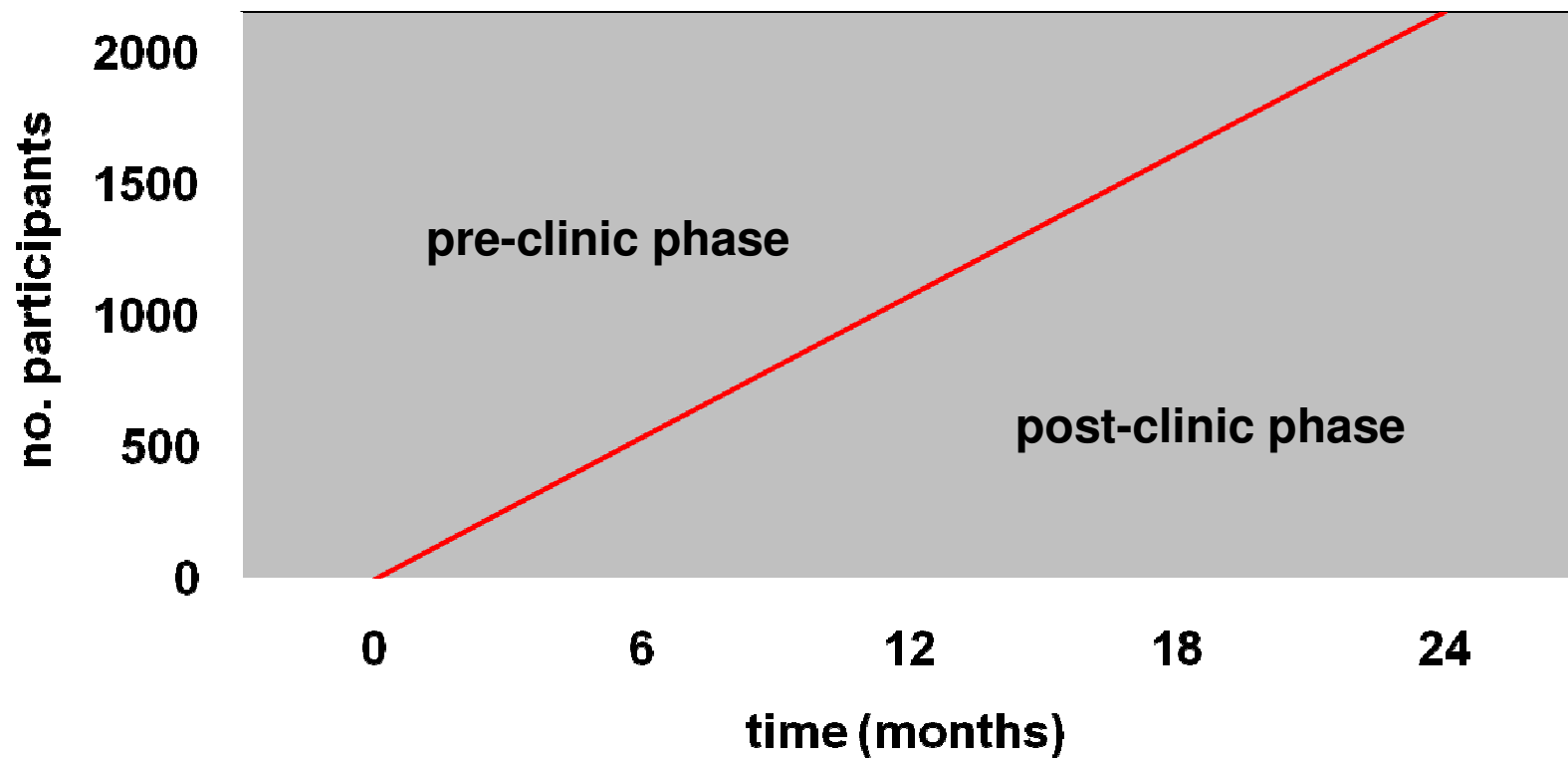
(Van Halsema, IAS Cape Town 2009)

Strategies to reduce the risk of TB among HIV positive miners



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Effectiveness of IPT pre-ART



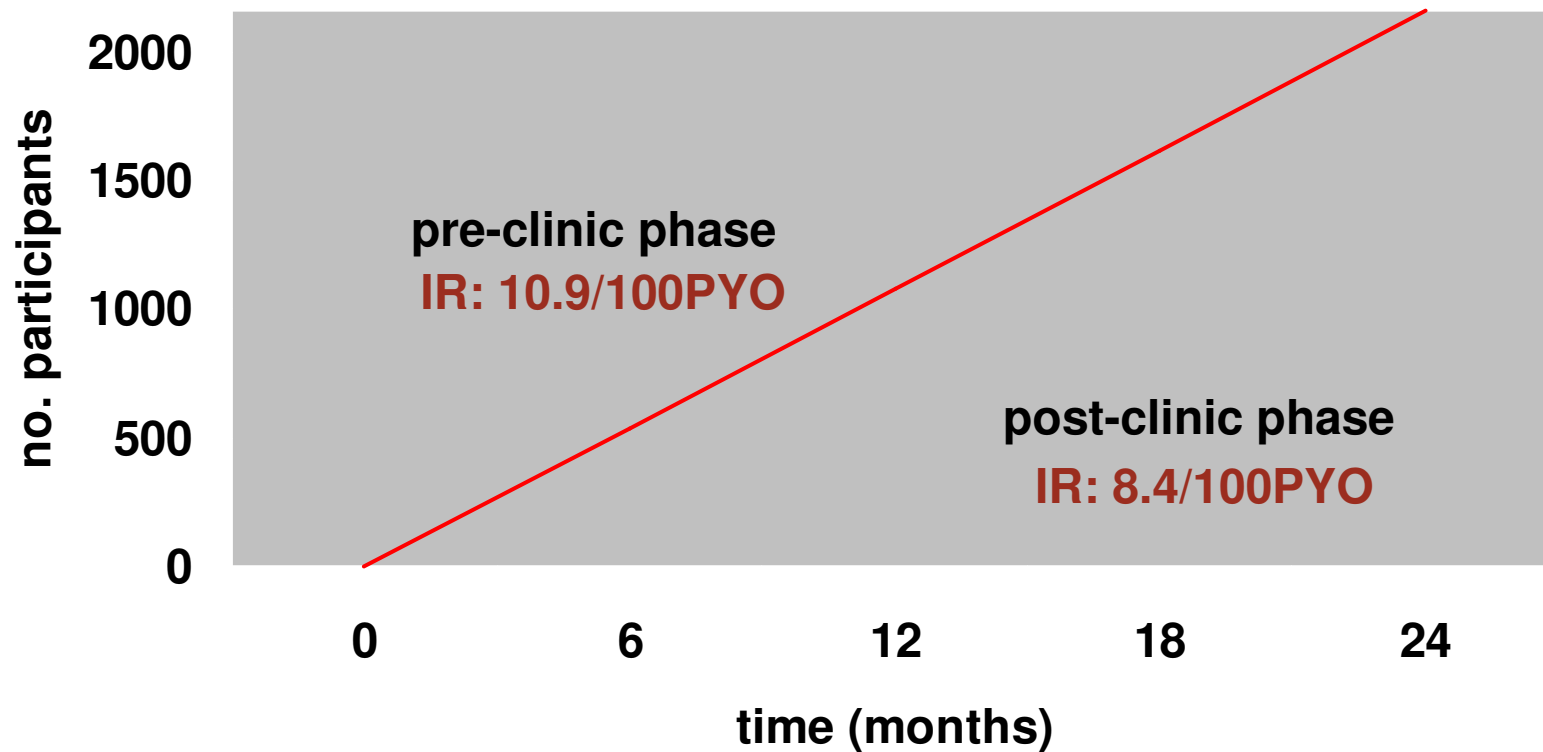
(Grant AD, JAMA, 2005; 293:2719-2725)



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Effectiveness of IPT pre-ART

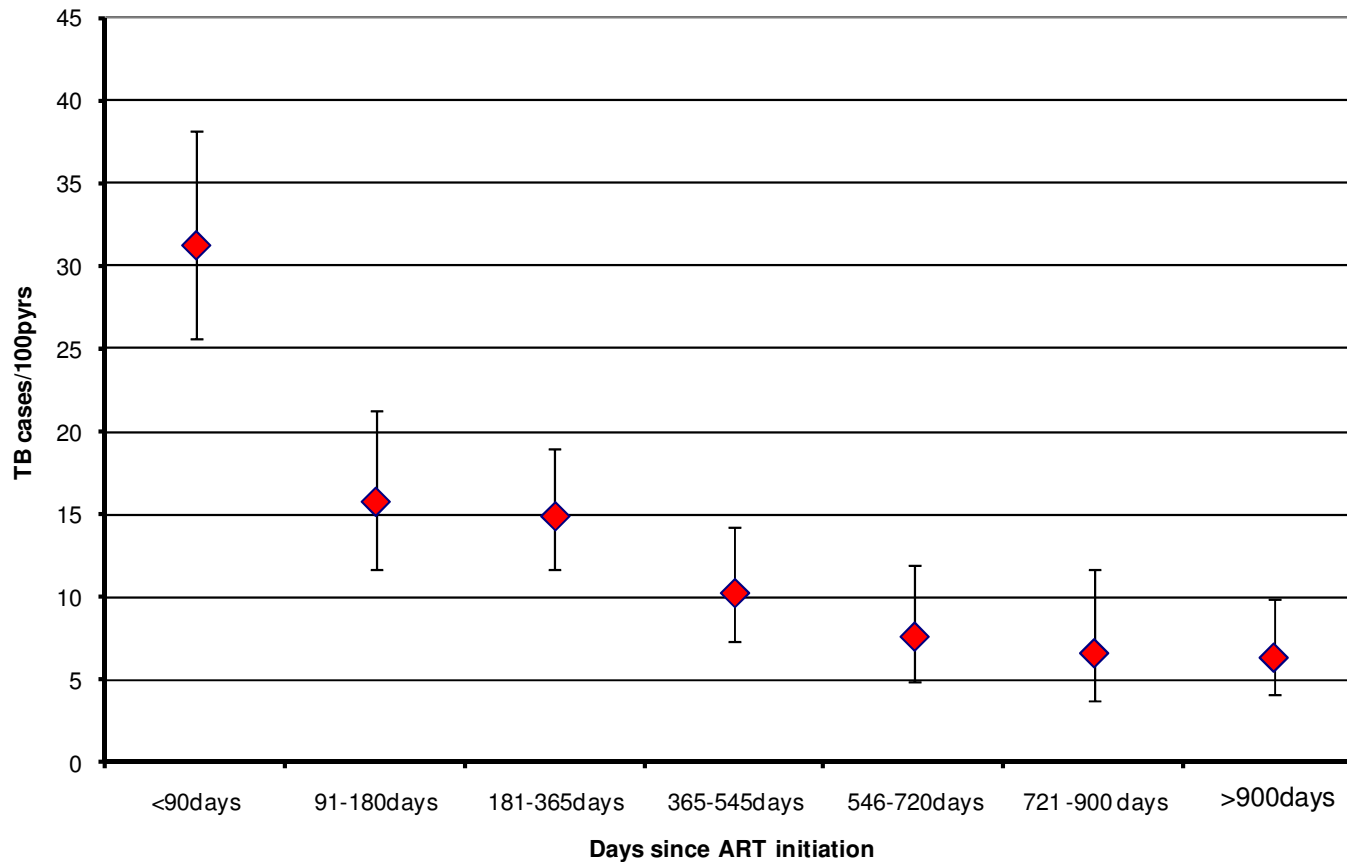
Adjusted IRR 0.54 (0.35-0.83)



(Grant AD, JAMA, 2005; 293:2719-2725)

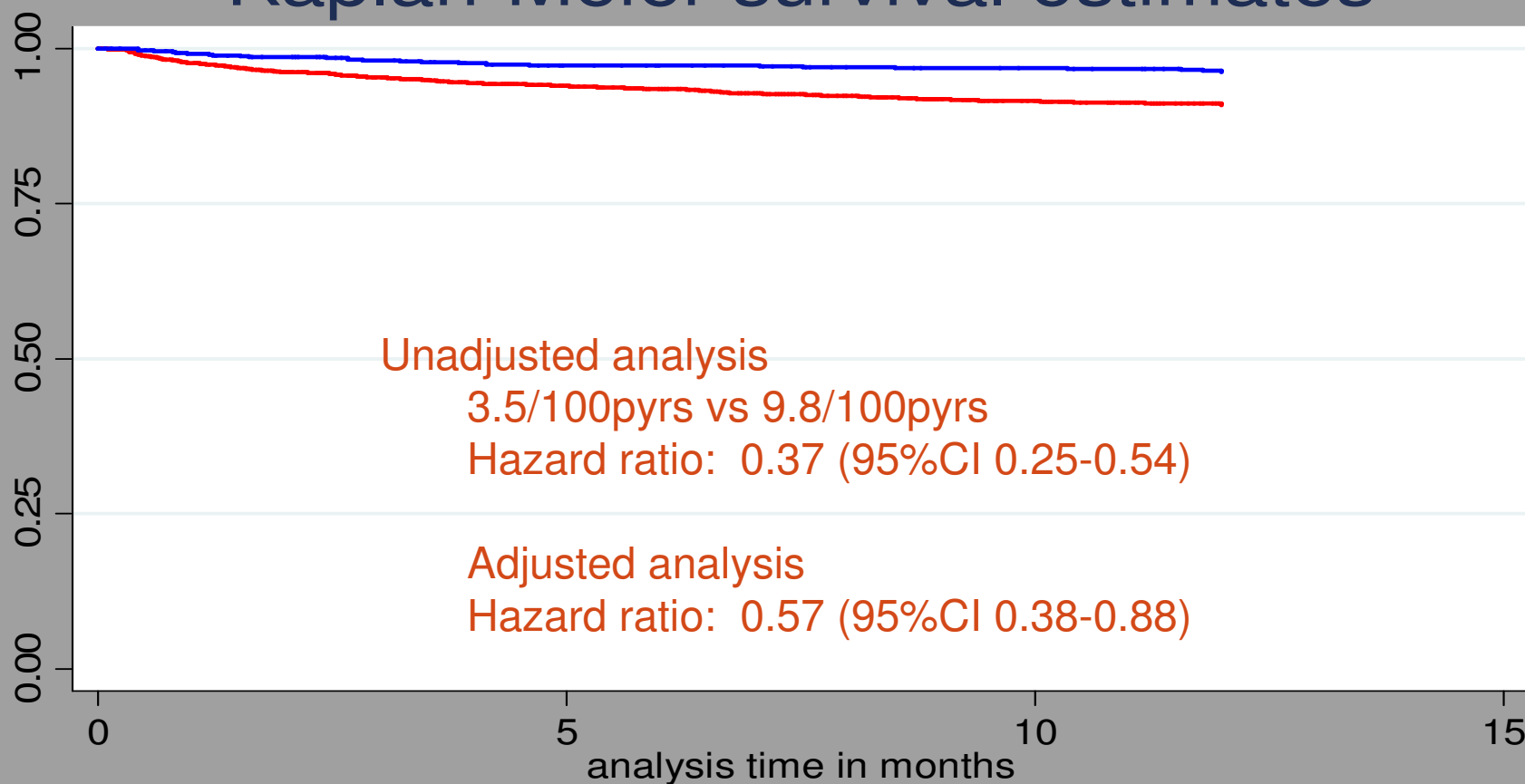
Antiretroviral therapy

TB incidence (first episode) following ART initiation



INH preventive therapy on ART

Kaplan-Meier survival estimates



— inhstart = 0 — inhstart = 1

Conclusions

- Miners high burden of disease due to dual risk factors: silicosis and HIV infection
- Additional strategies are required to control TB:
 - Active case finding
 - INH preventive therapy may be an additional mechanism
- HIV infected individuals
 - ART
 - INH preventive therapy

Acknowledgments

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Dr Y Hanifa





Resources

- TB/HIV tool kit for South African businesses. Global Health Initiative 2008
- Good Practice Guidance on HIV/AIDS, Tuberculosis and Malaria. International Chamber of Mines and Minerals 2007
- Isoniazid preventive therapy for patients with silicosis 2007. www.wahsa.net.
- Medical surveillance of silicosis and silica-related diseases. Expert Group Meeting. 2008

