Evidence from Asia : Implementation, Safety, and Effectiveness of the Short-course TPT Regimen

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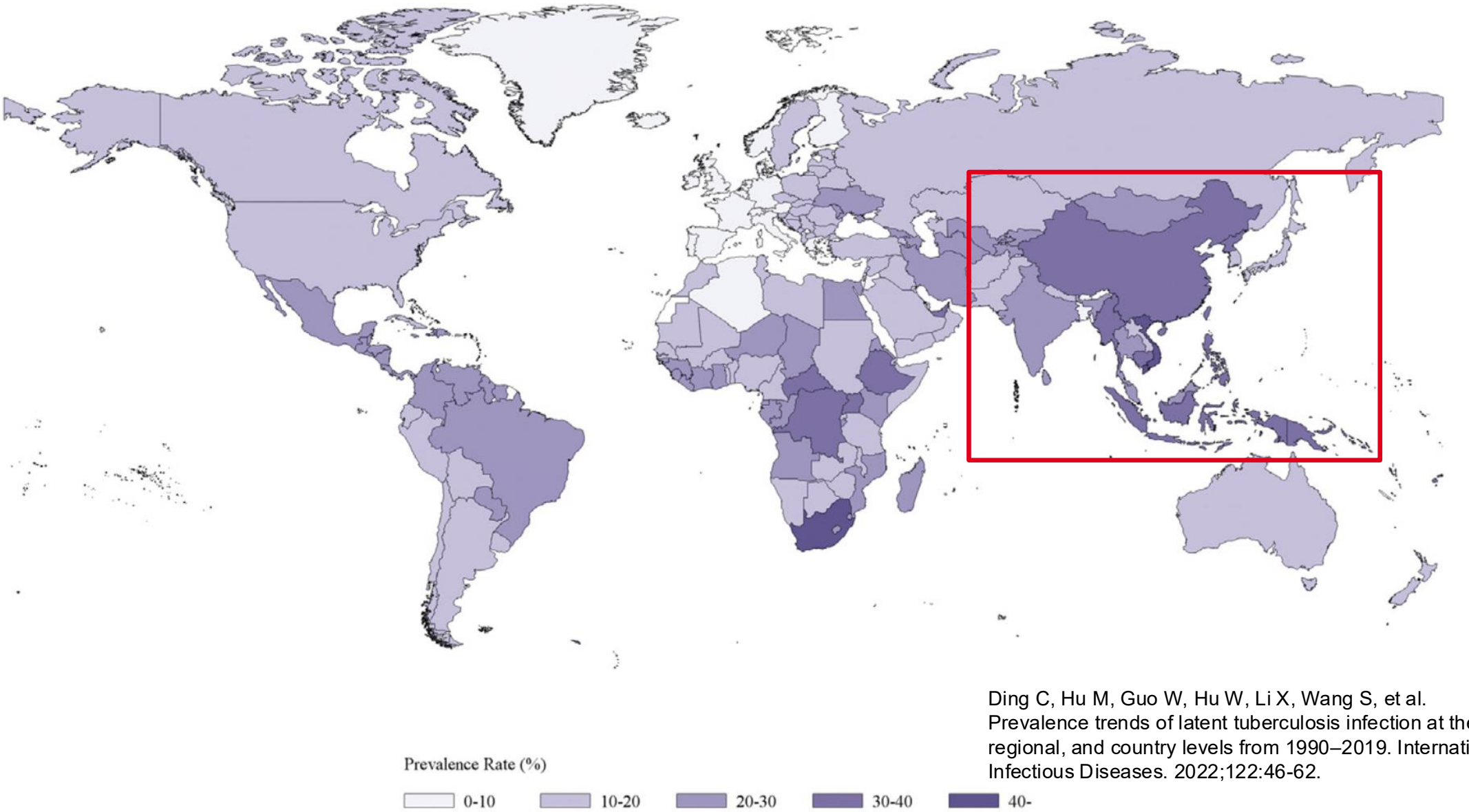
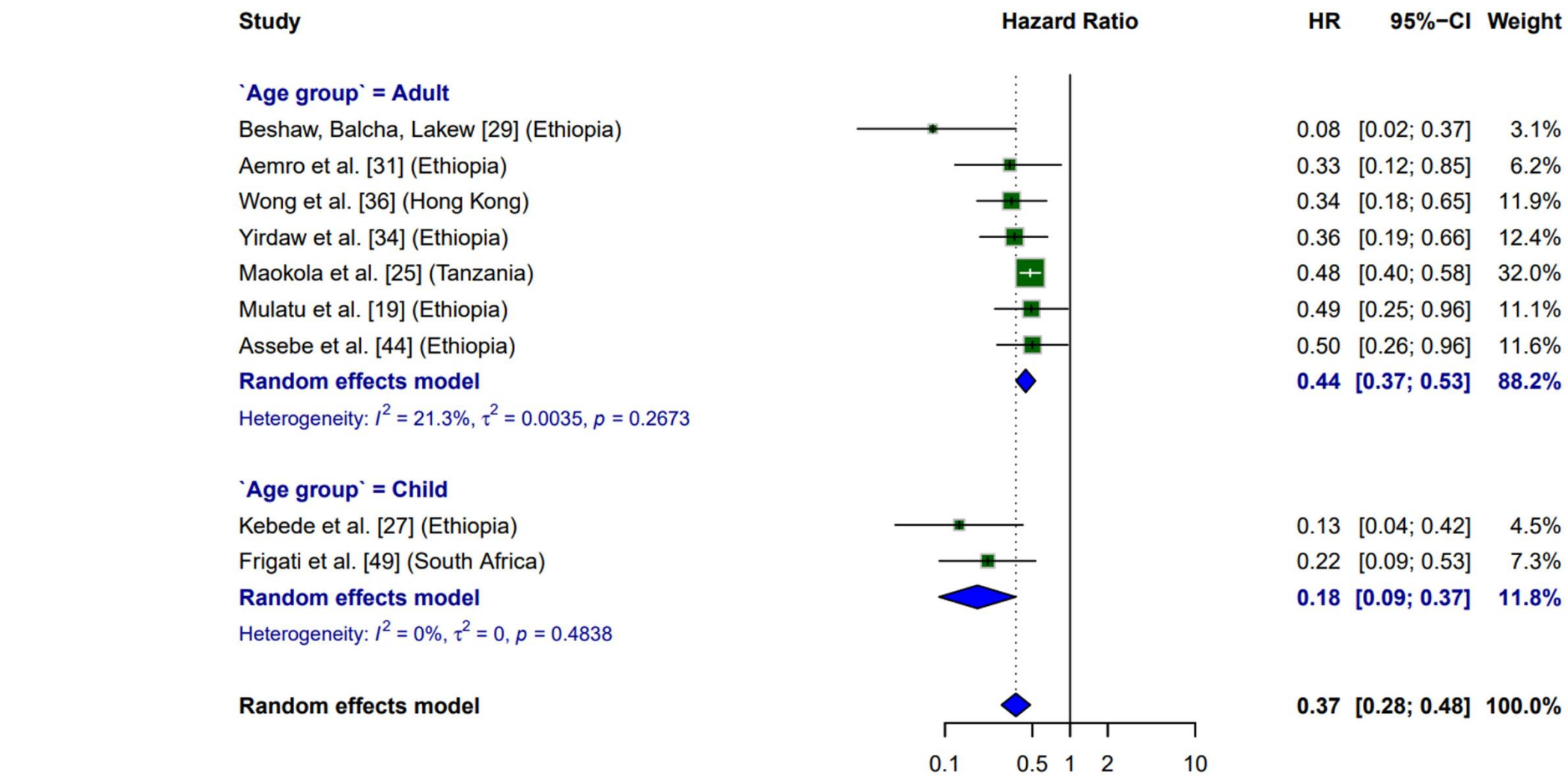
Prevalence Rate of Latent Tuberculosis Infection (2019)



Ding C, Hu M, Guo W, Hu W, Li X, Wang S, et al.
Prevalence trends of latent tuberculosis infection at the global, regional, and country levels from 1990–2019. International Journal of Infectious Diseases. 2022;122:46-62.

Effectiveness of tuberculosis preventive treatment on disease incidence among people living with HIV/AIDS: A systematic review and meta-analysis



Silva Júnior JNB, Leal GDC, Ferreira QR, Andrade LKA, Ballestero JGA, Santos VS, et al. Effectiveness of tuberculosis preventive treatment on disease incidence among people living with HIV/AIDS: A systematic review and meta-analysis. PLoS One. 2025;20(8):e0330208.

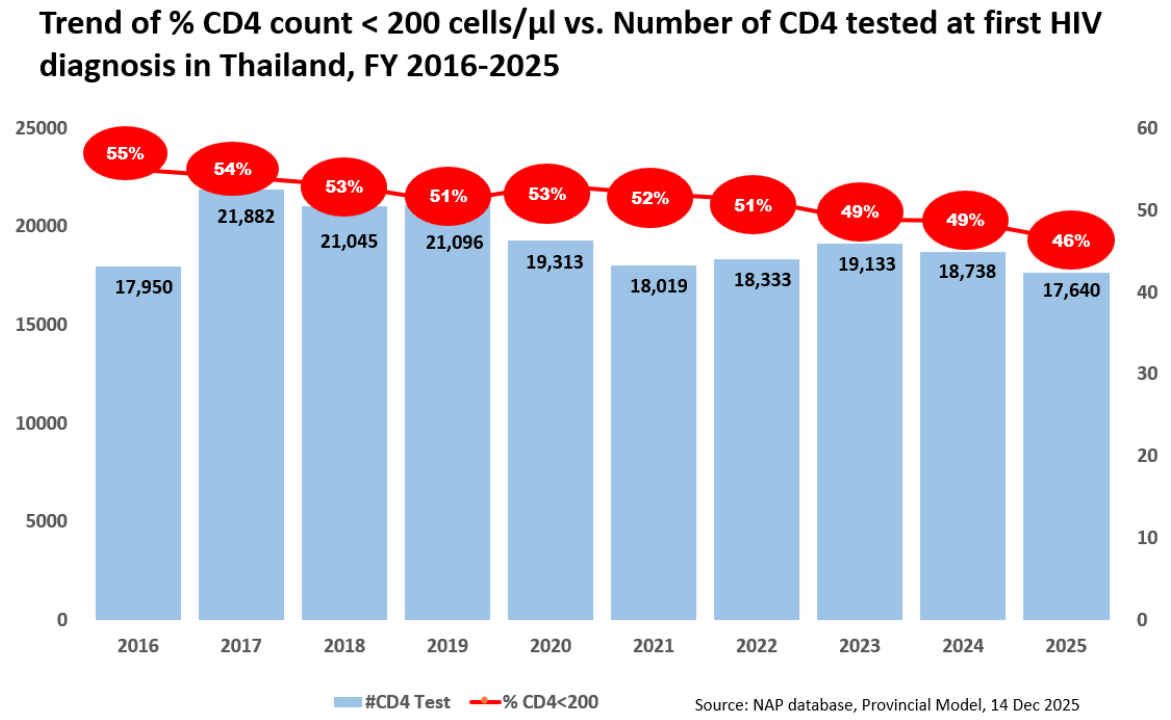
Key Studies on 1HP and 3HP in People with HIV

First Author (Year)	Countries	Setting & Population	N	Relevant Results
Sterling, 2016 (PREVENT TB)[2]	Brazil, Canada, Hong Kong, Peru, Spain, USA	HIV-positive, aged ≥2 years	399	**3HP non-inferior to 9H** (31% on ART). • TB cases: 2 vs. 6 • aHR: 0.27 (95% CI 0.05–1.44), p=0.13
Swindells, 2018 (BRIEF TB)[1]	Botswana, Brazil, Haiti, Kenya, Malawi, Peru, South Africa, Thailand, USA, Zimbabwe	HIV-positive, aged ≥13 years	3,000	**1HP non-inferior to 9H** (50% on ART). • 34 vs. 35 primary endpoints • TB cases: 29 vs. 24 • IRR: 0.025 (95% CI −0.30 to 0.35)
Churchyard, 2021 (WHIP3TB)[3]	South Africa, Ethiopia, Mozambique	HIV-positive on ART, aged ≥2 years	4,014	**3HP had higher completion vs. 6H**. (100% on ART). • Completion: 90.4% vs. 50.5% (RR 1.78) • TB incidence similar between regimens (HR 1.60, NS) • Annual vs. single 3HP: no added benefit (HR 0.96)

1. Swindells S, Ramchandani R, Gupta A, Benson CA, Leon-Cruz J, Mwelase N, et al. One Month of Rifapentine plus Isoniazid to Prevent HIV-Related Tuberculosis. N Engl J Med. 2019;380(11):1001-11.
2. Sterling TR, Scott NA, Miro JM, Calvet G, La Rosa A, Infante R, et al. Three months of weekly rifapentine and isoniazid for treatment of Mycobacterium tuberculosis infection in HIV-coinfected persons. Aids. 2016;30(10):1607-15.
3. Churchyard G, Cárdenas V, Chihota V, Mngadi K, Sebe M, Brumskine W, et al. Annual Tuberculosis Preventive Therapy for Persons With HIV Infection: A Randomized Trial. Ann Intern Med. 2021;174(10):1367-76.

Burden of TB disease in Thai PWH

- **Southeast Asia:** > 1/3 of new TB cases[1]
- **Thailand:** High TB/TB-HIV burden country; **incidence 146/100,000 in 2024[1]**
- High prevalence of **Advanced HIV disease** *(46% of new case in 2025)
- High TB-related mortality among PWH in Thailand **(~ 15% among AIDS related death[2])**



1 WHO global tuberculosis report 2025, 2 Getahun H. N Engl J Med. 2015 May 28;372(22):2127–35.3.Horsburgh CR Jr.. N Engl J Med 2004; 350:2060–2067.
2 The Lancet Regional Health - Southeast Asia 2025;36: 100576

Incidence of active tuberculosis among people living with HIV receiving long-term antiretroviral therapy in high TB/HIV burden settings in Thailand: implication for tuberculosis preventive therapy

Thailand estimated TB incidence of **150 cases per 100,000 persons** (2019)

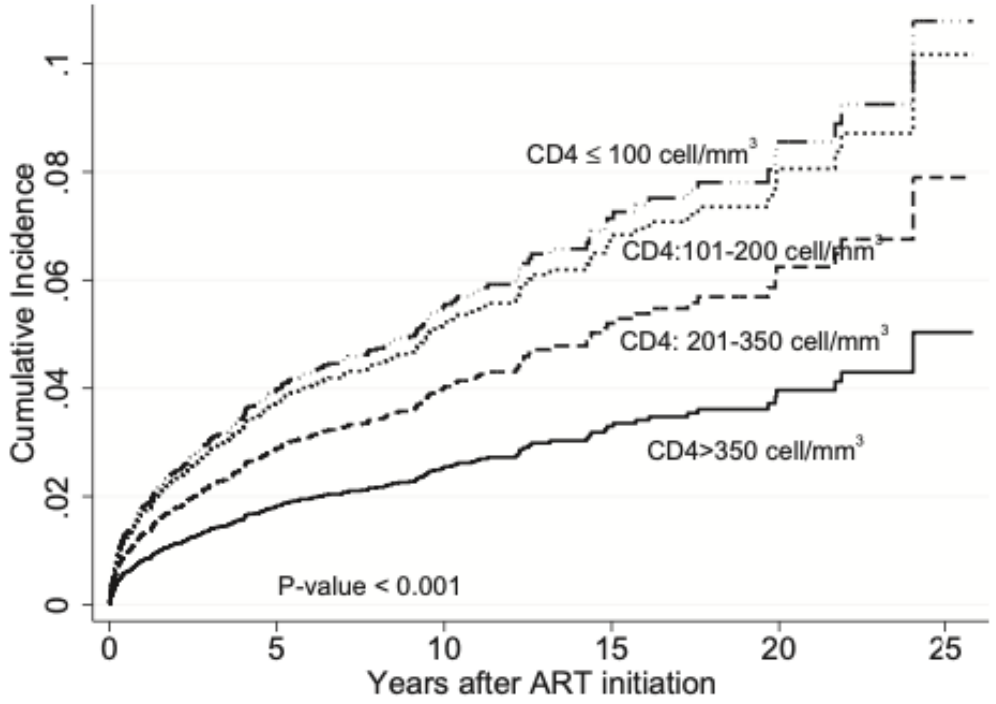
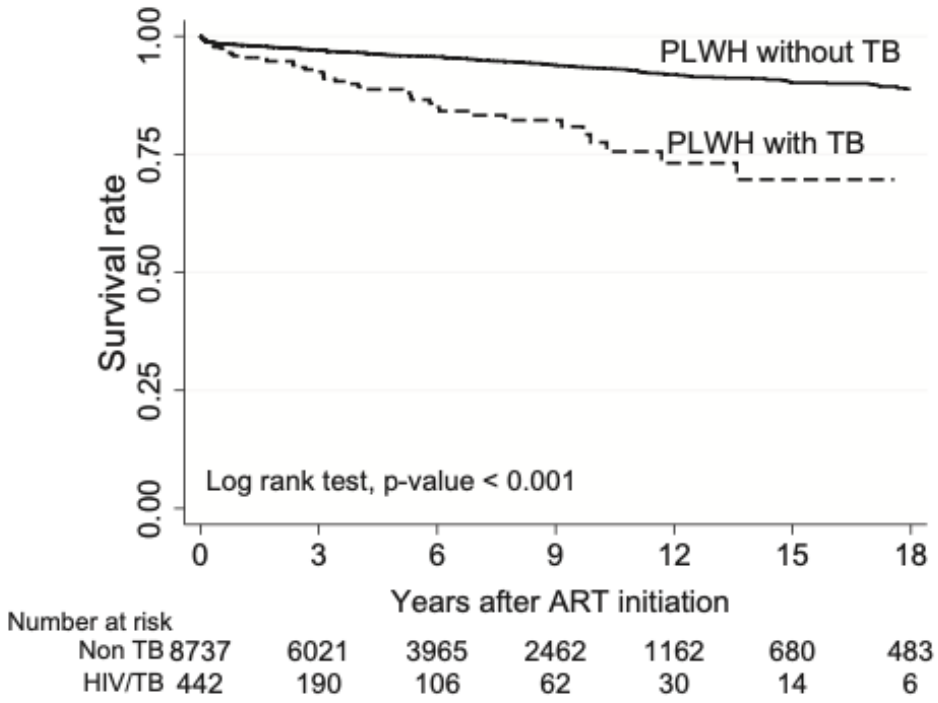


Figure 2. Cumulative TB incidence rate stratified by CD4 cell count at ART initiation.



PLWH aged ≥18 years who initiated ART from 1999 to 2017: 15 HIV clinics across Thailand **(n = 9179)**

- During follow-up, **486 (5.3%) died, 737 (8%) were transferred out and 962 (10.5%) were lost to follow-up**
- Median baseline CD4 count was 227 cells/mm^3

Suwanpimolkul G, Gatechompol S, Kawkitinarong K, Ueaphongsukkit T, Sophonphan J, Siriyakorn N, et al. Incidence of active tuberculosis among people living with HIV receiving long-term antiretroviral therapy in high TB/HIV burden settings in Thailand: implication for tuberculosis preventive therapy. J Int AIDS Soc. 2022;25(4):e25900.

Incidence TB per 100,000/year follow-up by CD4 at time of antiretroviral initiation

CD4 at ART initiation, cells/mm^3	PYFU	Incident TB cases	Incidence rate (per 100,000 PYFU)	95% CI	
≤100	14,652	169	**1153**	992	1341
101-200	10,469	102	**974**	802	1183
201-350	15,579	88	**565**	458	696
351-500	9160	33	**360**	256	507
>500	7113	31	**436**	306	620
Unknown	1978	19	**960**	613	1506
Total	58,951	442	750	683	823

Suwanpimolkul G, Gatechompol S, Kawkitinarong K, Ueaphongsukkit T, Sophonphan J, Siriyakorn N, et al. Incidence of active tuberculosis among people living with HIV receiving long-term antiretroviral therapy in high TB/HIV burden settings in Thailand: implication for tuberculosis preventive therapy. J Int AIDS Soc. 2022;25(4):e25900.

Incidence TB per 100,000 PYFU by duration on antiretroviral therapy

Duration on ART	PYFU	Incident TB cases	Incidence rate (per 100,000 PYFU)	95% CI	
≤ 3 months	48	84	**175,511**	141,720	217,359
> 3 months - 6 months	119	32	**26,974**	19,075	38,143
> 6 months - 1 year	310	39	**12,579**	9190	17,216
>1 year - 2 years	1350	58	**4298**	3323	5559
>2 years - 3 years	2335	39	**1670**	1220	2286
>3 years - 4 years	3476	34	**978**	699	1369
>4 years - 5 years	2527	30	**1187**	830	1698
>5 years - 6 years	3169	20	**631**	407	978
>6 years - 7 years	4039	18	**446**	281	707
>7 years - 8 years	3217	16	**497**	305	812
>8 years - 9 years	4211	10	**237**	128	441
>9 years - 10 years	5013	18	**359**	226	570
>10 years	29138	44	**151**	112	203

Suwanpimolkul G, Gatechompol S, Kawkitinarong K, Ueaphongsukkit T, Sophonphan J, Siriyakorn N, et al. Incidence of active tuberculosis among people living with HIV receiving long-term antiretroviral therapy in high TB/HIV burden settings in Thailand: implication for tuberculosis preventive therapy. J Int AIDS Soc. 2022;25(4):e25900.

Abstract # 145

One-Month vs. 3-Month Rifapentine-Based Prophylaxis for Tuberculosis in People with HIV

A Randomized Clinical Trial in Thailand (LTBI Study)

Anchalee Avihingsanon [1,2], Supunnee Jirajariyavej [3], Thitisant Palakawong [4], Jiratchaya Sophonphan [1], Praniti Danpornprasert [5], Virat Klinbuayaem [6], Worarat Imsanguan [7], Sirichai Wiwatrojanagul [8], Porntip Treebupachatsakul [9], Natcha Saetiew [10], Preudtipong Noopetch [11], Stephen J Kerr [1, 12, 13], Ploenchan Chetchotisakd [14] on behalf of LTBI study team

[1] HIVNAT, Thai Red Cross AIDS and Infectious Diseases Research Centre, Bangkok, Thailand; [2] Center of Excellence in Tuberculosis, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand; [3] Taksin Hospital, Bangkok, Thailand; [4] The Public Health Centre 28 Krung Thon Buri, Bangkok, Thailand; [5] Klang Hospital, Bangkok, Thailand; [6] Sanpatong Hospital, Chiang Mai, Thailand; [7] Chiangrai Prachanukroh Hospital; [8] Maharat Nakhon Ratchasima Hospital, Nakhon Ratchasima, Thailand; [9] Buddhachinnaraj Hospital, Phitsanulok, Thailand; [10] Sisaket Hospital, Si Sa Ket, Thailand; [11] Hatyai Hospital, Songkhla, Thailand; [12] Research Affairs, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand; [13] The Kirby Institute, UNSW, Sydney, Australia; [14] Srinagarind Hospital, Khon Kaen, Thailand

February 22-25, 2026
Conference on Retroviruses and Opportunistic Infections (CROI)
Denver, Colorado

In courtesy of Dr.Avihingsannon

Hypothesis, objective and outcomes

Hypothesis

Four weeks of daily rifapentine and isoniazid (1HP) will be non-inferior to three months of weekly rifapentine and isoniazid (3HP) in preventing TB in PWH

Primary Objective

To compare the efficacy of 1HP with 3HP inpreventing TB and death in adults with HIV in Thailand (non-inferiority design)*

Statistical analysis

Required sample: 1,232 participants → adjusted for 20% loss to follow-up →**1,500 participants**

Primary Outcome

- **TB incidence difference between groups**
- **Method:** Generalized Linear Model (Poisson family)
- **Non-inferiority criterion:** Upper limit of 95% CI < 2.5%

Secondary Outcome

- Factors associated with hepatotoxicity
- **Methods:** Fixed-effects, Random-effects, and Population-averaged Poisson models

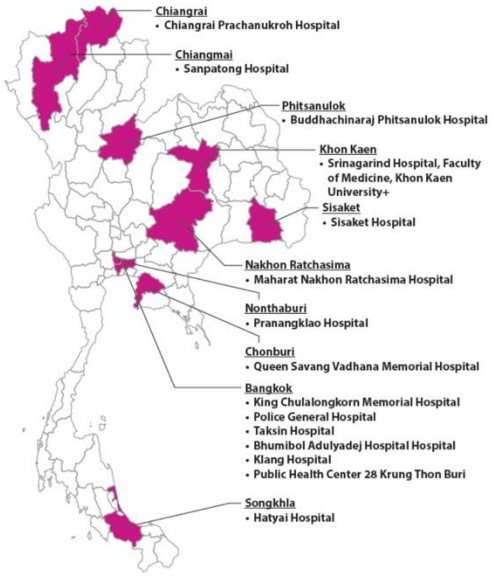
Secondary Endpoints :Safety and tolerability, all cause and non-TB mortality, Pharmacokinetics and drug-drug interactions of 1HP and 3 HP with dolutegravir, Rate and pattern of TB drug resistance

* Martinson et al NEJM 2011:365:11-20

In courtesy of Dr.Avihingsannon

Study Design & Methodology

Thai adults (≥18)
with HIV,
no active TB
On EFV or
DTG based ART
N=1500

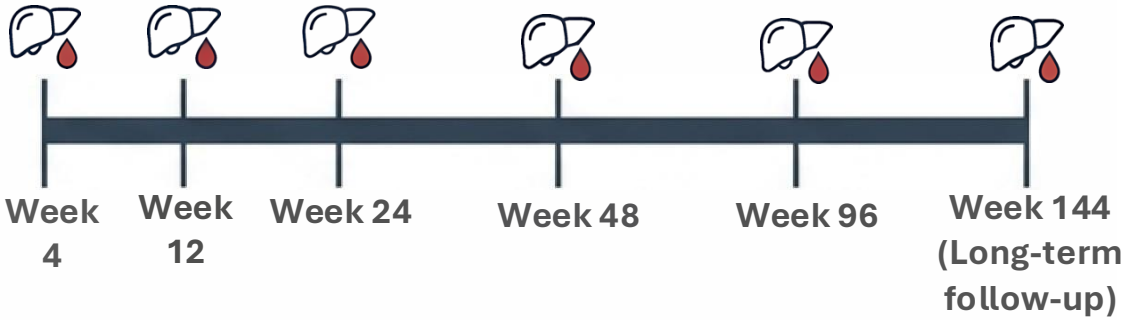


Arm A:1HP(N=748)

Daily Isoniazid (300 mg) +
Rifapentine (450 - 600 mg)
Duration: 4 Weeks

Arm B:3HP (N=752)

Weekly Isoniazid
(15mg/kg, max 900) +
Rifapentine 750 – 900 mg)
Duration: 12 Weeks



Vital status was linked to National Death Registry

1HP: INH 300 mg + RPT 450-600 mg daily (BW ≤ 45 kg, > 45 kg) + B6 for 4 weeks
3HP: INH 15mg/kg (max 900 mg) + RPT 750 - 900 mg weekly (BW ≤ 50 kg, > 50 kg) + B6 for 12 weeks
ART: efavirenz/TDF/FTC (2019-2020) or dolutegravir/ TDF/3TC/DTG (2021+)

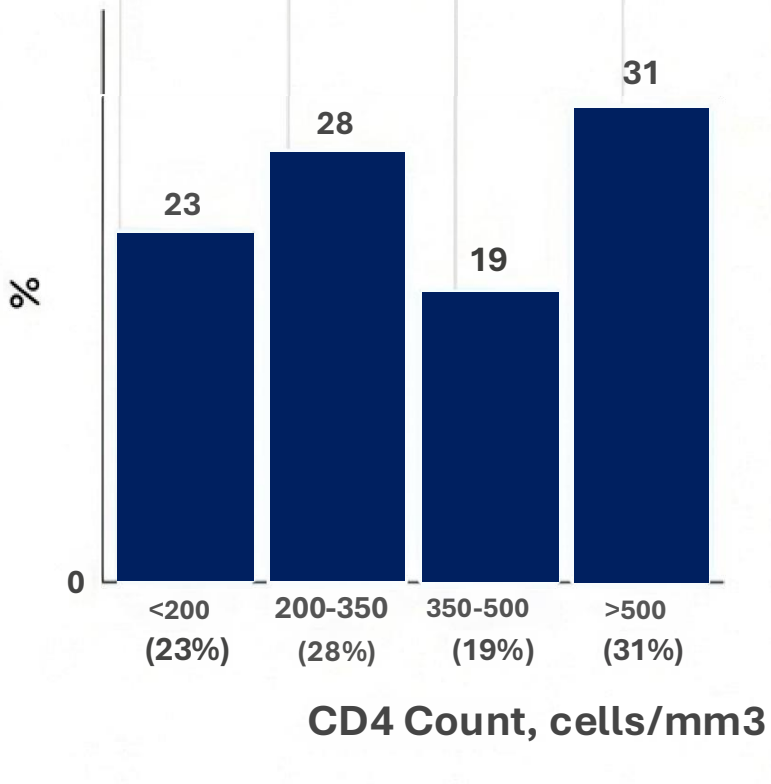
In courtesy of Dr.Avihingsannon

Cohort Profile: Baseline Characteristics

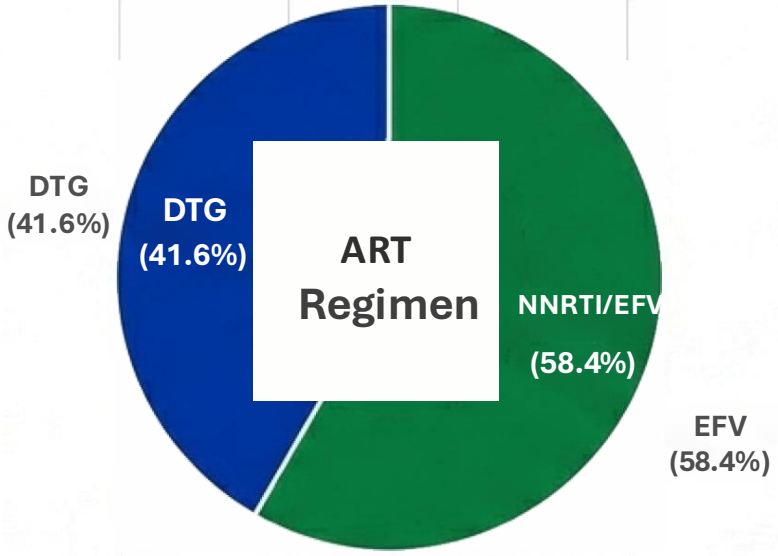
Demographics

- Median Age: 32 years
- Male: 82%
- BMI: 22.0 kg/m2

Immune status



ART regimen, hepatitis co-infection



Co-infection Risk Factors: HCV(5.7%),HBV(6.2%)

80% were ART naïve (no baseline VL) , Those with ART experienced have < 50 c/mL before 1HP/3HP initiation.

In courtesy of Dr.Avihingsannon

Participants' characteristics

	1HP	3HP
	N=748	N=752
Age (years), Median (IQR)	**32.0 (26.0-42.0)**	**32.0 (25.0-42.0)**
Sex, n (%)		
Male	610 (81.6)	616 (81.9)
Weight (kg), Median (IQR)	62.3 (55.4-71.2)	62.8 (55.0-72.0)
BMI (kg/m^2), Median (IQR)	**22.1 (19.9-24.7)**	**22.0 (19.9-24.9)**
CD4 T-cell count, Median (IQR)	346.2 (220.0-554.5)	350.5 (210.5-568.4)
CD4 T-cell groups, n (%)		
• <200	**163 (21.8)**	**176 (23.4)**
• 200 to <350	216 (28.9)	199 (26.5)
• 350 to <500	138 (18.4)	148 (19.7)
• ≥500	231 (30.9)	229 (30.5)
ALT (U/L), Median (IQR)	29.0 (21.0-42.0)	30.0 (20.0-43.0)
Duration on ART (month), median (IQR)	**3.7 (0.8-47.5)**	**3.4 (0.8-52.8)**
• < 6 months	406 (54.3)	410 (54.5)
• ≥ 6 months	342 (45.7)	342 (45.5)
ART regimen at baseline, n (%)		
• DTG/3TC/TDF	293 (39.2)	331 (44.0)
• EFV/FTC/TDF	455 (60.8)	421 (56.0)
HCV, n (%)	**40 (5.4)**	**45 (6.0)**
HBV, n (%)	**48 (6.4)**	**45 (6)**

In courtesy of Dr.Avihingsannon

Primary endpoints: TB Incidence & Mortality

	1HP	3HP
Active TB, confirmed	2	1
Active TB, probable	0	0
Death related to TB		
Death from non-TB	2 lymphoma, 1 PCP (poor adherence)	2 (cerebral hemorrage, DM/CHF)
Death from unknown cause	0	0

Regimen	Time to active TB	CD4 count	VL
1HP	Year 4.5	704	43
1HP	Year 3.2	191	<20
3HP	Year 3.9	182	28

	1HP	3HP	% difference
	% (95%CI)	% (95%CI)	(95%CI)
TB incidence rate	0.27 (0.03-0.9)	0.13 (0.003-0.74)	0.13 (-0.32 to 0.58)

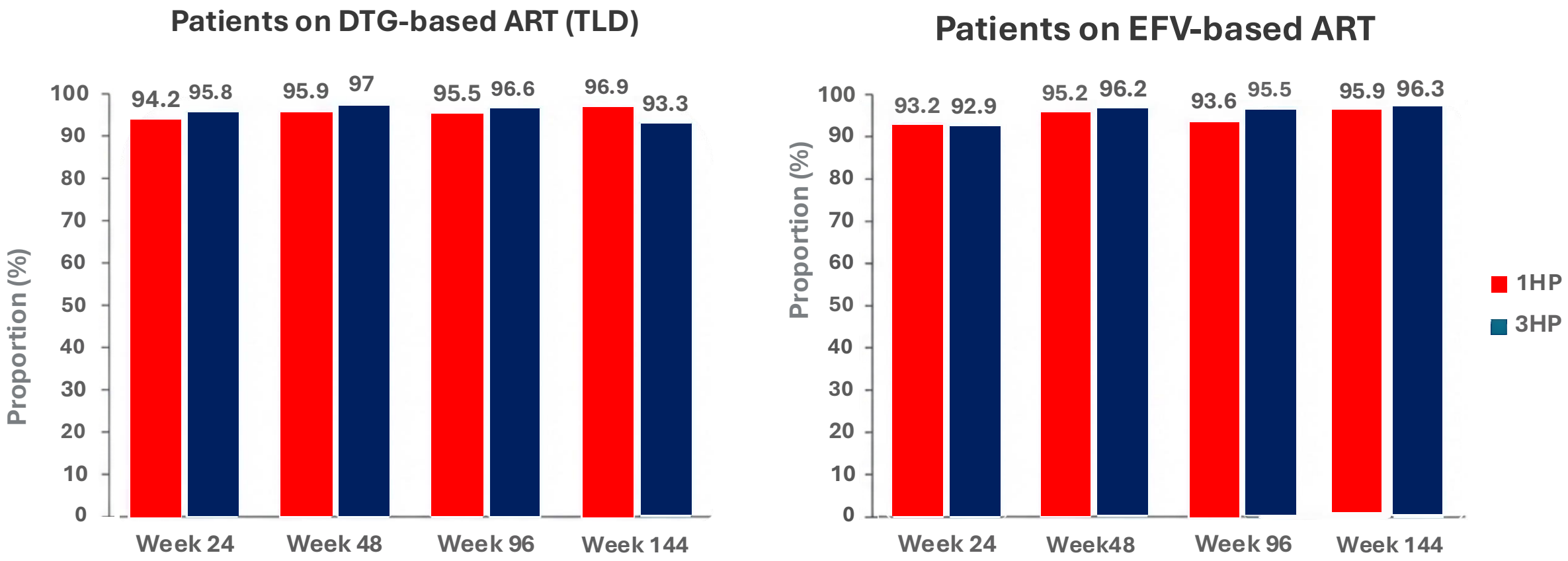
% difference in TB incidence calculated using Generalized Linear Models (Poisson family)
Non-inferiority criterion: Upper limit of 95% CI < 2.5%
Result: Upper limit of 95% CI = 0.58% → **met non-inferiority**

All 3 TB cases were drug-susceptible and responded well to standard anti-TB therapy

In courtesy of Dr.Avihingsannon

Durable HIV Viral Suppression Across Regimens

Proportion with HIV RNA < 50 copies/mL



Neither 1HP nor 3HP compromised HIV treatment success, regardless of ART regimen.

In courtesy of Dr.Avihingsannon

Safety profile remained consistent regardless of ART backbone (DTG vs. EFV)

	DTG			EFV		
	1HP (N=293)	3HP (N=331)	P-value	1HP (N=455)	3HP (N=421)	P-value
Any AE: Grade 3-4*	5 (1.7%)	7 (2.1%)	0.60	13 (2.9%)	11 (2.6%)	0.95
• **Grade 3**	5 (1.7%)	5 (1.5%)		10 (2.2%)	8 (1.9%)	
• **Grade 4**	0 (0%)	2 (0.6%)		3 (0.7%)	3 (0.7%)	
SAEs	3 (1%)	3 (0.9%)	0.99	5 (1.1%)	4 (1.0%)	0.83
Hepatoxicity grade 4	2 (0.7%)	4 (1.2%)	0.69	9 (2%)	9 (2.1%)	0.87
Hypersensitivity reaction (any grading)	2 (0.7%)	3 (0.9%)	0.99	0 (0%)	1 (0.2%)	0.48
Study treatment discontinuation due to AE	1 (0.3%)	2 (0.6%)	0.99	10 (2.2%)	8 (1.9%)	0.76

Treatment was well-tolerated. Only 1.4% of all participants discontinued due to adverse events.

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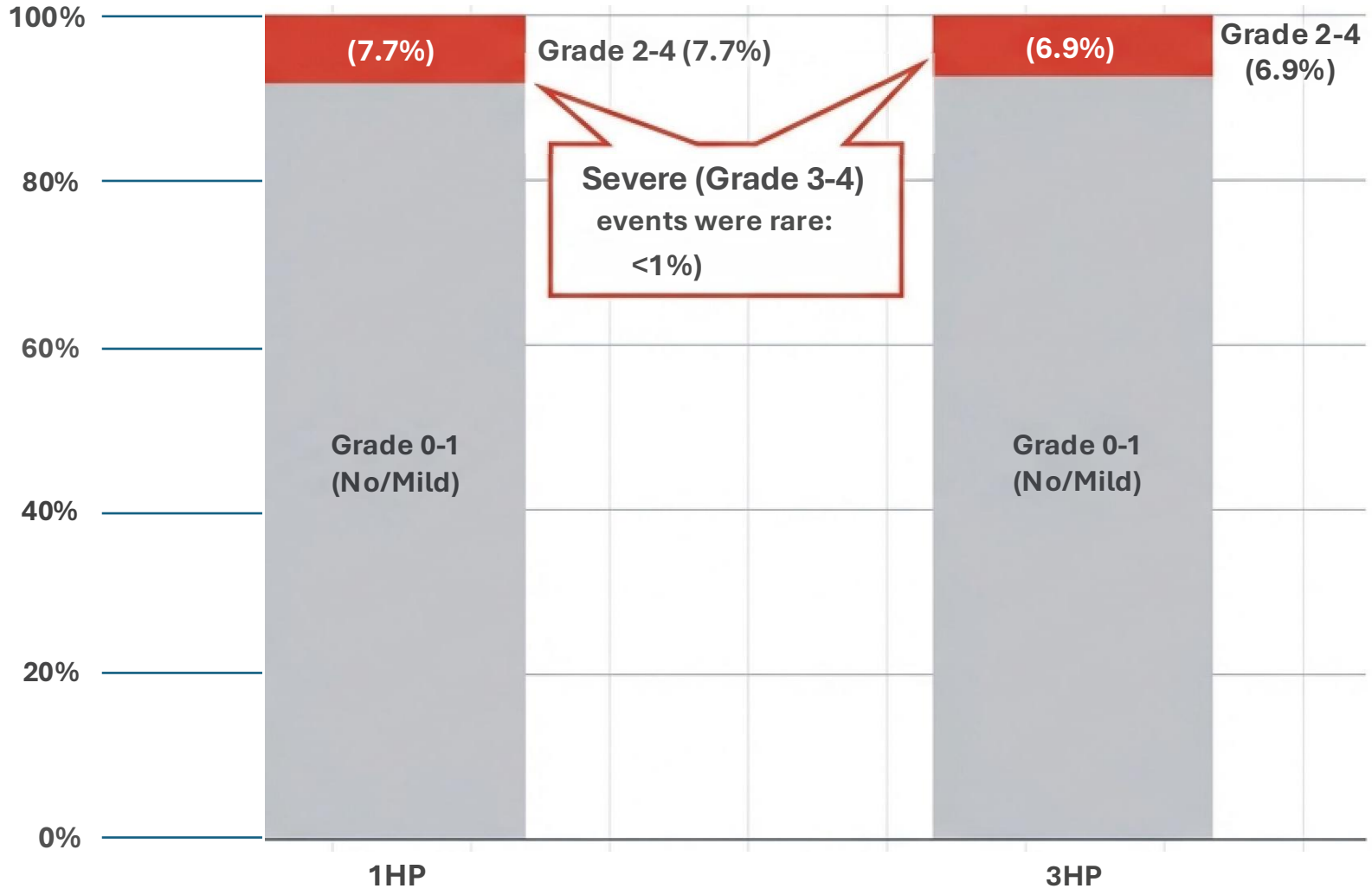
Incidence of Hepatotoxicity: 1HP vs. 3HP

Overall Hepatotoxicity (Grade 2-4):7.3%

1HP Incidence: 17.6 per100 Person-Years

3HP Incidence: 15.5 per 100 Person-Years

P-value =0.18



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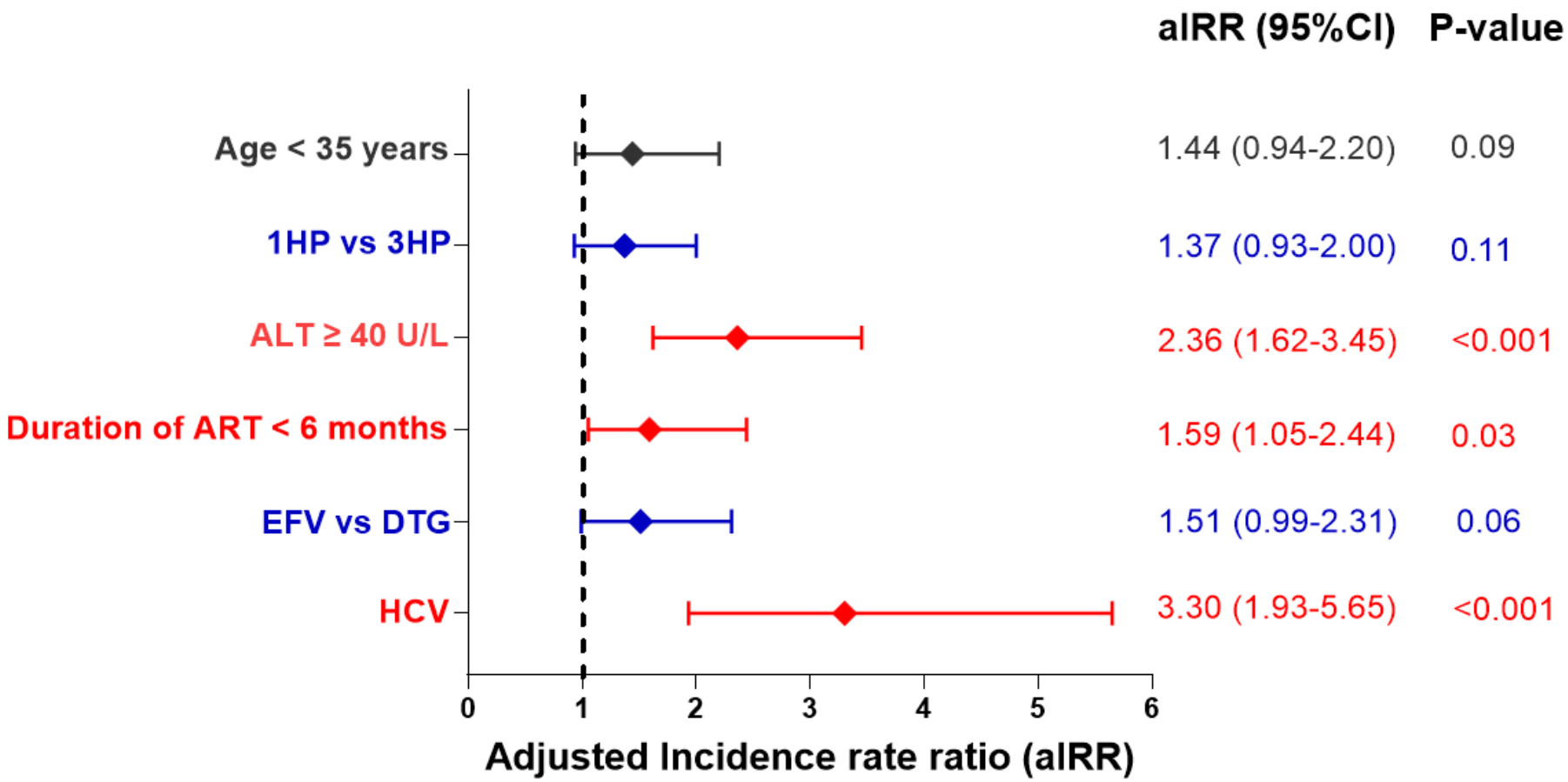
Predictors of Hepatotoxicity:
HCV co-infection, increased baseline ALT, ART duration < 6 months



In courtesy of Dr.Avihingsannon

NAT2 polymorphisms and Antituberculosis-Induced Hepatotoxicity in Thai People Living with HIV : Insights from a Pharmacogenetic–Pharmacokinetic Cohort Study

HIV-NAT, Thai Red Cross AIDS and Infectious Disease Research Centre in Thailand
2019 to 2023

PLWH (n=894)

Male 84%, Median age 31 years
, CD4 351 cells/mm^3
, ART duration 1.5 months

Isoniazid containing regimen
1HP/3HP 84.6%
Active TB treatment 15.4%

NAT2 genotyping
32.4% Slow acetylator (SA)
41.2% Intermediate acetylator (IA)
26.4% Rapid acetylator (RA)

Hepatotoxicity occurred in 10.9%

AST/ ALT elevations > 2.5 X ULN

NAT2 SA phenotypes, especially **6A/*6A* (aOR 1.84) and **7B/*7B* genotypes (aOR 4.46) significantly increase the risk of anti-tuberculosis drug-induced liver injury (ATDILI)

PK substudy (n=93) 2 times INH exposure in SA (assessed by AUC_{0-24})

Other independent risk factors : Elevated baseline ALT (aOR 3.43), SA phenotype (aOR 2.57, compared to RA), 2HRZE/4HR regimen (aOR 2.52, compared to 1HP or 3HP), HCV co-infection (aOR 2.06), and EFV-based regimens (aOR 1.63, compared to DTG-based regimens).

Hiranburana N et al. NAT2 Polymorphisms and Antituberculosis-Induced in Thai People Living With HIV: Insights From a Pharmacogenetic–Pharmacokinetic Cohort Study. The Journal of Infectious Diseases. 2025;2Hepatotoxicity33(2):287-97.

Conclusions

- **1HP was non-inferior to 3HP** for prevention of TB, TB-related death, or all-cause mortality among adults with HIV in Thailand.
- Both regimens were **safe and well tolerated**, with low rates of grade 3–4 adverse events using weight-based rifapentine (and isoniazid for 3HP).
- **No DTG dose adjustment required:**
  both 1HP and 3HP maintained durable HIV viral suppression.
- The shorter **1HP regimen offers a convenient alternative** to 3HP, supporting implementation in high TB-burden, HIV-endemic settings.

Thank you for your attention