

Supplementary material

Decreasing cost effectiveness of testing for latent TB in HIV in a low TB incidence area.

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Appendix A: Table 1

Variables for univariate and probabilistic sensitivity analyses

Variable	Baseline variable	Range for univariate sensitivity analysis	Distribution for Probabilistic Sensitivity Analysis	Alpha	Beta	Source
Cost IGRA (based on T.Spot.TB test)	€72	€27.60 - €108.00	Gamma	10.10	7.127	[1,2], local charges
Cost TST	€19.37	€9.68 - €38.74	Gamma	15.35	1.262	[1]
Cost 6 months isoniazid	€943.80	€449.40 - €1,579.80	Gamma	13.99	67.42	[1,3], local charges
Cost treatment for active TB	€9,143.60	€4,571.81 - €18,287.2	Gamma	15.37	595.0	[4]
QALY reduction for active TB	0.676	0.271 to 6.72	Gamma	16.72	0.0404	[1,5,6]
QALY reduction for latent TB	0.007	0.001 to 0.1	Gamma	7.530	0.0009	[1]
Sensitivity of IGRA	91%	70%-100%	Beta	710.8	71.16	[7]
Uptake testing	87%	87%-100%	Beta	519.1	79.87	[8]
Uptake LTBI treatment	87%	60%-100%	Beta	39.13	5.870	[8]
Efficacy LTBI treatment	62%	40%-100%	Beta	1474	903.3	[9]
Indeterminate IGRA rate	3%	0%-10%	Beta	20.03	569.0	[10]
Proportion of black Africans with positive IGRA	13%		Beta	16.9	113.1	[8]
Proportion of subjects from middle TB incidence countries with positive IGRA	10%		Beta	7.8	70.2	[8]
Proportion of subjects from low TB incidence countries with positive IGRA	3%		Beta	7.23	233.8	[8]

Appendix A: Figure 1

Model structure

*IPT – Isoniazid Preventive Therapy or alternative treatment for LTBI

Appendix A: Figure 2

Testing algorithms for: No testing, BHIVA strategy, NICE strategy, testing all clinic attendees with data between 2005-2010 [1,11]

Appendix B: Univariate and multivariate sensitivity analyses

Univariate and multivariate sensitivity testing data with incremental cost-effectiveness ratio and cost/quality adjusted life year (QALY) gained. Efficacy of preventive treatment is 62% (unless specified) and QALY reductions are 0.676 for active TB and 0.007 for latent TB. Discounting at 3.5%.

Table 1: Incremental cost per case averted (ICCA) for: British HIV Association (BHIVA) strategy compared to No testing, National Institute for Health and Care Excellence (NICE) strategy compared to BHIVA strategy and testing all clinic attendees compared to NICE strategy.[1,11]

Variable	BHIVA to No testing		NICE to BHIVA		All to NICE	
	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010
Middle inputs	€3,997	€5,875	€4,550	€19,888	€19,803	€40,241
TST €9.68	€3,997	€5,875	€3,461	€18,941	€23,169	€42,530
TST €38.74	€3,997	€5,875	€6,729	€21,781	€13,072	€35,663
IGRA €27.60	Cost saving	€994	Cost saving	€6,538	€4,864	€18,215
IGRA €108.00	€7,657	€9,833	€9,741	€30,712	€31,914	€58,099
LTBI €449.40	€707	€1,912	€3,877	€16,966	€13,579	€30,460
LTBI €1579.80	€8,229	€10,973	€5,417	€23,647	€27,808	€52,822
Active €4571.81	€8,799	€10,678	€9,198	€24,504	€24,588	€45,025
Active €18287.21	Cost saving	Cost saving	Cost saving	€10,656	€10,230	€30,672
LTBI efficacy 0-4	€11,477	€14,389	€12,165	€35,904	€35,957	€67,636
LTBI efficacy 1	Cost saving	Cost saving	Cost saving	€8,822	€8,640	€21,313
Uptake of testing 60%	€3,997	€5,875	€4,550	€19,888	€19,803	€40,241
Uptake of testing 100%	€3,997	€5,875	€4,550	€19,888	€19,803	€40,241
Uptake of LTBI treatment 60%	€10,107	€12,830	€2,608	€18,797	€27,662	€54,231
Uptake of LTBI treatment 100%	€2,223	€3,856	€5,114	€20,205	€17,520	€36,179
Sensitivity of IGRA 70%	€8,058	€10,497	€8,684	€28,582	€28,572	€55,112
Sensitivity of IGRA 100%	€2,759	€4,467	€3,290	€17,238	€17,129	€35,708
Indeterminate rate 10%	€4,464	€6,380	€5,213	€21,270	€21,349	€42,521
Indeterminate rate 0%	€3,756	€5,615	€4,209	€19,176	€19,006	€39,067
Least expensive testing, most expensive costs	Cost saving	Cost saving	Cost saving	Cost saving	Cost saving	Cost saving
Most expensive testing, least expensive costs	€59,942	€68,979	€35,162	€86,684	€108,736	€197,671

Appendix B Table 2

Incremental cost/QALY gained for: BHIVA strategy compared to No testing, NICE strategy compared to BHIVA strategy and all attendees with a single IGRA to NICE strategy.[1,11]

Negative costs imply the strategy is cost-saving compared to no testing/alternative strategy.

Variable	BHIVA to No testing		NICE to BHIVA		All to NICE	
	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010
Middle inputs	€6,270	€9,332	€6,998	€32,564	€33,473	€74,067
TST €9.68	€6,270	€9,332	€5,322	€31,014	€39,164	€78,282
TST €38.74	€6,270	€9,332	€10,348	€35,664	€22,096	€65,642
IGRA €27.60	Cost saving	€1,580	Cost saving	€10,706	€8,222	€33,527
IGRA €108.00	€12,012	€15,618	€14,980	€50,288	€53,948	€106,937
LTBI €449.40	€1,109	€3,038	€5,962	€27,779	€22,954	€56,066
LTBI €1579.80	€12,909	€17,430	€8,331	€38,720	€47,005	€97,224
Active €4571.81	€13,803	€16,960	€14,145	€40,123	€41,562	€82,874
Active €18287.21	Cost saving	Cost saving	Cost saving	€17,448	€17,294	€56,455
LTBI efficacy 0-4	€18,625	€23,823	€19,125	€62,461	€66,103	€144,437
LTBI efficacy 1	Cost saving	Cost saving	Cost saving	€13,882	€13,836	€35,812
Uptake of testing 60%	€6,270	€9,332	€6,998	€32,564	€33,473	€74,067
Uptake of testing 100%	€6,270	€9,332	€6,998	€32,564	€33,473	€74,067
Uptake of LTBI treatment 60%	€15,856	€20,379	€4,011	€30,778	€46,759	€99,817
Uptake of LTBI treatment 100%	€3,487	€6,125	€7,865	€33,083	€29,616	€66,592
Sensitivity of IGRA 70%	€12,873	€17,049	€13,515	€48,343	€50,505	€109,660
Sensitivity of IGRA 100%	€4,304	€7,047	€5,042	€27,954	€28,574	€64,256
Indeterminate rate 10%	€7,003	€10,135	€8,017	€34,827	€36,087	€78,263
Indeterminate rate 0%	€5,892	€8,919	€6,473	€31,399	€32,126	€71,906
QALY loss active TB 0.271	€17,194	€26,164	€18,555	€96,673	€106,128	€290,964
QALY loss active TB 6.72	Cost saving	Cost saving	Cost saving	Cost saving	Cost saving	Cost saving
QALY loss latent TB 0.001	€5,961	€8,777	€6,768	€29,832	€29,825	€61,245
QALY loss latent TB 0.1	€31,931	€471,668	€14,774	Strictly dominated	Strictly dominated	Strictly dominated
Least expensive testing, most expensive costs	Cost saving	Cost saving	Cost saving	Cost saving	Cost saving	Cost saving

Variable	BHIVA to No testing		NICE to BHIVA		All to NICE	
	2000-2005	2005-2010	2000-2005	2005-2010	2000-2005	2005-2010
Most expensive testing, least expensive costs	€100,171	€118,417	€56,336	€159,166	€215,794	€487,906

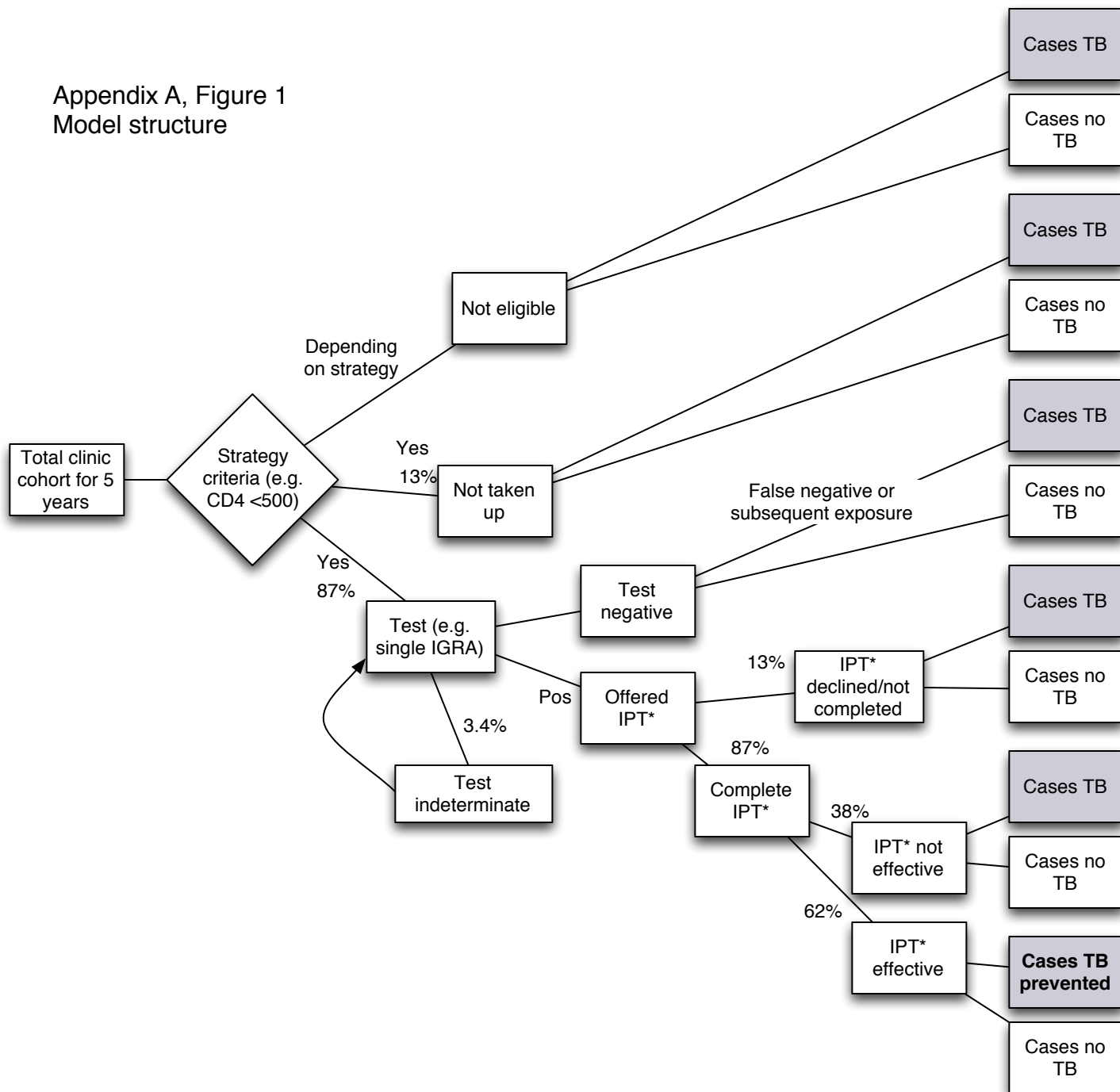
Note: BHIVA – British HIV Association, IGRA – Interferon Gamma Release Assay, LTBI – Latent Tuberculosis Infection, NICE – National Institute for Health and Care Excellence, QALY – Quality of Life Years, TST – Tuberculin Skin Test.

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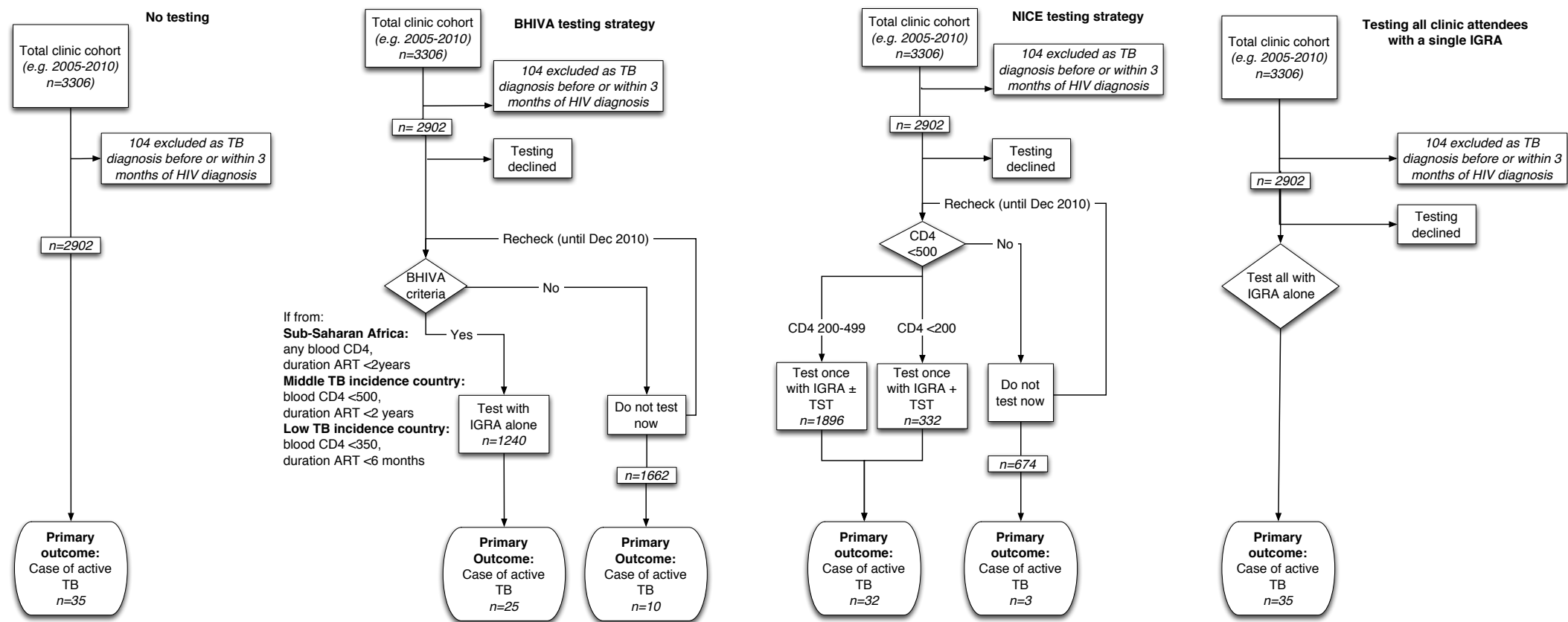
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Appendix A, Figure 1
Model structure



Appendix A, Figure 2



Note: ART – Antiretroviral therapy, BHIVA – British HIV Association, CD4 – blood CD4 cell count (cells/ μ L), IGRA – interferon gamma release assay, NICE – National Institute for Health and Care Excellence, TST – tuberculin skin test. Numbers marked in italics represent the number of subjects at each stage using hospital cohort data between 2005-2010.