Web appendix

Table S1: Input parameters and assumptions for estimating health equity and financial risk protection

The population size, and fertility rates were extracted from Global burden of disease (1).

Diseases	Value*¥	Reference
Malaria	Prevalence of malaria: 2.0, 1.35, 1.6, 1.0, 0.9% Malaria diagnosed by rapid diagnostic tests (author's assumption): 60% Hospitalization of malaria: 1.16% Coverage of malaria treatment in children (<5): 25.6, 39.2, 31.2, 49.4, 48.8% Coverage of malaria treatment in adults: 23.8, 30.4, 33.0, 42.3, 50.5% Efficacy of LLIN, IRS, intermittent preventive treatment (pregnancy), artesunate for sever malaria, and ACT: 50, 29, 49, 24 and 98% Patient cost for malaria in US$ (outpatient and inpatient (average)): 2.5, 4.6, 3.9, 4.7, 6.3, and 70.5	(2-10)
HIV	Prevalence of HIV (male, female, and child): 0.3, 0.1, 0.2, 0.3, 1.6%; 0.7, 0.4, 0.4, 1, 3% and 0.3, 0.2, 0.1, 0.2, 0.3% HIV incidence per 1,000 population (adults 15-49): 0.17 HIV prevalence in women and men (15 to 49): 1.1% and 0.6% Prevalence of Syphilis: 1.3,1.4,1.1, 1.5, 1.1% Hospitalization of HIV: 0.54% Hospitalization of PMTCT: 0.16% Hospitalization of Syphilis/STI: 0.33% Coverage of ART (male, female, and child): 58.8, 62.6, 66.4, 68.3, 73.9; 57.9, 61.6, 65.4, 67.2, 72.8; 52.6, 55.9, 59.3, 62.0, 66.1% Coverage of ART (pregnant women): 81.9, 87.2, 92.5, 95.2, 99% Coverage of cotrimoxazole treatment: 67.7, 72.1, 76.4, 78.6, 85.2% Coverage of syphilis treatment: 30.8,20.8,22.1,25.8, and 22.5% Efficacy of PMTCT, ART, CPT, and Syphilis treatment: 61, 52, 74, and 98% Patient cost for HIV care in US$ (outpatient and Inpatient): 33,53, 59, 60, 107 and 116, 95, 115, 220,133 Patient syphilis treatment and CPT costs in US$ (assumed to be the same for both outpatient and inpatient treatment across quintiles): 8.1 and 15.7	(3, 4, 11-21)
Tuberculosis	Prevalence of TB per 100,000 population (author's estimation based on 21 and 22): 132, 107, 92, 81, 74 Prevalence of MDR-TB per 100,000 population (author's estimation based on 21 and 22): 0.50, 0.40, 0.35, 0.30, 0.28 TB/HIV co-infection rate: 8.6/100,000 population Proportion of bacteriologically confirmed TB: 62% Hospitalization of TB: 2.93% Coverage of TB treatment, with ART, with ART and preventive therapy, with preventive therapy, with preventive therapy in children: 66.3, 92.8, 91.9, 99, 94.9; 80.2, 85.4, 90.5, 93.1, 99; 37.4, 39.8, 42.3, 43.4, 47.1; 66.3, 92.8, 91.9, 99, 94.9 and 22.8, 32.0, 31.7, 35.8, 32.7% Coverage of MDR-TB treatment, with ART, with ART and preventive therapy, with preventive therapy, with preventive therapy in children: 51.5, 72.2, 71.6, 80.8, 73.9; 62.4, 66.4, 70.4, 72.4, 78.4; 37.4, 39.8, 42.2, 43.4, 47.1; 30.9, 43.3, 42.9, 48.5, 44.3; 22.8, 32.0, 31.7, 35.8 and 32.7% Treatment success rate for TB, for TB/HIV, IPT for TB: 90, 86, 33% Treatment success rate for MDR-TB, for MDR-TB/HIV: 60, 56% Patient cost of DS-TB in US$ (outpatient and Inpatient): 46,77,100, 137,192 and 110,119,337,289, 399	(3, 12, 13, 19, 22-28)

	Patient cost of DS-TB and HIV-coinfection treatment in US$ (outpatient and Inpatient): 108, 92, 67, 160, 292 and 133, 217, 221, 262, 478 Patient cost of MDR-TB treatment in US$ (outpatient and Inpatient): 199, 162, 137, 289, 1118 and 950, 150, 544, 1185, 748	
Acute childhood infections	Prevalence of pneumonia: 15.4,20.9,23.5, 22.9, 11.9% Prevalence of diarrhoea: 10.2,11.9,12.4,13.6,11.2% Hospitalization of dysentery, pneumonia, and diarrhoea: 0.52; 1.88; and 0.38%, respectively. Coverage of pneumonia treatment: 25.0, 26.9, 28.9, 41.0, 40.2% Coverage of diarrhoea treatment: 26.7, 27.7, 32.4, 23.4, 41.4% Coverage of zinc treatment: 29.2, 27.1, 30.50, 36.7, 49.2% Coverage of treatment for dysentery: 8.8, 8.2, 8.8, 10.2, 11.6% Efficacy of pneumonia, diarrhoea, zinc supplement, and dysentery treatment: 70, 93, 18 and 93%, respectively. Patient cost for pneumonia in US$ (outpatient and Inpatient(average)): 3.5, 5.2, 10.1, 9.0, 16.6 and 70.1 Patient cost for diarrhoea in US$ (outpatient and Inpatient (average)): 3.5, 5.1, 5.3, 7.1, 14.8 and 87.2	(3, 4, 29-34)
GDP per capita (US$), estimated from (GDP = 856, and Gini 0.332): 316, 547, 764, 1,032, 1,517		(35, 36)
Cost effectiveness threshold (base-case) (US$ per DALY averted): 176		(37)
CHE threshold: 10%		

*Most of the inputs were ordered by income quintiles (poorest to the richest) except for hospitalization rate and specific proportion estimates (i.e., reported in average).
¥ The total hospitalization rate was derived using DHIS-2 data and was then assigned to each income quintile by dividing the rate by the percentage of individuals seeking care.
Abbreviations: ACT: Artemisinin-based combination therapy; ART: Antiretroviral therapy; CPT: Cotrimoxazole preventive therapy; DHIS-2: District Health information system-2; DS-TB: Drug-susceptible TB; HIV: Human immunodeficiency virus; IPT: Isoniazid preventive therapy; IRS: Insecticide residual spray; LLIN: Long-lasting insecticidal nets; MDR-TB: Multi-drug resistant TB; PMTCT: Prevention of mother-to-child transmission; TB: Tuberculosis; US$: United States dollar; YLD: Years lived with disability.

Table S2: Target population for each intervention

The target population for each intervention was determined by considering the prevalence of the diseases as well as population subgroups.

Disease	Intervention	Target population	Reference
Malaria	LLIN	453,000	(2, 3, 38) and author's assumptions
	IRS	301,500	
	Malaria treatment for pregnant women	11,300	
	Uncomplicated malaria treatment in children (RDT)	388,000	
	Uncomplicated malaria treatment in children (Microscopy)	259,000	
	Severe malaria treatment in children (RDT)	8,000	
	Severe malaria treatment in children (Microscopy)	8,000	
	iPT for pregnant women	12,000	
	Uncomplicated malaria treatment in adult (RDT)	495,000	
	Uncomplicated malaria treatment in adult (Microscopy)	326,000	
HIV	FL ART men	185,000	(11, 38)
	FL ART female	339,000	
	Paediatric ART	161,000	
	Cotrimoxazole for children	161,000	
	PMTCT	19,100	
	Syphilis Det and Rx (pre. Women)	20,300	
Tuberculosis	DS-TB treatment	142,000	(22)
	DS-TB treatment and ART for TB	152,000	
	DS-TB treatment, ART for TB and preventive therapy	170,000	
	DS-TB treatment and preventive therapy	143,000	
	DS-TB treatment and preventive therapy for children	198,000	
	MDR-TB treatment	5,400	
	MDR-TB treatment and ART for TB	5,800	
	MDR-TB treatment, ART for TB and preventive therapy	5,800	
	MDR-TB treatment and preventive therapy	8,500	
	MDR-TB treatment and preventive therapy for children	7,500	
Acute childhood infections	Pneumonia treatment (children)	3,450,000	(3, 4, 29, 39)
	ORS for diarrhoea treatment	1,050,000	
	Zinc (diarrhoea treatment)	920,000	
	Treatment for dysentery (Antibiotics)	584,000	

Table S3: Cost-effectiveness inputs of selected interventions

S.No	Intervention	Total cost (US$)	Health benefit (HALY)	ACER	References**
Malaria					
1	Long Lasting Insecticide-Treated Nets (LLIN)	3929041	49611	79	(40)
2	Indoor residual spraying	1971130	49611	40	(41)
3	Treatment of malaria in pregnant women	2235733	1522	1469	(41)
4	Detection [RDT] and treatment of uncomplicated malaria, child	39411656	363576	108	(42)
5	Detection [Microscopy] and treatment of uncomplicated, child	8628874	242384	36	(42)
6	Detection [RDT] and treatment of severe malaria, child	42091	5612	108	(42)
7	Detection [Microscopy] and treatment of severe malaria, child	127209	3741	34	(43)
8	Intermittent preventive treatments (pregnant women)	3026859	2310	1310	(44)
9	Detection [RDT] and treatment of uncomplicated malaria, Adult	52243357	481949.8	108	(41)
10	Detection [Microscopy] and treatment of uncomplicated malaria, Adult	11438275	321299.9	36	(41)
Tuberculosis					
11	Treatment + detection (smear + Xpert) + drug sensitivity analysis	446401	3403	131	(45)
12	Treatment + detection (smear + Xpert) + drug sensitivity analysis & ART prioritisation for TB cases	470848	3421	138	
13	Treatment + detection (smear + Xpert) + drug sensitivity analysis & ART prioritisation for TB cases & preventive therapy & preventive therapy for children	557260	3426	163	
14	Treatment + detection (smear + Xpert) + drug sensitivity analysis & preventive therapy	500280	3405	147	
15	Treatment + detection (smear + Xpert) + drug sensitivity analysis & preventive therapy for children	479627	3405	141	
16	Treatment + detection (smear generally and culture for MDR) + drug sensitivity analysis	435830	3373	129	
17	Treatment + detection (smear generally and culture for MDR) + drug sensitivity analysis & ART prioritisation for TB cases	467102	3393	138	
18	Treatment + detection (smear generally and culture for MDR) + drug sensitivity analysis & ART prioritisation for TB cases & preventive therapy for children	550619	3404	162	
19	Treatment + detection (smear generally and culture for MDR) + drug sensitivity analysis & preventive therapy	494032	3377	146	
20	Treatment + detection (smear generally and culture for MDR) + drug sensitivity analysis & preventive therapy for children	462605	3378	137	

HIV					
21	ART (first-line treatment) for men	2277965	67710	34	(46)
22	ART (first-line treatment) for women	2277965	176520	13	(46)
23	Paediatric ART	3429898	173854	20	(46)
24	Cotrimoxazole for children	2163636	5365	403	(47)
25	Prevention of Mother to Child Transmission of HIV (PMTCT)	2201089	36307	61	(48)
26	Syphilis detection and treatment (pregnant women)	3557391	60467	59	(49)
Other infectious					
27	Pneumonia treatment (children)	19775898	725407	27	(50)
28	ORS for diarrhoea treatment	21244633	600801	35	(51)
29	Zinc (diarrhoea treatment)	34415191	132329	260	(52)
30	Antibiotics for treatment of dysentery	9626822	56599	170	(53)

Table S4. Sensitivity analysis of the health, health inequality, and financial protection impact of all 30 interventions.

Scenario	***Selected interventions (30) impact***			
	Population ΔNHB	***Social welfare ($\Delta EDE_{A,\varepsilon}$)***	***ΔEDE-NHB***	***FRP (CHE)***
Base case	2,287,236	2,353,297	66,061	179,475
Equal distribution of diseases prevalence	2,287,236	2,324,137	36,901	187,260
Unequal distribution of diseases prevalence	2,287,236	2,422,239	135,001	191,898
Low HOC (US$167/HALY gained)	2,216,975	2,284,841	67,866	
High HOC (US$221/HALY gained)	2,552,700	2,611,940	59,240	
Low opportunity cost in the poorest and richest quintiles	2,287,236	2,315,871	28,635	
Opportunity cost proportionately borne by lower quintiles	2,287,236	2,283,844	-3,393	
Equal opportunity cost across income quintiles	2,287,236	2,318,577	31,341	
Inequality aversion (Atkinson: ε = 8)	2,287,236	2,338,820	51,584	
inequality aversion (Atkinson: ε = 12)	2,287,236	2,363,831	76,595	

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