



This appendix contains further presentation and analysis of cost-effectiveness thresholds in low- and middle-income countries using data from the following study:

Ochalek J, Lomas J, Claxton K. Estimating health opportunity costs in low-income and middle-income countries: a novel approach and evidence from cross-country data. *BMJ Global Health* 2018; 3: e000964. <http://dx.doi.org/10.1136/bmjgh-2018-000964>

### Cost-effectiveness thresholds for low-income countries

Country	Region*	Cost per DALY averted	
		2015 USD (range)	% GDP per capita (range)
Bangladesh	SAS	\$140 (114 – 165)	12% (9 – 14)
Benin	SSF	\$199 (171 – 223)	26% (22 – 29)
Burkina Faso	SSF	\$153 (138 – 182)	26% (23 – 31)
Burundi	SSF	\$112 (99 – 131)	41% (36 – 47)
Cambodia	EAS	\$244 (189 – 276)	21% (16 – 24)
Chad	SSF	\$139 (124 – 165)	18% (16 – 21)
Comoros	SSF	\$273 (233 – 311)	38% (33 – 43)
Democratic Republic of the Congo	SSF	\$60 (54 – 69)	13% (12 – 15)
Eritrea	SSF	\$129 (112 – 147)	24% (21 – 27)
Ethiopia	SSF	\$192 (167 – 221)	31% (27 – 36)
Gambia, The	SSF	\$288 (247 – 326)	61% (52 – 69)
Guinea	SSF	\$125 (111 – 145)	23% (21 – 27)
Guinea-Bissau	SSF	\$58 (52 – 68)	10% (9 – 12)
Haiti	LCN	\$166 (133 – 190)	20% (16 – 23)
Kenya	SSF	\$576 (491 – 647)	42% (36 – 47)
Madagascar	SSF	\$76 (66 – 87)	19% (16 – 22)
Malawi	SSF	\$140 (124 – 164)	38% (33 – 44)
Mali	SSF	\$77 (69 – 93)	11% (10 – 13)
Mozambique	SSF	\$220 (189 – 244)	42% (36 – 46)
Nepal	SAS	\$256 (206 – 291)	34% (28 – 39)
Niger	SSF	\$99 (88 – 118)	27% (25 – 33)
Rwanda	SSF	\$247 (211 – 277)	35% (30 – 40)
Sierra Leone	SSF	\$117 (105 – 137)	18% (16 – 21)
Tajikistan	ECS	\$392 (323 – 449)	42% (35 – 48)
Tanzania	SSF	\$266 (231 – 305)	30% (26 – 35)
Togo	SSF	\$134 (117 – 153)	24% (21 – 27)
Uganda	SSF	\$134 (117 – 154)	19% (17 – 22)
Zimbabwe	SSF	\$244 (202 – 273)	26% (22 – 30)
	<b>Mean</b>	<b>\$188 (160 – 215)</b>	<b>28% (24 – 32)</b>
	<b>Median</b>	<b>\$147 (129 – 173)</b>	<b>26% (22 – 29)</b>
	<b>Range</b>	<b>\$58 – 576</b>	<b>10 – 61%</b>

Source: Ochalek et al. (2018)

\*SAS = South Asia. SSF = Sub-Saharan Africa. EAS = East Asia & the Pacific. LCN = Latin America & the Caribbean. ECS = Europe & Central Asia.

## Cost-effectiveness thresholds for lower-middle-income countries

Country	Region*	Cost per DALY averted	
		2015 USD (range)	% GDP per capita (range)
Armenia	ECS	\$1,239 (954 – 1,422)	36% (27 – 41)
Bolivia	LCN	\$2,616 (2,106 – 3,053)	85% (68 – 99)
Cameroon	SSF	\$120 (107 – 140)	10% (9 – 12)
Cape Verde	SSF	\$2,463 (1,938 – 2,843)	80% (63 – 92)
Congo	SSF	\$1,438 (1,235 – 1,613)	78% (67 – 87)
Cote d'Ivoire	SSF	\$231 (205 – 268)	16% (15 – 19)
Egypt	MEA	\$1,237 (977 – 1,474)	34% (27 – 41)
El Salvador	LCN	\$3,395 (2,573 – 3,832)	80% (61 – 91)
Georgia	ECS	\$950 (743 – 1,044)	25% (20 – 27)
Ghana	SSF	\$433 (371 – 491)	32% (27 – 36)
Guatemala	LCN	\$1,516 (1,226 – 1,726)	39% (31 – 44)
Guyana	LCN	\$1,978 (1,566 – 2,147)	48% (38 – 52)
Honduras	LCN	\$2,190 (1,707 – 2,530)	87% (68 – 100)
India	SAS	\$317 (264 – 363)	20% (17 – 23)
Indonesia	EAS	\$679 (535 – 778)	20% (16 – 23)
Kyrgyzstan	ECS	\$837 (644 – 973)	76% (58 – 88)
Lesotho	SSF	\$652 (556 – 718)	61% (52 – 67)
Mauritania	SSF	\$317 (272 – 360)	23% (20 – 26)
Moldova	ECS	\$2,080 (1,570 – 2,353)	113% (85 – 127)
Mongolia	EAS	\$1,764 (1,394 – 1,949)	44% (35 – 49)
Morocco	MEA	\$1,191 (927 – 1,484)	41% (32 – 52)
Nicaragua	LCN	\$2,687 (1,830 – 3,674)	129% (88 – 176)
Nigeria	SSF	\$246 (214 – 291)	9% (8 – 11)
Pakistan	SAS	\$153 (133 – 175)	11% (9 – 12)
Paraguay	LCN	\$4,716 (3,401 – 5,797)	116% (83 – 142)
Philippines	EAS	\$845 (672 – 987)	29% (23 – 34)
Senegal	SSF	\$339 (284 – 371)	38% (32 – 41)
Sri Lanka	SAS	\$1,687 (1,281 – 2,090)	43% (33 – 53)
Sudan	SSF	\$351 (302 – 398)	15% (12 – 16)
Swaziland	SSF	\$1,888 (1,505 – 2,351)	59% (47 – 73)
Ukraine	ECS	\$1,377 (1,059 – 1,626)	65% (50 – 77)
Uzbekistan	ECS	\$1,237 (985 – 1,426)	58% (46 – 67)
Vietnam	EAS	\$1,585 (1,198 – 1,813)	75% (57 – 86)
Yemen	MEA	\$237 (202 – 267)	17% (14 – 19)
Zambia	SSF	\$504 (417 – 575)	39% (32 – 44)
<b>Mean</b>		<b>\$1,300 (1,010 – 1,526)</b>	<b>50% (39 – 59)</b>
<b>Median</b>		<b>\$1,237 (954 – 1,426)</b>	<b>41% (32 – 49)</b>
<b>Range</b>		<b>\$120 – 4,716</b>	<b>9 – 129%</b>

Source: Ochalek et al. (2018)

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### Cost-effectiveness thresholds for upper-middle-income countries

Country	Region*	Cost per DALY averted	
		2015 USD (range)	% GDP per capita (range)
Albania	ECS	\$2,861 (2,087 – 3,338)	73% (53 – 85)
Algeria	MEA	\$5,173 (4,086 – 6,485)	123% (97 – 154)
Argentina	LCN	\$6,445 (4,936 – 7,469)	48% (37 – 56)
Azerbaijan	ECS	\$1,673 (1,345 – 1,954)	30% (24 – 36)
Belarus	ECS	\$4,095 (3,113 – 4,967)	71% (54 – 87)
Belize	LCN	\$4,000 (2,935 – 4,808)	82% (60 – 99)
Botswana	SSF	\$2,710 (2,097 – 3,411)	43% (33 – 54)
Brazil	LCN	\$7,952 (6,048 – 9,318)	93% (71 – 109)
Bulgaria	ECS	\$5,286 (4,067 – 5,952)	76% (58 – 85)
China	EAS	\$4,823 (3,650 – 5,669)	60% (45 – 71)
Colombia	LCN	\$9,391 (7,067 – 11,459)	155% (117 – 189)
Costa Rica	LCN	\$17,200 (12,473 – 21,327)	153% (111 – 189)
Dominica†	LCN	\$4,731 (3,740 – 5,849)	66% (53 – 82)
Dominican Republic	LCN	\$3,593 (2,731 – 4,045)	56% (42 – 63)
Ecuador	LCN	\$5,808 (4,479 – 6,965)	94% (72 – 112)
Gabon	SSF	\$2,758 (2,275 – 3,047)	33% (28 – 37)
Jamaica	LCN	\$2,685 (2,137 – 3,270)	51% (41 – 63)
Jordan	MEA	\$6,617 (4,917 – 8,771)	134% (100 – 178)
Kazakhstan	ECS	\$4,918 (3,734 – 5,809)	47% (36 – 55)
Lebanon	MEA	\$6,548 (4,704 – 9,105)	81% (58 – 113)
Macedonia	ECS	\$4,849 (3,373 – 6,335)	100% (70 – 131)
Malaysia	EAS	\$6,121 (4,396 – 7,314)	63% (45 – 75)
Mauritius	SSF	\$4,608 (3,560 – 5,442)	50% (38 – 59)
Mexico	LCN	\$7,401 (5,723 – 8,730)	82% (64 – 97)
Namibia	SSF	\$4,041 (3,142 – 5,014)	86% (67 – 107)
Panama	LCN	\$14,315 (11,003 – 17,101)	108% (83 – 129)
Peru	LCN	\$5,071 (3,836 – 6,531)	84% (64 – 108)
Romania	ECS	\$7,027 (5,382 – 7,838)	78% (60 – 87)
South Africa	SSF	\$3,035 (2,480 – 3,334)	53% (43 – 58)
Thailand	EAS	\$5,493 (4,069 – 6,507)	94% (70 – 112)
Tunisia	MEA	\$3,688 (2,763 – 4,730)	95% (71 – 122)
Turkey	ECS	\$9,902 (7,446 – 13,032)	109% (82 – 143)
Turkmenistan	ECS	\$2,004 (1,636 – 2,230)	30% (25 – 33)
Venezuela	LCN	\$4,716 (3,618 – 5,540)	38% (29 – 45)
<b>Mean</b>		<b>\$5,634 (4,266 – 6,844)</b>	<b>78% (59 – 95)</b>
<b>Median</b>		<b>\$4,884 (3,737 – 5,900)</b>	<b>77% (58 – 87)</b>
<b>Range</b>		<b>\$1,673 – 17,200</b>	<b>30 – 155%</b>

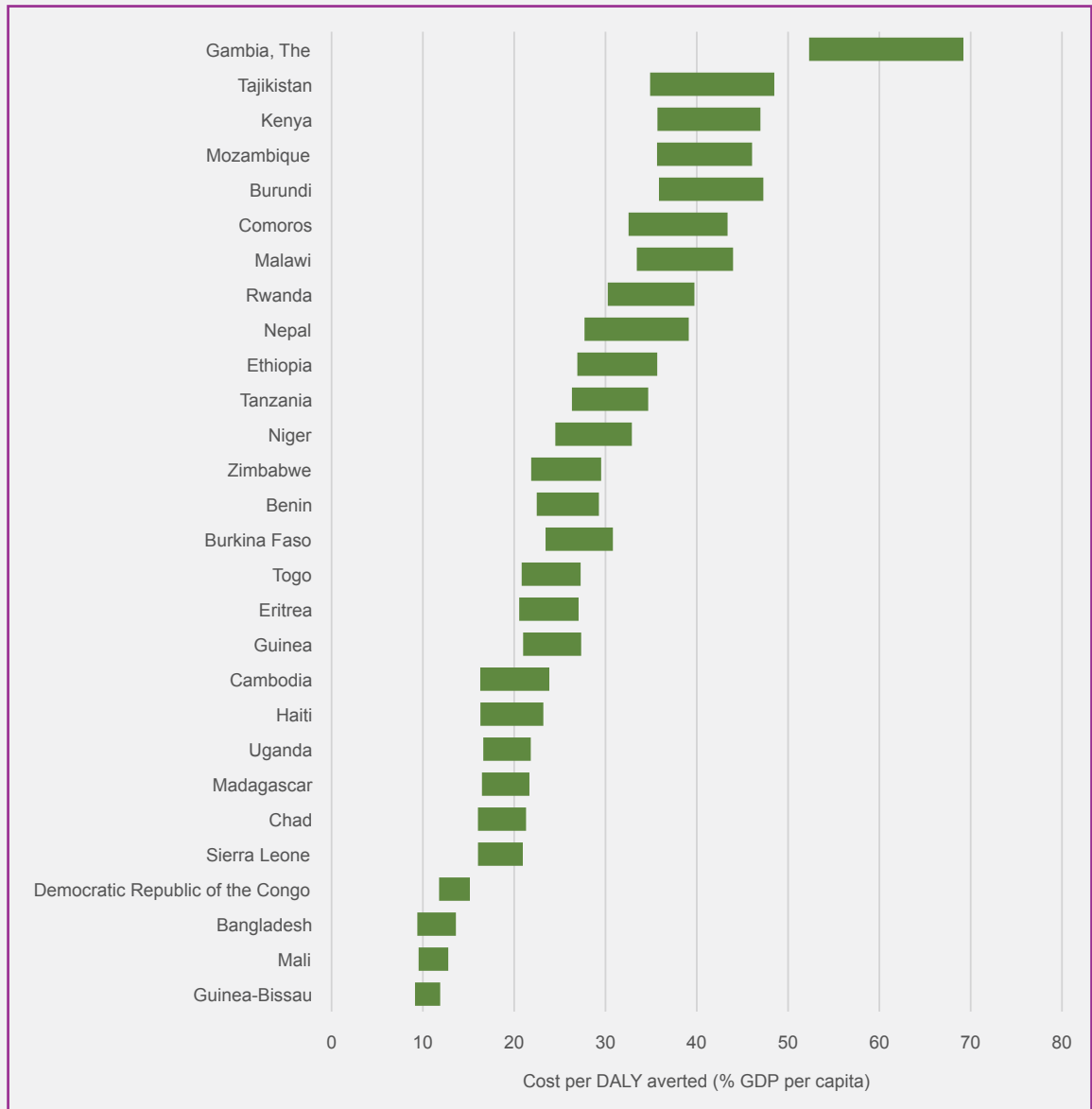
Source: Ochalek et al. (2018)

†Based on three, rather than four, estimated thresholds due to data unavailability.

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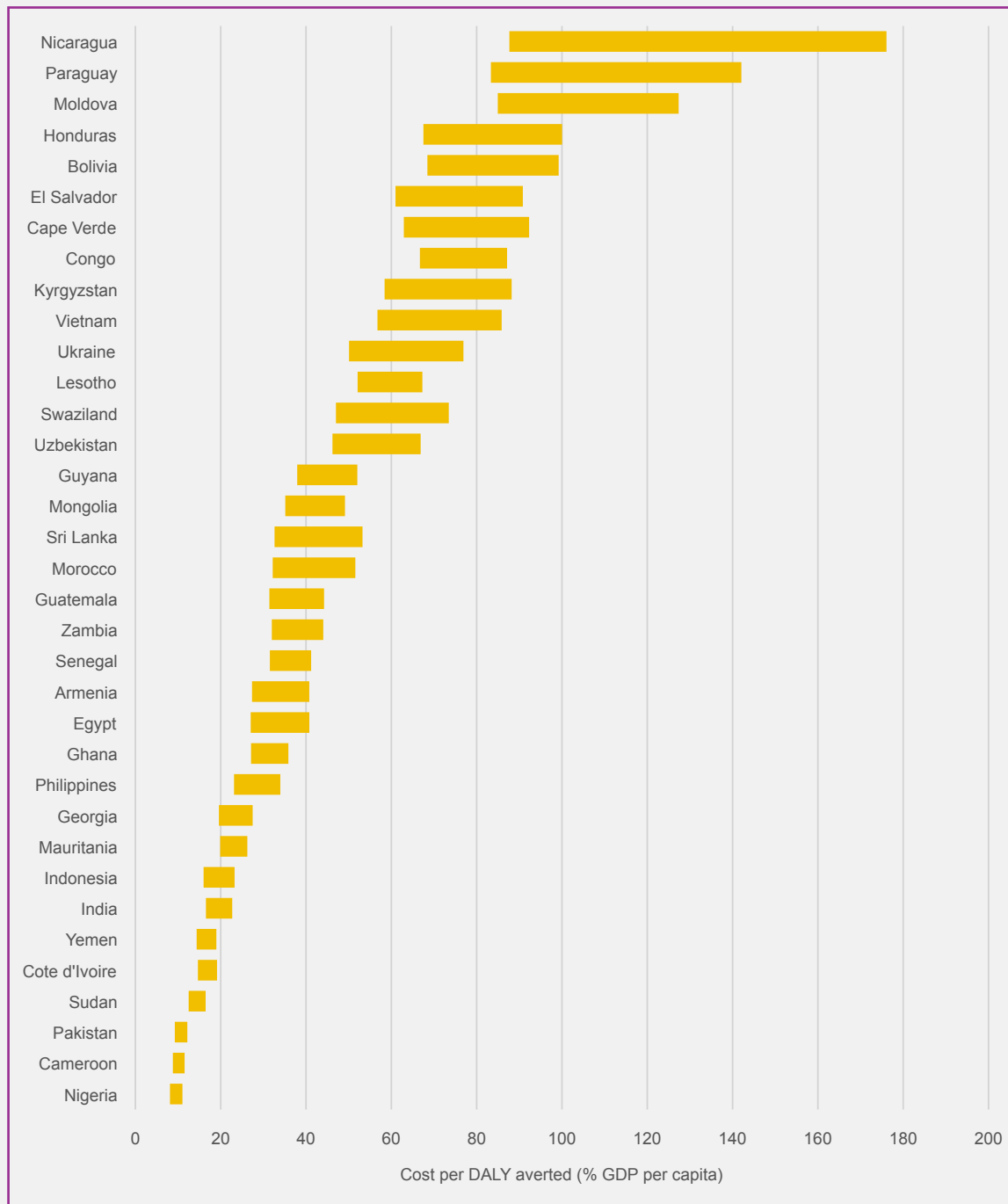
## Cost-effectiveness thresholds as a proportion of GDP per capita, by income group

### Low-income countries



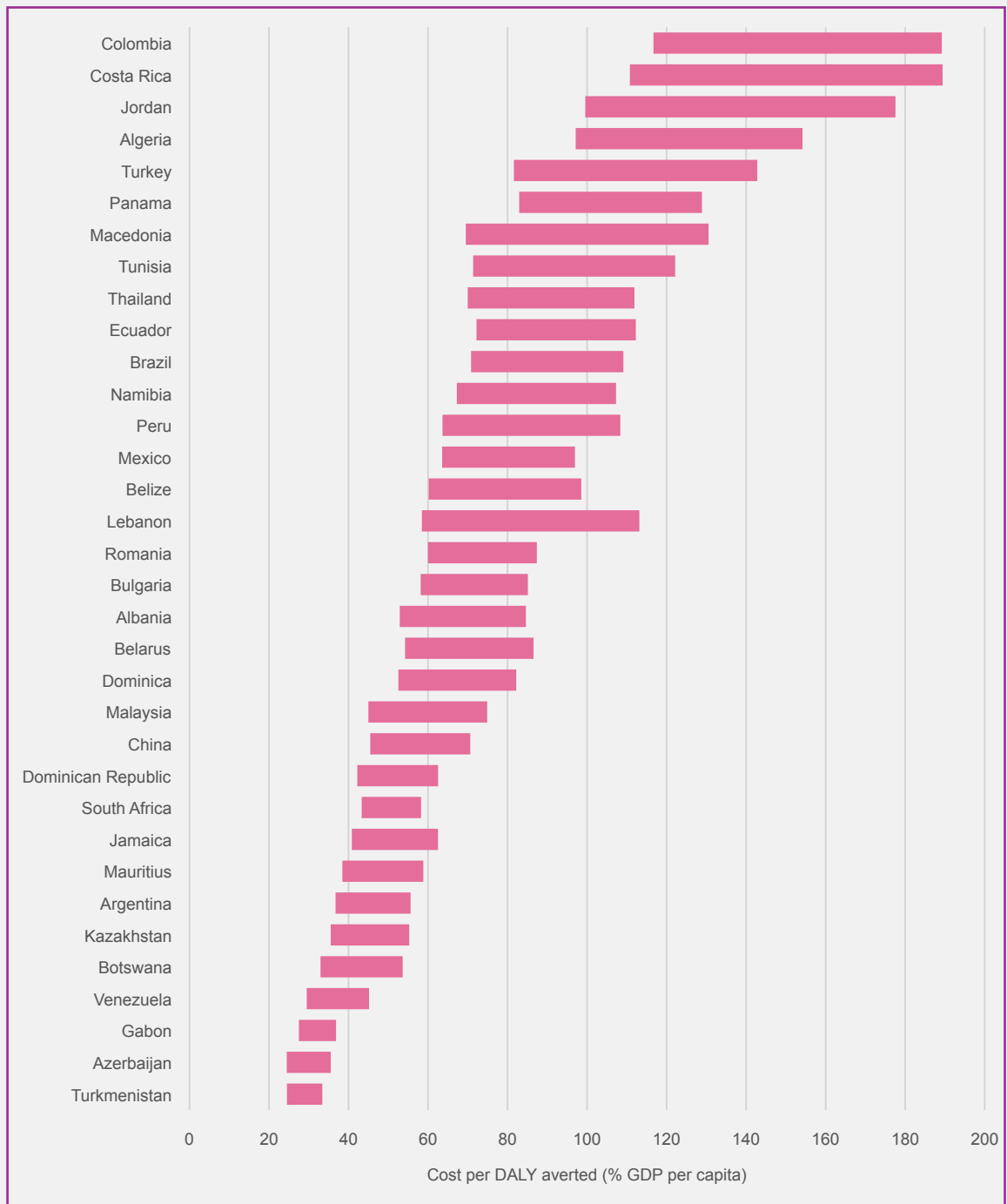
### Cost-effectiveness thresholds as a proportion of GDP per capita, by income group

#### Lower-middle-income countries



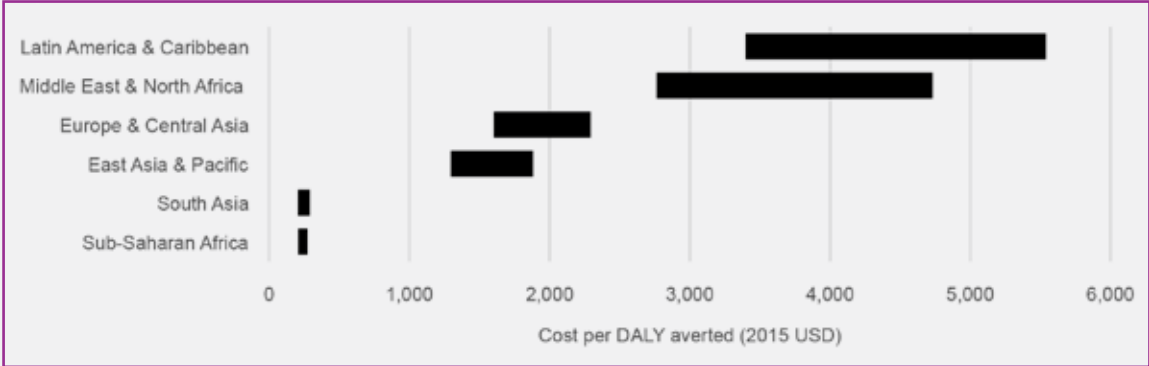
## Cost-effectiveness thresholds as a proportion of GDP per capita, by income group

### Upper-middle-income countries



### Cost-effectiveness thresholds by region

Regional estimates\*

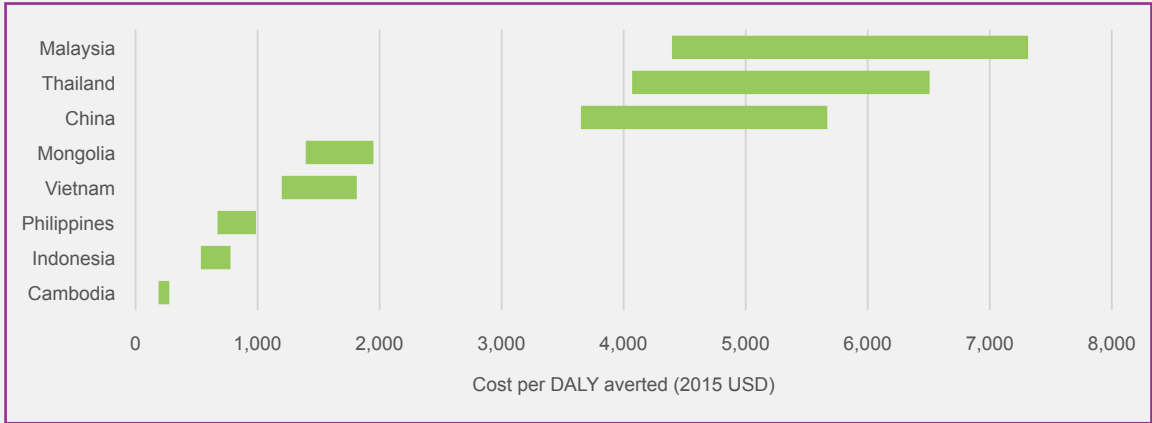


\*The bars indicate the range of possible medians, based on the median of the lowest and the median of the highest of the four estimates for all countries in the region.



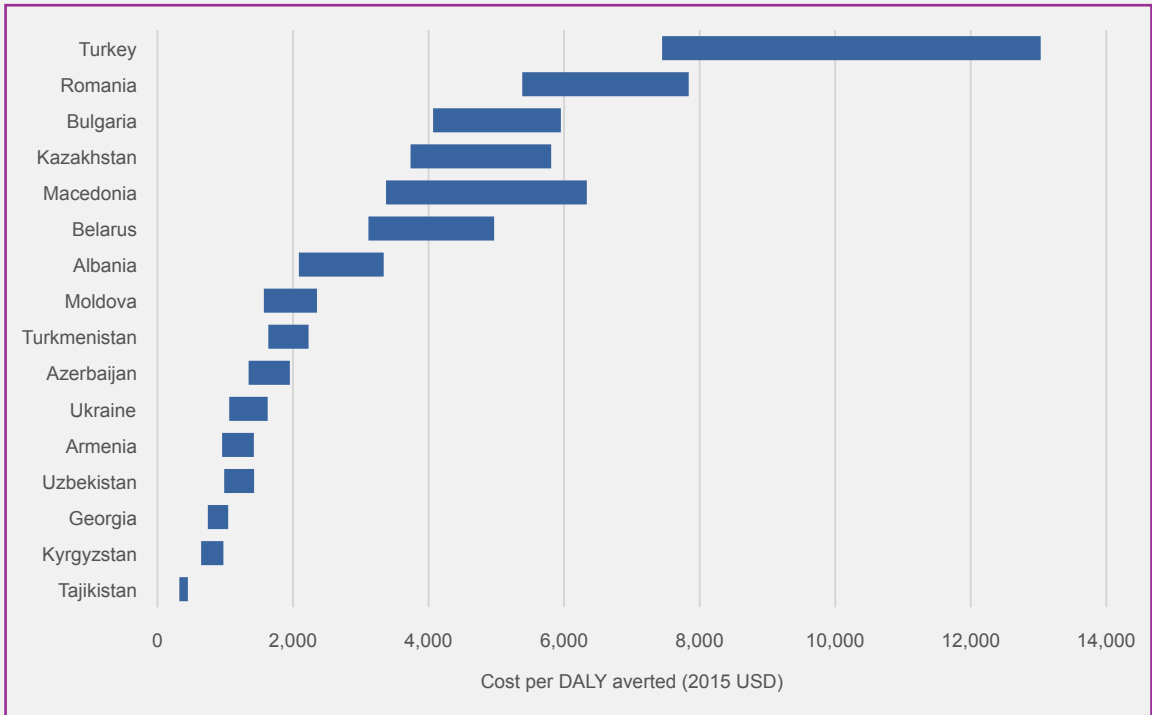
## Cost-effectiveness thresholds by region

### East Asia & the Pacific



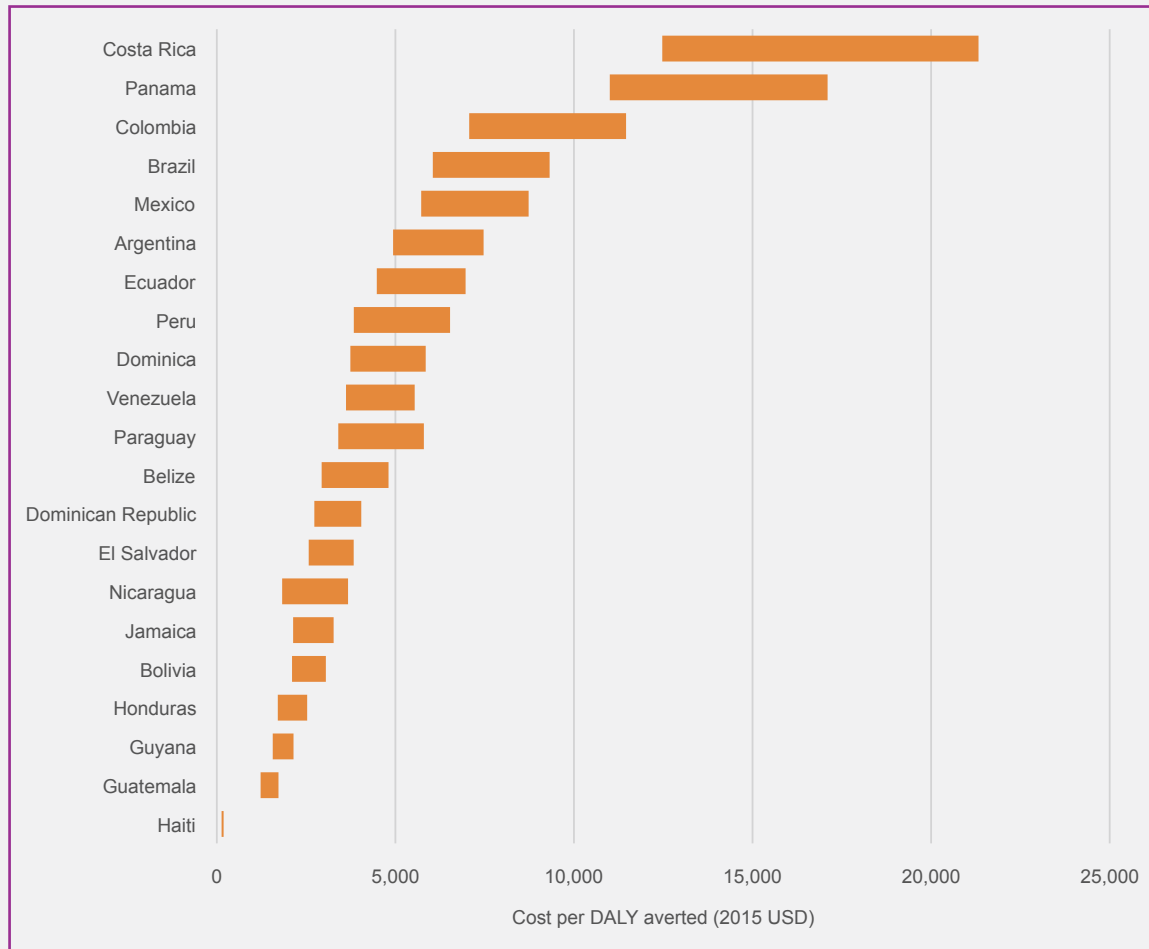
## Cost-effectiveness thresholds by region

### Europe & Central Asia



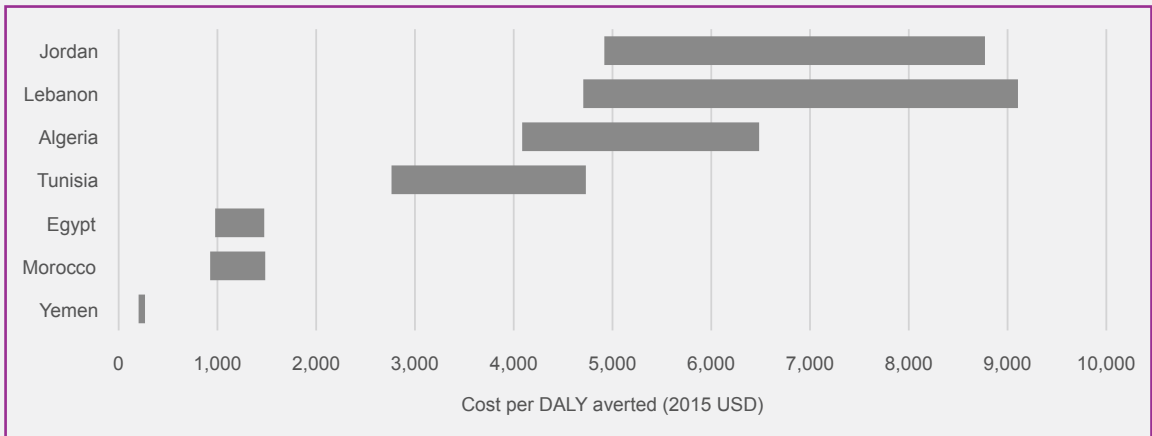
### Cost-effectiveness thresholds by region

#### Latin America & the Caribbean



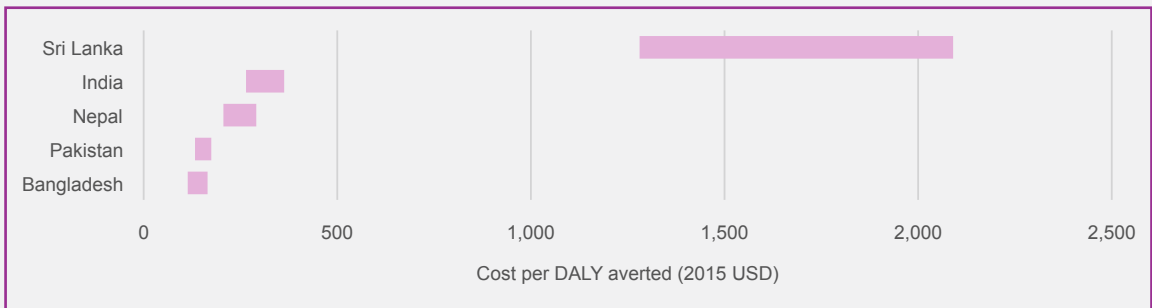
## Cost-effectiveness thresholds by region

### Middle East & North Africa



## Cost-effectiveness thresholds by region

### South Asia



## Cost-effectiveness thresholds by region

### Sub-Saharan Africa

