Dictionary of input sources and assumptions for "Cost-Effectiveness of Radical Cure" online tool

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This tool was developed by Angela Devine and Brad Crammond. For queries, please contact angela.devine@menzies.edu.au. Funding was provided by Medicines for Malaria Venture.

While this is a useful tool for beginning to think about the cost-effectiveness of options for the radical cure of vivax malaria, we recommend a complete cost-effectiveness analysis using strategies and data that are specific to your setting and robust one-way and probabilistic sensitivity analyses.

Model Inputs and assumptions

Text in italics are parameter values that are calculated automatically and cannot be altered by the user.

Tab	Input	Start value	Reference & notes on assumptions
General	Primaquine strategy	Low dose	Switching to high dose primaquine automatically doubles the cost of low-dose primaquine regimen and increases the relative risk of recurrence following radical cure with high-dose primaquine (see [1] for methods for this calculation). This is assumed to be unsupervised and could be a 7-day or 14-day regimen.
	Number of patients seen annually at facility	200	This number impacts the cost per person screened with the quantitative G6PD test. Assumes that only one quantitative machine is placed in each facility. If more than one machine will be placed in the facility, enter the total cost for those machines in the cost parameter.
	Percentage of patients over the age of 16 who are male	63%	[1] Since costs and outcomes differ by sex, the percentage of adult males needs to be entered here.
	Percentage of patients who adhere to complete primaquine regimen	67%	[2] This is from a study on the 7-day primaquine regimen in Brazil. Other sources for this data include [3-5].
Recurrences	Percentage of patients who have at least one recurrence without radical cure	56%	[1, 6] This is for a one year time period but could be adjusted for a different time period if done consistently with the next three inputs
	Relative risk of recurrence following high-dose primaquine	0.24	[1, 6] This is the reduction in risk of having at least one recurrence over one year if given radical cure. This is automatically increased in the model calculations if low-dose primaquine is selected, so this value always needs to be for high-dose primaquine. It is assumed that the relative risk for tafenoquine is equivalent to low-dose primaquine.

	Mean number of recurrences without radical cure	2	[1, 6] For a one year time period.
	Mean number of recurrences with high-dose primaquine	1	[1, 6] For a one year time period.
	Percentage of vivax malaria recurrences that are severe	2%	[7] This is the percent of clinical cases that are severe enough to require hospitalization.
	Percentage of vivax malaria recurrences that result in death	0.01%	[8] This is the mortality rate for vivax malaria.
G6PD deficiency	Percent of males with G6PD deficiency (<30% activity)	2.0%	[1, 6] This is the prevalence of G6PD deficiency in those presenting with malaria.
	Percent of females with severe G6PD deficiency (<30% activity)	*0.01%*	*This is calculated automatically by applying Hardy-Weinberg principle to the percentage of males with G6PD deficiency*
	Percent of females with intermediate G6PD deficiency (30-70% activity)	*1.98%*	*This is calculated automatically by applying Hardy-Weinberg principle to the percentage of males with G6PD deficiency*
Qualitative G6PD *These are for a qualitative G6PD rapid diagnostic test (RDT).*	Sensitivity for severe G6PD activity (<30%)	94%	Using data on males and females with <30% G6PD activity from [9]. These patients are not prescribed radical cure in strategy 2.
	Percentage of true intermediates that test G6PD normal	83%	Using data on females with 30-69% G6PD activity from [9]. These patients are prescribed primaquine in strategy 2.
	Specificity for males (≥30%) and females (≥70%)	91%	Using data on males with ≥30% G6PD activity and females with ≥70% G6PD activity from [9]. These patients are prescribed primaquine in strategy 2.
Quantitative G6PD	Sensitivity for severe G6PD activity (<30%)	100%	Using data on individuals with G6PD deficiency from US and Thai venous samples from [10]. These patients are not prescribed radical cure in strategies 3 & 4.
	Percentage of true intermediates that test G6PD deficient (too low)	10%	Using data on individuals with intermediate G6PD deficiency from US and Thai venous samples from [10]. In strategies 3 & 4, these patients are not prescribed radical cure.
	Percentage of true intermediates that test G6PD normal (too high)	15%	Using data on individuals with intermediate G6PD deficiency from US and Thai venous samples from [10]. In strategy 3, these patients are prescribed primaquine. In strategy 4, these patients are given tafenoquine.
	Percentage of true intermediates that test G6PD intermediate. This is calculated by the following formula 1 - Percentage of true intermediates that test G6PD deficient (too low) - Percentage of true intermediates that test G6PD normal (too		

	high). In strategy 3, these patients are prescribed primaquine. In strategy 4, these patients are not prescribed radical cure.		
	Specificity for >70% G6PD activity	96%	Using data on individuals with normal G6PD activity from US and Thai venous samples from [10]. These patients are prescribed primaquine in strategy 3 and prescribed tafenoquine in strategy 4.
Hemolysis	Percentage of G6PD deficient individuals who need a transfusion after radical cure	11%	[11] Of patients who are G6PD deficient (<30% activity) and are prescribed radical cure, this is the percentage who need a transfusion due to hemolysis triggered by radical cure. It is difficult to find appropriate data for this parameter. *The model assumes that G6PD intermediates hemolyze at a lower percentage (0.5%).*
	Percentage of individuals who need a transfusion but do not receive it	10%	[8] Of those who are G6PD deficient, prescribed radical cure and need a transfusion, this is the percentage who do not receive the needed transfusion. It is difficult to find appropriate data for this parameter.
	Percentage mortality due to not receiving a transfusion	10%	[8] Of those who are G6PD deficient, prescribed radical cure, need a transfusion, but do not receive one, this is the percentage who die as a result. It is difficult to find appropriate data for this parameter.
Costs *All unit costs are in US dollars and should include any associated taxes, distribution fees, or other procurement costs required. If changing to local currency, please ensure all inputs are updated.*	Per hemolytic event requiring a transfusion	39.4	[1] Cost of a 7-day inpatient stay at a primary hospital from [12] and a transfusion from [13] and inflated using [14]. Applied only to those who receive a needed transfusion.
	Low-dose primaquine regimen	0.43	[15, 16]
	Tafenoquine regimen	2	Assumption
	Quantitative test machine	350	Assumption
	Blood draw	2.67	[15] This is the cost of an additional blood draw for either the quantitative or qualitative test. The cost here is for a finger prick blood draw, but you could use the cost for a venous blood draw if wanted.
	Uncomplicated malaria visit	5.3	[1, 15]
	Malaria hospitalization	17.6	[1] Cost of a 7-day inpatient stay at a primary hospital from [12] and inflated using [14].
	Qualitative G6PD test	0.89	[15] The cost of a qualitative rapid diagnostic test (RDT).
	Quantitative G6PD test strip	3.50	Assumption
	Quality control (per patient)	0.39	Assumes a cost of $9 for two controls and two test strips from each batch of 25 tests. $9 divided by 23 test strips = $0.39.

DALYs	Life expectancy for adult male patients	50	Indicator ‘ex’ from [17]. Requires knowledge of mean age of adult male patients.
	Life expectancy for adult females patients	53	Indicator ‘ex’ from [17]. Requires knowledge of mean age of adult female patients.

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