

REFERENCES

- Abel-Smith, B. and Leiserson, A., Poverty, development, and health policy. Geneva, World Health Organization, Public Health Paper, No. 20 : 61-87, 1978.
- Ainsworth, M., Orivel, F. and Chuhan, P. , Cost recovery for health and water projects in rural Mali: Household ability to pay and organizational capacity of villages. PHN Technical Note 87-3: 1-22, 1987
- Alonso, P.L., Tanner, M., Smith T., Hayes, R.J., Armstrong Schellenberg, J., Lopez, M.c., Bostos de azevedo, I., Menendez, C., Weiss, N., Kilama, W.L. and Teuscher, T., A trial of the synthetic malaria vaccine SPf66 in Tanzania: rationale and design. Vaccine, 12: 181-6, 1994.
- Anderson, J.G., Demographic factors affecting health services utilization: A causal model. Med. Care 11: 104-20, 1973.
- Bice, T.W., and White, K.L., Factors related to the use of health services: An international comparative study. Med. Care 7: 124-32, 1969.
- Daniel, Wayne W., Biostatistics: A foundation for analysis in the health sciences. John Wiley & Sons, 1983.
- Cameron, T.A., "A new paradigm for valuing non-market goods using referendum data: Maximum likelihood estimation by censored logistic regression," Journal of Environmental Economics and Management, 15 : 355-79, 1988.
- Ettling, M.B., Krongthong, T., Somsak, K. and Pongwit, B., Malaria clinic in Maesot, Thailand: Factors affecting clinic attendance. Southeast Asian J. Trop. Med. Pub. HLTH Vol. 20 : 331-40, 1989.

- Ettling, M.B., Thimasarn, K., Shepard, D.S. and Krachaiklin, S., Economic analysis of several types of malaria clinics in Thailand. W.H.O Bulletin, 69 : 467-76, 1991.
- Frankish, J.G., "Day hospital fees and accessibility of essential health services," South African Medical Journal, vol. 70 : p.286, 1986.
- Fungladda, W. and Sornmani, s., Health behavior treatment-seeking patterns, and cost of treatment for patients visiting malaria clinics in western Thailand. South East Asian J Trop Med Public Health, 17 : 379-85, 1986.
- Hanemann, W.M., "Welfare evaluations in contingent evaluation experiments with district responses," American Journal of Agricultural Economics, vol. 66: 332-41, 1984.
- Harinasuta, c., The need for health behavior and socioeconomic research in malaria control in Thailand. South East Asian J Trop Med Public Health, 17 : 475-8, 1986.
- Kaewsonthi, S., Cgabogaja, N., Chamarukkula, C., Malikul, S. and Harding, A.G., Costs and performance of malaria surveillance and monitoring in Thailand: A retrospective study based on apportionment of expenditure under budget headings. Social and Economics Research Project Reports No.5: 1-69, 1988
- Kaewsonthi, S. and Harding, A.G., Cost and performance of malaria surveillance: the patients' perspectives. South East Asian J Trop Med Public Health, 17 : 406-12, 1986.
- Kaewsonthi, S., Malikul, S., Luansritisakul, S. and Harding, A.G., Internal and external costs of malaria surveillance in Thailand. TDR Report on Executive Summary of objectives, conclusions, and recommendations:1-7, 1988.
- Kloos, H., Utilization of selected hospitals, health centers and health stations in central, southern and western Ethiopia. Social Science & Medicine, 31 : 101-14, 1990.
- Kondrashin, A.V. and Rooney, W., Overview: Epidemiology and malaria and its control in countries of the W.H.O. south-east asia region. South East Asian J Trop Med Public Health, 23 Supply. 4: 13-22, 1992.

- Lavy, V. and Quigley, J.M. , Willingness to pay for the quality and intensity of medical care: Low-Income households in Ghana. Living standards measurement study working paper no. 94, World Bank, Washington DC: 1-39, 1993.
- Livack, J.I. and Bodart, C., User fees plus quality equals improved access to health care: Results of a field experiment in Cameroon. Social Science & Medicine, 37 : 369-83, 1993.
- Malaria Division, Thailand country report . W.H.O/SEARO News, 1993.
- Malikul, S. , The current situation of the anti-malaria programme in Thailand. South East Asian J Trop Med Public Health, vol. 19: 355-9, 1988.
- O'Brien, B. and Viramontes, J.L., "Willingness- to- pay : A valid and reliable measure of health state preference?" Mc Master University Center for Health Economics and Policy Analysis Working Paper 93-7: 1-27, 1993.
- Olsen, J.A. and Donaldson, C. , Willingness to pay for public sector health care programmes in Northern Norway. The Health Economics Research Unit Discussion Paper 05/93: 1-24, 1993.
- Piperno, A. and Di Orio, F., Social differences in health and utilization of health services in Italy. Social Science & Medicine, 31 : 305-12, 1990.
- Prasittisuk, C. and Ettling, M. , Cost-effectiveness research in malaria control and the need for health behavior and socio-economic research in malaria control in Thailand. South East Asian J Trop Med Public Health, 17 : 393-5, 1986.
- Russell, S., Fox-Rushby, J. and Arhin, D., Willingness and ability to pay for health care: A selection of methods and issues. Unpublished Report, Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine.
- Waddington, C.J. and Enyimayew, K.A., "A price to pay: The impact of user charges in Ashanti-Akim District, Ghana," International Journal of Health Planning and Management, Vol. 4: 25-43, 1989.

- Wanmali, S., Rural household use of services: A study of Miryalguda Taluka, India. International food policy research institute, Washington DC. Research report 48: 1-57, 1985.
- Weaver, M., Chapko, M., Ndamobissis, R., Kornfield, R., Blewane, C., Sathe, A., Ngueretia, L.P., Estimating the willingness to pay for quality of care: Comparison of contingent valuation and traditional economic methods. Health Finance and Sustainability Project, Technical Report. May 13:1-39, 1993.
- World Health Organization . Practical chemotherapy of malaria. Geneva: World Health Organization, Technical Report Series no. 805, 1990.
- World Health Organization . Implementation of the global malaria control strategy. Geneva: World Health Organization, Technical Report Series no. 839, 1993.
- Yeneneh, H., Gyorkos, T.W., Joseph, L., Pickering, J. and Tedla, S., Antimalarial drug utilization by women in Ethiopia: A knowledge_attitudes_practice study. Bulletin of the World Health Organization, 71 : 763- 72, 1993.
- Yoder, R.A., "Are people willing and able to pay for health services?" Social Science and Medicine, Vol. 29: p.36, 1989.

APPENDICES

Appendix 1

**Table A.1 Socio-demographic Characteristics of Respondents
(N=98)**

Characteristics	Number	Percent
1. SEX		
Male	78	79.6
Female	20	20.4
2. AGE		
15-25	36	36.7
26-35	25	25.5
36-45	17	17.4
46-55	12	12.2
56-65	8	8.2
Range 15-65		
means 32.51		
S.D 13.34		
3. MARITAL STATUS		
Married	75	76.5
Single	21	21.4
Widow/widower	2	2.0
4. EDUCATION		
Illiterate	58	59.2
Primary	39	39.8
Secondary	1	1.0
5. OCCUPATION		
Farmer	66	67.3
General labor	24	24.5
Public servant	2	2.0
Self-employed	1	1.0
Trader	3	3.1
Others	2	2.0
6. Total income		
<5000	24	24.5
5001-10000	23	23.5
10001-20000	30	30.6
20001-50000	19	19.4
>50000	2	
Range 1450-106800		
Means 14437.03		
S.D 14168.86		
Median 11350		

Table A.2 Age and Sex Distribution of Respondents(n=98)

AGE	SEX		
	Classification	Male %	Female %
15-25	27 27.6	9 9.2	36 36.7
26-35	22 22.4	3 3.1	25 25.5
36-45	13 13.2	4 4.1	17 17.4
46-55	11 11.2	1 1.0	12 12.2
56-65	5 5.1	3 3.1	8 8.2
Total	78 79.5	20 20.5	98 100.0

Table A.3 Education and Sex Distributions of Respondents (n=98)

EDUCATION	SEX		
	Classification	M %	F %
Illiterate	44 44.9	14 14.3	58 59.2
Primary	33 33.7	6 6.1	39 39.8
Secondary	1 1.0	0 0.0	1 1.0
Total	78 79.6	20 20.4	98 100.0

Table A.4 Utilization and Independent Variables (n=98)

Independent Variables	Use of Services				% of Utilization
	Yes		No		
1. Severity	No	%	No	%	
Mild	20	20.4	6	6.1	22.6
Severe	39	39.8	8	8.2	39.4
Very severe	20	20.4	5	5.1	19.0
2. Perceived quality					
Score 0	0	0.0	6	6.1	
Score 1	0	0.0	0	0.0	
Score 2	0	0.0	0	0.0	
Score 3	4	4.1	0	0.0	3.6
Score 4	75	76.5	13	13.3	81.0
3. Frequency of malaria attacks/year					
1	31	31.6	11	11.2	29.5
>1	48	49.0	8	8.2	55.1

Table A.5 Frequencies of Attack of Malaria within one year (n=98)

Frequency	No	%
1	42	42.9
2	27	27.6
3	14	14.3
4	3	3.1
5	7	7.1
6	2	2.0
7	1	1.0
10	2	2.0
Total	98	100.0

Table A.6 Different Means of Travel to Seek Care at
Formal Malaria Services (n=79)

Means of travel	No	%
Walking	27	34.2
By Bicycle	7	8.9
By Bus	3	3.8
Others (mostly by motorbike)	42	53.1

Table A.7 Relationship between Utilization of Formal Malaria Services and Independent Variables (N= 98)

INDEPENDENT VARIABLES	USE OF SERVICES				% OF Utilization
	Yes		No		
1.HAMLETS(incidence)	No	%	No	%	
A (5.5)	23	23.5	10	10.2	21.2
B (8.8)	3	3.1	1	1.0	4.4
C (9.7)	3	3.1	0	0.0	3.6
D (13.5)	7	7.1	2	2.0	7.3
E (9.1)	7	7.1	5	5.1	7.3
F (5.1)	11	11.2	1	1.0	11.7
G (6.4)	18	18.4	0	0.0	16.1
H (NA)	7	7.1	0	0.0	8.0
2.DISTANCE(Kilometers)					
1. (1-4)	51	52.0	11	11.2	49.6
2. (5-10)	24	24.5	8	8.2	27.7
3. (11-40)	4	4.1	0	0.0	3.7
3.SPECIES					
1.Falciparum	51	52.0	12	12.2	52.6
2.Vivax	21	21.4	5	5.1	22.6
3.Malariae	3	3.1	1	1.0	2.9
4.Ovale	1	1.0	0	0.0	0.7
5.Mixed	3	3.1	1	1.0	2.2
4.No. OF FAMILY MEMBER					
1. (1-3)	22	22.4	6	6.1	22.6
2. (4-6)	40	40.8	9	9.2	40.9
3. (7-10)	17	17.3	4	4.1	17.5
5.No. OF CHILDREN					
1. (0)	16	16.3	5	5.1	16.8
2. (1-4)	52	53.1	11	11.2	52.6
3. (5-7)	11	11.2	3	3.1	11.7
6.DEBTS					
1.Yes	54	55.1	12	12.2	57.0
2.No	25	25.5	7	7.1	24.1
7.MOTORCYCLE					
1.Yes	18	18.4	4	4.1	20.1
2.No	61	62.2	15	15.3	59.9

Table A.8 Ability to Pay (ATP) Score Index

Assets	Scoring	
	Min	Max
1.Having debts yes=1;no=2	1	2
2.Having a truck yes=1;no=0	0	1
3.Having a radio/cassette yes=1;no=0	0	1
4.Having a sewing machine yes=1;no=0	0	1
5.Having a television yes=1;no=0	0	1
6.Having a motorbike yes=1;no=0	0	1
7.Having ploughing machine yes=1;no=0	0	1
8.Condition of house cement=3;wooden=2; bamboo=1	1	3
9.Material of roof ceramic=4;zinc=3; bamboo=2;thatch=1	1	4
Total scores	3	15

Table A.9 ATP Scores in Relation to Numbers of Respondents
(n=98)

Score	No	%
3	11	11.2
4	14	14.3
5	12	12.2
6	26	26.5
7	18	18.4
8	8	8.2
9	1	1.0
10	6	6.1
11	2	2.1
Total	98	100.0

Table A.10 Cost (Baht) Incurred by Patients for Acquiring Malaria Treatment

Items	costs		
	Min	Max	Means
1. Formal services (n=66)			
Patients			
Travelling cost	0	52	12.76
Food cost	0	50	4.18
Time cost	8.2	196.4	27.15
Patients' total cost			44.09
Attendants' total cost			8.51
Total cost for both			52.6
2. Non-formal services (N=15)			
Total cost	20	861.3	281.4

Table A.11 Average WTP in Relation to ATP Scores

ATP score	DWTP	TRWTP	BWTP	Order
Score 3	15.9	24.5	40.4	9
4	24.6	35.0	59.6	4
5	24.1	39.2	63.3	2
6	22.2	25.2	47.4	8
7	28.6	31.4	60.0	3
8	23.4	33.1	56.5	5
9	25.0	25.0	50.0	7
10	49.1	37.5	86.6	1
11	25.0	30.0	55.0	6

DWTP= WTP for diagnosis of malaria

TRWTP= WTP for drug treatment of malaria

BWTP= WTP for both diagnosis and treatment of malaria

Table A.12 WTP for Diagnosis of Malaria in Relation to
Numbers of Children (n=98)

No. of children	Zero		Low		High		Total No
	No	%	No	%	No	%	
0	2	4.8	8	38.1	11	52.4	21
1	1	5.0	12	60.0	7	35.0	20
2	2	10.0	8	40.0	10	50.0	20
3	2	16.7	6	50.0	4	33.3	12
4	2	18.2	3	27.3	6	54.5	11
5	0	0.0	2	20.0	8	80.0	10
6	1	50.0	0	0.0	1	50.0	2
7	0	0.0	1	50.0	1	50.0	2

Table A.13 WTP for Drug Treatment of Malaria in Relation
to Numbers of Children (n=98)

No. of children	Zero		Low		High		Total No
	No	%	No	%	No	%	
0	0	0.0	8	38.1	13	61.9	21
1	0	0.0	11	55.0	9	45.0	20
2	0	0.0	6	30.0	14	70.0	20
3	0	0.0	7	58.3	5	41.7	12
4	0	0.0	2	18.2	9	81.8	11
5	0	0.0	1	10.0	9	90.0	10
6	1	50.0	0	0.0	1	50.0	2
7	0	0.0	0	0.0	2	100.0	2

Table A.14 WTP for Diagnosis of Malaria in Relation to Perceived Provider Cost (n=96)

Perceived provider cost (baht)	Zero		Low		High		Total No
	No	%	No	%	No	%	
<45	8	25.8	16	51.6	7	22.6	31
45-100	2	3.3	21	35.0	37	61.7	60
>100	0	0.0	1	20.0	4	80.0	5

Table A.15 WTP for Drug Treatment of Malaria in Relation to Perceived Provider Cost (n= 96)

Perceived provider cost (baht)	Zero		Low		High		Total No
	No	%	No	%	No	%	
<45	0	0.0	20	64.5	11	35.5	31
45-100	1	1.7	15	25.0	44	73.3	60
>100	0	0.0	0	0.0	5	100.0	5

Appendix 7
(continued)

-
- 9.What is total annual income from the following?
1. What is your total cash income per annum.....
 2. What is total cash income of other family members per annum.....
- 10.What are the consumptions of your family from followings ?
1. Food per month.....
 2. Clothing/month.....
 3. Social/month.....
 4. Others/month.....
- 11.How much can you save per annum..... Bahts
- 12.Do you have debts?
- 12.1 Yes
 - How much do you have?
 - 12.1.1 How much did you repay for debts.....
 - 12.1.2 How much do you have to pay for it.....
 - 12.2 No
- 13.Do you own the land for farming ? /_/
- 1.Yes
 - 2.No
- If yes, /_/_/_/
- How many rai of land do you have?
- If no,
- Who owns the land for farming?
- 1.Relative
 - 2.Non-relative
 - 3.Others(specify).....
- Do you pay to rent for the land? How much per annum?/_/_/_/
- 14.Do you own the following ?
- Tick the responses and answer where necessary.
- 1.House
 - 2.Land (Square meters).....
 - 3.Truck/Pick up/van
 - 4.Bicycle
 - 5.Radio/cassette
 - 6.Sewing machine
 - 7.Refrigerator
 - 8.Television
 - 9.Cattle How many?
 - Cow
 - Pig
 - Sheep
 - Goat
 - Duck
 - Chicken
 - 10.Mosquito net
 - 11.Motorcycle
 - 12.Ploughing machine
- Condition of house
- 1.Cement
 - 2.Wooden

Appendix 7
(continued)

3. Drugs are always available
 1. Yes
 2. No
4. Fully faithful on skill of health personnel
 1. Yes
 2. No
25. How severe was your last malaria episode? /_/
 1. Mild
 2. Moderately severe
 3. Very severe
- What were the clinical symptoms of the last malaria episode? /_/
 1. Clinical malaria (One or more of following symptoms)
 -Fever with or without chill and rigor
 -Dizziness
 -Vomiting
 -Headache
 -Bodyaches
2. Clinical malaria with one or more of following complications except cerebral malaria.
 -Easily fatigue with or without pallor
 -Air hunger (Dyspnoea)
 -Tightness of chest
 -Yellow discoloration of sclera, skin, mucous membrane and/or urine (Jaundice).
 -Black color urine (Black water fever).
 -Swelling of face and/ or legs.
 -Malaria with pregnancy.
3. Cerebral malaria. (Loss of consciousness with or without fever).
26. How many days were you absent from the normal work /_/_/
 due to the last malaria episode?
27. How many days did you wait before going to malaria /_/_/
 clinic or village malaria volunteer or health center
 for your last malaria episode ?

III. Cost of receiving services.

28. Where did you go for the treatment of the last episode of malaria?
 Tick the responses, please.
1. Malaria clinic
 2. Village malaria volunteer
 3. Health center
 4. Self-treatment or drug store
 5. Traditional healer
 6. Private clinic
 7. Health assistant

Appendix 7
(continued)

- 1.Nothing (Give the reasons)
- 2.5-10 Bahts
- 3.11-20
- 4.21-30
- 5.31 + (Maximum)
- 31.If you are asked to pay for drugs of treating one episode of malaria, how much are you willing to pay? /_/
 1.Nothing (Give the reasons.....)
- 2.10-20 Bahts
- 3.21-30
- 4.31-40
- 5.41 + (Maximum.....)
- 32.How much are you willing to pay for both diagnosis and treatment of one episode of malaria?
- 1.Less than 20 bahts
2. 20
3. 45
4. 60
5. 80
6. 100
7. More than 100
- 33.Do you continue seeking treatment at the formal services if you have to pay for services and drugs?
- 1.Yes (Give the reason)
- 2.No (Give the reason)
- If you have to pay for services, which one do you prefer to seek malaria treatment?
- 1.Malaria clinic
- 2.VMV
- 3.Health center
- 4.Traditional healer
- 5.Drug store/Self-treatment
- 6.Private clinic
- 7.Health assistant
- 8.Nurse/ Midwife
- 9.Others(specify)

V.REMARKS

- 34.Which species of malaria infected him ? /_/
 1.Plasmodium falciparum
- 2.P. vivax
- 3.P. malariae
- 4.P. ovale
- 5.Mixed infection.
- 35.Incidence of malaria in his/her village ?