



References

- Drummond, M.F., O'Brien, B.J., Stoddart, G.L., and Torrance, G.W.. 1997. Methods for the Economic Evaluation of Health Care Programmes. 2nd ed. New York: Oxford University Press.
- Faine, S., Adler, B., Bolin, C., and Perolat, P.. 1999. Leptospira and Leptospirosis. 2nd ed. Melbourne: Medi Sci.
- Gordis, Leon. 2000. Epidemiology. 2nd ed. Pennsylvania: W.B. Saunders Company.
- Kaewsonthi, Somkid, and Harding, G. Alan, 1992. Starting, Managing, and Reporting Research. Bangkok: Chulalongkorn University Press.
- Kamolratanakul, Pirom. 1999. Principal and Applied Health Economics for Public Health Administrator. Bangkok: Chulalongkorn University Press.
- Khuharat, Suriya, ed. 1999. Handbook on Epidemiology. Bangkok: Express Transportation Organization Press.
- Khuharat, Suriya, ed. 2000. Definition of Infectious Disease, Thailand, 2001. Bangkok : Express Transportation Organization Press.
- Kingnet, Darika, ed. 2001. Leptospirosis. 4th ed. Bangkok: The Agricultural Cooperative Federation of Thailand, Ltd. Press.
- Meungkeang, Renu. 2001. A study of Socio – Cultural, Behavioral and nvironmental Factors Associated with Leptospirosis Infection in Nong Bunnak District, Nakhon Ratchasima Province. The Master's Thesis, Mahidol University.
- Phuthikanon, Kitti. 2000. Study of the Efficiency of Leptospirosis Prevention Boot. Phitsanulok: Regional Office for Communicable Disease Control Zone 9.
- Santerre, E. Rexford, and Neun, P. Stephen. 2000. Health Economics : Theories, Insights, and Industry Studies. USA: The Dry den Press.

- Shepard, D.S., Hodgkin, D., and Anthony, Y.E.. 2000. Analysis of Hospital Costs : A manual for Managers. Geneva: World Health Organization.
- Sirinavin, Sayompom, and Chunsuthiwat, Supamitr, ed. 2001. Clinical Practice Guideline for Infectious Disease. Vol.1 Leptospirosis by Working Group on Clinical Practice Guideline for Leptospirosis. Bangkok: Lothong Master Print Co., Ltd.
- Sa Kaeo Provincial Agriculture Office. 2000. Agricultural Data Base of Sa Kaeo Province, 2000. Sa Kaeo: Sa Kaeo Provincial Agriculture Office. Photocopied.
- Sa Kaeo Provincial Health Office. 2000. Annual Epidemiological Surveillance Report, Sa Kaeo Province, 2000. Sa Kaeo: Sa Kaeo Provincial Health Office. Photocopied.
- Tangkanakul, Waraluk, Tharma phompil, Piyanit, Plikaytis, D. Brian, and Bragg, Sandra, eds. 2000. Risk Factors Associated with Leptospirosis in Northeastern Thailand 1998. American Journal of Tropical Medicine and Hygiene. 63 (March-April): 204-8.
- Tangkanakul, Waraluk, Naikowit, Pimjai, Samitrsuwan, Pannarai, and Kaeomarang, Pravit, eds. 2000. Prevalence of Asymptomatic Leptospirosis Infection among High Risk Group, 1998. Journal of Health Science. 9 (January – March): 56-61.
- Tisayathikhom, Ganjana, and Thonimitr, Deungnet, 2000. Unit Cost Analysis of Public Health Facilities in 6 Provinces, Fiscal Year 2000, Under the Social Investment Project (SIP). Bangkok: Office Health Insurance, Ministry of Public Health.

APPENDICES

Appendix A

An average cost per pair of the protective boot, year 2000

Procurement	Number of boot (Boots)	Amount of Baht (Baht)
1	142,875	20,000,000.00
2	166,667	20,000,000.00
3	85,275	11,935,980.00
4	35,714	4,999,960.00
Sum	430,531	56,935,940.00

$$\bar{X} = \frac{56,935,940.00}{430,531} = 132.24, \text{ S.D.} = 9.9923$$

Source: Office of Leptospirosis Control, Dept. of CDC, 2000

Appendix B

An average medical cares cost for treatment, length of stay, 2nd visit rate of 30 leptospirosis patients, Sa Kaeo Crown Prince Hospital, year 2000.

Table B-1 An average medical cares cost, length of stay, and 2nd visit rate for mild cases.

Pt	Sex	Admitted date (yr 2000)	Discharge date (yr 2000)	LOS (Days)	Medical cares cost at current charge prices (Baht)							
					1 st visit			2 nd visit				
					Total	Lab	Radiological Diagnosis	Drugs & medical supplies	Total	Lab	Drugs & medical supplies	
1	M	Sep 21	-	-	-	210.00	-	36.60	-	210.00	38.00	
2	M	Oct 20	-	-	-	210.00	-	141.60	-	-	-	
3	M	Nov 20	-	-	-	210.00	-	30.60	-	-	-	
X (S.D.)						210.00 (0.00)	-	69.60 (62.43)		210.00 (0.00)	38.00 (0.00)	
Adjusted charge						287.38	226.86	-	60.52	259.90	226.86	33.04

2nd visit rate = 33.33%

Table B-2 An average medical cares cost, length of stay, and 2nd visit rate for moderate cases.

Pt	Sex	Admitted date (yr 2000)	Discharge date (yr 2000)	LOS (Days)	Medical cares cost at current charge prices (Baht)						
					1 st visit			2 nd visit			
					Total	Lab	Radiological Diagnosis	Drugs & medical supplies	Total	Lab	Drugs & medical supplies
1	M	Apr 28	May 2	5	1,900.00		150.00	223.43	160.00		12.50
2	M	Jul 13	Jul 19	7	1,930.00		-	947.00	-		-
3	F	Jul 20	Jul 24	5	1,610.00		-	796.38	100.00		18.50
4	M	Jul 22	Sep 1	11	2,570.00		-	1,003.05	240.00		26.00
5	M	Jul 24	Aug 2	10	2,450.00		150.00	1,398.60	-		3.00
6	M	Jul 24	Jul 30	7	1,750.00		800.00	965.74	-		-
7	M	Jul 26	Aug 2	8	3,790.00		950.00	1,630.05	-		36.50
8	M	Jul 31	Aug 4	5	930.00		-	462.00	-		-
9	M	Aug 3	Aug 8	6	1,630.00		-	905.73	-		213.50
10	M	Aug 4	Aug 9	6	1,670.00		-	429.33	-		-

Table B-2 Continued.

Pt	Sex	Admitted date (yr 2000)	Discharge date (yr 2000)	LOS (Days)	Medical cares cost at current charge prices (Baht)						
					1 st visit			2 nd visit			
					Total	Lab	Radiological Diagnosis	Drugs & medical supplies	Total	Lab	Drugs & medical supplies
11	M	Aug 5	Aug 8	4	370.00	-	-	584.68	-	-	3.00
12	M	Aug 21	Aug 24	4	2,050.00	800.00	800.00	218.18	520.00	-	15.60
13	M	Aug 29	Sep 13	16	4,430.00	800.00	800.00	2,908.09	-	-	-
14	M	Sep 14	Sep 20	7	1,970.00	150.00	150.00	531.23	-	-	-
15	M	Sep 17	Sep 26	10	820.00	-	-	783.03	220.00	-	266.40
16	M	Sep 19	Sep 25	7	1,930.00	-	-	904.17	-	-	-
17	M	Sep 25	Sep 27	3	1,070.00	-	-	207.05	-	-	-
18	M	Oct 27	Oct 31	5	1,710.00	150.00	150.00	372.76	-	-	-
19	M	Oct 31	Nov 10	12	4,390.00	1,100.00	1,100.00	1,730.93	520.00	-	256.10
20	F	Nov 2	Nov 4	3	870.00	-	-	296.63	-	-	-

Table B-2 Continued

Pt	Sex	Admitted date (yr 2000)	Discharge date (yr 2000)	LOS (Days)	Medical cares cost at current charge prices (Baht)						
					1 st visit			2 nd visit			
					Total	Lab	Radiological Diagnosis	Drugs & medical supplies	Total	Lab	Drugs & medical supplies
21	M	Nov 9	Nov 13	5	2,040.00		150.00	2,107.63	-	-	
22	F	Nov 15	Nov 22	8	1,930.00		150.00	1,182.29	-	-	
23	M	Nov 17	Dec 5	19	5,740.00		450.00	5,873.32	-	159.80	
24	F	Nov 19	Nov 23	5	1,660.00		-	853.39	-	-	
25	F	Nov 23	Nov 27	5	980.00		-	561.64	-	173.00	
—											
X (S.D.)				7.32	2,087.60	483.33	1,115.05		293.33	98.66	
				(3.89)	(1,261.79)	(377.39)	(1180.96)		(182.28)	(105.99)	
Adjusted charge					3,722.38	2,255.16	497.61	969.61	402.67	316.88	85.79

2nd visit rate = 48.00%

Table B-3 An average medical cares cost, length of stay, and 2nd visit rate for severe cases.

Pt	Sex	Admitted date (yr 2000)	Discharge date (yr 2000)	LOS (Days)	Medical cares cost at current charge prices (Baht)						
					1 st visit			2 nd visit			
					Total	Lab	Radiological Diagnosis	Drugs & medical supplies	Total	Lab	Drugs & medical supplies
1.	M	Jul 15	Jul 16	2	740.00	-	-	659.58	-	-	-
2.	M	Oct 5	Oct 6	2	710.00	-	-	-	-	-	-
—											
X (S.D.)				2.00	725.00	-	-	659.58	-	-	-
				(0.00)	(21.21)			(0.00)			
Adjusted charge					1,356.74	783.19	-	573.55	-	-	-

2nd visit rate = 0%

Appendix C

Hospital medical price list (Charged price), Sa Kaeo Crown Prince Hospital, year 2000.

Medical items	Price (Baht/Unit)
1. Drugs & medical supplies	
1.1 Air-X	0.97
1.2 Aluminium hydroxide, Magnesium hydroxide 240 ml.	21.28
1.3 Amoxicillin 500 mg.	3.61
1.4 Atarax 10 mg.	2.00
1.5 Augmentin 375 mg	9.35
1.6 B1-6-12	0.50
1.7 Bamolin	0.56
1.8 B-Complex	0.15
1.9 Brufen 400 mg	3.00
1.10 CaCO ₃ 625 mg	0.57
1.11 Chlorpheniramine 4 mg	0.07
1.12 Cimetidine 400 mg.	0.70
1.13 Cinnarizine 25 mg	0.28
1.14 Clotrimazole	0.88
1.15 Cloxacillin 500 mg.	1.85
1.16 Cyprobay	0.25
1.17 Diasgest	0.46
1.18 Diazepam 2 mg.	0.13
1.19 Diazepam 5 mg.	0.19
1.20 Diclofenac 25 mg	7.29
1.21 Doxycycline 100 mg.	1.33
1.22 F B C	0.30
1.23 Gential Violet 30 ml.	3.65
1.24 Indocid 25 mg	0.30
1.25 KCL 500 mg	0.78

	Medical items	Price (Baht/Unit)
1.26	KCL Elixir 60 ml.	8.38
1.27	Kremil-S	0.74
1.28	Lactulose 60 cc.	43.00
1.29	Lasix 40 mg.	0.35
1.30	Lasix 500 mg.	23.00
1.31	Lipochol	2.02
1.32	Lorazepam .5 mg.	0.28
1.33	Lorazepam 1 mg.	0.40
1.34	Lorazepam 2 mg.	0.80
1.35	Metronidazole 200 mg.	0.39
1.36	MOM 60 ml.	5.00
1.37	Domperidone 10 mg	0.85
1.38	MTV	0.29
1.39	Mydocalm 50 mg	0.60
1.40	NaHCO ₃	2.00
1.41	Neotiga balm 25 g	16.00
1.42	Norfloxacin 400 mg.	1.50
1.43	Norgesic	0.60
1.44	Omnicef 100 mg	34.50
1.45	ORS	3.65
1.46	Paracetamal 500 mg.	0.20
1.47	Plasil	0.23
1.48	Prednisolone 5 mg.	0.44
1.49	Ranitidine 150 mg	2.50
1.50	Roxithromycin 150 mg.	3.00
1.51	Tranxene 5 mg	0.40
1.52	7.5 % Na HCO ₃ 50 ml	26.00
1.53	Amikacin 250 mg/2ml	40.00

Medical items	Price (Baht/Unit)
1.54 Ampicillin 1 g.	18.24
1.55 B1-6-12	3.13
1.56 B-Complex	2.00
1.57 Ceftriaxone 1 g.	56.25
1.58 Chlorpheniramine 10 mg/ml	2.80
1.59 Cimetidine 200 mg/2ml	7.35
1.60 Claforan 1 g.	50.00
1.61 Diclofenac 75 mg/3ml	3.75
1.62 Digoxin 0.25 mg/ml	41.46
1.63 Dopamine 250 mg/10ml	90.00
1.64 Gentamicin 80 mg/2ml	6.69
1.65 Haloperidol 5 mg/ml	12.38
1.66 Heparin Sodium 25,000 u/5ml	118.75
1.67 Hydrocortisone 100 mg/5ml	64.20
1.68 Hyoscine-N-butylbromide 20 mg/ml	17.39
1.69 KCL 20 Meq.	6.25
1.70 Lasix 20 mg/2ml	6.03
1.71 Lasix 250 mg/25ml	111.01
1.72 Metronidazole 0.5%	26.25
1.73 Penicillin G. Sodium 1.0 mu.	10.33
1.74 Penicillin G. Sodium 5.0 mu.	21.88
1.75 Plasil 10 mg/2ml	3.35
1.76 Ranitidine 50 mg/2ml	16.25
1.77 Sterrile water for injection 10 ml	3.00
1.78 Vitamin B1	3.00
1.79 Vitamin K 10 mg/ml	4.68
1.80 D-5-N/2 1,000 ml.	16.25
1.81 D-5-NSS 1,000 ml.	16.25

Medical items	Price (Baht/Unit)
1.82 D-5-NSS 500 ml.	13.20
1.83 D-5-NSS/2 1,000 ml.	13.75
1.84 D-5-W 100 ml.	13.75
1.85 D-5-W 500 ml.	13.75
1.86 0.9% NSS 1,000 ml.	17.50
1.87 0.5% Bupivacaine	163.18
1.88 PRC/FFP (Cross matching, Screening & Preparing)	900.00
1.89 Blood Transfusion Set	38.79
1.90 Cut-down No. 6	18.75
1.91 Endo tube	157.50
1.92 Extension tube	11.68
1.93 Foley catheter No. 16	27.50
1.94 Heparin lock	21.00
1.95 I.V. Set	8.21
1.96 Infusion Set	81.25
1.97 Intravenous catheter No. 18	28.00
1.98 Intravenous catheter No. 20	28.00
1.99 Intravenous catheter No. 22	28.00
1.100 NG-tube No. 16	18.75
1.101 O ₂ bag	58.00
1.102 T-way	21.25
1.103 Unison enema	46.25
1.104 Urine bag	19.38
1.105 Urine condom	23.00
2. Radiological diagnosis	
2.1 Pain KUB	150.00

Medical items	Price (Baht/Unit)
2.2 Ultrasound Upper Abdomen (kidney)	800.00
2.3 Chest X-ray	150.00
3. Laboratories	
3.1 BUN	60.00
3.2 CBC	60.00
3.3 CPK	100.00
3.4 Creatinine	60.00
3.5 Dengue virus-Ab.	200.00
3.6 Electrolyte	240.00
3.7 Hct	20.00
3.8 HIV-Ab (Screening)	200.00
3.9 LDH	100.00
3.10 Leptospirosis Ab.	100.00
3.11 LFT	420.00
3.12 Malaria	40.00
3.13 PT	60.00
3.14 PTT	60.00
3.15 Stool examination (Routine)	40.00
3.16 Urine analysis (Routine)	50.00
3.17 Urine culture (Specific test)	160.00
3.18 Weil-felix test	80.00
3.19 Widal's test	100.00

Appendix D

Form for collecting individual medication

Form No.....

Name..... H.N..... A.N.....

Sex..... Age(yr)..... Admitted date..... Discharged date.....

Item	Medical items	1 st visit		2 nd visit	
		Amount	Number	Amount	Number
1. Drugs & medical supplies					
1.1	Air-X	.....	.....	.....	.....
1.2	Aluminium hydroxide, Magnesium hydroxide 240 ml.	.....	.....	.....	.....
1.3	Amoxicillin 500 mg.	.....	.....	.....	.....
1.4	Atarax 10 mg.	.....	.....	.....	.....
1.5	Augmentin 375 mg	.....	.....	.....	.....
1.6	B1-6-12	.....	.....	.....	.....
1.7	Bamolin	.....	.....	.....	.....
1.8	B-Complex	.....	.....	.....	.....
1.9	Brufen 400 mg	.....	.....	.....	.....
1.10	CaCO ₃ 625 mg	.....	.....	.....	.....
1.11	Chlorpheniramine 4 mg	.....	.....	.....	.....
1.12	Cimetidine 400 mg.	.....	.....	.....	.....
1.13	Cinnarizine 25 mg	.....	.....	.....	.....
1.14	Clotrimazole	.....	.....	.....	.....
1.15	Cloxacillin 500 mg.	.....	.....	.....	.....
1.16	Cyprobay	.....	.....	.....	.....
1.17	Diasgest	.....	.....	.....	.....
1.18	Diazepam 2 mg.	.....	.....	.....	.....
1.19	Diazepam 5 mg.	.....	.....	.....	.....

Item	Medical items	1 st visit*		2 nd visit	
		Amount	Number	Amount	Number
1.20	Diclofenac 25 mg	.....	.....	.....	.....
1.21	Doxycycline 100 mg.	.....	.....	.....	.....
1.22	F B C	.....	.....	.....	.....
1.23	Genital Violet 30 ml.	.....	.....	.....	.....
1.24	Indocid 25 mg	.....	.....	.....	.....
1.25	KCL 500 mg	.....	.....	.....	.....
1.26	KCL Elixir 60 ml.	.....	.....	.....	.....
1.27	Kremil-S	.....	.....	.....	.....
1.28	Lactulose 60 cc.	.....	.....	.....	.....
1.29	Lasix 40 mg.	.....	.....	.....	.....
1.30	Lasix 500 mg.	.....	.....	.....	.....
1.31	Lipochol	.....	.....	.....	.....
1.32	Lorazepam .5 mg.	.....	.....	.....	.....
1.33	Lorazepam 1 mg.	.....	.....	.....	.....
1.34	Lorazepam 2 mg.	.....	.....	.....	.....
1.35	Metronidazole 200 mg.	.....	.....	.....	.....
1.36	MOM 60 ml.	.....	.....	.....	.....
1.37	Domperidone 10 mg	.....	.....	.....	.....
1.38	MTV	.....	.....	.....	.....
1.39	Mydocalm 50 mg	.....	.....	.....	.....
1.40	NaHCO ₃	.....	.....	.....	.....
1.41	Neotiga balm 25 g	.....	.....	.....	.....
1.42	Norfloxacin 400 mg.	.....	.....	.....	.....
1.43	Norgesic	.....	.....	.....	.....
1.44	Omnicef 100 mg	.....	.....	.....	.....
1.45	ORS	.....	.....	.....	.....
1.46	Paracetamal 500 mg.	.....	.....	.....	.....

Item	Medical items	1 st visit		2 nd visit	
		Amount	Number	Amount	Number
1.47	Plasil	.....	.....	.....	.....
1.48	Prednisolone 5 mg.	.....	.....	.....	.....
1.49	Ranitidine 150 mg	.....	.....	.....	.....
1.50	Roxithromycin 150 mg.	.....	.....	.....	.....
1.51	Tranxene 5 mg	.....	.....	.....	.....
1.52	7.5 % Na HCO ₃ 50 ml	.....	.....	.....	.....
1.53	Amikacin 250 mg/2ml	.....	.....	.....	.....
1.54	Ampicillin 1 g.	.....	.....	.....	.....
1.55	B1-6-12	.....	.....	.....	.....
1.56	B-Complex	.....	.....	.....	.....
1.57	Ceftriaxone 1 g.	.....	.....	.....	.....
1.58	Chlorpheniramine 10 mg/ml	.....	.....	.....	.....
1.59	Cimetidine 200 mg/2ml	.....	.....	.....	.....
1.60	Claforan 1 g.	.....	.....	.....	.....
1.61	Diclofenac 75 mg/3ml	.....	.....	.....	.....
1.62	Digoxin 0.25 mg/ml	.....	.....	.....	.....
1.63	Dopamine 250 mg/10ml	.....	.....	.....	.....
1.64	Gentamicin 80 mg/2ml	.....	.....	.....	.....
1.65	Haloperidol 5 mg/ml	.....	.....	.....	.....
1.66	Heparin Sodium 25,000 u/5ml	.....	.....	.....	.....
1.67	Hydrocortisone 100 mg/5ml	.....	.....	.....	.....
1.68	Hyoscine-N-butylbromide 20 mg/ml	.....	.....	.....	.....
1.69	KCL 20 Meq.	.....	.....	.....	.....
1.70	Lasix 20 mg/2ml	.....	.....	.....	.....
1.71	Lasix 250 mg/25ml	.....	.....	.....	.....

Item	Medical items	1 st visit		2 nd visit	
		Amount	Number	Amount	Number
1.72	Metronidazole 0.5%	.....	.....	.....	.....
1.73	Penicillin G. Sodium 1.0 mu.	.....	.....	.....	.....
1.74	Penicillin G. Sodium 5.0 mu.	.....	.....	.....	.....
1.75	Plasil 10 mg/2ml	.....	.....	.....	.....
1.76	Ranitidine 50 mg/2ml	.....	.....	.....	.....
1.77	Sterile water for injection 10 ml	.....	.....	.....	.....
1.78	Vitamin B1	.....	.....	.....	.....
1.79	Vitamin K 10 mg/ml	.....	.....	.....	.....
1.80	D-5-N/2 1,000 ml.	.....	.....	.....	.....
1.81	D-5-NSS 1,000 ml.	.....	.....	.....	.....
1.82	D-5-NSS 500 ml.	.....	.....	.....	.....
1.83	D-5-NSS/2 1,000 ml.	.....	.....	.....	.....
1.84	D-5-W 100 ml.	.....	.....	.....	.....
1.85	D-5-W 500 ml.	.....	.....	.....	.....
1.86	0.9% NSS 1,000 ml.	.....	.....	.....	.....
1.87	0.5% Bupivacaine	.....	.....	.....	.....
1.88	PRC/FFP (Cross matching, Screening & Preparing)	.....	.....	.....	.....
1.89	Blood Transfusion Set	.....	.....	.....	.....
1.90	Cut-down No. 6	.....	.....	.....	.....
1.91	Endo tube	.....	.....	.....	.....
1.92	Extension tube	.....	.....	.....	.....
1.93	Foley catheter No. 16	.....	.....	.....	.....
1.94	Heparin lock	.....	.....	.....	.....
1.95	I.V. Set	.....	.....	.....	.....
1.96	Infusion Set	.....	.....	.....	.....

Item	Medical items	1 st visit*		2 nd visit	
		Amount	Number	Amount	Number
1.97	Intravenous catheter No. 18	.....	.....	.....	.....
1.98	Intravenous catheter No. 20	.....	.....	.....	.....
1.99	Intravenous catheter No. 22	.....	.....	.....	.....
1.100	NG-tube No. 16	.....	.....	.....	.....
1.101	O ₂ bag	.....	.....	.....	.....
1.102	T-way	.....	.....	.....	.....
1.103	Unison enema	.....	.....	.....	.....
1.104	Urine bag	.....	.....	.....	.....
1.105	Urine condom	.....	.....	.....	.....
		-----		-----	
	Total	.....		.....
		-----		-----	
2.	Radiological diagnosis	.....	.....	.....	.....
2.1	Pain KUB	.....	.....	.....	.....
2.2	Ultrasound Upper Abdomen (kidney)	.....	.....	.....	.....
2.3	Chest X-ray	.....	.....	.....	.....
		-----		-----	
	Total	.....		.....
		-----		-----	
3.	Laboratories	.....	.....	.....	.....
3.1	BUN	.....	.....	.....	.....
3.2	CBC	.....	.....	.....	.....
3.3	CPK	.....	.....	.....	.....
3.4	Creatinine	.....	.....	.....	.....
3.5	Dengue virus-Ab.	.....	.....	.....	.....
3.6	Electrolyte	.....	.....	.....	.....

Item	Medical items	1 st visit		2 nd visit	
		Amount	Number	Amount	Number
3.7	Hct	.....	.....	.....	.....
3.8	HIV-Ab (Screening)	.....	.....	.....	.....
3.9	LDH	.....	.....	.....	.....
3.10	Leptospirosis Ab.	.....	.....	.....	.....
3.11	LFT	.....	.....	.....	.....
3.12	Malaria	.....	.....	.....	.....
3.13	PT	.....	.....	.....	.....
3.14	PTT	.....	.....	.....	.....
3.15	Stool examination (Routine)	.....	.....	.....	.....
3.16	Urine analysis (Routine)	.....	.....	.....	.....
3.17	Urine culture (Specific test)
3.18	Weil-felix test
3.19	Widal's test
	
	Total

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